CER Comparative European Research 2020

Proceedings | Research Track

of the 14th Biannual
CER Comparative European Research
Conference

International Scientific Conference for Ph.D. students of EU countries

October 26-28, 2020 | London

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Introduction

The conference Proceedings you are holding is a collection of selected peer-reviewed texts presented at the international scientific conference Comparative European Research - CER 2020 (October 26-28).

The biannual international scientific conference is organized under the auspices of the SCIEMCEE scientific platform every March and October and follows up on activities aimed at providing greater support for the scientific activities of Ph.D. students and beginning researchers. The various biannual CER conferences represent a space for the international assessment of the qualitative standard of scientists and the results achieved by the various academic institutes. The CER conference is an ideal place for comparing the standard of scientific work, particularly on a European scale.

The Proceedings from the CER 2020 conference contains several dozen academic texts whose main purpose is the presentation and sharing of knowledge always in one of nine conference sections. The conference Proceedings prioritize only those articles which are good enough to offer readers new insights into the issues analyzed, or which extend the known boundaries of science. The guarantor of the CER 2019 conference is a signatory of the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, and therefore all papers are made available to professionals and the general public via OpenAccess.

The conference committee, comprising experts from several university departments, believes that the CER international scientific conference will attract an ever wider base of participants to join in the discussions and will stimulate further scientific work and interdisciplinary development.

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Table of Contents

Session: Management, Marketing

Session: Economy, Financing, Public Administration

Session: Industrial Engineering, Innovations

Session: Applied Informatics

Session: Natural Sciences

Session: Medical Sciences

Session: Pedagogy, Psychology

Session: History, Sociology

Session: Management, Marketing

Index of Author(s)

THEORETICAL EXAMINATION OF TRUST AND SOCIAL POWER AS A COMMON VALUE OF LEADERSHIP FOR SUPERVISOR AND SUBORDINATE

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Abstract: *While researching the influence of the use of social powers onto the trust behaviour in a business relationship between supervisor and subordinate, different models and relations between the terms trust and power had been found. One remarkable finding is that none of them reflecting the situation of both parties by its own and just combining the results at the end. The author defined the circumstances of their trust behaviour, same as the social powers they have both in a two-person relationship, on basis of a literature research and defined a theoretical model. The circumstances of supervisor, subordinate, social power and trust is defined in different equations to visualize an outcome that reflects the high importance of trust in a two-person business relationship with different hierarchy level. It shows that the use of trust has a doubling effect, which is promising a potential higher output than the use of social power alone.*

Keywords: *trust, social power, confidence, leadership*

1. Introduction

The relation of trust and power is often brought into relation and seems to be so important, that well-known standard works same as Luhmann‘s Trust and Power from 1979 [1] actually started in a new edition, aside of new words of introduction. Independent of that also this standard work is a combination of two separated books: „Trust“ and „Power“. That could be a reason, why these terms are defined more separate than in a relation and many researchers all over the world try to combine them, until today. Möllereing interprets the connection of these two books as follow: “Regarding trust and power, we may actually have to complete Luhmann’s work for him, as it were, because he left only hints, at best, on how they are related.” [2] Many authors researched in the meanwhile this relation and most authors based their research on the social powers of French&Raven [3] in their various differentiations. The item trust itself is researched in different kind research(-ers) direction.

Independent of that, often in literature the term of an asymmetric between trust and power is found, independent if defined as a model or just by interpretation of the results of the researchers, who showed a negative correlation between the coercive power and the term trust. Coercive power which is often mentioned with others powers, defined as negative powers. Positive and negative powers are defined in so much different ways that a continuous term seems not possible, but at least about the definition that coercive power is a negative power, seems to be a general consensus.

2. Theoretical examination

The described asymmetric function can be seen in the research of Jäckel, but it is described by others, too.

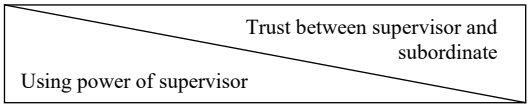

Figure 1: Relationship between trust and power in a supervisor/subordinate relationship [4]

The idea behind this model is, that the more trust is available, the less (negative) power is needed to get the action, the supervisor wants to have. [5]

This asymmetric situation is not only available on the supervisor side. It is also in a similar architecture on the subordinate side existing. It’s similar and only in very specific situations the same, because the difference between a supervisor and a subordinate are the different levels of power. On the one side, the supervisor has power about the subordinate. This is the normal situation of a supervisor/subordinate relationship with different hierarchy levels in business or other situations. The subordinate has in a normal case no huge power about the supervisor, but also this person is or can be an owner of power about the supervisor. E.g. can the subordinate cancel his job, what the supervisor wants to avoid. So, this is also some kind of coercive power a subordinate can use or threaten, if the supervisor doesn’t act as expected. As said before, the bigger power comes from the supervisor, but the subordinate has the possibility to use social power, too. In a boundary case it can be that a subordinate has the same power than the supervisor, because the subordinate is a good friend of the owner or is a specialist, who is same or more important for the company than the supervisor. So independent from the case and the relationship, the subordinate can have power. The question is just, if the subordinate will use it. If the power will be used from the subordinate against the supervisor, the power of the supervisor decreases and the leadership relationship decreases as well.

This effect is very important for the later definition of the behaviour of the subordinate.

Trust exists between two persons and has the effect, that a steady-state trust relationship has on both sides the same value. Each reaction of the person who gets trust has an effect to the person who gives trust and on the trust level itself. Due to this reciprocal effect, the trust level increases or decreases at both persons at the end to a similar level. This is also a well known process out of the Leadership research area. E.g. the LMX-theory takes supervisor and subordinate in a dyadic role making system and in these cycles, both sides negotiate with their acts and expectations, unless they come to a common basis. This is same as Lewin [6] defined many years before, behaviour is a function of interaction and the environment. With environment is especially meant the important social influencing values, which are also a part of the leadership process.

But also Wimmer recommended, to stop trust if it's just a one sided relationship. For sure in a business relationship it can be that in the beginning one person trusts very much the other person, but the other person didn't or just less trusts the first person. But this is just an effect at the beginning. At the end, the trust level from both sides get closer, so that they have the same level at the end. A look at the boundary cases show, that if one person does not trust the second person, then also the second person will not trust the first one. In the other boundary, if one person trusts after many meetings and time the second person, this person will trust the first person. For sure this effect is slightly different in organizational trust, but if two person have a relationship, same as supervisor and subordinate, the trust level of both have a similar level and makes things more effective, than just working with power.

By adding these two behaviours of supervisor and subordinate, the power of the leadership in this special relation can be visualized.

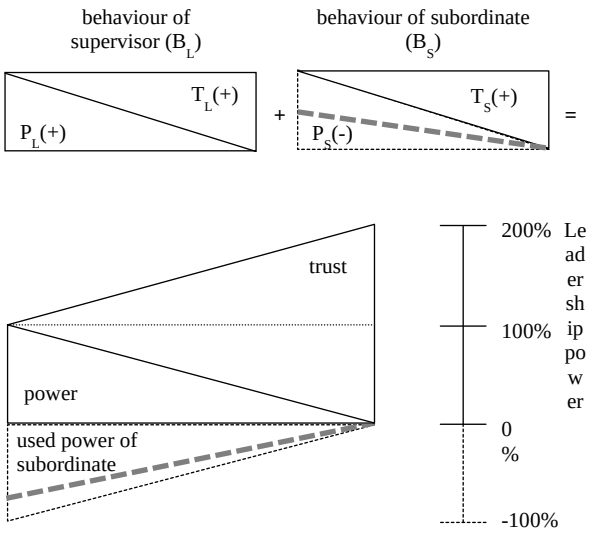

Figure 2: model of leadership power (by author)

Leader same as subordinate have the possibility to trust the opposite side by 0% up to 100%. This means by this asymmetric model, that the leader uses the power from 100% down to 0%

The subordinate can use all the power he has, in case he does not trust (0%) the leader but it is not a must for him. On the other side, as mentioned before in normal case the potential power he can use is in most of the cases lower than the one from the supervisor, but it can be 100%, too.
The situation that the subordinate has power about the supervisor can be also seen in Emerson's Power-Dependence Theory [7]. The difference to a normal exchange-theory can be seen in Nienhüser's description [8]. He defines the basics of this theory in three terms:

a) The power of person A (supervisor) to person B (subordinate) is defined, as the dependence of person B to person A
b) The dependence of person B to person A is the bigger, the more important the resource of person A for person B is and the less person B has the possibility to get onto this resources outside the relationship to person A. (other way around is the same)
c) The more person B is dependence to person A, the more it is possible for person A to conquer a potential resistance of person B and to get an advantage result for person A. So the degree of power is defined as the effort that person A gets from person B, or in other words, the more effort person B does for person A, the more power person A has to person B. Independent of that, if the subordinate uses its power against the leader, the level of the leadership will decrease. The above shown model shows this power of the subordinate as a minus value, because of the theory, that this power is negative related to the power of the leader. In normal case also the power of the leader is bigger than the one of the subordinate, that's why the overall power value cannot be negative. In theoretical, the power of the subordinate can be higher than the one of the supervisor and the result can be negative, but in this case this is a clear indicator that the supervisor/subordinate relationship will not work. The trust itself is decreasing by the same factor. The opposite side gives trust and ends at this point, when a total trustful relationship, without power, is reached. This trustful situation is then also more effective, than a leadership with power only. That's why the overall level of the leadership is higher on the right than on the left side. As an alternative and a little more complex model, trust can be seen in this model as the result, the use of special powers creates. In best case the supervisor leads with the five powers by creating a maximum of trust. This would be the best situation, because trust has a doubling effect in the leadership scale. Compared this model with the asymmetric model of Jäckel, the influence of trust in a leadership relationship is more visible, because the trust and power of the subordinate is integrated, and it shows,

that if the leader uses more trust instead of power, the level of its leadership increases.

This effect is described in the below shown equations.
The behaviour of the leader (B_L) is the asymmetric function and the sum of its use of trust (P_L) and power (P_L), which gives 100% of its leadership behaviour.

$$B_L = T_L + P_L = 100\%$$

The behaviour of the subordinate (B_S) is also the sum of trust (T_S) and power (P_S), but its use of power has a negative effect as described before and so the sum of its part of the leadership behaviour can be 100% in best case, but it also can be lower.

$$B_S = T_S - P_S \leq 100\%$$

In the next steps the leadership level (η_L) is defined by the sum of both, leader and subordinate behaviour.

$$\eta_{L(f=T,P)} = B_L + B_S$$
$$\eta_{L(f=T,P)} = T_L + P_L + T_S - P_S$$

Based on the meaning of Zand [9], is the level of trust depending on both sides and a learning effect, which results in the situation, that the trust situation from leader (T_L) and subordinate (T_S) have a similar level or value after time. [Requirement (1) $T_L = T_S = T$] That is why the trust of the subordinate (T_S) can be replaced by the trust value of the leader (T_L). This definition of the maximum of trust can go in both directions, because the leader defines the situation with its leadership behaviour, or better to say with its use of power, the maximum share of the maximum possible trust. But if the subordinate doesn't accept the remaining level of trust, it will decrease further and so the maximum level of trust is depending on subordinate or supervisor side and can be named as trust (T), independent of the relation side. E.g. if the leader just uses a small share of trust, the subordinate has no chance to increase the share of trust between both, if the leader does not want to do so, but the subordinate can further decrease the trust level. Opposite direction is the same. The leader is the beginner to create trust.[10]

$$\eta_{L(f=T,P)} = T + P_L + T - P_S \quad (1)$$
$$\eta_{L(f=T,P)} = 2\,T + P_L - P_S$$

At this stage of equation it can be visualized theoretical, that the trust-side has an higher positive influence on the effective level of leadership based on trust and power, than the power side, which just has the half positive influence from the side of the leader and can be further negative influenced from potential power of the subordinate side.

For further information the trust of the leader (T) can be replaced by the before mentioned function, that the use of trust (T_L) and power (P_L) of the leader gives 100% of its leadership behaviour. This is the basis of its own leadership behaviour. [Requirement (2) $T_L = 100\%\ B_L - P_L$ ($T_L + P_L = 100\%\ B_L$)]

$$\eta_{L(f=T,P)} = 2\,(100\%\ B_L - P_L) + P_L - P_S \quad (2)$$
$$\eta_{L(f=T,P)} = 200\%\ B_{L(f=T)} - 2P_L + P_L - P_S$$
$$\eta_{L(f=T,P)} = 200\%\ B_{L(f=T)} - P_L - P_S$$

At the end it is visible, that the leader can reach the best result for the leadership level ($\eta_{L(f=T,P)}$), by doubling its own leadership performance ($B_{L(f=T)}$), by minimizing its own Leadership power (P_L) and creating, same as using trust. The result is same than in the discussed model that the maximum leadership level between a leader and a subordinate can be just reached, if the use of power will be minimized.

It has to remarked that from authors point of view the term power, called in this leadership model can be used in different directions:

- as a negative power, same as coercive, which would mean it is the opposite side of trust, or
- as the remaining part of power, for which it was not able to create a trust situation. This is in line with the main hypothesis of the author, that the special use of power can create a high trust relationship.

3. Conclusions

Trust as the topic of research is according to scientists, supervisors and subordinates of all levels, in German speaking countries same as international, highly relevant and undeniable important in the leadership of today, which increases the necessity to research of its relation to the management tools of today. Trust and leadership belong to each other, this is independent of former experiences with their own supervisors. Specialists say: " A leader is not able to lead without trust." "I employ people by checking factors same as knowledge, personality, marks, etc. but if there is not a first feeling of having trust to the person, all other points are not relevant." "Trust in leadership gives loyalty in both directions, flexibility, good salary, good working atmosphere." "Trust is essential for leadership, otherwise I just have to control which is not efficient." In the asymmetric function of trust and social power is trust not only the opposite component of the social power. It can be also the result of the specific use of the social powers and the share of social power shows the remaining part of social power, which can be optimized to reach the maximum of trust.

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THE IMPACT OF POOR SUPERVISOR SUPPORT ON BURNOUT – A CONTRIBUTION TO THE ISSUE OF HEALTH ORIENTED LEADERSHIP

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Abstract: *The development of a health-oriented leadership style is complex. It requires the change of health-related values which provide orientation for the perception of the employees. This is, on the one hand the only way to sharpen employees' awareness of the sickening effects of excessive and insufficient demands, on the other hand, inspiring, supportive and motivating behavior is lowering burnout symptoms. Health-promoting leadership and the associated social support requires the professional competence and social skills of superiors. Based on the feedback of test persons in the context of a quantitative study (N=338), the effect of social support (perceived support) by the direct superior on the three burnout dimensions according to Maslach was examined. The German version (MBI-D) of the Maslach Burnout Inventory and the SPSS (Scale of Perceived Supervisor Support) were used. According to the initial assumptions at project start, a significant correlation in the dimensions "emotional exhaustion" & "reduced personal accomplishment" could be identified. Thus, individuals with a higher perceived social support from their supervisors tend to have higher burnout symptoms than individuals having a lower supervisor support perception. The findings are particularly interesting for the higher education sector as well as for Human Resources Management or within the framework of Occupational Health Management.*

Keywords: *burnout, perceived supervisor support, health-oriented leadership*

Introduction

In this paper, supervisor support offered in the dyad between the leader and the guided, with its impact on the three burnout dimensions is in the focus. In return, and in case of a positive evaluation of social support given, the supervisor in a dyadic relationship receives a higher degree of loyalty from his employee, more commitment to the goals of the organization and a greater willingness to take on duties and unpleasant tasks.[1] [2] In accordance with the relevant literature on support research and a veritable flood of reports in this field, in this paper it is assumed that dyadic employee-supervisor relationships in particular, initiate a process of mutual investment in professional activity, in which the full development potential of the interpersonal relationship is released. This results in contributions to team performance that go beyond the basic contributions and contribute decisively to team success.[3] But whether employees cooperate and show the aforementioned loyalty, depends largely on even if supervisors act as a resource and this is also perceived as such by the employees. Thus, managers who hardly or not at all show supportive behavior, who focus one-sidedly on the achievement of objectives and not on the needs of the employees, who exercise strong control, withhold information or deal with employees in a destructive way, are less a resource than a burden.[4] Studies confirm the link between social support by the supervisor and sickness absence as well as early retire-ment.[5] In conclusion, social support from supervisors has a positive influence on the employees' perception of stress [6], burnout symptoms [7], job satisfaction [8] and mental health.[9] The transition from a stress orientation to a resource-oriented perspective offers numerous starting points for health promotion and a health oriented leadership style. Thus, socially supportive behavior of superiors can be described as a very important resource[1] in the company context.

1. Perceived social Support and the Main-Effect Model

The mere assumption of being supported can increase the general well-being of the supported person (perceived social support). According to KAHN, HESSLING & RUSSEL, subjective conviction to have a high degree of support leads to the greatest degree of personal well-being - regardless of whether the perceived support can be taken advantage of.[10] In this study it is assumed that, as a result, there will be also fewer burnout symptoms among the employees concerned. The main-effect (direct-effect) model of social support states that social support contributes to the satisfaction of basic social needs (e. g. bonding, contact, sociability) and thus also to mental health and burnout prevention. Because a person is involved in a system of social relationships, there are direct effects on general well-being. NESTMANN considers direct effects to be unintentional *„by-products and side effects of every-day life"*.[11] Social support is thus ascribed an effect on individual well-being that goes beyond specific situations. The existence of a concrete stress situation is not necessary for the direct-effect thesis. The direct effect is based on being socially embedded and being able to count on the support of others, which could results in lower burnout-symptoms of those affected.[12] Thus, the following hypo-thesis can be stated:

[1] Antonovsky (1979) was the first to bring this perspective to research by looking for causes why some people stay healthy while others get sick under the same strain and conditions.[13]

Hypothesis: A high level of social support by the supervisor (perceived support of the employee) has a significantly negative correlation with employee burnout in all three operationalized dimensions.

2. Sample & Methodology

The sample surveyed in this study consists of two sub-samples using different survey methods. Firstly, test persons were acquired via the XING network. This network was deliberately chosen because the majority of its members are resident in Germany. The sample was explicitly surveyed in Germany to avoid cultural differences. Secondly, the link to the questionnaire was distributed among persons from the author's professional social network with the request to answer it themselves and also to forward it to other potential participants in their own company or beyond. Again, only persons from Germany were interviewed. The survey was conducted anonymously. The respondents did not receive any reward. The persons addressed expressed their consent to participate in the survey by filling out the online questionnaire, to which an explanatory cover letter with contact address and telephone number for further inquiries was attached.

A total of 662 questionnaires were distributed or sent out online via the first access channel. The total response was N = 256 (38.67%). The second access method resulted in a total response of N = 84, whereby the number of respondents is unknown due to the corresponding distribution of the questionnaires (separate survey-link). It was necessary to exclude 2 individuals from the sample (0.59%) for error in the age indication, totaling 338 participants with data available for analysis. This sample size can be considered as very good when comparing the calculated minimum sample size in relation to the total number of all employees in the German automotive industry (n=384).

2.1 MBI-D (Büssing & Perrar, 1992)

For this research, the German version of the Maslach Burnout Inventory (MBI-D) according to BÜSSING & PERRAR has been chosen. The MBI-D closely follows Maslach & Jackson's item content and scaling and captures the components (according to the original MBI construct) “emotional exhaustion”, “depersonalization” and “personal accomplishment”. The MBI-D consists of 21 items on a six-step Likert scale with possible answers: 1=”nie” (never), “sehr selten” (very rare), “eher selten” (rather rare), “manchmal” (sometimes), “eher oft”(rather often) and 6= “sehr oft” (very often).[14] MASLACH & JACKSON recommend the separate consideration of the three subscales. The values are calculated for each of the three scales by summation.[15]

Important to notice is, that the scale of personal accomplishment has to be calculated vice versa. In this study, the scale has been renamed in “reduced personal accomplishment” to ease the scoring and interpretation of the findings. Higher reduced personal accomplishment scores refer to lower feelings of competence and successful achievement, whereas scoring high on this subscale indicates a higher attitude of inefficacy and reduced motivation. Scoring higher on the subscale emotional exhaustion indicates greater feelings of fatigue and being drained; a higher score on the subscale depersonalization denotes a greater tendency toward cynical, callous and uncaring attitudes against e. g. colleagues.[11] The reliability was estimated for the subscale emotional exhaustion at .823, for the subscale depersonalization .811 and for the subscale reduced personal accomplishment .902.

2.2 SPSS (Kottke & Sharafinski, 1988) To measure Perceived Supervisor Support, the SPSS - Scale has been used.[16] The SPSS scale is based on the Perceived Organizational Support Survey by EISENBERGER, HUNTINGTON, HUTCHINSON & SOWA - with one difference - all items refer to the supervisor, not to the organization as a global entity.[17] Given that the definitions of Perceived Organizational Support and Perceived Supervisor Support are practically identical in nature, their measurements have been adapted to accommodate these similarities. The SPSS consists of 16 items with a 7-point Likert scale anchored from “strongly disagree (1) to “strongly agree” (7). Example items include: “My supervisor really cares about my well-being.” “My supervisor is willing to help me, when I need a special favour.” “My supervisor tries to make my job as interesting as possible.” The items “If my supervisor could hire some-one to replace me at a lower salary, he/she would do so.” and “If given the opportunity, my supervisor would take advantage of me.” must be reversed during summation of the total values. Higher scores indicate that participants perceived their supervisors to be more supportive.[16] Cronbach's alpha in the present study was measured at .944.

2.3 Statistical Analyzes

We performed a correlation and regression analyses. All statistical investigations were conducted using SPSS 25. The level of statistical significance was set at $p<0.05$. perceived supervisor support was set as an independent variable, the three dimensions of burnout were defined as a dependent variable.

3. Results

As part of a bivariate correlation analysis possible, relation-ships between the individual variable were tested. For the variables “Perceived Supervisor Support” and the three MBI burnout dimensions, the Pearson coefficient was used. There is a correlation between “perceived supervisor support” and “emotional exhaustion” of (r=.-352). The correlation is significant at the $p< 0.01$ level. “Perceived supervisor support” correlates also significant negative with “reduced personal accomplishment” (r=-.322). The correla-tion is significant at the $p< 0.01$ level. There is no significant correlation between “perceived supervisor support” and “depersonalization”. For the outcome variable “emotional exhaustion” the multiple correlation coefficient R=.352 corresponds to the bivariate

correlation coefficient. In this study 12.4% of the variance of "emotional exhaustion" can be predicted from "perceived supervisor support" (R^2=.124/Adj. R^2=.120). The standard error of the estimate is 1.567. For the outcome variable "reduced personal accomplishment" the multiple correlation coefficient R=.292 corresponds to the bivariate correlation coefficient. 10.4% of the variance of "reduced personal accomplishment" can be predicted from "perceived supervisor support" (R^2=.104/Adj. R^2=.099). The standard error of the estimate is 1.398. The ANOVA shows that the regression model makes a statistically significant prediction (Sig. .000≤.050).

4. Discussion

The aim of the study was to capture the perceived support that employees experience from their immediate super-visors and to investigate the extent to which this support predicts the development of burnout in its three dimensions. The theoretical starting point was that the positive effect of social support in connection with coping with stressful situations is transferable to dyadic supervisor-employee relationships of office-based managers - i.e. there is a connection between social supervisor support and the occurrence of burnout among the surveyed employees. A distinction of the three burnout dimensions according to MASLACH; JACKSON & LEITER made it possible to obtain a more precise description of the effect of supervisor support and to explain the specific connections.[18] The analyses on the prediction of burnout point to the special importance of the superior, since high levels of support are accompanied by lower levels of exhaustion. Social super-visor support can act as a psychosocial immune system. Granted or denied, social support can directly affect the mental state of individuals - both in a positive or negative sense. In a positive way, it promotes health and helps to overcome disease. Social support is thus a prerequisite for employee-oriented and health-oriented leadership. It can take the form of tips or work relief (instrumental) as well as encouragement, comfort and motivation (emotional). Less hierarchical leadership through emotional competence counteracts burnout among employees.[19] Hence, the more dissonant and dictatorial the leadership is, the more likely burnout will become noticeable among employees. Supervisor support is therefore strongly related to the emotional intelligence of the executive. Emotional Intelli-gence (EI), which became known through the psychologist and science journalist Daniel Goleman, describes the ability to perceive emotions appropriately, to use them in thought processes, and to control and understand them adequately. Goleman distinguishes between two components of Emotional Intelligence: On the one hand, social skills (in relation to oneself), which include self-perception and self-management. On the other hand, social competencies (in relation to dealing with other people), which include social awareness and relationship management. Emotional intelli-gence is a prerequisite for leaders to put themselves in the shoes of employees, to perceive complex situations and to be able to react with appropriate support.[20]

The influence on the burnout dimensions is made clear by the results of this work. In a preliminary study in the framework of the authors dissertation it was shown that perceived supervisor support has a medium strong and significant influence especially on the SF-36[2] factors „emotional well-being" ($r = .312$; $p < 0.01$) and „energy/ fatigue" ($r = .344$; $p < 0.01$). „Emotional well-being" measures overall mental health, including depression, anxiety, emotional and behavioral control, and overall positive mood. „Energy/fatigue" measures whether the person is feeling energetic and full of energy or whether she/he is more tired and exhausted. This fact makes it clear that both SF-36 factors are relevant to burnout. The factor „emotional well-being" in a negative connotation shows parallels to the MBI dimension „emotional exhaustion". For the burnout dimension, a medium strong, significant influence of ($r = -.352$; $p < 0.01$) on the „perceived social support" could be determined in the main study. The SF-36 factor „energy/fatique" shows parallels to the burn-out dimension „reduced personal accomplishment". It correlated medium-strong and significantly with „perceived social support" and shows similar values ($r = -.322$; $p < 0.01$).[21] According to GOLEMAN, successful managers have a high emotional intelligence: „Truly effective leaders are also distinguished by a high level of emotional intelligence". Emotional intelligence is based on mutual understanding and trust, empathy, sociability and contributes to synergy effects in teamwork and group learning.[22] Thus, if a manager can recognize negative feelings and emotions, she/he has a decisive influence on stress and finally also on the perception of exhaustion and burnout-relevant factors of the employees. In this respect, coaching sessions for managers should focus on the feelings. But also the teams, departments and companies they lead, not on the basis of a functional and therefore manipulative attitude, but on the basis of compassion, genuine empathy and sensitivity, following the principles of human dignity, respect and appreciation. Emotional intelligence should therefore not just be a catchphrase, but an important personality aspect of a successful entrepreneur and a health-oriented, supporting and burnout-preventing leadership.

5. Conclusion

In summary, it can be said that interesting findings are avai-lable after this research, which now need to be taken up in further work. The connection between burnout and social support has been scientifically proven and the results of the present study further support this fact. What steps can follow next? The focus should be extended to the organi-zation. After all, by choosing their leadership style, supervisors make a lasting decision about the culture in the company. Health-oriented leadership is not only character-ized by social support, but also by appreciation and a health-promoting design of working conditions. Due to the direct contact with employees, supervisors at lower and middle management levels in particular are predestined to

[2] The Short Form (36) Health Survey is a 36-item, patient-reported survey of patient health.

take on the task of implementing health-oriented leadership. Many existing management concepts, such as transformational or employee-oriented management, already have a positive effect on employee health. The question is whether health-oriented leadership really needs to be redesigned, or whether "good and correct" leadership does not also have the positive side effect of social support for employees. The possibilities for shaping a healthy management style are therefore nothing fundamentally new for managers, but it is assumed that these are generally perceived less consciously because the influence on the operational performance process and the performance of the employees was not considered to be significant. Accordingly, the company's goal must be to sensitize management levels to the connection between leadership and health. Only then can they initiate appropriate measures. A decisive starting point for this should be offers for supervisors at the level of personnel development. As an important source of impetus for the implementation of personnel development concepts, the human resources department must rethink the means by which the awareness of healthy and supportive leadership can be strengthened and how existing deficits can be improved.

6. Limitations of the study

In further examinations it should be checked, if a supervisor in a small circle would be more likely to respond to the individual and his or her needs and problems than if he or she had significantly more colleagues to lead. This informa-tion was not collected during the survey.

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THE POTENTIAL OF THE METHODOLOGY OF EVALUATION OF INNOVATIVE PROJECTS BY SME MANAGEMENT

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Abstract: *The aim of the paper is to formulate preconditions for the proposal of a methodology for the evaluation of innovative projects by SME (small and medium enterprise) management. It is about designing a comprehensive conceptual framework for creating model tools for a new generation of modeling organizational systems to achieve a qualitative radical generation leap in the quality of support for innovative innovation processes in business management. The ability to model organizational systems comprehensively, but in a simple way, is a necessary condition for systemic perception and effective management of modern business entities. The basic theoretical contribution lies in the extension of management theory with new principles and knowledge. The practical benefit is the creation of a framework guide for the design of a methodology for the evaluation of innovation projects by SME management, for the functioning and innovative development of the researched, representatively specified entity, in the form of an innovation and quality program.*

Keywords: *evaluation, innovation, project, management, SME*

1. Introduction

One of the manifestations of modern management is a fundamental change in the approach to management, organization and creation of modern business programs of companies on the market. Current trends can be described as the transition from a production company to an innovation company. Yesterday was marked by long periods of prosperity and short periods of chaos and crisis, while today it is about long periods of crisis and stagnation, only brief flashes of prosperity and growth. Imitation is the first impulse for one's own activity and a breakthrough in innovative thinking. [7] But in entrepreneurship imitators do not win, but those who create new things and open a new market and achieve mastery. It can be argued that while most managers recognize modern approaches to company management such as innovation and total quality management of production (TQM), they are internally always dissatisfied with the way of management and the level of achievement of success and profit. In general, therefore, a model of a small, successful, creative, innovative, project management and super quality (excellent) company with low cost operators, flat organizational structure, educated, active and successful people is seeked - this form can only be approximated to a certain extent and scope.

2. Innovation and innovative vitality of the company

Nowadays, there are seven lines of innovation known. [13] The founder of innovation theory, J. A. Shumpeter, said: "Innovation is the practical transfer of ideas into new products, processes, systems and social relationships." [23] "Innovation is a process (not an action, event or phenomenon) and as such must be controlled. The factors that determine this process can be influenced and thus influence the result." [5] The innovative capacity of the company is given by competitive advantages in terms of quality, efficiency and flexibility. The company itself, as a producer and at the same time a successful innovator, has the ability to explore the unknown and can continuously, quickly and easily operate in the innovation market at a price advantage from competitors." [12] The innovative vitality of a company is its ability to prove the state when it exists today without its present existence limiting its future existence beyond what is necessary. It is therefore a system of functioning of the company, which strives to be a sustainably successful. [17] The innovative factor of vitality responds to the company's ability to determine in practice how long it will last in the catchment market of business and product operations, while the very existence of the company in real time and environment wears and consumes itself and whether its results are permanent or temporary, successful. or unsuccessful, literally futile and unnecessary, or effectively and ecologically clean, beneficial or dangerous, that is, considering whether a company exists in accordance with the environment of its existence or in conflict with it. [16]

3. Current state - management criticism

Managers of businesses and other organizations generally (and this is a long-term trend) treat their managed entity as a common technical matter: if something goes wrong, it is replaced or cancelled and perhaps remedied. Mainly the fastest and the cheapest. A simple solution and what is at hand is looked for. At the same time, managers often don´t see things differently than a set of commands and stable tasks, which, if done well, produce great results. Also negative is the fact that in recent decades in the knowledge and practical database of solutions have appeared countless "guaranteed successful" recipes, which are, however, largely only non-systemic general examples, which are in the specific conditions of a particular company operating with its product in a specific market

and in real time absolutely unusable and chaotic, and even only exacerbate the already existing obvious or even hidden problems of a given company. It is demonstrable [3] that the real value of many solutions, manuals and procedures and their interrelationship and impact on a company at risk as a whole gets as an organic set lost. It is obvious that system solutions are not approached in management practice "systematically and systemically", so nowadays the concept of systemicity has become only a kind of cliché and today's companies are trapped in the paradigm of the past, which protects them from greater flexibility and dynamism." [22] So when managers solve a company problem today, they actually invest all their efforts in its outputs/consequences and not in inputs/causes, and thus the whole effect of the solution is lost and this is often at a given stage and time literally unimaginably big problem, threatening the future existence of a business entity. The most important step in strengthening a company by management is to create a new idea of management for its future, formulate its structure, strategy and identify specific principles and measures overcoming traditional wisdom and knowledge, i.e. solutions that are unusual, original, applying new approaches.

In the conditions of the company, it is possible to point out six known steps of creating a winning position in the future:

1) New understanding of the principles - consists in reassessing the principles that govern the company, its ties to the environment, internal relationships and personal factors of people in it. It is looked for a new application, a new meaning of life and functioning.
2) New understanding of competition - focusing on fundamental changes that occur in the nature of benefits by new unconventional ways in the age of globalization with the search for gaps in the system for fixing the company.
3) New understanding of management and complexity - deals with what structure and management to give to the company and how to create a new operating system with collective ambitions, system thinking, proactive action and individuals - champions in creating products capable of self-reflection and self-study.
4) New understanding of leadership - helps to see the new position of management in the company as an intellectual capacity decentralizing powers to people and coordinating teamwork in the company.
5) New understanding of the market - monitors significant changes in the nature of customers and marketing relationships between customers and the company, takes into account demographic factors and specifics of customers in the segment of small and medium business, while monitors how modern advanced technologies fundamentally change the marketing methods of the company's products.
6) New understanding of the world - deals with unprecedented changes in business and society, networking of industries, markets, competition, the changing position of the state in the world and the impact of global applications of scientific and technical research results on the view of company managers on the world. [6]

The problem with any small business and its management is that it is generally reluctant to choose between different alternatives - it seems dangerous and restrictive - it always wants the best, easiest and simplest option, but this is a problem in times of market change and fluctuation. Change is a basic factor in the development of customer needs and expectations, a basic factor in the development of technology and the development of management techniques. [19] Managers of SME often ask themselves as to how an initiative to promote innovation in the European Union actually changes Europe. It is known that such a situation is on the European market, according to Fig. 1.

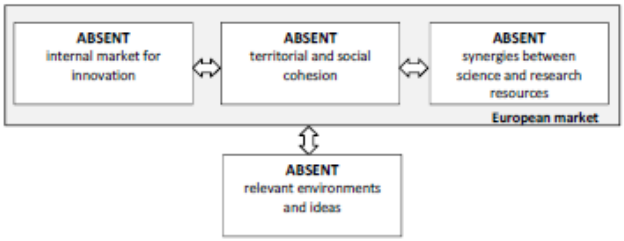

Figure 1: Innovation - the link between the continuity of strategy and rapid change in the company [15]

There are many obstacles in the way, such as:

1) weaknesses in public education and innovation systems,
2) insufficient financial resources and access to them,
3) costly defense and obtaining patents,
4) outdated regulations and unproductive bureaucracy,
5) incomplete and hindering public procurement system,
6) the disparate efforts of the EU - 27 Member States.

There are several challenges ahead of the management of companies, but it is important to try to shape the competition and to take the company's destiny into its own hands and create tomorrow's advantages in a competitive market environment. The approaches of forming of innovation policies tend to refer to the specifics of a particular country or region and to the applicable legislation and standards as well as the available knowledge base, neglecting and overlooking the transit national approach and common, generally scientifically valid elements and rules of innovation in a given economic policy. [9]

The tools and procedures described by the authors [1], [10] for management and innovation capacity and vitality of companies are not applied and are not known here, but there is no simple clear way of self-diagnostics, flexible interventions in self-management and actual setting by offer-demand oriented updated marketing mix for

companies, as described by several authors [11], [17], see Fig. 2.

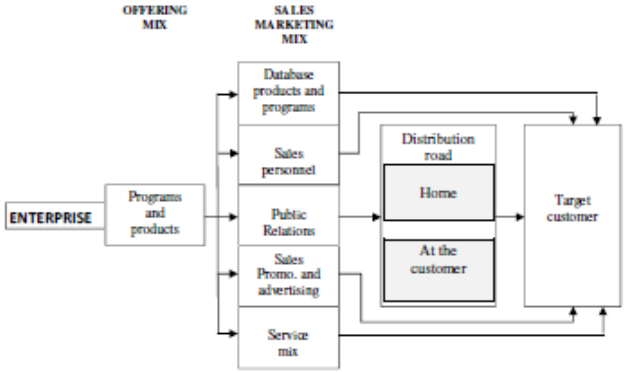

Figure 2: Offer – demand oriented updated marketing mix of the company [17]

4. Assumptions of the methodology proposal of evaluation of innovative projects

In terms of the chosen approach to research on creativity and innovation, it will be possible to apply in particular the so-called psychometric and at the same time cognitive approach, where the goal will be on focusing on the scope of creation first, i.e. on the performance of management and the project team in tasks involving specific aspects of creativity. It is assumed that these are measurable and evaluable quantities (exact or verbal) and that testing can be applied in the activity, which quantifies and qualifies the intuition and appearance and active knowledge of the object under study. Consideration is given to size, sociographic, personal, technical and technological requirements and specifics of research subjects chosen from the field of SME business, as well as the possibilities to enhance business potential in the context of the establishment of cluster and other groupings. [4], [2]

Over the last decade, research's approach to innovation has changed diametrically. Innovation no longer means only intentional, new and beneficial change, exclusively in the organizational and team context and defining change or creating a new process or product, as defined by several major world authors (Grossman and King, Roffe, Peters and Waterman, Pietrasiński, Drucker and others) [1], but innovation already applies to organizational changes to achieve a new concept, flexibility and adaptability of small and medium-sized companies in global markets and progressiveness of their capabilities in the future with high production efficiency, permanent satisfaction of needs and expectations of current and future customers and a sustainable social, energy and ecological environment. [20] Nowadays managers learn how to understand innovation not only as a management tool, but especially primarily as a process that can be managed, changed and influenced effectively for the success of the company, so as to create a literally organic type of company capable of adapting to unstable and changing conditions and factors and able to constantly overcome problems progressively. The result must be the creativity and innovation in competition in the relevant regional, national, continental or even global market.

The phases of the innovation process must be subjected to this in a new way, namely:

1) Producing ideas.
2) Collection of ideas.
3) Development and implementation of ideas.

The following Fig. 3 documents essential information for management and decision-making in the innovation and product processes of a business entity, understanding the real influences and errors of action due to known factors of loss of effectiveness of the company's management system due to underestimation, non-registration or failure to capture typical management components. Therefore, it is generally possible to talk about loss of efficiency 1 (addressing manifestations instead of cause) due to, for example, problems, manifestations or causes in the system, as well as loss of efficiency 2 (low cooperation of organizational units) due to regulations, standards, finances, staffing of project teams, and the staff themselves in the performance of production and services and finally the loss of efficiency 3 (incorrect selection and application of methods of analysis and work) consisting in incorrect implementation or ignorance of methods such as ABC, PM, TQM, BSC, process or strategic management. [8] All of these losses of efficiency subsequently cause a gradual and descending chain of negative consequences in the system of functioning of the company. An important criterion is to ensure competitiveness and sustainability, the ability to survive and be creative.

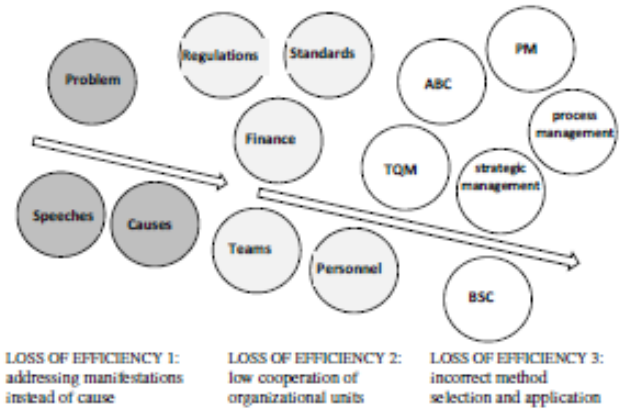

Figure 3: Chaining of negative consequences in company management [15]

The following premise can be used:

a) Business management of the company is part of the business strategy and overall marketing management of the company. [18]
b) Business technique - sales technique is a specific manual, i.e. a summary of rules, tangible and intangible inputs, procedures and tasks for working with customers and a substantial output of the

company's sales system (providing specific activities). [24]

5. Objectives and tasks of the methodology proposal for the evaluation of innovative projects

The defined areas of research appear to be:

1. Analysis of the level of innovation capacity of the business entity;
2. Analysis of the level of knowledge of managerial concepts, methods and tools;
3. Analysis of the level of the apparatus of management of organizations;
4. Analysis of the attitude of organizations to management tools;
5. Analysis of managers' approach to the selection of management tools.

The following tasks and goals need to be formulated for the objective identification and design of the methodology for evaluating innovative projects:

1 - The currently available knowledge database for SME management is inhomogeneous, extensive and disorganized and available working procedures and methods for evaluating and managing one's own company and its results and problems are used and perceived by managers only in isolation and therefore only partial, unconceptual interventions and problem solving are applied. In practice, this means that with the increasing technical level of management tools, their use decreases. Technological development does not correspond to the real needs and expectations of business practice and the market in a given segment of SMEs. Well-known and advanced tools for managing and supporting innovation in the company (such as various strategic analyzes, statistical monitoring and evaluation of activities and business results, etc.) are either too specialized, expensive, complicated or even lengthy and too broad-spectrum to be practically and especially dynamically used in the conditions of SMEs.

Task 1) Creation of a representative model company for further research and search for applications according to the set goals. (To map the characteristics, needs and expectations of a comprehensive set of researched selected business entities and their generalization and accumulation of parameters).

Objective 1: Specification of starting points and creation of a new generation of tools for the creation of an innovation program to achieve a qualitative radical generational leap in the quality of support for management innovation processes in company management. Finding out the real state, characteristics, personal and knowledge level of management work and creativity of management in SMEs.

2 - Elements of organizational structures of the surveyed entities are conceived as relatively isolated components with a low level of synergy, which represents a loss of performance and innovation capacity of SMEs by an average of about 30-50 %, while the ideal defined state of operation of innovation processes and company management is taken as the standard for comparison.

Task 2) Prepare an audit of innovation management, audit of marketing mix, analysis of the state of project innovations, and analysis of the current level of production quality management and diagnostics of the dimension of management innovation.

Objective 2: Implementation of the analytical and diagnostic part based on the experiment of measurable knowledge and statements of the SME and subsequently create a primary strategic analysis to examine the parameters of the SME model and derive measurable results and statements using supporting diagnostic methods (innovation management audit, diagnostics of innovation dimension, etc.).

Task 3) Designing specific rules, principles and procedures for the implementation of analysis in a modern program of innovation and quality of the company as a tool for strategic management and designing a manual of a comprehensive approach and designing an integrated model of SME management.

Objective 3: Design of concrete, originally understood and universally applicable rules for innovation management in a verified model of SMEs in the form of two crucial important documents, mutually related in content and meaning, namely the Innovation Program and the Manual of a comprehensive approach to innovation management.

6. Conclusions

There are several challenges ahead of companies, but it is important to try to shape the competition to take the company's destiny into its own hands and create tomorrow's advantages in a competitive market environment."... instead of simply eliminating disadvantages, companies need to look for ways to grow and build up benefits, and it is not enough to do what is done but better - it needs to be done differently." [18] Many analysts agree in their quotes that "if a company wants to be successful and show a high degree of innovation, it simply has to try more things and more activities and more projects". [21], [20]

It can be assumed that due to the large number of principles, rules, tools and procedures, these become only too expensive and demanding processes in the case of nationwide implementation in SMEs due to its background, capabilities, possibilities and time, without adequate final effect. This means that the overall level of application of selected current concepts of company management (strategic management, process management, production quality management, management of innovation processes and own creativity in the company, project management of product processes and subsequent control and evaluation of these processes) is less than 50%.

Here, to verify the behaviour of current company management, it is based on the suggestion that a low level of knowledge of current management tools and resources with incorrect access to their systemic application will always cause a reduction or loss of the company and its results in production. This can be verified by analysing the concepts and approaches of current quality and production management as well as by auditing the level of innovation management and diagnostics of the innovation dimension in each company in the SME segment. The stated considerations, set tasks and goals are thus the starting point for the implementation of the proposal of a comprehensive methodology for the evaluation of innovative projects in the conditions of SME management.

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PROMOTING THE WELL-BEING OF SOCIAL WORKERS IN THE CONTEXT OF ORGANIZATIONAL CULTURE AND THE COVID - 19 CRISIS

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Abstract: *The aim of the paper is to outline the perspective of supporting and increasing the well-being of social workers as one of the key tasks and solutions to today's current problems, to which the new crisis of the COVID-19 pandemic will be added in 2020. Methods: a qualitative analysis of professional literature and research studies on the topic. Results: the autor present organizational culture as one of the possible areas of the solution on how to increase the well-being of social workers today and indicate the possibilities for further research in this area.*

Keywords: *social worker well-being, organizational well-being, organizational culture, culture of well-being*

1.Introduction

The situation of the social work profession in Europe and worldwide is facing several difficulties. Asquith, Clark, Waterhouse [1] refer to social work as a "profession in crisis". According to these authors, social work in Britain has lost its course, pointing to a crisis of professional identity, erosion of professional commitments, lack of recognition for professionals, shortage of skilled workers, insufficient recruitment, high turnover and high numbers of people leaving the profession, problematic working conditions, lack of resources to ensure effective practice and more. Social work is a profession that is still strongly "client-focused". Given the current situation in the profession and the new global crisis of the COVID-19 pandemic, it is important to look at the worker, his needs and overall well-being. In this study, we focus primarily on the organizational background and variables that support the well-being of social workers. The aim of the paper is to highlight the possibilities of organizational culture as a way to increase social worker well-being.

2. Well-being of social workers

Tesi, Aiello [2] claims that the well-being of social workers associated with their profession is becoming a central concern of international psychosocial literature. Klajkó et al [3] say that decreasing chronic stress factors and increasing employees 'well-being are common objectives in the 21st century. The perspective of the well-being of social workers brings, as if from the other side, a view - not just how to reduce risks, but how to increase the support of the worker, not only emotionally, but holistically. Well-being has its basis in philosophy, it is linked to reflections on a person's desire to be happy and to live "life well lived". On this basis are based two psychological conceptions of well-being hedonic (pleasant life) in the concept of subjective well-being (E. Diener), which assesses the level of well-being by subjective evaluation of happiness and cognitive evaluation of one's own life satisfaction and eudaimonic (meaningful life) in The concept of psychological well-being according to C. Ryff assesses the areas: positive relationships with others, personal mastery, autonomy, and feeling of purpose and meaning in life, and personal growth and development, and the concept of social well-being according to R. Keyes. These concepts found penetration in positive psychology and M. Seligman's concept of "flourishing", thriving ". [4] A broader perspective on the concept of well-being is provided mainly by the world organizations WHO, ILO, OECD, which defines concepts of mental health, workplace well-being or human well-being and progress [5, 6, 7].

The well-being of social workers was mostly conceived within the hedonic approach as subjective well-being (SWB). Graham, Shier [8] found that the SWB of social workers was shaped by working conditions (workload, type of work), characteristics of the working environment (physical, cultural, organizational) and relationships at the workplace. Shier, Graham [9] state that the availability of professional roles and opportunities, understanding of boundaries and one's own limits, principles and values of social work, social support, professional development and networking have a positive effect on SWB. Graham et al. [10] found that the subjective satisfaction of social workers with the profession appears to be linked to the organizational environment, satisfaction with professional associations and satisfaction with the workload. Some research studies have examined the links between the psychological well-being (PWB) of social workers and work or traumatic stress [11, 12], and results, which maintain the operation of the organization and its development - work engagement, commitment, performance, etc. [2, 13, 14, 15, 16]. Kan, Rho [16] state that there is not much research on PWB of social workers, although their role in society is growing and in addition to economic compensation, it is necessary to pay attention to the mental well-being of the social worker.

Most social work today still takes place within an organization, an organizational context that has its own specifics. Well-being in an organisation has its specific features. It is the model of "organizational well-being" that could be one of the suitable models for research in social workers as well.

3. Organizational well-being

According to Torri, Toniolo [18], organizational well-being can be defined as the ability of an organization to increase and maintain the physical, psychological and social well-being of workers at all levels and for every job position. Organizational well-being is therefore not just a focus on the positive feelings or satisfaction of the employee or on various aspects of his quality of life. Rani et al. [19] states that low organizational well-being leads to low productivity, low attendance, poor performance and motivation among the employees, negative attitude at work, and low self-esteem. On the contrary, the support and increase of well-being of employees is related to higher productivity and employee involvement [20]. The CIPD defines well-being at work as "creating an environment to promote a state of contentment which allows an employee to flourish and achieve their full potential for the benefit of themselves and their organization." [21]. Klajko et al. [3] say that practice and research have shown - that because people spend most of their active time in work, it is important to create suitable physical, and social work environment, protective working conditions which ensure adequate employee motivation and performance. Investing in health and social programs(wellness programs) is now a near-normal part of running a successful organization. However, organizational well-being (OWB) as a whole is not limited to the physical and psychosocial aspects of health, but takes into account several dimensions that arise from the relationship between organisation and worker. OWB thus includes dimensions as follows: - organizational (work environment and conditions, job satisfaction, work competencies), financial (educational programs of financial literacy), mental resp. emotional (subjective assessment of happiness and satisfaction, PWB, flourishing), social (happy relationships in the workplace and in the community), physical (active promotion of physical health [22], creative (increasing aesthetic interests and creativity), intellectual (constant learning and development of critical thinking, spiritual (searching for harmony and meaning of human being), career (development for one's own professional and human enrichment) [23].

Multidimensional OWB models offer a holistic view of a worker's well-being in an organization and relate it to the organizational culture. Here we meet the concepts of culture of health, culture of wellness and the latest culture of well-being, which represents this holistic approach to OWB. Organizational culture here acts as a factor through which it is possible to implement individual elements of OWB into the life of the organization.

4. Organizational culture and well-being

Employee well-being (also used in literature as work-related well-being / workplace well-being/ organizational well-being) has become imperative in the field of management in recent decades. Since the 1980s, thanks to the work of Peters and Waterman, who claim that all "excellent" societies have certain cultural qualities that ensure their success. The authors argue that a dominant cohesive culture is a hallmark of all excellent societies (organizations), the stronger the culture and the more market-oriented is, the less important it is for companies to have written regulations, organizational charts and procedures, because in such societies people usually know themselves , what is expected of them, as it is clearly identified by several guiding values [24].

Schein [25, 26] presents a model of 3 levels of organizational culture (OC) - "cultural iceberg", where the invisible basal part consists of basic beliefs and assumptions, based on these are formed (and formulated) values and norms (rules, standards) and those are manifested in the behavior and actions of people (speech, performance, dress, rituals), and also in their material artifacts (logo, physical environment). According to Schein [25], it represents the characteristics of an organization's culture: culture is a stable way of acting that persists even when some members leave, this way is predictable, thus culture stabilizes the organization structurally, is sealed in unconscious, elusive parts of group life, therefore it is also more difficult to change as the organization is "permeated" by its culture.

According to Lukášová [26], organizational culture is an important subsystem of the organization, which determines its efficiency and quality of working life of its members, reduces conflicts within the organization, helps the cohesion of the organization, facilitates coordination and control, reduces employee insecurity and affects their job satisfaction and emotional well-being. It can be an important source of motivation for employees - the meaning of work, a sense of belonging and importance in the organization, identification with the goals and mission of the organization.

The simplest way we can perceive organizational culture is „the way things are done here." Rather, it is a set of habits and common patterns of behavior. The Latin word "colo", from which the word comes, means "to cultivate, to educate", people as bearers of culture form a system of values, rules and common patterns of behavior in individual situations. Hofstede, Hofstede [24] speaks of culture as the software of the human mind - certain programming for certain types of behavior in a certain situation. It is obvious that if we want to achieve stable, broad and deeply rooted changes in the organization, they must be rooted in the core of the organization - in its culture.

Bedrnová, Nový [27], Lukášová [26], Armstrong [28] talk about a change in culture, which begins with an analysis and diagnosis of the current state to the preparation and implementation of changes. Lukášová [26] presents a model of change of the culture, which is inspired by previous works. In terms of an objectivist approach, this model is used as a model for changing the culture governed mainly by managerial processes.

Schein and other authors discuss which elements to focus on when changing organizational culture, recommending that changes should made at all levels parallelly and continuously:

- material elements of culture (architecture of buildings, workplace equipment, visual style of the organization)
- intangible artifacts - "stories and heroes" representing new values, published in materials, shared orally, customs and rituals for which conditions are created (related to eating, exercise, recreation, education), ceremonies and celebrations,
- organizational values - are the core of organizational culture, the formulation of key values is an essential tool for building a new desired culture, eight to ten elements, their content should be in accordance with the strategy of the organization, values should be consistent, motivating and logically connected, understandable and also expressed in behavioral categories,
- standards of conduct - inextricably linked to values, when formulated behaviorally, inform members of the culture about specific rules of conduct that management represents by their behaviour[26].
- In the literature today, the steps to change the culture of the organization are well theoretically elaborated [26, 27, 29], several studies and manuals are available which give practical steps to change the organizational culture in the desired direction [30, 31, 32] and overcome obstacles in the process [33]. It is necessary to lead the change of culture according to the type of organization and its goals, to determine the appropriate type of organizational culture. Regardless of the type of organization, however, we can now see a trend in the field of management which is related to the well-being of the employee. "Creating a culture of well-being" can be found in the titles of many manuals published by specialists and agencies focused on supporting the effectiveness of the organization [34, 35].

5. Culture of well-being in social services

Organizational culture in the context of social services has been the subject of interest for a relatively short time. Jung et al. [36] claim that the research of organizational culture and its changes as essential also for the modernization and further development of organizations within public administration and public services (health and social). Havrdova et al [37] presented in research the context of organizational culture and supervision, which is one of the essential tools of support for social workers. Regarding these tools, Lovašová [38] mentions that it is crucial, as the part of the model of self-care, that the organization should be responsible for creating psychologically healthy workplaces, while creating conditions for supervision, well-being and education. The creation of healthy workplaces and conditions for the well-being of the worker in organizations providing social services should also be imperative in this area of services. The systemic and ecological perspective as well as the organizational culture perspective tell us that especially in the case of care of clients within the organization, it is not possible to ensure well-being of the client and client satisfaction without well-being of employees and employee satisfaction. Roman [39] argues that if the company does not understand the complexity of performing the job in the area of social services facilities and does not create such economic, social, but also rehabilitation conditions that correspond to this complexity, there is a high presumption that the quality of services will inevitably be decreased. The "culture of well-being" as a model revives the potential of organizations and it is a possible solution on the way to the quality of services, support of the employee and revival of the potential of the profession.

Examples of good practice can be added to the theoretical background, both from the private sector and the area of helping professions. American association AVMA [40] formulated its vision, mission and core values, although paradoxically it is the organization of veterinary professionals, their formulations reflect a high level of understanding of their own and society's mission. The goal of the organization is "The association's goal is focused squarely on our efforts to grow member value by increasing member satisfaction and market share across all segments of the profession". Core values of AVMA focus the association to be: Ethical, Inclusive, Science-based, Client-focused, Member-centric, Supportive, Fiscally responsible, Efficient, Innovative [40]. In the handbook "100 healthy tips how to create a culture of well-being" [41], the association brings 100 tips divided into 9 dimensions of organizational well-being, where we find specific steps and tips for individual and organizational level that can be incorporated into normal operation. organizations as a practical support for well-being in the workplace. Formulation and interpretation of values as well as practical steps have signs of professional background and practical experience.

6. Discussion

Social work as a profession is currently experiencing a difficult situation, not only is it "suffering from its diseases", it is also suffering from the global crisis of the coronavirus pandemic. The recovery of the profession, its potential and status, increasing the quality of services and solving the current crisis can no longer be sought (or requested) only at the individual level of social workers. At a time of global crisis, the need for well-being of social workers and workers in social and health services is even more visible. The College of Paramedics claims that psychosocial support is important because it enables us to step-in and support the individual in seeing how the incident is shaping their life and perhaps to see things from a different perspective [42]. UNICEF has issued a handbook emphasizing the importance of care,safety, health and well-being of social workers during the global crisis, highlighting the responsibilities of individual sectors - government, social service employers, managers and social services workers themselves [43].

The crisis is a phenomenon that highlights both strengths and weaknesses. Social work is and always will be strongly client-focused, but today it is clear that it needs to be as well "member-centric", focused also on the needs of its members. Satisfaction and well-being of a social worker can thus generate a satisfied client and a better service. Organizational culture is a phenomenon that unites behavior and value in people's coexistence. Organizational culture can cultivate new customs, habits, rituals and practices of the members of the organization, which can support their own well-being in everyday working life. This requires a willingness and an initiative "from above". In the case of organizations providing social services, it is mainly the role of managers and supervision and the ability to win their employees round for changes. A component of managerial activity is leadership, which means also influencing people to achieve their desired behavior and positive change so that they are willing to engage in common goals [44]. Competent supervisors include knowledge of quality issues, different levels of problems, the ability to continue learning and reflection of the supervisee, to know and use examples of good practice [45]. In an organization providing social services, management, and supervision are two key components of the processing of changing towards the required organizational culture.

For the cultural change, it is now necessary to review organizational goals, vision, mission, and formulate values that will reflect efforts to support social workers and gradually implement them as an inevitable part of their organization.

Given the existing amount of literature on the topic of change and building organizational culture, it will be appropriate to include these topics also into curriculum for management programs in social services, into study programs of supervision and into various seminars or internship opportunities that show practical possibilities and examples of good practice. The author of the paper also recommends these outlined topics in the field of the organizational well-being of social workers associated with organizational culture for further research.

7. Conclusion

"The crisis is a productive state - one only has to remove the taste of catastrophe from it." In the words of Max Frisch, the Swiss playwright, it is possible to express an approach that we can choose today in the field of social work. We are facing a crisis of the profession and, at the same time, a global crisis that is threatening not only the health and lives of people, clients of social work and the social workers themselves. It is a challenge today how we approach the situation. The employee and the organization can take responsibility for managing the situation, while the organization can "open arms and embrace" its members with a favorable atmosphere and environment that protects well-being and health. Creating a "culture of well-being" in the field of social services can be a good step not only for today's crisis, but also a tool to overcome it and revitalize the potential of the social work profession.

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NEW INSIGHTS FOR SMALL AND MEDIUM SIZED CITY DEVELOPMENT WITH SMART URBAN PROFILING AND MANAGEMENT

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Abstract: *The world has become predominantly urban and many cities attempting to improve the quality of life and urban living in the future. Rapidly changing framework conditions for city development and urban area growth resulted in far-reaching transformations. The radical changes are caused by globalization progression, information technology, and the decline of agricultural and industrial work. Globalization also includes culture and amenities that reshape economic principles. In addition, better education of people in general and drastic social-economic transformations have an overwhelming impact on our urban life. Life in cities and urban areas of tomorrow will differ essentially from present circumstances. It is important to have a solid and realistic plan to respond to these changes. Therefore, procedures and strategies to resolve issues in this complex environment of cities and urban areas require a close cooperation with government and technology. In order to make citizen to live better in cities and urban areas, low-tech and high-tech approaches pertaining to transportation, buildings, utilities and smart citizens services should be balanced. This study focuses on a novel multi-dimensional model that accounts for managed growth strategies ("smart growth"), economic vitality as well as cultural amenities and sustainable development goals in a scientific and coherent matter. The Model shows a novel holistic Smart Urban Profiling and Management Model to support a smart cities market and smart growth. The assessment included literature analysis, secondary surveys and interviews of trained professionals. European cities with similar planning and zoning authorities were included in the analysis, therefore Austria was used as representative for European cities, since its small and medium sized towns are typical of Austrian small-scale structures. The data shown in this paper applied qualitative and quantitative methods to satisfy the requirements of a descriptive questions because of the lack of a quantitively verifiable hypothesis. Here, it displays analysis of critical elements of the Model and expert surveys in relation to a Smart City Market plan. The Model combines adaptation management methods with novel and established smart city strategies that also improves sustainable urban development goals. This Model, "Smart Urban Profiling and Management Model" is systematic and strategic and allows more effectively to respond to changing market conditions and to aide policy makers in the administration and management of cities. The Model constitutes a conceptual framework that can be used by various stakeholders to respond efficiently to changes and innovations in the smart cities market.*

Keywords: *adaption management, city & urban development and management, profile-oriented marketing, smart city strategies, sustainability*

1. Introduction

In Europe Cities and their surrounding urban areas are taking an active role and are leading the debate about our future. Over the coming years cities will substantially continue with strong growth and are subject to constant change and diverse development trends. To show this from the perspective of the Austrian example, the demographic development of Austria is characterized by strong growth in large cities with a simultaneous decrease in population in peripheral rural regions. This means, actually more thane five million Austrians, two thirds of the population, live in small and medium sized cities in rural areas [16]. Due to a better infrastructure and better career prospects more and more people are attracted by cities. This means concrete, that until 2030 a migration of up to 10% away from the structurally weakest areas are expected [17].

Thus the small-scale structured cities of the rural areas urgently need equal opportunities to open new perspectives to people living there. Another essential point are the protecting of the resources and strengthening the economy to provide a basis for social justice, these are one of the main challenges for cities in the 21st century. Therefore, the future of mankind lies in the cities and this will change also urban life (Singles, Seniors, etc.) [5] [25]. Urbanization is one of the trends of the future, strong cities are becoming urban (rural) areas with growing surrounding communities. This Increasing urbanization is a key trend and the design of city systems, their processes and management will play an essential role in shaping a sustainable, innovative and livable future in cities and surrounding areas, and must be utilized more professionally and strategically focused as a comprehensive process, herby should be determined what needs to be done to secure effective and lasting regeneration [6].

To navigate the big challenges of the next decades, city systems must be smarter and flexible, therefore holistic concepts are needed instead of the current single measured strategies, frequently applied in the past. It is important to develop innovative & sustainable strategies for dealing with the diverse and complex agendas of a city in dialogue with those who responsible for (politics, administration and companies). This development increases the demands in for city and urban management and show that the

constant growth of cities creates an environment in which cities are challenged to compete with each other for citizens and organizations [4].

To adapt to this changing reality, Cities and Regions can no longer rely on business as usual [2]. Therefore, innovation processes and a holistic view must be initiated and management systems established so that new things can develop continuously and systematically.

To react appropriately to the broad range of changes, evidence-based research should be applied to support municipal planners and other stakeholders. Cities and companies facing similar challenges, both should promote sustainable practices in relation to production and labour, as well as demonstrate social responsibility.

In order to achieve and sustain competitive advantage, managers rely on various management and marketing models [14] [15]. Although for example, Porter's framework for strategic management is a reasonable basis of a systematic approach to strategy, it does not guarantee scientific rigor and research.

"Systematic and future-oriented evaluation approaches can meet the challenges of a rapidly changing and increasingly complex society [13]. " Marketing models and urban development have frequently studied independently of each other. The model developed here will expand the model of profile-oriented marketing by elements of adaption management, thereby focusing on the adaptive capacity of cities which is essential for the sustainability of city development. The shown research data rely on city profiles of Austrian cities, representing the characteristics and peculiarities of midsize and small cities in Austria or other European nations. The evaluated indicators and profiles were comprehensively analyzed in relation to recent developments and positioned to the smart cities market. The presented "Smart Urban Profiling and Management Model" is systematic and strategic and allows more effectively to respond to changing market conditions and to aid policymakers in the administration and management of cities. It constitutes a conceptual framework that can be used by various stakeholders to respond efficiently to changes and innovations in the smart cities market..

2. Current Trends, Strategies, Concepts and Challenges of the Research Elements "Smart Cities", City Marketing" and "Sustainable Urban Development" in Austria

2.1 Strategies and Concepts for Smart Cities

On how to define the term smart city, there is still not much consensus. The Smart Cities Council, a for-profit industry-led organization, states that "a smart city harnesses information and communication technology to improve livability, workability and sustainability" [22].

In the presented Smart Urban Profiling and Management (SUPM) model, smart city model profiling requires the assessment of social, economic and sustainability features. To guarantee a high probability of success, appropriate openness to different potentially useful ideas is desirable.

Evaluation of the strengths and weaknesses of various strategies and the preferred state for each of the three features is undertaken in accordance with the principles of adaption (resource) management. Adaptive management procedures can have an active or passive design; active adaptive management involves testing multiple options at once in order to determine the best strategy, while passive adaptive management requires selecting and implementing one option to assess if modifications are needed. Adaptive management allows to reduce uncertainty over time via system monitoring and hence favors robust decision making. In order to determine the best strategy, the SUPM model must allow to select and implement to one option, monitor it, and when needed adjustments are made. The used tri-angular approach for profiling supports trade-off options within a certain decision frame and preserves identity in this process. If some factors of the profile need to be modified with respect to one of the domains, consistency can be achieved via the others. The idea of pursuing several aims in different areas simultaneously is strongly supported by adaption management. Systemic thinking, unlike analytical thinking, requires multiple skill sets to establish a holistic view of a system and explain its behavior.

Adaptive and strategic management principles constitute managerial and administrative tools of organizational change. Such models exist both in the profit sector, an example being the St. Gallen Management Model [18], and in the non-profit sector, the " Freiburg Management Model (FMM) [20], that are also facing economic, ecological and social challenges [3].

Stakeholder integration and sustainable leadership must essentially form the foundation before sustainable management can even begin to succeed. In the " normative orientation processes " [7], the stakeholders can effectively voice their opinions and be paid attention to and subsequently a report is recorded of the acknowledged concerns of society in the form of commitments and policies.

The presented model scrutinizes management's basic tasks, and examines the most important concepts of management science, providing measures and indicators for an organization's health. The management tasks and scientific concepts are presented within a multi-dimensional framework, that reveals interdependencies and interrelatedness.

As the St. Gallen Management model is an integrative part of Kellner's concept of communal profiling which in turn presents a key concept for developing a new holistic model for city marketing, it is also considered with respect to the implementation of management processes in urban marketing [10]. Finally, parts of the presented

management theories will be combined to create the key elements of the management processes of the Smart Urban Profiling and Management model.

Despite the above described existing change- and strategic management models for smart cities markets and urban development, fundamental gaps remain. Specifically, implementation processes in conjunction with monitoring need to be optimized. The presented study aspires to apply the potential of systems thinking and helps to improve our understanding of urban spaces and to change policy and practice.

2.2 Current situation of city marketing in Austria

A city competes for tax-paying residents, enterprises and skilled works, and lastly tourists. Cities and towns can use sustainability as a brand position. However it appears "to have focused on the environmental aspect of sustainability, while the adoption of other aspects of sustainability, including social and economic, has been limited" [24]. For small to medium-sized cities with a tight budget, the right topics and authentic contents for developing an overall strategy in the sense of a masterplan are the prime concern rather than creating a new slogan word or logo. Initially originating from the field of brand products, slogans should convey a pointed value or reasoning while logos make the brand visible. Having long been the favorite instruments of city marketers their positive impact was often dubious.

The holistic marketing concept incorporates profile-oriented city marketing, smart city strategies, adaptive management principles, and analysis of sustainability. It suggests multi-dimensions should be considered in the brand position and guides strategic actions to sustainably develop places. A brand position within the holistic marketing concept is refined, dynamic, peaceful and green. Regarding the Austrian status quo of the main elements of the holistic city marketing concept, the survey revealed that city marketing is frequently used, in particular in larger cities and smart city strategies are at least implemented in more than one-third of the surveyed cities regardless of their size.

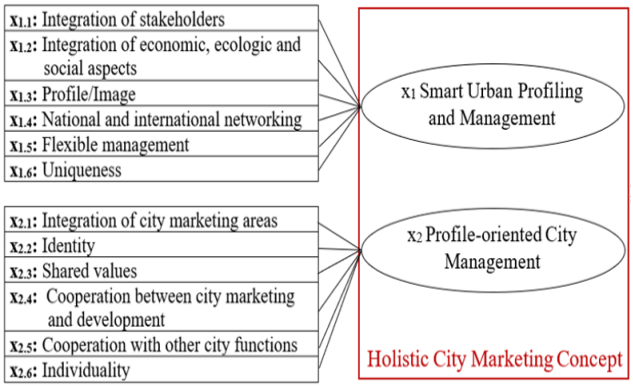

Figure 1: Scenario of the Holistic City Marketing Concept.

2.3 Austrian urban sustainability goals

The objective of this study is to create a branding tool that can help small cities and towns develop a brand position that is credible, drives growth, involves residents and fosters sustainability. This sustainable place branding analysis was adapted from the importance–performance analysis widely used in business and in the tourism industry. For small to medium-sized cities with a tight budget, the right topics and authentic contents for developing an overall strategy in the sense of a masterplan have top priority rather than creating a new slogan or logo. Initially originating from the field of brand products, slogans should pithily convey the positioning or a rational or emotional value while logos make the brand visible. Having long been the favorite instruments of city marketers their positive impact was often dubious. Regarding the Austrian status quo of the main elements of the holistic city marketing concept which are profile-oriented city marketing, smart city strategies and adaptive management, the survey revealed that city marketing is widely-used especially in bigger cities and smart city strategies are at least implemented in more than one-third of the surveyed cities regardless of their size. The study presented here did not evaluate metropolitan cities, however, it is worth to mention, that Vienna in various rankings, demonstrated that it is on the right path with an integrated and balanced approach. It led the Smart City strategy index in 2019, worldwide [23].

2.4 Austrian urbanization, trends and changes

The urbanization trend is also characterized in Austria and shown by strong growth in large cities with a simultaneous decrease in population in peripheral rural regions. In Austria there are already 830 of a total of 1.200 municipalities with a negative population development, and the trend is rising [19]. People are fleeing the country and moving to the city, until the COVID-19 pandemic caused a rethink. There is also the trend of New Regionality, which is becoming more and more popular in many areas of our lives, for example in tourism and cuisine [16]. Nevertheless, the appeal of the cities is unbroken, and the development opportunities between urban and rural areas are very different. Therefore, individual future opportunities are a key factor in emigration processes. This demographic change, tight budgets and increasing administrative complexity that municipalities have to find new ways to cope with their tasks.

The latest and most current development the COVID-19 pandemic will undoubtedly change the way we live and work for the foreseeable future, and new trends will emerge that will become part of the 'new normal.' [9]. In this context, urbanization does not mean urbanization in the proper sense. Urbanization derives from the Latin "urbanus" (city) and stands for the change in life in the city.

Those who live in rural areas in western European industrialized countries, like Austria, live mostly in urban

areas. The infrastructure is similar to the city, there are hardly any differences in e. g. medical care, schools, shopping or the transport network [19]. The main difference is that cities create jobs that don't exist in the countryside. These job opportunities cause people to leave rural areas because there is a lack of infrastructure such as roads, public transport networks and fast internet. Urbanization involves more than just changing living spaces. Not all cities are the same and the respective city flair depends on the size of a city and there are enormous differences in size. Austria is growing by around 60.000 inhabitants every year. 40.000 people moved to the federal capital Vienna and the rest were spread across the nine federal states. According to Gottfried Kneifl from IWS (Initiative Wirtschaftsstandort OÖ), no other capital in the EU has such a high degree of density as Vienna. The former east-west divide was replaced by an intensive rural-urban migration into the metropolitan areas of the federal states [12].

The region between Wels and Linz (also called the Upper Austrian central area) is the area with the highest density of large and medium-sized cities and counts as the most economically strong region in Austria. The state capital Linz is growing due to its geographical advantage, excellent transport connections, shipping, economic prosperity and a strong industry. But even the capital Linz, with more than 200.000 inhabitants, has no big city characteristics, because the city has comparatively few bacon belts due to the close proximity of other important regional centers. A surrounding area has formed here that is well connected in terms of traffic and allows the surrounding cities to grow together constantly. The close interweaving of urban density and extensive rural open space for business settlements, suburban development as well as for local supply and relaxation makes this area in Austria unique. . Behind prosperous small towns and their rural areas are the great commitment and exceptional achievements of the people who live, work and manage there. With around 312.000 jobs, the Upper Austrian central area is one of the economically strongest and fastest developing small regions throughout Europe [19].

One of the central tasks of the next few years is therefore to create contemporary framework conditions so that the small and medium-sized cities and their surrounding areas remain spaces for the future. Important prerequisites for this are digitization, sustainable infrastructure, high-quality jobs, modern education, reliable health care and an inspiring range of cultural and leisure activities to compensate for structural disadvantages. More equal opportunities for this type of small-scale structured towns also requires joining forces and getting to the heart of what the small towns and their surrounding regions need for successful development. It is also about rethinking the rural area with its small-scale structure, because these rural regions are not deficit areas, but real future treasures, the potential of which must be maximized. All of these are important prerequisites for this type of small-scale structured towns to be and remain future spaces through new thinking. A forward-looking model to cope with this tasks are inter-communal cooperation. The expansion of cross-community Cooperation makes it possible to use synergies for the benefit of the citizens [16].

In summary, it can be said that the Upper Austrian example as well as Salzburg with its surrounding area or the Vorarlberg Rhine Valley clearly show that the most important development in the next few years will be the space between the cities, their gaps. Cities and municipalities are growing together to form a quasi-city or [19].

The residents of these regions or new spaces in between need the best possible infrastructure in public transport, roads, childcare and creative freedom for the immediate neighborhood. Cities need the country and rural communities need the vitality and diversity of cities.

However, the Covid-19 pandemic, has made the big city and metropoles less attractive because people feel safer in the countryside. The disadvantage of commuting to work is compensated for with mobile office options by working from home. Housing researcher Wolfgang Amann thinks about this development that whoever can afford it will want to have their own work room in the future. Smaller apartments will therefore go out of fashion because the home office will have a different status than before [1] [19].

According to the findings of the media specialist Doris Schulz published by STAMA Austria and the current study by sReal, 43% of those looking for real estate in Austria currently want an apartment or a house in the countryside and almost 60% want to move from the larger district capitals. A house in the country and a small apartment in the city could be a new way of life for this if you can get by with three working days in the office and two working days at home in the future [19].

The tasks are therefore larger than before to enable greater flexibility and mobility, increasing life expectancy and the associated quality of life and feel-good atmosphere as well as individuality, internationality and neighborhood networks. Through new forms of mobility and networking, urbanity is above all a new way of life and thinking.

All these changing framework conditions and trends look set to continue, although with some new characteristics and points of focus:

Urbanization: The pandemic is unlikely to slow the long-term trend in growing urbanization, but will prompt a rethink in urban design, increasing the imperative to develop truly scalable smart city solutions, to put a much greater focus on public health and safety, and to deliver greater investment in public infrastructure [9].

Sustainability: There will be an increased spotlight on corporate social responsibility, and through this, greater awareness of the fragility of our society and ecosystem [9].

The 'new normal' will take time to evolve. New trends are already starting to take shape as governments, businesses and communities begin to adjust to the postpandemic environment. But equally, there will be other consequences to the pandemic that will surprise us and that are not yet possible to predict. But the responsibles for city and urban development have to ensure that our cities and urban, as rural areas have a real future for all those who live there and want to live there.

3. Research Design

The research design & methodology for this study report involved the use of extensive secondary sources, primary research including several reputed open source databases to identify and collect information for this study. This multi-step methods approach of research has the advantage that each stage is based on the experiences and results of the previous and allows an integrated view with revisions during the research based on the preliminary results. Systemic thinking, unlike analytical thinking, requires multiple skill sets to establish a holistic view of a system and explain its behavior.

Secondary Data: Mainly used to obtain relevant data about market structure, the sustainable city as well as urban development and the groups of key players. The secondary sources included press releases, financial statements and annual reports of companies, annual reports, peer-reviewed journal publications, and articles from trade and business associations as well as government publishing sources.

Primary Data: The aim of this survey was to test whether or not in accordance with the assessment by the stakeholders, the Smart Urban Profiling and Management model has a positive impact on the sustainability of city marketing with respect to economic, social, and environmental aspects. A detailed questionnaire was shared with the respondents containing all the aspects related to the study topic. The primary sources included 80-90 professionals in the area of city marketing, urban development and relevant management. The experts were surveyed via standardized questionnaires to gather data about applied elements, indicators, values and practice related to a holistic city market ecosystem. The survey gathered data about applied elements of the holistic city marketing concept and perceived urban sustainability. The answer options for the closed questions were analyzed and interpreted from Likert-Type scales.

The sampling of Austrian cities was based on a definition for medium-sized cities with a population between 10.000 and 500.000 inhabitants, at least 1 university and catchment areas less than 1,5 million. In addition, the cities should have well accessible and relevant databases and therefore be covered by Urban Audit, a Europe-wide database on cities. Austria was used as a representative for European cities, since here small and medium-sized towns are typical of Austrian small-scale structures. Although this is also true worldwide and the vast majority of the world´s urban population lives in medium-sized cities, they are hardly considered in most surveys, which focus primary on the global metropolises.

Integrating Information: As revealed by the analysis of secondary data, many of those responsible for city marketing and sustainable city development in Austria are often defined by their position in the city administration such as city office directors or city councilors. For them, city marketing and sustainable development are areas of responsibility among many others. They have a general overview of the relevant situation but are not experts by their qualification or profession and were interviewed on the situation in certain Austrian cities. In addition to the cities, municipalities, communal associations, private businesses, and academic institutes are important actors in the networks for sustainable city, regional and communal development and city marketing. Chief executive officers, marketing directors, and innovation directors of select were also contacted for the expert interviews. To make coherent decisions and strategies related to the relevant goals and indicators, an integrated approach aspires to evaluate and interpret economic, environmental, and social aspects.

Data Processing: The evaluation and subsequent data processing was performed with SPSS Statistics applying normal distribution tests, scale testing, factor analysis, and correlation analysis, regression analysis and canonical correlation as tools of descriptive statistics as well as group comparison tests, to detect distinctive features and gain some more interesting insights.

Data Triangulation: Figure 2 depicts the sustainable development triangle, i.e., economic, environmental, and social facets of sustainability. It demonstrates in a nutshell, what sustainable development means.

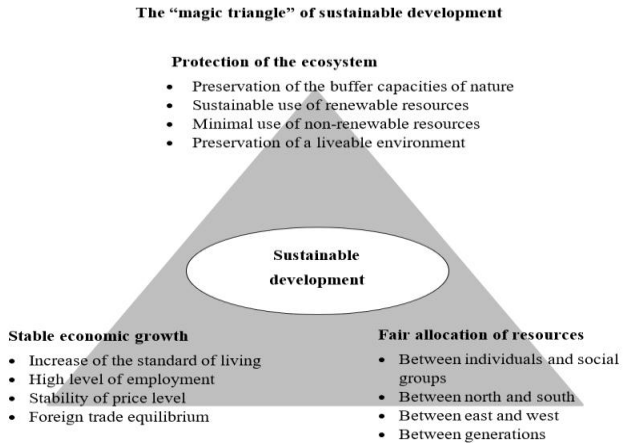

Figure 2: Sustainable development triangle shows key elements and interactions Adapted from [21].

Positive interactions stimulated strategies across the three domains, whereas negative types will be subject to trade-offs. The interactions between sustainable development goals help policymakers to think systematically, beyond simple synergies and trade-offs.

4. Acumen and Construction of the Model

In the Smart Urban Profiling and Management model, the profile of a city/town relies on relevant indicators of the three key dimensions, economic, social, and ecological sustainability. In the past, sustainable development has been hampered by trade-offs in favor of economic growth over social and ecological benefits. Thus, the model simultaneously evaluates indicators of economic, social, and ecological strengths and weaknesses. In accordance with the principles of adaption management, it should always be possible to go back if several attempts to improve a certain weakness fails and select another strategy or weakness to improve. The integration of a triple bottom line into the profile provides it with the necessary support to maintain identity in this process. If some aspects of the profile need to be reformulated in one of the domains, consistency can be achieved via the others. The idea of pursuing different goals in various areas simultaneously is backed by adaption strategies and adaption management, which help to manage risks to an acceptable level for each aspect. In order to evaluate progress towards the goals, an evidence-based practice that relies on scientific substantiation should help the decision-makers.

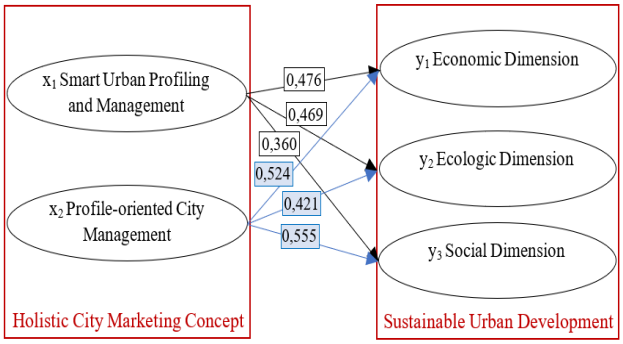

Figure 3: Spearman´s correlation coefficients are testing the influence of the holistic city marketing concept on sustainable urban development

Spearman's correlation can also be used when two variables are not normally distributed. It can take values from +1 to -1. As figure 3 shows, the Holistic City Market Concept is reasonably correlated with the Sustainable Urban Development plan.

5. Conclusions

The Smart Urban Profiling and Management model presents a new integrated approach for city marketing as an instrument of sustainable urban development. A strong city profile that considers the three dimensions of sustainable urban development strengthens the positive image, the identification of citizens with their commune and the attractiveness of a city in the long term while the flexible and participative approach allows for a balanced prioritization and therefore more holistic solutions. Therefore, the result of a strong city profile and the holistic city marketing concept is a superior sustainable, smart, attractive city. The presented model helps to implement efficient processes. Second, the implementation of the goals and targets attempts to challenge the business-as-usual approach to economic growth.

Furthermore, the assessment of the strategic and conceptual approach revealed a lack of professionalism and strategic overall planning. Most cities without professional advice or guidance did not adopt a procedure as suggested by specialist literature or experts. They often created a city brand or profile but did not start with a SWOT-analysis as a basis or involved the relevant stakeholders, or they have different slogans for each sub-strategy because of separate scattered marketing organizations. In many cases, no distinction was made between mission, vision, slogan or USP which is apparent from the answers of the expert interviews. This confirms the opinion of an interviewed expert that profile-oriented marketing might be widely used in Austria in the eyes of city marketers but not in the proper sense of the term and is also consistent with the group comparison of the main empirical survey which revealed that the insiders perceive the level of implementation of elements of the holistic city marketing concept more positively than observers outside the group.

Evolution into an environmentally and socially sustainable location for smart businesses demand structural changes. Readjustments in a comprehensive process can be challenging and rapid changes make it necessary to review and adjust processes at short intervals. The lifestyle concerns of people are increasingly important in defining the overall role of urban social processes. Sustainability-based business management seeks to harmonize economic, ecological, and social aspects within the enterprises. To guarantee healthy economic conditions in the future, sustainable places should promote innovation, foster a dense network of companies and organizations and provide equitable opportunities for local businesses [4] [8].

Here, are shown innovative steps for a holistic approach to city-marketing and sustainability. Adequate monitoring is essential and comprehensive in design. Special indicators have been defined for each dimension to assess the status quo. It is important to provide a high degree of transparency and making successes visible. New habits and behaviors will need to be educated and adopted. This reset will lay the groundwork for reimagining the new spaces between the cities, their surrounding and the rural areas and distributed through the Smart Urban Profiling and Management model.

Urbanization is above all a new way of life and thinking [16]. To enhance the quality of life for residents in cities, evidence-based research and innovative thinking are

indispensable. The presented framework strategy helps municipal administration, businesses, science entities, and civil society to create a vital city environment with equal opportunities for all citizens.

However, there are no "one size fits all" solutions. With a view to flexibility and closeness to the citizens, different cities, surrounding areas and rural regions require different approaches for successful communal cooperation to shape a sustainable, innovative and livable future.

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ENERGY MANAGEMENT OF ELECTRIC NETWORKS WITH DISTRIBUTED GENERATION SOURCES

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Abstract: *Distributed Generation is rising as a significant choice for the future turn of events and rebuilding of electric networks infrastructure and framework. Potential advantages of distributed generation incorporate lower power costs, higher adaptability, improved power and energy quality, higher networks effectiveness and more prominent dependability. This paper will look at some of the advantages and impediments related to the electric networks that contain different distributed generation resources, and the reliable methods of the energy management for the electric networks with the different renewable energy sources, alongside peddling a portion of the key innovations driving its turn of events. The empowering and restrictive conditions, from administrative and strategy points of view, are talked about in an overall way to present some of the more extensive ramifications of distributed generation.*

Keywords: *Energy Management, Distributed Generation, Renewable Energy Sources, Power Quality, Electric Load Models, Microgrids.*

1. Introduction

The energy collected from renewable resources is referred to as renewable energy. These resources are replenished on a human timescale, including wind, sunlight, tides, rain, geothermal heat, and waves. The provision of energy by renewable energy sources is in four key areas, such as air and water cooling/heating, rural (off-grid) energy services, generation of electricity, and transportation.

Renewable energy is derived from natural processes or sources that are in constant replenishment. For example, the wind keeps blowing and the sunlight keeps shining even if their availability is dependent on time and weather. This energy is also referred to as clean energy.

Renewable energy has often been considered as new technology. However, the power of its nature has long been used for lighting, transportation, heating, and more. The sun assisted in kindling fires to last throughout the evening and supplied warmth during the day. The wind had windmills to grind grain and powered boats to sail the seas. Nevertheless, over the past 500 years, humans opted to use dirtier and cheaper sources of energy, including fracked gas and coal (Ramelli et al., 2007).

The renewables are becoming an essential source of power owing to the current innovations also, more affordable approaches to catch and hold solar oriented vitality and wind. This accounts for more than one-eighth of the United States' generation (Shamatah et al., 2017). The renewables' expansion is taking place in large and small scales, from the homes' rooftop solar panels that can trade the power to the grid to immense offshore wind farms. Also, several communities depend on renewable energy for lighting and heating. While the use of renewable energy continues to develop, a fundamental objective will involve modernizing the electricity grid in America to make it more secure, better, and smarter integrated across the regions (Rajab et al., 2017).

2. Traditional Energy Sources

The nonrenewable energy also referred to as "dirty," consists of fossil fuels, including coal, gas, and oil. The origins of this energy consume a lot of time to replenish and are only available in limited amounts (Tianze et al., 2011). During gas pumping at the site, we use a finite resource filtered from crude oil that has been available since the prehistoric times.

Also, the sources of nonrenewable energy are located in substantial parts across the globe. Besides, every state can access wind and sunshine. Focusing more on the nonrenewable energy can improve national security by minimizing the reliance of the country on exports from nations with fossil fuel (Safari & Mekhilef, 2010).

Many sources of nonrenewable energy can threaten human or environmental health. For example, the drilling of oil may need strip-mining. The technology linked to fracking can lead to air and water pollution and earthquakes. All these activities play a crucial role in global warming (Tung et al., 2006).

3. Types of Renewable Energy Sources

Solar Photovoltaic Technology

Increasing demand for food and electricity has significantly affected the energy sector around the globe. The world's energy resources are shrinking because of increased energy demand and population. One of the toughest problems of the 21st century is avoiding energy crises (Kadem et al., 2018). Accessible energy is insufficient for a nation because of many important factors, such as the country's growth rate, the country's economic structure and its own and a country's technology (Kim et al., 2017). When economic growth continues to

grow, so does energy requirement. Many techniques have been proposed for increased energy production, though many people in developing and underdeveloped countries live in the dark due to non-electrified areas (Chaudhari, 2005).

While renewable energy resources continue to decline, renewable energy incorporation fails to meet the need for increased energy use (Ramelli et al., 2007). It is now important for the world's future to shift the trend towards something environmentally friendly. In a way, solar energy, thermal water energy and wind power are relevant because they are environmentally friendly (Kim et al., 2017). The ranking of sustainable and environmentally sound energy resources tops the list of all solar energy available (McCormick, 2015).

The second major advantage of using solar power is that it will not go down and will not decline until the planet is destroyed. Solar radiation delivery and the strength of solar radiation, which varies from region to region and season to season, are main factors deciding the efficiency of solar energy worldwide (Rajab et al., 2017). Another big advantage of solar energy transmission is that it does not affect the environment and holds the natural system in check.

Structures of Photovoltaic Modules Photovoltaic
Photovoltaic cells are electrically connected in series, parallel or both in combined (series and parallel) circuits to provide high voltage, current, and power levels. One or more PV modules in the photovoltaic panels can be gathered into a pre-wired set that can be inserted into the installable field section (Tianze et al., 2011). The entire power generating machine is a photovoltaic system that has a limited number of PV modules and displays. Figure 01 shows that how it is structured from solar cell to PV.

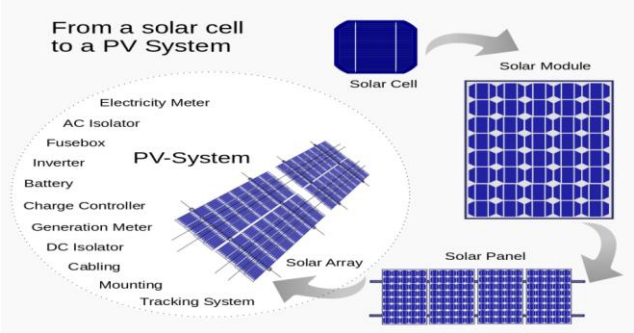

Figure (01) Photovoltaic cells, modules, panels and arrays (Rajab et al., 2017).

Under Standard Test Conditions (STC), PV modules and arrays performance are usually calculated by the average output of DC power. A cell working temperature is 25oC or 77oF (Tianze et al., 2011). And an incident solar radiation standard of 1000W/m2 and a spectral range of 1.5 under air mass is referred as usual test conditions. Photovoltaic modules, with low failure rates and an average service life of 20-30 years, are very stable and reliable devices today (Ramelli et al., 2007).

Wind Energy
Wind energy means the way of making electricity from the air streams of the wind, that happen naturally in the earth's climate (Tianze et al., 2011). New generation of the wind turbines are utilized to capture or catch the kinetic energy from the wind to generate electric power.
According to (Al-Bahadly, 2011) shows that three is different types of the wind turbines but the main three types as following:

- Utility-scale wind: Wind turbines that stretch out in size from 100 kilowatts to a couple of megawatts, where the energy is passed on to the electric sbustation and conveyed to the end clients by electric utilities through the dispersion organization.
- Distributed wind: Single small size wind turbines under 100 kilowatts that are utilized to provide the required home energy, independent, private or farms and are not connected to the public electric network.
- Wind turbines that are brought up in big streams, as on the terrain rack. Like the Offshore wind turbines are greater than Onshore or land-based breeze turbines and can make more power.

Wind Turbines Principle
When the wind air flows through the wind turbine blades that will result in capturing the wind's kinetic energy which will be transformed into mechanical force or power. This mechanical force will turn an inward shaft related with a gearbox, which rates up turn by a factor of 100 (Lotfi & Khodaei, 2015). That turns the electric generator which produces power.

Normally remaining at any rate 80 meters tall, round and hollow steel towers maintain a center with three associated Blades edges and a "nacelle," which houses the pole, generator, gearbox and all the control panels (Chaudhari, 2005). Wind estimations are gathered, which direct the turbine to turn and face the most grounded Wind, and the edge or "pitch" of its blades is improved to collect more power (Ramelli et al., 2007).

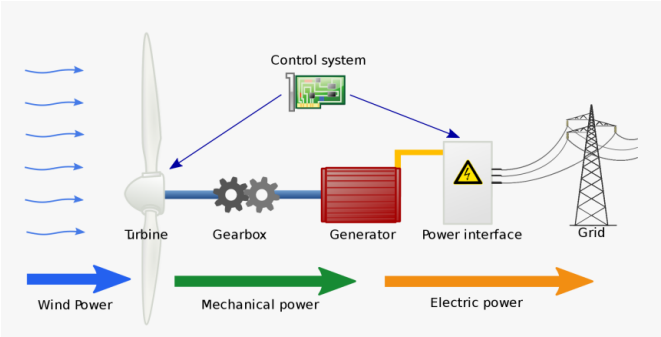

Figure (02) Wind Turbine structure (McCormick, 2015).

Wind Farm

Enormous number of wind turbines are generally installed near one another, which is known as a Wind Farm or Wind Park. A wind park capacities as one energy generation plant and convey the power to the electric network (Overbye et al., 2004).

The turbines in a wind park are connected to each other in strings and afterward to a substation and from where the power being generated will be delivered to the electric network (Ramelli et al., 2007). When wind power is on the public electric network, electric utilities or force administrators will deal with the power to deliver it to the customers.

Smaller electric networks, called low voltage LV distribution networks, receive the energy which being generated from the wind parks and transmitted through the electric network transmission lines, where the energy can be delivered for a long distances to the locations where the customers are (Chaudhari, 2005). Finally, LV distribution networks will deliver the power directly to the cities, houses or business (Ramelli et al., 2007).

Other Alternative Sources of Energy

Hydroelectric Power

The largest source of renewable electric energy in the US is hydropower, although it is soon expected the wind energy will emerge the top. Hydropower depends on rapidly descending water from a high point or fast-moving water in a huge river (Chaudhari, 2005). The force of the water is converted into electricity through the rotation of the generator's turbine blades (Lotfi & Khodaei, 2015).

Internationally and Nationally, mega-dams or bulk hydroelectric plants are regarded as nonrenewable energy. These mega-dams reduce and divert the natural flows controlling the restrictions for humans and animals that depend on the rivers. Also, the small hydroelectric plants with an installed capacity below 40 megawatts are attentively managed as they divert only a fraction of flow and do not cause environmental damage (Chaidez, 2011).

Biomass Energy

Biomass is regarded as an organic material originating from animals and plants, including trees, crops, and waste wood. When it is consumed, the chemical energy is emitted as heat hence allowing it to produce electricity using a steam turbine (Ramelli et al., 2007).

Biomass is wrongly defined as a better option than coal, renewable, and clean fuel for providing electricity. Nevertheless, recent studies have exhibited that most biomass forms, particularly from the forest, yield a higher carbon than fossil fuels. Also, there exists a negative impact on biodiversity (Chaudhari, 2005). Under the right circumstances, some of the biomass energy forms could be utilized as a low-carbon option. For example, chips and sawdust from sawmills can be utilized as a source of low-carbon energy instead of the quick decomposition and release of carbon (Ramelli et al., 2007).

Geothermal Energy

You have already used the geothermal energy if you have ever relaxed in a hot spring. The core of the earth is hot, just like the surface of the sun, because of the slow radioactive particles' decay in the rocks located at the planet's center (Kim et al., 2017). Hot underground water is driven into the surface as a hydrothermal resource by drilling deep wells. To produce electricity, the water is pumped via a turbine. If the geothermal plants pump the water or the steam they use into the reservoir, it may result in low emission. Besides, there exist approaches to generate geothermal plants in places without underground reservoirs; however, this may result in the risk of an earthquake in the locations already regarded as geological hot spots (Chaudhari, 2005).

Ocean Tidal Energy

Wave and tidal energy are in the developmental phase; however, the gravity of the moon will always rule the ocean hence making harnessing its power a better option (Tianze et al., 2011). Some of the approaches of tidal energy, such as tidal barrages located in a lagoon or an ocean, are associated with how dams work and may harm wildlife (Chaudhari, 2005). Wave power works the same way as tidal power and depends on the ocean floor–anchored devices or dam-like structures below the water surface (Rajab et al., 2017).

Sun power has been demonstrated to be the most proficient and viable among sustainable power hotspots for home and business use. Photovoltaics is becoming the World's Most Cost-Effective Energy Source. Not exactly USD 25 for each megawatt-hour of sun based energy, these sorts of costs are normal anything else in radiant districts. On the other hand, the power generation expenses of new coal and atomic power plants are between USD 60 and USD 110 (SunPower, 2020).

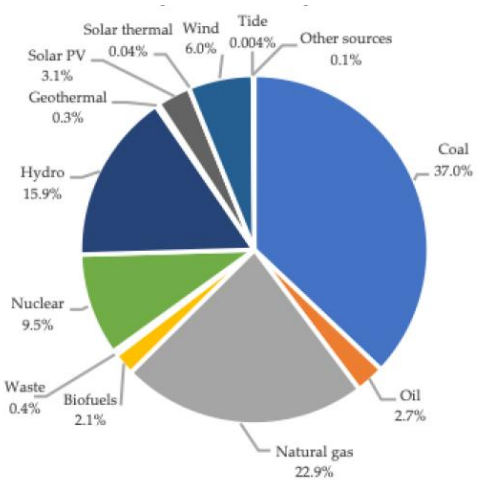

Figure (03) Global Electricity Generation by Source 2020 (Halkos & Gkampoura, 2020).

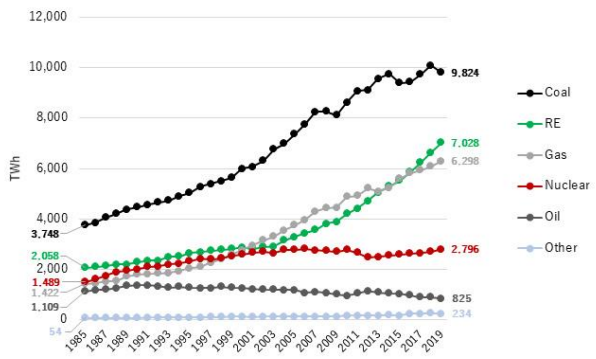

Figure (04) Global Energy Growth 1985 – 2019 (Halkos & Gkampoura, 2020).

With regards to power generation, non-renewable energy sources gave more than 64% of world's energy in 2017, where renewables generated around 25%. With some other renewables, hydropower was the most popular used since it provided 16.3% of total energy (Figure 11). So also, in view of the latest forecasts in 2020, petroleum derivatives will produce the majority of the world's power, despite the fact that the use of coal is by all accounts diminishing. Renewables will give about 27.5% of power in 2020; there will be an expansion in the portion of wind power and biofuels and a decline in the portion of hydropower, which actually remains the most broadly utilized generator of power among the renewables (Halkos & Gkampoura, 2020).

Distributed Generation

Distributed generation alludes to different advances that create power at or close to where it will be utilized, for example, sun-oriented boards and consolidated warmth and force. Distributed generation may serve a solitary structure, for example, a home or business, or it might be important for a microgrid (a littler network that is likewise integrated with the bigger power conveyance electric distribution networks), for example at a significant mechanical office, an army installation, or an enormous school grounds (Naredo et al., 2007). At the point when associated with the electric utility's lower voltage transition lines, distributed generation can help uphold conveyance of perfect, dependable capacity to extra clients and lessen power misfortunes along transmission and distribution lines (Nulty, 2014).

In the private area, regular distributed generation frameworks can have the following parts:

- Emergency reinforcement generators generally filled by gas or diesel fuel
- Photovoltaic / Solar Panels.
- Small wind turbines.
- Natural-gas-fired fuel cells.

In the business and modern divisions, distributed generation can incorporate assets, for example:

- Responding ignition motors, including reinforcement generators, which are might be powered by oil (Ma et al., 2007).
- Photovoltaic panels.
- Wind Turbines
- Hydropower sources
- Biomass combustion
- Fuel cells fired by natural gas or biomass.
- Combined heat and energy systems

The three main challenges communities, large buildings, commercial areas, industries, and municipalities face include CO_2 reduction, the security of supply, and costs (Ranade et al., 2001). The local distributed energy solutions can convert these issues into long-term variables across all the industrial and business sectors. These solutions are supported by sophisticated energy management and an optimized combination of distributed energy resources (DER), such as renewable energy, storage systems, and combined power stations and heating (Sharon, 1996). Energy-as-a-service is the preferred option when outsourcing energy. It deals with the problem's nuts and bolts from the design to operation hence allowing to focus on the fundamental business.

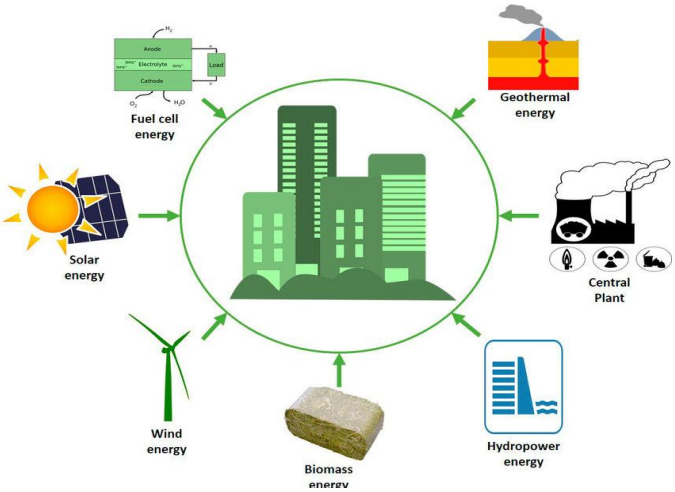

Figure (05) Distributed Renewable Energy Resources (Al-Bahadly, 2011).

There is a significant rise in new opportunities as a result of the change in the energy system. The system has shifted from centralized large-scale power generation to a progressively decarbonized, digitally enabled, and distributed landscape. This has allowed campuses, buildings, industrial plants, urban districts, municipalities, and infrastructural facilities to have a new role in the energy system (Knyazkin et al., 2004).

There is a need to customize the distributed energy solutions based on the companies' requirements. Discover our wide offering for the underlying technical applications and various markets (Li et al., 2014). As a knowledgeable co-partner, we enhance a comprehensive solution from

consulting to services inclusive of business and financing models.

The term distributed energy systems (DES) consists of a diverse generation, control solutions, and energy monitoring. The DES technologies represent a paradigm shift and provide the energy consumers and building owners with significant opportunities to improve reliability, secure any additional revenue via dynamic load management and on-site generation at reduced cost (Li et al., 2014).

The uncertain nature of electricity resources is considered one of the main problems associated with DER integration, including wind and solar power. The uncertainty can result in other issues, such as increasing the transmission network and reversing the flow of power from the distribution to the transmission system. Besides, it needs complicated organization tools to ensure balance in the network and make the relationship between supply and demand extremely complex (Ju et al., 2011).

Unlike the centralized, traditional electricity grid (microgrid), the microgrids are regarded as localized, small-scale, and contemporary grids. Besides, the microgrids can reduce the grid disturbances or reinforce the grid resilience, and detach from the centralized grid to operate autonomously (Gunda et al., 2012). Generally, they are AC grids with low voltage installed by the benefiting community and often use diesel generators. Also, they increasingly optimize a combination of various distributed resources, including solar hybrid power systems associated with reducing the quantity of the released carbon (Ainsworth, 1967).

DG is associated with reducing the quantity of energy lost while transmitting electricity. This is due to the generation of electricity close to where it is utilized, probably in the same building. Also, this minimizes the number and the size of the power lines that must be built (MANOHAR et al., 2018).

The characteristics of DER frameworks located in a feed-in tariff (FIT) project include high efficiency, low pollution, and low maintenance. To reduce pollution, these features needed large complex plants and dedicated operating engineers. However, the new embedded systems can offer these characteristics, automatic operation and renewable energy, including geothermal, solar, and wind. As a result, the power plant size that can give profit is reduced (Sharon, 1996).

4. Use of Distributed Generation Sources:

Utilization of DG has expanded for an assortment of reasons, including: Renewable advancements, for example, sunlight based boards, have become practical for some property holders and organizations (Li et al., 2014). A few states and local governments are propelling arrangements to empower more noteworthy sending of sustainable advances because of their advantages, including vitality security, versatility, and emanations decreases. DG systems, especially consolidated warmth and energy and emergency generators, are utilized to give power during power blackouts, including those that happen after serious tempests and during high vitality request days (Boemer et al., 2009).

Operators of the electric network may depend on certain organizations to work there on location emergency generators to keep up solid power administration for all clients during long stretches of pinnacle power use (MANOHAR et al., 2018). DG frameworks are dependent upon an alternate blend of local, state, and government approaches, guidelines, and markets contrasted and brought together generation (Gunda et al., 2012). As strategies and motivators fluctuate generally starting with one spot then onto the next, the monetary engaging quality of a DG venture additionally changes (Chicco et al., 2005).

Negative Environmental Impacts of the Distributed Generation

However, (Wanik, 2011) shows that DG can also cause negative environmental issues:

DG systems require an "impression" (they occupy room), and in light of the fact that they are found nearer to the end-client, some DG frameworks may be undesirable to the eye or cause land-use concerns.

DG advancements that include ignition especially consuming petroleum derivatives can deliver a considerable lot of similar kinds of effects as bigger non-renewable energy source terminated force plants, for example, air contamination. These effects might be littler in scale than the effects from a huge force plant however may likewise be nearer to populated regions.

Some DG advancements, for example, waste burning, biomass ignition, and joined warmth and force, may require water for steam age or cooling.

DG frameworks that utilization burning might be less proficient than brought together force plants because of efficiencies of scale.

Distributed energy innovations may cause some negative natural issues toward the finish of their valuable life when they are supplanted or taken out.

DG is rising as a significant alternative for the future turn of events and rebuilding of power framework. Potential advantages of appropriated generation incorporate lower power costs, higher adaptability, improved force quality, higher framework productivity and more noteworthy dependability. There are numerous possible advantages of the DG model, anyway there are additionally a few disadvantages. Not the entirety of the innovations that can be embraced in a conveyed network offer improved air outflow execution. Moreover, the different sources of the

distributed generation will add a significate amount of the converters which basically are nonlinear loads, which eventually will cause different power quality issues and instability within the electric network.

5. Management of Distributed Generation Resources:
The share of power electronics appliances in the distribution networks has increased significantly as of late, determined by the fast advancement of sustainable power sources (RES) and variable speed drives, as the Renewable Energy Directive sets up an arrangement for the creation and advancement of power from RES in the European Union (EU), it requires the EU to satisfy at any rate 27% of its both private and business needs of the vitality needs with renewables by 2030 to be accomplished through the accomplishment of individual public objectives (MANOHAR et al., 2018).

As a result, power-hardware based appropriation frameworks are turning out to be significant parts of electrical networks, for example, inexhaustible force plants, microgrids, nonlinear burdens, and electric railroad frameworks. These frameworks present better highlights than construct the cutting edge power framework, including the full controllability, the maintainability, and the improved productivity, yet additionally bring new difficulties (Pepermans et al., 2005).

High-order harmonics tend to be increased by the high-frequency switching operation of power converters, which may trigger the parallel and series resonance in the power system (Naredo et al., 2007). The interactions of the wideband control systems for power converters with each other and with passive components may increase the harmonic problem as well. All of these aspects expected to cause a serious harmonic instability phenomenon in the low voltage (LV) distribution networks in the years to come (Pileggi et al., 1993). Such phenomena have been frequently reported in renewable energy systems and high-speed railway and are challenging the power quality and the stability of the electric distribution system (Ma et al., 2007).

Previous work on the subject of harmonic stability reported in the literature indicates that harmonic divergence scenarios demonstrate stability limits and indicate the need for a broader perspective of harmonic studies, in addition to quantification of harmonic distortion levels, also stability aspects have to be considered (Gunda et al., 2012). Generally, the main cause of inaccuracy in distribution simulation studies due to lack of accurate and effective nonlinear load models, till now there is no accepted nonlinear load model (Boemer et al., 2009).

The significance of accurate nonlinear load models in distribution system analysis and the impact of nonlinear load models on harmonic stability, voltage stability and the interarea oscillations has been extensively studied in the literature. However, still there is a need to develop an effective and accurate nonlinear load model and analysis approach for the harmonic stability problem in the active LV distribution networks (Berisha et al., 1996).

Nonlinear models of feed-in devices are also required to consider additional aspects like the dependency on operation conditions (partial or full power), this has to be considered by developing respective models (Pepermans et al., 2005). Furthermore, the frequency dependence of linear load models is usually only determined using the reactive share (Knyazkin et al., 2004). It should possibly be considered if also the ohmic share changes significantly with frequency (e.g. due to skin effect). The same applies to existing system components models, which are represented by constant impedances and are frequency dependent only due to their reactive share (Ju et al., 2011). Furthermore, with regard to the development of load scenarios, it would be important to investigate in more detail the simultaneity of used nonlinear devices by considering load and feed-in profiles e.g. per day (Boemer et al., 2009).

Due to the high penetration of RES feed-in sources and the large use of different non-linear loads in the LV distribution networks, the waveforms of the flexibly voltages and flows have been influenced. Thus, PQ issues particularly sounds are expanding in the LV circulation organizations. In certain circumstances, these can have critical specialized and budgetary effects on the clients and organization administrators (Boemer et al., 2009).

Power quality (PQ) related issues have expanded all around the globe during the most recent twenty years. Power quality, similar to quality in different products and enterprises, is hard to evaluate. There is no single acknowledged meaning of value power (MANOHAR et al., 2018).

Many harmonic producing loads and feed-in devices are identified by harmonic studies, where feed-in devices at normal operation conditions show rather low current distortions compared to load devices (Ainsworth, 1967). There are low-power devices (switch mode power supply (SMPS) or lighting devices) as well as high power devices (electric vehicles or heat pumps) (Berisha et al., 1996). The basic components topologies of these loads (diode bridge rectifier, smoothing capacitor, power factor correction (PFC) circuit) are similar in most of load categories (Ranade et al., 2001). The harmonic emission depends significantly on the used PFC method, which is suitable to mitigate effectively harmonic components, but simultaneously results in additional costs (Pepermans et al., 2005).

Various harmonic studies deal with individual sources of harmonics and intend to investigate their contribution to the disturbance levels of distribution system. Most studies are motivated by increasing usage of harmonic-producing devices, e.g. due to new technologies and the political support (Pepermans et al., 2005). In the residential sector, the focus is usually set on devices of low rated power,

which do not cause serious harmonic problems individually, but large application of these loads may have the potential to increase the harmonic currents and voltages to unacceptable levels (Knyazkin et al., 2004).

Electric vehicles are also expected to be introduced in large numbers to low-voltage networks in the near future. Different application of electric vehicles (cars of various sizes, electric bicycles, mopeds, buses and transport vehicles) are already available (Ma et al., 2007). The topologies of the respective charger circuit very dependent on rated power and battery capacity, but generally diode bridge rectifiers and PFC circuits are applied. In contrast to previously mentioned categories, electric vehicles are considered as a high power devices that have the potential to inject high distorted currents into the LV distribution network (Chicco et al., 2005).

Since there are hundreds of such electrical loads in the modern distribution system, which made it difficult and uneconomical to establish a model for each electrical load respectively (Pepermans et al., 2005). Hence, the system-wide and accurate load modeling has to be developed.
Inaccuracy of the Load Models

Several studies of literature states that the main source of inaccuracy in power system simulation studies come from the load modeling. Modeling of nonlinear loads is the main challenge in harmonic studies. Basically, nonlinear models are characterized by their nonlinear behavior, but in order to achieve high level of accuracy further aspects must be considered, the respective limits and assumptions determine both the model confidence and the related effort (Li et al., 2014). As for any model, a compromise between required accuracy and acceptable effort has to be made.

Load models based on good answers to these three questions can reflect the aggregated load properties more accurately. Although most studies on load modeling are usually trying to answer these questions directly or indirectly, there are still no general solutions to them, and more work still needed to be done in this field (Li et al., 2014).

For the transmission system operator, distribution systems are usually an unknown large mix of power consuming devices and electric network equipment. Distribution systems are most often treated in power system analysis as equivalent loads connected to the transmission network and could be represented by a static model (e.g., a ZIP model), a dynamic model (e.g., a large induction motor, a transfer function, a group of smaller induction motors) or even a mix of both load model structures (Pepermans et al., 2005). Consequently, Characteristics of individual loads are not modeled properly.

The distribution framework loads must be amassed so as to accomplish sensible burden models reasonable for investigation and reproductions (MANOHAR et al., 2018). Depending on the load type (e.g. lighting, heating, motor load etc.), the boundaries of the total burden model may differ in a wide range. At the point when the boundaries of all heap parts are notable, the boundaries of the total burden model can be effectively decided. In the event that the heap structure is known, however the extent of different burden parts isn't, determining an amassed load turns out to be more troublesome (Knyazkin et al., 2004).

Due to the uncertainty and the complexity of the electric loads in the distribution networks, load modeling is becoming more and more difficult. In the last decades, large studies are conducted in the field of electrical load modeling (Pileggi et al., 1993). Two modeling methods, namely component based and measurement-based method, are widely used. To represent loads properties accurately, the measurement based load modeling method attracted researchers and power engineers, where the dynamic responses of the electrical loads under a system disturbance can be measured, and a set of parameters for the load model could be obtained by the optimization strategy with the objective to minimize the difference between the results of the simulated load model and the measurements (Gunda et al., 2012).

Defining the problem the electric distribution network will face will serve as valuable information for the distribution system utilities, equipment manufacturers, operators and for the researchers by providing them adequate and detailed important information, regarding the harmonic stability limits in the LV distribution networks in the future expected scenarios and also the necessary steps for the successful integration of renewable energy sources (Knyazkin et al., 2004). Will also serve as a guide to other researchers in the early stages of the harmonic stability research area and as a foundation for the development of future research works in this field. It will also give insights into how effectively the distribution system could be operated under various levels of nonlinear loads and RES penetration (Ma et al., 2007).

6. Power Quality Issue

Modern society became highly dependent on power electronics devices and digital technology. The utilization of electronic devices, PCs, information preparing gadgets, variable speed drives, electronic counterbalances, and so forth., has expanded and expected to increment fundamentally in the years to come. These gadgets are very helpless against voltage deviations and bends and interestingly, they produce current discharges in the organization as a result of their non-direct working properties, and in this way sway the force nature of the network.

Beside power electronic loads, also renewable energy feed-in sources in the LV distribution networks especially PV systems are increasing remarkably. The connection of PV feed-in sources is done by different types of regulated inverters, the regulation of power electronic switches causes, in addition to harmonic frequencies ($\leq$ 2.5 kHz), frequency components at switching frequencies (> 15

kHz). Thus, higher frequency components and Interharmonics must be considered in the future harmonic studies (Ainsworth, 1967).

7. Conclusion

The main source of inaccuracy in distribution simulation studies due to lack of reliable load models, until now there is generally no accepted nonlinear load model and challenges concerning harmonic contents in distribution grids emphasize the need for suitable harmonic simulation tools. Since harmonic instability in LV distribution networks could prompt different technical and financial inconveniences to the customers and to the network operators as well.

DG can prompt noteworthy ecological advantages using a gathering of effective generators including gaseous petrol plants, energy units, sustainable force sources and nearby force stockpiling choices. Increments in by and large organization productivity through decrease of conveyance misfortunes and expanded baseload adaptability would require a lower generally fuel gracefully prompting huge emanation investment funds, especially those of carbon dioxide.

Fruitful activity of a dispersed organization of age offices is subject to the capacity to progressively arrange numerous individual units to give the general framework yield. Current data innovation capacities can accomplish this errand and besides permit an unrivaled chance to give ideal power gracefully custom fitted to neighborhood prerequisites, lattice spot-market openings and a method for powerfully limiting natural deliveries.

Energy analyses of systems are nearly always associated with costs; in some instances, the analysis is used solely to compare performances of alternative packages. The assessment of costs can be performed approximately by examining only the electrical energy used in a power system. However, where optional sources are available, such as imported power from another system or locally generated power, it is necessary to estimate the two separately and to assess the total cost on a common basis to determine if the conditions selected are optimum or whether some relative adjustment would be more economical. The cost of electrical energy produced by a local generator set will not be the same as that provided by the supply authority and cannot easily be directly related to it.

Thus, when the installation of local generation is economically justified by the increased reliability of supply, it is quite reasonable to compare imported electrical energy with local generation costs on the sole basis of fuel costs plus a factor to compensate for maintenance costs and possible deterioration or replacement costs.

In this manner, not just the customary vitality age advancements must be grown more, yet additionally naturally amicable elective vitality sources, (for example, wind, sun powered, geothermal, hydro, and bio) must turn out to be more far and wide to support the vitality requirements for what's to come. Nonetheless, this requires a lot of exploration on vitality advancements and a successful administration of the vitality sources.

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Acronyms

EM	Energy Management
CO2	Carbon Dioxide
GHG	Green House Gas
IEA	International Energy Agency
BATs	Best Available Technologies
EnMS	Energy Management System
STC	Standard Test Conditions
TQM	Total Quality Management
ISO	International Organization for Standardization
LIEN	Large Industry Energy Network
NEMA	National Electrical Manufacturers Association
LV	Low Voltage
DC	Dirct Current
DG	Distrbutied Generation
HVAC	Heating Ventilating Air Conditioning
EMCS	Energy Management Control System
DER	Distrbutied Generation Recourses
PV	Photovoltaic
DES	Distrbutied Generation Systems
RES	Renewable Energy Sources
EU	Euraopean Union
AC	Altarnitive Current

Session: Economy, Financing, Public Administration

Index of Author(s)

ARTIFICIAL INTELLIGENCE AND ROBOTICS IN THE FOURTH INDUSTRIAL REVOLUTION: TRENDS AND ECONOMIC IMPACTS

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Abstract: *Artificial intelligence (AI) and robotics are shaping the global economy towards a new level of digitalization and automation. With the current breakthrough technologies in the Fourth Industrial Revolution, AI and robotics are playing important roles in our daily activities, in critical areas of economy such as manufacturing, healthcare, education, energy, transportation and logistics, legal and public services. AI applications have overcome human in the performance of some tasks related to human intelligence. AI including many subfields and a wide range of applications is seen as a growth engine of productivity in the economy, boosting significantly economic growth. Besides that, AI and robotics are introducing unprecedented disruptive factors to the labor market and businesses. Some jobs will be automated and replaced by automation, and new jobs with new skills will be generated not in the same speed and scale. This may result in unemployment, inequality and job polarization. The objective of this paper is to provide an overview of AI and robotics and their current trends. In addition, the paper discusses economic impacts by reviewing the opportunities and challenges that AI and robotics are bringing.*

Keywords: *artificial intelligence, robotics, industry 4.0, economic growth*

1. Introduction

Artificial intelligence (AI) with the new breakthroughs in development and industrial applications has been transforming the way we live, work and entertain. These profound changes in the daily activities have been seen from the use of a robotic vacuum cleaner Roomba to virtual assistants connecting through Amazon Alexa or Google Google Assistant to purchase foods or to check a bank account balance.

Over the past several decades since the concept of AI was introduced for the first time by John McCarthy at Dartmouth College in the United States, AI and robotics have been accelerating and enabling the applications in several industries from industrial robots in smart manufacturing to flying robots, autonomous vehicles, unmanned trucks in transportation and logistics; or chatbots and augmented intelligence applications in legal services, healthcare systems and medical research.

Today, advances in AI technologies have overcome many challenges that were considered impossible in few decades ago. In 2011, IBM's Watson computer powered by natural language processing and advanced AI capacities beat human champions on a TV game show Jeopardy!. In 2016, a computer program AlphaGo developed by Google DeepMind team beat top players of the world's most complex board game Go, marking a major milestone in AI research that machine learning algorithms with artificial neural network can be trained from human and computer play to reach beyond human capability in this specific gameplay field.

Artificial General Intelligence or human-level AI doesn't exist yet because it will take time to overcome many current major hurdles to get to that human level. However, AI and robotics are bringing an engine of productivity to the economy, boosting the economic growth. The total economic impact of AI in a worldwide level is significant.

Besides that, AI and robotics may also have disruptive effect on the labor market worldwide. Some jobs will be automated and replaced by automation while new high skills or non-routine cognitive skills will be in high demand to create new jobs. This trend will lead to many issues of unemployment, inequality, and polarization in labor market.

The purpose of this paper is to provide an overview of AI and robotics and their current trends with selected applications. Furthermore, the paper discusses opportunities and challenges in terms of economic impacts.

2. Literature review and major concepts

This section introduces some main concepts and definitions related to AI and robotics.

AI is one of the newest areas in science. Therefore, the concept of AI has changed over time. The development in many fields such as philosophy, mathematics, economics, neuroscience, psychology, computer engineering, control theory and cybernetics and linguistics have provided the foundations of early AI research.

From 1943, there were many early activities recognized as AI by Warren McCulloch and Walter Pitts. Early research topics were about knowledge of the basic physiology and function of neurons in the brain, analysis of propositional logic, and Turing's theory of computation. The first model

of artificial neurons was developed by them during this early time.

The full name of Artificial Intelligence itself was first introduced in 1956 by John McCarthy at Dartmouth College in the United States. McCarthy and other researchers organized a two-month workshop that set the foundation for AI to become a separate field. Nowadays, AI refers to multiple technologies that can be combined to perform human-like processes such as understanding, learning, thinking and taking actions. There are many forms of AI in use today such as digital assistants, speech recognition, machine translation, robotic vehicles, game playing, logistics planning, robotics and many more.

The following part reviews some key technologies which are the important components of AI. These terms are summarized in the latest book by Ford [1] that brings the latest updates from many key architects of AI worldwide.

Machine learning: Machine learning is a fundamental part of AI that involves creating algorithms that can learn from data. Those algorithms build a mathematical model based on training data in order to make decisions to perform the tasks.

Machine learning algorithms are used in many applications such as automated sorting of mail, automated reading of checks and tax returns, computer vision applications, recommendation systems, natural language processing and many others. Machine learning algorithms are classified into several sub-categories including supervised learning, semi-supervised learning, unsupervised learning, reinforcement learning.

Supervised learning involves providing carefully structured training data that has been categorized or labeled to a learning algorithm, while unsupervised learning deals with unstructured data coming directly from the environments without being labeled, classified or categorized. Semi-supervised learning falls between unsupervised learning and supervised learning.

Reinforcement learning means learning concerned with how agents have to take actions to maximize cumulative reward. Reinforcement learning is used to build AI systems to play games. DeepMind is one of the examples of using reinforcement learning to create AlphaGo.

Deep learning: Deep learning is a type of machine learning method that uses deep artificial neural networks. Learning algorithm can be supervised, semi-supervised or unsupervised. Deep learning architectures have been applied to many fields such as computer vision, machine translation, natural language processing, medical image analysis, board game programs.

Artificial General Intelligence (AGI): AGI refers to a true thinking machine as human-level AI or strong AI. AGI researchers have gained significant progress on the field.

3. Application trends of AI and robotics

Modern AI technologies have been used in a wide range of industries including manufacturing, finance, energy, healthcare, education, transportation, legal and public services.

In addition, the convergence of new breakthrough AI advancement with the innovation of other technologies such as IIoT, cloud computing, 3D printing, big data analytics have brought a wide range of applications in the economy. This part analyses some of the major trends of AI and robotics implementations in several fields.

The trend #1: Augmented intelligence

Augmented intelligence is a broad concept of AI applications that are designed to enhance human intelligence. The combination of machine and human makes AI more powerful to scale up human expertise in many industries. In 2011, IBM Watson beat two long-time human champions on a popular quiz show 'Jeopardy!'. From 2015, IBM acquired Alchemy_API to incorporate new capabilities such as text and image analysis into the cognitive computing platform of the IBM Watson to extend its applications in several areas of legal services, healthcare systems and medical research.

In addition, AI applications that leverage speed recognition and machine translation have become reliable to interact with people. On the market, there are several virtual assistants such as Siri of Apple, Alexa of Amazon, Google Assistant of Google, Cortana of Microsoft, X.AI and many other tools. Those virtual assistants offer easy access to useful functionalities to help people manage their daily activities such as managing personal data, flights, reservations, calendar appointments, searching for knowledgeable information and even suggesting where people can eat and drink.

The trend #2: Robotics

Along with the emerging technologies such as AI, computer science, biotechnology, and nanotechnology, robotics is becoming a very dynamic field, bringing many breakthrough applications into the economy. In 2005, in an autonomous vehicle challenge organized by DARPA, a driverless robotic car named Stanley won the prize for the first time of Grand Challenge. According to Thrun [2], the robot Stanley was equipped with radar sensors, cameras, lasers and the GPS systems to sense and navigate a 142-mile long course through the Mojave Desert. The robot's software system was built on state-of-the-art artificial intelligence technologies, such as machine learning and probabilistic reasoning to control the steering, acceleration and braking systems.

Today's robots are mainly categorized into three primary types of manipulator (or robot arms), mobile robot, and humanoid robot, according to Russell and Norvig [3]. Robot arms are the most common types of industrial robots with the installation of million units in factory assembly lines around the world. Advanced industrial robots combined with 3D printing are bringing a new level of automation, intelligence and full customization to the manufacturing. Future manufacturing with the support of advanced robots and 3D printing will be fully automated with limited human involvement.

Besides that, mobile robots have been deployed in several sectors of the economy such as unmanned vehicles, NASA's robots, flying robots, and autonomous underwater vehicles. Unmanned vehicles have achieved significant progress towards a fully automatic level, the highest level of autonomous vehicles. Several market leaders such as Waymo, GM Cruise, and Ford Autonomous have been testing their autonomous cars on streets and highways. In the area of autonomous trucks, Rio Tinto – a leading mining company – has deployed 20 percent of Rio Tinto's existing fleet of almost 400 haul trucks as autonomous trucks in the Pilbara region in Western Australia, according to Cecilia [3].

Finally, humanoid robots have been developed to perform human tasks such as personal assistance for elderly care, daily task assistance from autonomous vacuum cleaners to lawn mowers, customer service, entertainment, and dangerous missions for human search and rescue or space exploration. One of the examples of humanoid robot is the Pepper robot. This robot of Japanese company Softbank Robotics can interact with people by recognizing emotion in human voices and facial expressions using its computer vision and natural language processing capabilities. Currently, thousands of the Pepper robots are being used in customer service worldwide.

The trend #3: AI in marketing, customer service agents and back-office support

The new applications of AI have changed the way businesses engage with customers. Chatbots are one of examples of successful subfields of AI. The chatbot trends show that more and more economic sectors such as travel, food chains, education, insurance and financial services are using chatbots to automate business processes, to deliver business services and to improve customer experience in an effective cost saving way with 24x7 support.

Chatbots are built on sophisticated natural language processing systems with the support of machine learning and AI. Nowadays, most chatbots can be accessed via virtual assistants such as Amazon Alexa and Google Assistant to perform several online transactions such as purchasing foods and services, checking account balance or performing simple payments.

In addition to that, Robotic Process Automation (RPA) software and AI systems applied to product recommendations have brought new value chain in marketing and sales sectors.

The adoption of AI and robotics can be seen worldwide. The survey of Bughin et al. [5] shows that around 70 % of companies would adopt at least one type of AI technology by 2030.

One of the early implementations of automation has been made by Siemens in their first smart factory in Amberg, Germany [6]. As a pioneer in smart manufacturing, Siemens has built up the Electronics Works Amberg factory with more than 75% automation handled by smart machines and computers, covering from production to material and information flow. The factory in Amberg obtains a high level of flexibility to produce 15 million products of Siemens' Simatic product line per year with the high level of quality of 99,9989%.

The trends of automation and robotics have been adopting at a regional level in Central and Eastern Europe (CEE) region. In Slovakia, automotive industry which contributes about 12% of GDP is one of the fast-growing industries with the support of automation and robotization. According to Liptáková [7], the three leading carmakers Volkswagen Slovakia, Kia Motors Slovakia and PSA Groupe and their suppliers have been using thousands of robots in their production lines. At Volkswagen Slovakia in Bratislava, approximately 2,000 robots are installed. In addition, these carmakers are using augmented and virtual reality, big data, online monitoring of production or intelligent gloves with a scanner. Automation and robotics are also playing an increasing role in CEE region. Therefore, they are bringing significant impacts to the local labor market and its resource structure change in the near future.

2. Economic impacts of AI

According to the estimation of Gillham et al. [8], global GDP would increase by 14% by 2030 as a result of AI impact, respectively, an equivalent of up to $15.7 trillion. AI brings economic benefits to all geographical regions of the global economy as it is shown on Figure 2.

Figure 1: Economic impact of AI by 2030
Source: Gillham et al. [8]

China and North America expect to gain the biggest economic benefits with AI boosting GDP growth by 16.1% and 15.5% respectively. Besides that, many countries across Europe are also likely to experience a high GDP growth of around 9.9% - 11.5% by 2030.

This section highlights some of the positive economic impacts of AI and robotics and discusses some challenges.

Firstly, the positive contributions of AI can be seen as follows.

Impact of AI on productivity: According to the research for 12 developed countries by Purdy and Daugherty [9], AI has the potential to increase labor productivity by up to 40% in 2035. The adoption of AI solutions in many industries boosts firm's productivity significantly, reducing human errors and improving product quality. For examples, robotics automating assembly lines are used in manufacturing industry; AI chatbot customer service agents, recommendation systems of products and services are used in marketing; automation process of ordering raw materials is implemented in supply chain and logistics industry, etc.…

By implementing AI solutions, the routine tasks are automated in a new level of intelligent automation rather than the traditional automation technologies. This is powered by powerful features such as self-learning, cross industries solutions of natural language processing capabilities, and a combination with many different advanced technologies such as IoT, Cloud Computing, big data analytics, 3D printing and Augmented Reality.

Enabler of labor effectiveness: A significant part of AI impact will come from enabling existing labor to be more effective. This labor augmentation is supported by AI tools that offer labor forces to enhance their natural intelligence.

According to The Digital Insurer [10], the case of a risk modeling firm Praedicat Inc. in Los Angeles using an AI platform with machine learning and big data processing to help insurance underwriters better understand risk in writing property and casualty insurance is one of the examples of AI's augmentation capabilities. Praedicat Inc.'s algorithms are constantly mining scientific research to build dynamic metadata for risk modelling. The platform is able to search through over 22 million peer-reviewed scientific papers to make it possible to incorporate the large amounts of information into risk analysis for the firm.

AI is also transforming the legal profession with the new legal technology powered by cognitive computing and the next generation language processing to provide new approaches for lawyers to look at data. The AI applications are implemented in investigating securities frauds, predicting legal outcomes, automating contract review and due diligence and different legal work. Virtual assistants now are able to review 1,000 legal documents in a matter of days instead of taking three people to complete that task in six months [11].

AI and robots are designed not only to handle complex tasks at scales beyond human capability, but also to deal with hazardous tasks and exploration missions. Robots are developed to travel to Mars and space exploration. In search and rescue missions or deep-sea operations, robots have been deployed.

Increase of consumer demand: AI products are expected to enhance consumer products and services by providing new ability to collect and process large scale of data in new intelligent way and speed that have never seen before. For example, in legal business, Sobowale [11] analyzed that AI has the potential to bring in new business for lawyers, opening the door for different legal work that previously wasn't possible. This refers to the recent introduction of powerful cognitive computing products from companies such as Ravn Systems or Riverview Law in UK.

In addition to that, the introduction of personalized products such as recommendation systems expects to increase consumer demand. If a customer service can learn and adapt based on user behavior, products that can be customized to the individual or adjusted automatically to specific need will target more users than the traditional mass customer approach. Amazon uses Amazon Personalize – a machine learning service – to train, adjust and optimize a personalization model with the input data from customer activity stream, generating the real-time recommendations for their customers.

Innovation synergy: AI and robotics are not only facilitating the growth of large organizations, but also creating new chances for small players to start their own projects that were mostly done by bigger companies in the past. This disruptive trend and the emergence of innovations have been generating business synergy through the economy.

Driverless vehicles boost the innovation diffusion among several industries [9]. As driverless vehicles use global positioning systems, radar, cameras, computer vision and machine learning algorithms, not only technology companies in Silicon Valley are entering the market, but traditional companies are also participating or building new partnerships to stay competitive. Those traditional businesses include traditional car makers like the Ford Motor Company and BMW AG. Insurance industry, entertainment industry, transportation and logistics as long as service companies like Lyft, Inc. or Uber Technologies Inc. see new opportunities and potential business synergy with driverless vehicles.

On the other side, AI and robotics come up with many challenges and open issues besides the positive contributions.

First of all, while AI and robotics are widely adopted in many areas of the economy, this trend leads to the potential job losses, especially for routine jobs. However, new types of jobs that require high skills or non-routine cognitive skills will be in high demand.
For example, in logistics industry, autonomous trucking implementation will create a disruption of mass job losses in the labor market. High-routine occupations such as accountants, desk officers are the target of job elimination because these jobs will mainly be done by AI software.

According to the study of Manyika et al. [12], the impact of AI and robotics on labor markets in US and Europe is expected to be around 46% jobs facing automation potential. This issue highlights the need of giving the workforce necessary up-skills to adapt to the new job creation in the new sectors or other high-skill jobs required by AI and robotics. New types of jobs include data engineer, data scientist, robotic engineer and several jobs in IT and AI implementation experts in industries. Therefore, in order to stay relevant and competitive, businesses need to review their activities according to their automation strategy, and to develop a strategic plan to skill up their resources.

Secondly, the topic of ethical standards and governance policies for AI and robotics is one of the crucial problems as analysed by Schwab [13]. This links to the question of how much the acceptability of delegating authority from human to AI agents to make their own decisions based on machine-learning algorithms. For example, if a doctor relies on the judgment of an AI medical expert system for a diagnosis, who is accountable if the diagnosis goes wrong?

While applications of AI and robotics are being adopted widely in the global economy, guidelines of ethical standards, governance procedures, conflict management standards are still missing. These concerns need suitable solutions with high priority from policy makers, industry organizations, researchers and businesses in both regional and global scales.

Finally, security, privacy and the lack of global cybersecurity standards are still remaining the challenges of AI and robotics. Applications of AI and robotics in the workplace are under the risk of cyberattack from cyber criminals. Cyberattack may cause serious problems to autonomous weapons, robots controlled by AI systems.

6. Conclusions

In the near future, AI and robotics are expected to have bigger impact on the economic growth. AI has transformed the business structure by adding new engine of productivity. This paper highlights the key trends of AI and robotics with broad applicable scope including augmented intelligence, robotics, chatbots, RPA and recommendation systems by AI.

AI and robotics bring positive economic impacts such as increases of productivity, quality, and enhancing the flexibility and customization in several industries. In addition, new business models are expected to be generated more to boost the global economic growth.

On the other side, there are many challenges and open issues such as losing jobs by automation and robotization; ethical standards and governance policies for AI and robotics; and security, privacy and the lack of global cybersecurity standards. Those changes and issues will need the suitable solutions not only from businesses but also from industry associations and the policy makers worldwide.

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SOCIAL DISPARITIES AND INDIGENCE

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Abstract: *A high percentage of the population is currently at a risk of poverty or feels injustice, let us say social inequality in the society. This situation can also be caused by the continually emerging crises, which had been deepened the deterioration of the indicators of socio-economic development and contributed to the decline of the quality of life of its citizens. Because the quality of life depends on the happiness and satisfaction of the members of the society, it is necessary to address this issue, especially in the context of eliminating inequalities in access to resources and life opportunities, which can lead to the negative social phenomenon - poverty.*

Keywords: *social inequalities, poverty, quality of life, risk, disparities*

1 Equality vs. inequality in society

In the world of a man, there is a paradigm of equality, which usually comes out of a premise that the natural state is such that we all are equal. To a certain extent, equality can be understood as justice, which is associated with the application of the general rules, that result from the low and from the generally applicable principles of action and behavior [8]. Professor Holländer supposes that a human's belief in the inception of injustice brings a sense of social inequality, which is often perceived as unacceptable in society [4]. However, Dworkin substantiates the social inequality by assertion that all the people are responsible and conscious individuals, and rich people are richer through their own efforts. Consequently, he considers a social inequality to be legitimate [7]. However, difference between legitimacy and legality should be taken into account. It is necessary to achieve a compromise in practice, but legality must take precedence over legitimacy anyway. As a result, there have been various ethical issues and dilemmas in real entourage [8]. Some authors are convinced that social inequality is a radical and antiliberal idea and is the result of the dividing of labor in society [9]. The concept of inequality can represent different relationship of the social structure´s elements or dissimilar treatments with individuals who are part of society perhaps even an inequality of whole social categories or groups (classes, social groups, strata). On the one hand thet can be understood as a necessary part of human´s society structure and the other hand as a consequence of some arrangement of society [6]. We can state that social inequality is either an irreversible consequence of the social organization (political and economic conditions) or a consequence of personal fault of the individual (insufficient adaptability, industriousness, good-will, ambition, etc.) [5]. We have known the term "social inequality" from history. Nowadays, we can see that it is constantly deepening among people, which may be also the cause by globalization. It brings not only new trends, but also some threats in social protection area. We can say that inequality introduces the sense of an individual or a group in the society that they are disadvantaged either in comparison with other people or by the different attitude of the system the part of which they are of. The real presence of social inequality in society has always been accompanied by the efforts to overcome it by improving the quality of all its members. Quality of life is a phenomenon, which has a biological, psychological, social, cultural, economic, ethical etc. dimensions. In general, we describe the quality of life as a historically conditioned level of life processes within which the man or the whole society develop its existence in keeping with the principles of humaneness and humanity. Definition of quality of life is not only focused on expenditure, but above all on the real individual´s personality development, which is focused on his happiness and satisfaction [3]. Among the indicators of quality of life in Slovakia (based on them, people assess their position and situation in society and consider them fair or unjust) according to the statistical office, are including:

- *material living conditions*
  - income (net income, income distribution, risk of poverty),
  - material deprivation,
  - quality of living,
- *productive or main activity*
  - economic activity rate,
  - employment or unemployment,
- *health*
  - healthcare access,
  - level of health care,
- *education*
  - level of education,
  - equal opportunities
- *free time and social interaction*
  - amount of free time,
  - personal relationships with people,
  - activities (recreation, volunteering),
  - social support,
  - social cohesion,
- *economic and a physical safety*

- economic guarantee,
- security (crime rate),

- *governance and fundamental rights*
- trust in institutions and public services,
- discrimination and equal opportunities,
- active participation in public life,

- *natural and environmental*
- pollution,

- overall life´s experience
- satisfaction with life,
- feeling of happiness,
- life´s meaning [10].

Social inequalities have a significant impact on the quality of life of individuals and thus affect their standard of living. We can evaluate inequality from several points of view, but the most common aspects we consider inequality of outputs (income and assets) and inequality of opportunities.

1.1 Social disparities

In social context, we can see inequality in living conditions (wage and asset disparity), which apportion of individuals according to that which have an economic, social, cultural or symbolic source and an inequality in life´s opportunities (inequality of opportunities), which differentiate them based on opportunity to get for sources and change their status in society [2]. Income inequality represents the distribution of income in the economy among the population. We determinate its value by the various indicators. The most commonly used are Gini coefficient (comparison of household incomes with other households) and Upper-and-lower quintile income ratios (comparison of 20 % of the richest households with 20 % of the poorest households) [16]. Income inequality is the most significant kind of inequality in society [3]. Wealth inequality is indirectly linked to income and it deepens. Material values owned by an individual are often distributed more unevenly than income. Inequality of opportunity may be related with income inequality. If there is inequality of opportunity, there may occur the higher income inequality. Incompatibility between skills and earning potential is deepening in relation to the next generation, changing its seed capital. If incomes are distributed unevenly, they may result in higher inequality of opportunities for the next generation [16]. Inequalities in society need to be measured and to compared. It has these basic causalities:

- disparities in society can lead to poverty, to lower level of quality of life of individuals and to upward of individual´s feeling that them social situation is worst compared to others and the satisfaction of basic necessities of life is insufficient. Thus, a high level of inequalities, for example between regions, may causes regions where quality indicators are insufficient to increase the risk of poverty,
- inequalities in society can lead to increased crime, civil unrest and violence,
- inequality incidental to economic growth, so countries where inequalities occur at a higher rate, achieve lower economic growth [11].

1.2 Causes of inequalities

Charles-Coll describes following reasons of inequalities:

- *external*
- market mechanism (enquiry and offer at labour market, incomes policy, migration),
- education (different access to education),
- globalisation (transferring a global inequalities to the local level)
- economic development (low level of development = more inequalities and vice versa),
- democracy (democratic establishment to shows symptoms of an unfair redistribution of wealth in society),

- *internally*
- innately abilities,
- gender,
- race,
- cultural,
- position in the social structure (employment, income, education, gender, etc. [1]

2 Poverty. The consequence of social disparities?

Social inequalities are a serious problem, as they go hand in hand with poverty. Poverty is a concept that is not easy to define. Geist talks about poverty as a situation in which an individual or a social entity cannot satisfy basic living needs from its own resources, therefore is necessary to ask for someone else´s help or the help of an institution. It may also be a situation where an individual cannot achieve the standard of living acceptable in society of which he is a part. Poverty can be defined in two terms:

- *absolute poverty* - that´s a situation in which people cannot even cover expenditure related to their basic necessary needs (food, accommodation, clothing, etc.), its extreme form being associated with hunger, malnutrition, disease and others,
- *relative poverty* - its values are compared with the situation of other people, often associated with social exclusion, a person has limited possibilities or suffers by material or other shortages [13]. At present, the issue of poverty and social exclusion, or prevention, is a current topic in the field of a social policy in multiple country. The reason is the Covid-19 pandemic too, as a consequence, pursuant to actual data of Word bank, is possible that 40 - 60 million people in the world can easily been at risk of absolute extreme poverty. The most endangered are less developed countries and those, where live majority people with low or medium income [15]. All the people are being afflicted by income poverty, but also people whose suffered by the material deprivation or lived in household with low intensity of work of all its member. However, most of all, those affected by all three indicators [18].

2.1 Poverty in Slovakia

More than 16,1 % of Slovak citizens were threatened by poverty of social exclusion in Slovakia last year (2019). It represents approximately 863 000 people who were

affected by one of three already remembered indicators at least. At most expressively is poverty, respectively social inequalities manifested in regional disparities, for example from the capital city are endangered just 4,4 % of habitants and it is as many as 19 % in Presov district [17]. The most people are threatened by income poverty (the border of risk of poverty is represented 60 % of median of national equivalent available capital), which we evaluate on base of household´s net income. In Slovak republic, the border by risk of individua´s poverty is income which is low as 360 euros per month, it is 754 euros in family of four.

At most risk-bearing groups are the unemployed (48.9 %), families with more as one child (35.8 %) and single parents (36.9%). A significant indicator is also the lack of assets, let us say commodities, that people can or cannot to afford (arrears of payment, ability to face the unexpected expenses, keep hold of a mobile phone, car, washing machine etc.). The last of the indicators is low work intensity, which can be seen as employment or unemployment [14]. We can expect that in the result of loss of the job and the restrictions that have had an impact on entrepreneurs per consequences by epidemiological measures (Covid-19) in the recent period, poverty will deepen not only in Slovakia but also in the world. A reduction or loss of income will lead to income poverty and material deprivation, which can result in extreme absolute poverty. Ultimately, a high level of poverty in a country can lead to inefficient management and negative economic development. The World Health Organization (WHO) has said that we can expect a global doubling of world-wide poverty by next year, which should result in a rapid increase in child malnutrition [19]. Regulation of this situation and elimination of the risk of poverty and social exclusion are part of the national strategic priorities of public policy in Slovakia. That is part of the National Framework Strategy for the Support of Social Inclusion and the Struggle with Poverty, which brings the opportunities to solve these problems, at which coming from the objectives of the Europe Strategy 2020 (smart, sustainable and inclusive economic growth) [12]. One of the goals of this document is to reduce the amount of people at risk of poverty and social exclusion by at least 20 million people at European Union level and 170,000 at national level of Slovak republic. In the current situation, it may be necessary to re-thinking these objectives. We can also evaluate that even if the statistics show the Slovakia falls into the European countries with the lowest level of poverty risk, its measurement is insufficient according to actual substinence minimum. People feel that they are poor as the gulf between the incomes of the poor and the rich run deeper. The Ministry of Labor, Social Affairs and the Family also has said that the set of the level of subsistence is no longer a real informative value of poverty and needs to be updated.

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REGULATION OF ELECTRONIC MEDIA

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Abstract: *The author in his article deals with the regulation of electronic media. Further, the author assesses, discusses and analyzes the legislation covering electronic media in the Slovak republic. In the main part, the author refers to the application of the legal problems of the electronic media.*

Keywords: *electronic media, application problems, legislation*

1. Introduction

Regulation means interference in a certain activity on the basis of established rules, within which the regulated activity can be performed freely. Generally speaking, the purpose of regulation is to achieve an organized and functional environment in which all the individual interests protected by law are balanced. Regulation includes setting general abstract rules, issuing individual specific acts, including licenses and other permits, keeping records, making registrations and properly supervising compliance with established legal obligations, which can then be followed by sanctioning (again in the form of individual specific acts).[1] The very fact that in the conditions of our society we currently have a number of publishers of periodicals, as well as a number of television broadcasters, whether at local, regional or national level, as well as the fact that virtually the entire territory of the Slovak Republic is covered by the Internet, does not mean that media activity is not regulated.

Following the content of the term regulation, it cannot be concluded that the media and the spread of information in the Slovak Republic are not regulated. Even in the real conditions of the Slovak Republic in the current period, both the media and the spread of information through the media are regulated, of course with the difference.

Periodicals and television broadcasting are currently one of the main means of information, not only in the Slovak Republic but also worldwide. Periodicals and television are thus one of the main means of obtaining information for people around the world, but they are also one of the main means of influencing people and public opinion around the world. The popularity and prevalence of periodicals in particular increased witoh the emergence and subsequent huge development of the Internet. Nowadays, it can be said that all dailies, weeklies and other periodicals are distributed in an electronic version via the Internet. Due to this development of the spread of periodicals via the Internet, the question of their regulation also arises in the Internet environment.

In today's information society, where information is processed electronically, the possibility of this information being compromised, either directly or through an attack on a technical device or environment in which the information is processed, is very high. Given the adverse possible impact, it is the duty of the government to ensure the protection of information against misuse and also to minimize the consequences in case of misuse. Emphasis must therefore be placed on the protection of information, where the state plays a major role as a subject of media law.

Among other things, the Internet can be considered as an environment in which information can be communicated and disseminated regardless of time and space. Communication and dissemination of information in the Internet environment takes place in many ways, whether it is email communication, communication via social networks, or even communication via the Internet by sharing video and audio, but also communication in many other forms. The media can use and nowadays already use the Internet environment extensively for their activities and for the dissemination of information.

For a long time now, not only in the Slovak Republic, but also all over the world, the media in their original form have been experiencing a retreat from the main positions as information channels. However, the popularity and prevalence of the media has grown, but in a new "electronic" form at a time of expansion and development of the Internet. Nowadays, all media are distributed in the electronic version via the Internet.

Electronic media can be defined as media that use digital code and data transmission to disseminate information. Electronic media compared to media in their original form have much greater opportunities to disseminate information.

While the print media spread the word and the image and radio and television broadcast sound, respectively image and sound, the dissemination of information in its digitized form does not know these limitations at all. The combination of zeros and ones spread by computer

[1] POUPEROVÁ, O. Institucionální aspekty regulace médií. 1. vydání. Praha: Wolters Kluwer ČR, 2016, s. 21

networks can therefore be text, as well as video recording, sound, but above all a combination of all of this. Due to this feature, new media are sometimes referred to as multimedia. The combination of text, image and sound makes it difficult to translate formulas and typologies into the virtual world. There is no sharp line between media services at all, because it is suppressed. There is a mutual combination and interconnection of text, sound and image, while it can be assumed that this tendency will continue to intensify as the connection will improve, respectively the access to fast internet will be expanded. Audiovisual sequences are already a common part of news portals, whereas in the past they were compared in their form with newspapers and print media in general. The technology also allows the inclusion of live broadcasts. Thus, a medium (typically a news portal) focused primarily on written text and image documentation may include audiovisual recordings that may even be disseminated in real time. It is already clear from this that the usual division of media for printing and broadcasting is not up to date.

First, electronic media, in contrast to typical media categories, provides the ability to correct, modify, change, disseminate, and update disseminated information in real time. This means that information disseminated through electronic media, such as information disseminated in the form of articles by periodicals published on the websites of these periodicals, is edited and supplemented 24 hours a day compared to traditional newspapers, which again accelerated the dissemination of information worldwide and created the possibility to react immediately to a change in the information disseminated or the possibility to correct the disseminated information immediately in the case of, say, a false factual statement.

Second, electronic media, compared to typical media categories, brings the possibility of using hypertext. It is a very important and also very often used means of electronic media. While in typical media categories it was only possible to refer to previously published information and the reader or the viewer had to find this information in a difficult way, in electronic media using hypertext electronic media can not only refer to previously published information, but provide the reader or viewer with a link to retrieve this previous information with a simple click.

Third, electronic media, compared to typical media categories, offer the possibility of essentially unlimited archiving. Electronic media archives are a matter of course for us today and contain a huge amount of historically published information, which, in comparison with typical media categories and archiving newspaper prints or recording broadcasts, is a very important attribute of electronic media.

Fourth, compared to typical media categories, electronic media offer the possibility of the audience reacting to the published information in the current time, through various discussions or the possibility of adding comments.

The following legal standards can be described as basic legal standards in the field of electronic media:

1. European Convention on Transfrontier Television, which was promulgated in the Collection of Laws as Statement of the Ministry of Foreign Affairs of the Slovak Republic of Cases no. 168/1998 Coll. (hereinafter referred to as the "European Convention on Transfrontier Television")
2. Directive of the Council of the European Communities no. 89/552 / EEC on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the pursuit of television broadcasting activities, as amended by Directive No. 2007/65 / EC (hereinafter referred to as the "Television Broadcasting Directive")
3. Directive of the European Parliament and of the Council no. 2010/13 / EU on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the provision of audiovisual media services (Audiovisual Media Services Directive), as amended by Directive No. 2018/1808 (hereinafter referred to as the "Audiovisual Media Services Directive")
4. Act no. 308/2000 Coll. on broadcasting and retransmission and on the amendment of Act no. 195/2000 Coll. on telecommunications, as amended
5. Act no. 220/2007 Coll. on the digital broadcasting of program services and the provision of other content services by means of digital transmission and on the amendment of certain acts (the Digital Broadcasting Act), as amended

2. Blog

A blog can be any website that is regularly contributed to by one or more bloggers, and is sometimes run by companies such as a corporate blog. It doesn't matter if it's a journal, short tips, scientific articles or a professional site for a specific area. We can still call it a blog. It also doesn't matter if you are blogging with your own domain and hosting or freehosting with your own CMS (Content Management System).

Blogs such as blog.sme.sk, denikn.sk/blog, blog.pravda.sk are also part of the internet portals of periodical publishers. Such blogs are part of the business of the same periodical publisher and operator of the website on which they publish their articles and run the blog in order to increase traffic to their website.

The blog can be included under hosting, i.e. under the storage of information on the host computer according to Sec. 14 of E-Commerce Directive. According to Sec. 14 of the E-Commerce Directive, where an information service is provided to a company which consists in storing information provided to the recipient of that service, Member States must ensure that the service provider is not responsible for the information stored at the request of the recipient, provided that: (a) the provider is unaware of the illegal activity or information and, as regards claims for

damages, is unaware of the facts or circumstances from which it would be apparent that the activity or information is illegal; or (b) the Provider, upon finding or becoming aware of such facts, acts promptly to remove or disable access to the information.[2]

Hosting is a secure harbor for services that consist of storing information provided by the recipient of that service at his request. The service provider is protected against liability for the information stored through its service. In order not to lose a secure harbor, the hosting provider must promptly remove or disable access to such information after discovering or becoming aware of the above.[3]

It is clear from the above that in order for the service provider in our case of the blog not to be responsible for the transmitted information, they must meet the conditions under Sec. 12 of the E-Commerce Directive. If they violate the conditions set out in Sec. 12 of the e-Commerce Directive, he will also be liable to the service provider. Anyone who provides space for running their own blog is not, in principle, responsible for the actions of those who infringe someone's rights through it, unless they know or have no reason to know about the disputed posts. If they become aware of the existence of those posts, they must remove them from their service if their illegality is apparent to a prudent economic operator without the need for any additional effort. However, they may also be called upon to help reveal the identity of such an offender or to prevent his actions in the future.[4]

3. Link

Nowadays, we can no longer imagine that it would not be possible to send a link to some information, article, photo or video. It is an element which, from a technical point of view, is made possible only by the Internet and which can therefore only be found in electronic media.

A hyperlink is an element that is used on a website in various forms. Nowadays, a website without hyperlink is rather an exception, but what we praise is that it is precisely what makes it easier for us to find information and which allows us to connect several websites immediately. A hyperlink can be in the form of text, an image, or any place on a web page that is linked to another web page anywhere on the Internet.

Surely each of us has already encountered the fact that there was a link within the article to another article, an older article from the same publisher, or even to information created by a third party. Likewise, each of us has certainly encountered the sharing of links that contained music or movies, many times to content that infringes copyright.

A link is a very simple element in the internet environment, but it is important to deal with the issue of liability, especially since one simple click on a link can lead to information that can harm the rights of others. Although the reference to an old statement published in the past in the press theoretically makes it possible to find defamatory information in public libraries, the probability of serious damage to personal rights is rather insignificant. However, the situation is completely different in the online environment. Providing information that allows the average individual to find the website in question without the need for a hyperlink greatly facilitates access to defective information and significantly increases the risk of infringement.[5]

Participation will also play a significant role in various online liability cases. However, it follows from the nature of the case that a subscriber cannot be a completely passive provider. The provision of various warez forums (forums for sharing links to infringing content), torrent search engines, storages for predominantly infringing content, or the provision and dissemination of hyperlinks to infringing content may be subject to participation doctrine in certain circumstances. A good example is the Swedish decision on the criminal, and therefore civil, liability of those behind the "ThePirateBay" platform (torrent search engine). The persons who organized the operation of this site or received its money were accused of participating in the copyright infringement of their users. They committed an infringement of copyright by making it available to transfer the content to other users. The court held that, by providing a database linked to a catalog of torrent files and enabling it to be searched, the defendants provided the functionality necessary for the infringement of direct perpetrators - users. And although they were not known by the court in the proceedings, the illegality of their actions could be objectively established. The court therefore considered the conduct of the accused natural persons behind the website responsible for the participation, which should always have taken place before an individual user committed his copyright offense by "sharing" files via torrents.[6]

4. Speeches on social media

Social networks have also been included in this section, as this is a huge phenomenon today, even though it is not a typical medium. However, we would like to note in this connection that, according to the Supreme Court of the Czech Republic, a publicly accessible user profile on a social network, as well as other publicly accessible websites, has the character of a mass medium of communication and is thus equivalent to print, radio and television.[7]

[2] čl. 14 E - Commerce Directive
[3] HUSOVEC, M. Zodpovedenosť na internete podľa českého a slovenského práva. Praha: CZ.NIC, z. s. p. o., 2014
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[7] Resolution of the Supreme Court of the Czech Republic of 25 June 2014, file no. 3, Tcu 33/2014

Social networks and their use also raise a number of questions in terms of their legal regulation. One of the most serious issues in solving the legal regulation of social networks is the issue of publication and subsequent sharing or spread of hate speech. In the Slovak Republic, there is no legal definition of the term "hate speech", so the very question of what can be considered hate speech is complex. For example, the Criminal Law in Denmark evaluates hate speech as a public statement (statement) by which a group of persons is endangered, insulted or humiliated on the grounds of race, color, national or ethnic origin, religion or sexual orientation. Therefore, it does not have to be explicitly just grossly offensive or vulgar manifestations, with which we identify.

Hate speech is generally defined as all forms of expression that spread, incite, promote or justify racial hatred, xenophobia, anti-Semitism, or other forms of hatred based on intolerance, including intolerance manifested by aggressive nationalism and ethnocentrism, discrimination and hostility towards minorities, migrants and people of immigrant origin.[8]

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REQUIERED COMPETENCES AT THE EUROPEAN UNION VS. COMPETENCES PROVIDED BY A UNIVERSITY STUDY PROGRAM IN THE FIELD OF ADMINISTRATION

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Abstract: *According to the European Council's new strategy, the EU must strive to be the most competitive and dynamic knowledge-based economy in the world, capable of sustainable growth through higher employment, better jobs and stronger social cohesion. Achieving this requires education and training systems that meet the requirements of a knowledge-based society and can meet the need for higher levels and quality employment. The Act No. 204/2011 Coll., which amends and supplements Act No. 184/1999 Coll. on the Use of Languages of National Minorities, regulates the use of minority languages in official communication. According to this act, the Hungarian language, as a minority language can be used in municipalities, where at least 20% of the municipal population is made up of this national minority. In Slovakia currently 512 municipalities meet this criterion. On these municipalities administrative officers need higher level communication competence during their job. This research compares competences provided by a university study program in the field of multilingual administration and the key competencies appearing in the recommendation by the Council of the European Union.*

Keywords: *EU competences, public administration, administrative officer, key competences*

1. Introduction

These days young people need a wide range of competences in order to find a fulfilling job and become independent, committed citizens. The level of key competences in the education has been increased at all European Union's Member States. The knowledge, skills and attitudes are the major factors in boosting the innovation capacity, productivity and competitiveness in the EU. Europe's education and training systems need to adapt both to the needs of the knowledge society and to the need for higher levels and quality of employment. They should offer learning and training opportunities that suit different target groups at different stages of their lives, such as young people, adults, the unemployed, etc. To achieve this, one of the objectives was that a European framework should define new basic skills to be acquired through lifelong learning, which should include: skills in IT, technological culture, entrepreneurship and social relations, and the acquisition of a foreign language.

In the last few years, several higher education institutions have set the "student-centered education strategy" [1] as a goal. The student-centered education strategy is an important element of the education and its goal is treating the students as partners and involve them in the decision-making processes what affecting them and their future. The relevance of this strategy is unquestionable, as recent university students do not receive clear guidance in their education on what competencies, skills and knowledge they should actually acquire in order to best meet labor market expectations.

The recommendation adopted in May 2018 of the Council of the European Union [2] could serve as a starting point for the students in higher education system, because they are already in control of their own decisions and own choices. This recommendation includes the eight key competences for lifelong learning. Through the knowledge and acquisition of key competences, students are equipped with a solid foundation that is not profession-specific but generally applicable in many areas of life, as it identifies key competences for citizens such as personal fulfillment, a healthy and sustainable lifestyle, employability, active citizenship and social inclusion. The Recommendation addresses the need for current competencies and provides a basis for a common understanding of future competencies.

1.1 Relevance of the research

In the Slovak Republic Act No. 204/2011 Coll., which amends and supplements Act No. 184/1999 Coll. on the *Use of Languages of National Minorities* [3], regulates the use of minority languages in official communication. According to this act, the Hungarian language, as a minority language can be used in municipalities, where at least 20% of the municipal population is made up of this national minority. Currently (until the next census in 2021) there are 512 such municipalities in South Slovakia.

Since 2011 Constantine the Philosopher University in Nitra (hereinafter referred to as "UKF") provides higher education training [4] for students who want to work in public administration on those municipalities where the Hungarian, as language of minority can be used in official administration. The Hungarian-Slovak Bilingual Mediator (hereinafter referred to as "MSBM") study program provides training for professionals in the field of administration at local governments and in public administration as well as companies. The study program focusing on developing:

- communication competence in Hungarian, Slovak and English languages,

- economic and computer science,
- basic legal knowledge.

This is the only university in Slovakia where students can study this kind of program in Hungarian language.

Yes, the las ensures the official use of the Hungarian language in 512 municipalities, but the incomplete terminological knowledge of the employees dos not facilitate the efficient administration of the clients in the language of minority. This is proven by The *Report on the Use National Minority Language in the Territory of the Slovak Republic for the period 2017-2018* [5] as well. Because of this, it is really important to examine the competences provided specifically by this study program. This is the only higher education institute in Slovakia what offers education specifically for this job market, so it is important that the training is maintained for a long time.

2. Methodology of the research

During the research I examined the recommendation of the Council of the European Union adopted in May 2018 about key competences for lifelong learning. This recommendation is a reference tool for education stakeholders. It contains the key competencies needed nowadays and in the future. According to this recommendation the European Union must strive to achieve a knowledge-based economy that leads to better jobs and more employments.

As I mentioned the UKF is the only higher education institute in Slovakia where the Hungarian minority can study as administrative officer in mother language. This is why important to examine what competencies the study program focuses on developing.

By comparing the examined materials, we get a more comprehensive picture about what level meets the study program the current European Union requirements. In this way we can get a conclusion about the popularity of the study program in long time period.

3. Competencies focused by the study program

The MSBM study program is practice oriented with lots of practical lectures, and a two-week long internship program, what every student has to absolve before the graduation. Because the popularity of the study program since the academic year 2015/2016 students have possibility to studying not only at BA, but at MA level as well. The master level focusing more to communication and managerial competencies, essential for effective management of formal administration. According to the study guide [6] what first year university students receive each year, at this study program the subjects are divided into different groups:

- compulsory subjects (students must complete)
- compulsory elective subjects (students can choose what they would like to complete from this group)
- optional subjects (students do not have to complete subjects from this group).

It is important to point out that the subjects can be classified into 3 groups according the competences they develop:

- subjects focusing on language and communication competences (LCC),
- subjects focusing on social and political competences (SPC),
- subjects focusing on economic and IT competences (EITC).

According to the subjects list at the BA (45) and MA (22) level together students have 67 subjects. To this number I do not count the optional subjects, usually students do not take this opportunity. The following charts show how many subjects belong to each group in terms of competence development. The charts also show the differences between BA and MA level.

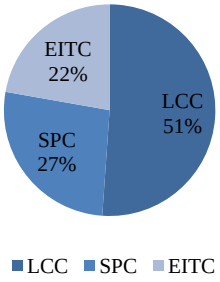

Chart 1: Subjects at BA level

From the Chart 1 we can see, that language and communication competence is the most important at this study program (23 subjects). This is not surprising, several studies [7] have pointed out, that administrative officers must have a high level of communication competence because contacting with customers is essential on this field. For example, the Competency Framework by The Centre for Learning and Development [8] includes six core competences for administrative supports. Although this is not a European recommendation, it is worth to examine, as we do not have such a structured expectation. It could be a great starting point for creating similarly produced competency framework. According to this framework the six competences which are specific behaviors and skills that are generally relevant to all administrative support position officers are the following:

- organization,
- communication,
- service delivery,
- technical,
- adaptability,
- interpersonal.

The communication competence includes 10 sub-points, such as: *listen attentively to people ideas and concerns, speak clearly and can be easily understood, uses appropriate business style writing, demonstrates correct use of grammar, spelling and punctuation in all produced documents*, etc. If we take a look to these competencies, we could say that this is mostly the same as the *Literacy competence* (see below). In our case it is even more understandable, as one of the biggest challenges for people living and working in bilingual environment is to acquire a high level of bilingual communication.

The results show at MA program the same: the language and communication competence is the most important (12 subjects). However, at BA level the social and political competence (12 subjects) is more important that the economic and IT competence (10 subjects), at MA level this two are interchanged (2 SPC and 7 EITC). The main reason is that the first 3 years of the education are more basic, students learn about the regulation of language rights, the possibilities of using the official language and language of minorities. The MA level focusing more to managerial competencies, management of official administration, and these kinds of knowledge, competence belong to economic field.

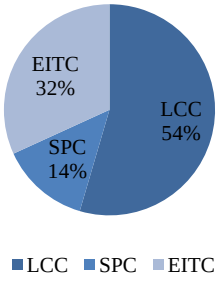

Chart 2: Subjects at MA level

After examination the subjects provided by the study program MSBM we can say, that according the university, language and communication competence (35 subjects) is the most important for the officers in this field. Followed by economic and IT competence (17 subjects) and social and political competence (15 subjects).

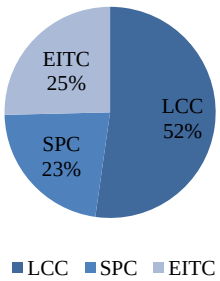

Chart 3: Subjects together at BA and MA level

More than half of the subjects focusing on developing language and communication competences.

4. Framework of the Council of the European Union

The framework states that key competences cannot be narrowly defined. It is combination of knowledge, attitudes and skills. According to the framework the eight key competences are the followings:

Literacy competence: This competence is about the ability to identify, understand, express, create and interpret concepts, feelings, facts and opinions in both oral and written forms. It implies the ability to communicate and connect effectively with others. Basically, it is about the competence of mother tongue.

Multilingual competence: This compete is same as the Literacy competence. The main difference is the language. This competence defines the ability to effectively use different languages.

Mathematical competence and competence in science, technology and engineering: This is about mathematical thinking and review. It focuses on solving problems and difficulties that arise in everyday situations. The science competence refers to the ability and willingness to express evidence-based conclusions, and the technological competence is the ability to applicate this kind of knowledge.

Digital competence: It is about the confident, critical and responsible use of digital technologies in work and social life It has major impact on logical and critical thinking and a high level of communication skills. It teaches how to create, store, present digital contents.

Personal, social and learning to learn competence: The ability for a person to reflect on themselves. Manage time and information effectively by being able to work constructively with other people. This competence includes the ability to manage our own career.

Citizenship competence: This include those behaviors that are essential for a person to be a constructive member of his own society.

Entrepreneurship competence: This competence is also based on creativity, critical thinking and problem solving. Refers to the capacity to act upon opportunities and ideas, and to transform them into values for others.

Cultural awareness and expression competence: Involve understanding and respect for how ideas and meaning are creatively expressed and communicated in different cultures and through a range of arts and other cultural forms.

5. Conclusions

If we compare those competences that appear at the Recommendation of the Council of European Union with the competences developed by the study program we can say that the level of education corresponding to the

modern age expectations. By individual subjects the study program focuses on the development of all competences. From the point of competences, the MSBM study program perfectly synchronize the strategy of Council of the European Union's Lifelong Learning Recommendation and the expectation at the public administration field.

All the studies in the field point out that the communication competence is the most important for an administrative officer. In our research the multilingualism is also very important, because students mostly located in workplaces where knowledge of the Hungarian language (beside the Slovak state language) is essential. These competences also appear at the EU's Recommendation.

The study program also focuses in high volume to economic and IT competences. By this subjects students acquire knowledge from various computer programs that are essential in everyday life. They also gain knowledge in the field of economic, accounting, management and statistics. This knowledge is the same as included in the Digital, Mathematical and Entrepreneurship competence.

And the social and political subjects such as *Basic Psychology*, *Basic Sociology*, *Cross-Border Cooperation*, *Institution of European Union* embraces the Personal, social, the Citizenship and Cultural competences.

Acknowledgements
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CROSS-BORDER SUBURBANISATION OF BRATISLAVA

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Abstract: *The paper focuses on the economic and demographic development of rural areas located in the suburban zone mainly in Bratislava's agglomerations in cross-border territory. Special attention is devoted to demographic processes and related economic phenomenons and comparison in terms of territorial trends of suburbanisation and its impact on regional development. The impact of suburbanization is not only economic issue, it became a social and demographic issue. Two important hypotheses are investigated in the paper. Firstly, that cross-border suburbanization is stronger on one side of the border, in Slovakia. Secondly, that nationalities living in suburbanized territory are influencing the trends of suburbanisation. The results of field research, survey and comparative analysis can serve also as basis for verification of general conclusions in suburbanisation trends of Centrope.*

Keywords: *cross-border region, suburbanisation, microregions, regional development, Centrope, index of well-being*

1. Introduction

A remarkable sign of Bratislava's suburbanization is its spread to neighboring states to Austria and Hungary. Bratislava's eccentric location on the border of Slovakia and Hungary resulted an exceptional possibility of suburbanization. As the suburbanization process is considered to be one of the most significant transformation processes of capitals it changes its intraurban structures. The process may be accompanied by transformations taking place outside the city in places where the use of urban space will not match the new social and economic conditions. Suburbanisation is the growth of city in size, population and density gradient and nowadays starts to take tendency toward reurbanisation, where inhabitants decide to move back to the city, also justified by transforming lifestyle and missing services in suburbia. [1]

The choice of research topic is justified by the fact that the agglomeration, which has growth of population, urban ring and size of a city is considered rather a negative phenomenon according to latest surveys. [2] "Modern villages", garden towns and suburbias are often not providing adequate services that the residents of the capital or neighboring settlements have become accustomed to and neglect the infrastructure, transport and institutional services in some point of view [3].
Researching a particular set of problems involves many pitfalls, therefore suburbanisation is a complex interdisciplinary phenomen and with increasing demography it is becoming a current socio- economic topic.

2. Literature review

According to *Brake's* [4] definition, suburbanization is primarily an outflow from cities at the city limits and outside the settlement boundary. An important driver of the process is the growing demand for land from actors whose interests are linked to a city area or a site there, but who are unable or unwilling to meet it in the city. Suburbanization is thus accompanied with decentralization of the urban population and economy as well as the central functions of the city. Theoretical background and literature review of this paper in the Central European region pays great attention to the phenomenon of Centrope's region.

In Western Europe, since the Schengen Convention in 1985 national borders have become freely crossable, analysed further in the publication of *Struver 2005* for the German-Dutch, Belgian-Dutch and French-German borders; *Terlouw 2008; Van Houtum, Gielis 2006,* but it should be noted that even before 1985 the concept the borders were loosely treated. Suburbanization processes in conditions of Bratislava have been gradually studied by several geographers, architects and sociologists starting from the behavioral survey of villages on the suburbs of Bratislava as *Kurta, Korec, Ira* and *Šveda,* who prepared case studies of Lozorno, Chorvátsky Grob and Rusovce and measured inhabitants number with GPS provided mobile data [5]. Hungarian data from cross-border point of view was published in 2010 in the publication of „Agglonet" by *Hardi.* Győr and its agglomeration was published by *Hadházi,* cross-border impact by B*alizs and Bajmócy.*

2.1 Suburbanisation of Bratislava

Bratislava, as the capital of the Slovak Republic offers currently home to 424 428 inhabitants. 550 200 inhabitants are planned until 2030 according to the latest prognosis of *analysis by demography prognosis made by Infostat.*[6]. Bratislava meets all the characteristics of s state capital covering an area of 367.5 km2. Geogpraphically, the capital lies deep it extends into the Little Carpathians, lies 25 km far from the Hungarian border of Rajka.

However, modern decline of Bratislava's population definitely does not mean the deprivation of the city, there is a mass escape of people from the city from 2006 continuing the trend not only in the directions of other districts of Western Slovakia, but also to Hungary [7].

It is estimated that more than 600,000 people enters Bratislava every day, along with commuters from the area. However, precise data is missing, GPS locations of mobile phones of inhabitants were taken into consideration. [8]

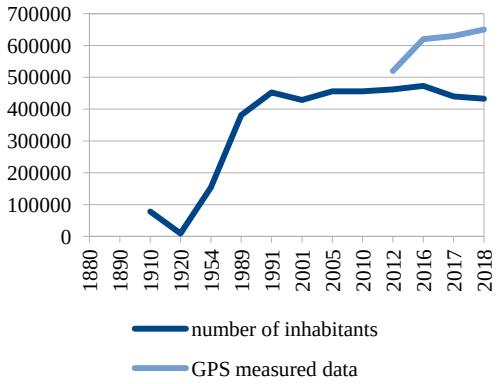

Figure 1: Number of inhabitants of Bratislava - Prognosis Source: own preparation according to Statistical Data

The current administrative boundaries of the city are not sufficient to assess urban and economic development taking place in Bratislava. The position of Bratislava is not only characterized by Centrope (Bratislava – Brno - Győr-Vienna), but also the Bratislava - Vienna - Győr triangle is an economically interesting definition towards the location and infrastructure. [9]

According to latest changes in the labor market caused by COVID-19 in 2020, it is easy to imagine that free move of labor market in Central Europe becomes as flexible as in the world regarding telework and decentralisation. [10]

The paper therefore considers Bratislava and its urban sprawl as a cross-border transport hub. Bratislava also stands out in the country with its hierarchy of settlement development, administration, politics and economy. [11]

2.2 Suburbanisation and cross-border suburbanisation

The labor market migration toward Hungary is defining a feature of borderlessness in the history of the Slovak-Hungarian - Austrian urban split. [12] Cross-border cooperation projects have shown that common problems can be coordinated with common solutions.[13] Therefore, there are planned bilateral under operational programme Interreg SK-HU as DANUrB.[14] On the Hungarian side, Szigetköz microregion with Rajka counts as the largest "Hungarian Suburbia of Bratislava", where the majority of inhabitants has Slovak nationality. [15]

Historically,suburbanization as a process first began in the late 19th century, but manifested itself much more spectacularly after World War II. It first appeared in Europe, especially in London, in Central Europe it was researched by architects and sociologist int eighties. [16]. It appeared later in the US, but with greater dynamism and had a spectacular impact on the core of cities.

In Hungary, we can observe a recreational suburbanisation in case of Budapest, but rather missing or solid type in Győr – Moson- Sopron County in Norhern Hungary 30 km from Bratislava. In terms of functionality, there is a debate about whether it is a counter-urbanization or an urban sprawl. [17] After all, the results of this are the newly created resident districts around the city. From *Figure 1* it is difficult to derive what is the exact percentage of commuting inhabitants to Hungarian part of the agglomeration, but the village of Rajka graw by 245 % in the last decade. Furthermore, Rajka underwent rapid changes in social, architectural and ethnic character of a cross-border suburban village of Bratislava, not in Slovakia, but in Hungary. Cross- border suburbanisation is a very unique and individual phenomena, it is visible on the Italian - Slovenian border or in Western Europe. [18] Creation, change and character of spatial borders depend to a large extent on the spatial unit they surround, but this is a mutual relationship: states, border regions, and the characteristics of the state border all influence each other. [19]

2.3 Measuring cross-border suburbanisation

GDP is a measure of the value of final goods and services produced within a country in a given time-period.

The indicators of the process on both sites can be measured with *migration growth, quantitative and qualitative growth of the housing and housing stock, and the consequences are better technical infrastructure, higher prices of land and real estate, changes in the social structure, and segregation.* [20]

The primary factor for selection Hungarian property for Slovak citizens is usually the price difference in the rural, peripheral environment of Bratislava. The secondary factor of motivation became the traffic and accessibility. Although, the inventors of GDP never intended to use it as a measure of social welfare, in the absence of better measures of well-being, many have used GDP as the main metric for gauging whether societies were prospering.

3. Research methods

Suburbanisation as an interdisciplinary issue can be target of different types of research methodologies. This paper conducts quantitative survey and Slovak - Hungarian comparison of *„Indexes of wellbeing". Strenghts of suburbanisation* can be also measured by the *Density gradient approach"* frequently used by geogpraphist indicating suburbanisation's size, nature, and type. There can exist various causes and degrees of suburbanization and urban sprawl in the immediate vicinity of capitals. For residents consequences will prove unbearable conditions in terms of living standards, wellbeing, quality of life and sustainability. [21]

3.1 Comparative research between Slovakia and Hungary

Besides generally acceptable statistical data, other relevant data were collected during field research in communities

representing suburban survey. It brings in foreground the socio-economic effect of suburbanisation, after all its impact on society of Hungarians living in Slovakia. However, from perspective of assessing people's well-being, GDP has some important shortcomings, therefore we measure in *Table 1* a complex set of indexes.[22]

Table 1 Comparative analysis on suburban indexes

Comparison measurements	*Slovakia (Bratislava)*	*Hungary (Győr)*
*Cross-border migration**	✓ *high*	× *medium*
*Growth of city by size***	✓ *high*	× *lower*
*Housing stock growth**	✓ *high*	× *medium*
Demographic growth (1991-2010)*	*high 17,41 %*	*medium 9,4%*
*Price of land and property**	× *medium*	✓ *higher*
*Recreational suburbanisation***	× *low*	✓ *strong*
*Density Gradient***	*Strong: 318 km2*	*Medium:210 /km2*

** Measurement of Suburbanisation, ** Measurement of Density gradient*
Source: own calculation and preparation based on the data wwwwww.citypopulation.de/

We compared Győr and Bratislava, because both are 30 km from capital, but Slovak citizens move to Hungarian settlements, while Hungarians to Slovakia not often. In the case of Győr, we can see many similarities with the processes described around Bratislava [21] mainly in the form of suburbanization which is often just recreational suburbanization. Comparing indexes of suburbanisation Bratislava has higher indexes in housing stock growth and Cross border migration and lower in Price of land growth.

3.2 Example of Slovak suburbanisation

In quantitative survey taken in 2019 in the district of Dunajská Streda in Slovakia it became evident that lacking services are transportation, services connected with healthcare and new educational institutions. From the sample N=545 from 25 suburban villages we referred to quality of life and regional development. Only 35% of respondents think there is a neutral influence of suburbanisation, 36 % of them think positively, but the majority (39%) is still negative in terms of attitude.

Figure 2: Attitude of inhabitants to suburbanisation in district Dunajská Streda (Slovakia, Bratislava suburbia)

Souce:own preparation based on survey „Suburbanisation and identity", 2019

In the majority of cases the perception was neutral, but many missing services and problems were mentioned in opened questions. Firstly, because indogenous inhabitants aim to retain their typical village characteristic, there is need for new services mainly from non-indogenous newcomers. Secondly, because of the quick growth, where demography is growing more rapidly as economy, it has a negative tendency towards attitude and perceptions. Thirdly, there is a missing budget raised by local taxes in the lack of permanent adress of inhabitants. The growth of such settlements is unplanned, and in some places explicitly disorganized. Negative consequences can also cause problems for local government budgets, with residents moving here who do not change their officially registered permanent residence being declining sources of taxation. The current status of the suburbanization is poorly documented, mainly assessed and prognosed. [23]

3.3 Example of Rajka – Bratislava's suburbia on Hungarian side

Based on survey among 329 families in the field research of DANUrB conducted by Bajmócy and Balizs in six settlements near Rajka - Hungarian suburbia of Bratislava. Thus, 52.9% of the families were from the examined settlement, 29.2% from Győr and 17.9% from other settlements were included in their sample. Demography changed to double size, roughly 60% of inhabitants has Slovak citizenship and commutes to everyday for work within the 25 km long agglomeration ring. There is a threat that suburban area will become dependent only on individual transport. [24]

Table 2 Comparative indicators between Slovak and Hungarian cross border suburbanisation survey

Comparative indicators between Hungary and Slovakia	*Slovakia*	*Hungary*
Travelling difficulties	✓	×
Work-related commuting	✓	×
Bratislava centered inhabitants	✓	✓
Economically well situated inhabitants	✓	×
Language barriers	×	✓
Recreational suburbanisation	×	✓
Residential suburbanisation	✓	✓
Lack of services	✓	✓
Move motivated by lower property price	✓	✓

Source : own survey (Slovakia) compared to Hungarian survey Balizs Bajmócy survey from 2017

Table 2 above indicaties the differences between the two part of the border in terms of travel, work commuting and Bratislava centrism. The language barriers and residential suburbanisation and increased lack of services is typical.

3.4 Hypothesis

Hypotheses were set in order to analyze data further from sample of 545 inhabitants in Slovakia emphasising national minorities living in the urban fringe and suburbia. *H1: The impact of regional identity is significant with*

regards to the microregional development.
H2: Regional identity is more important to indogenous residents than to non-indogenous (suburbanitzed) ones. Based on survey regional growth was positively assessed by non-indogenous in suburban regions *(Figure 2).* Answering hypotheses correlation tables and tests were made with Pearson Wilcox test of ranking sings. The most important hypothesis was correlation between nationalities and economic development, which was previously proved by Myrdal [25]. He stated that territories where ethnic minorities are represented as majority (more than 50 %) of society are economicaly less developed. Therefore, we examined the impact of regional identity on the regional development. The definition of microregion was provided in questionnaire as Podunajsko, Žitný ostrov- Rye Islad (district Dunajská Streda), while Bratislava is the centre.

H0: There is no correlation between the nationality and microregional development preference.
H1: There is a correlation between the nationality of inhabitants and microregional development preference.

Table 3: Satisfaction of respondents

Contingency table : nationality/ development	*Microegional development is important*	*Microegional development is not important*	*Total*
Hungarian respondents	*245*	*100*	*345*
Slovak respondents	*90*	*110*	*200*
Total	*335*	*210*	*545*

Source: own survey (2019, Bott)

The test results in Chi Square indicated value of 36,17. It is statistically significant by result $p < 0.05$. The Cramer V value is 0,29 with slightly strong effect. Roughly interpreting Hungarians living in Slovakia are regionally more conscious towards microregion, Slovaks towards Bratislava. Their ratings were evaluated for 545 responses from Cramer V test also showed a high correlation., counted as $r(V) = \sqrt{(X2 / n * (m-1))}$ $V = \sqrt{36.17 / 545 * 1} = 0.266$ (where m=2, n=545, X2= 36,17.) It opens discussion whether Bratislava is the only preference for living, because the correlation is slightly strong.

4. Findings of research

In the theoretical line of the research, we compared the economic effects on the basis of comparative values. We mentioned cross-border trends, those strongly exist on territorial level as a result of suburbanization. The impact of suburbanisation of Bratislava is evident on the Slovak side, it is stronger in terms of density, growth of population and new suburbias. *(H1)* At the same time, we examined the identity of suburban residents, as its main objectives include defining cross-border suburbanization *(H2)*, obviously the indogenous residents were more sensitive towards regional changes and generally less satisfied *(Table 3).*

Furthermore, in comparative research we analyzed economically effected indicators of suburbanisation in the cross- border area. Slovakia showed the traits of typical, capital-residential suburbanisation and Győr the agglomeration traits of size and property growth with proper services. As a result of the research we evaluated the current situation in the "most suburbanized" places and answered questions and hypothesises with the intention to develop recommendations for decision-makers while assessing the current needs of the residents.

5. Conclusions

Concluding cross-border suburbanisation of Bratislava, by comparing local development strategies, regional and cross-border indicators of density, growth and satisfaction level, as well as local , both sides of the border need to focus primarily on information that can be useful for each newcomer and planned move and focus more on the needs os micro-regions surrounding the suburban areas of capitals. Survey on both sides of the border has showed that suburban indogenous residents need to argue with the priority options for development topics.

Good examples and sensible solutions exist in many places during the development of international suburbanization. Therefore, microregional impact is also necessary to assess and learn from best practices where the issue is treated centrally, bilaterally and interregionally. It is reccomended to cooperate among the leaders of the suburban municipalities in cross-border area, this has a perspective to create a cross-border network. Even a cross-border common strategy at level of joint projects, actions, meetings and actions would be required. This paper can provide a fast cross-border understanding on the topic that is important for commuters, indogenous, newcomers and municipalities.

Another important way to proceed further with research data is to forecast the social consequences of suburbanisation. However, it can affect not only local people's well being but also traffic, environmental and cultural issues in co-living.

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WHAT ARE THE SOLUTIONS FOR WASTE MANAGEMENT IN SLOVAK REPUBLIC

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Abstract: *Everyone creates waste. Some try to minimize production, but most is creating more and more waste. This paper draws attention to the Slovak Republic. How many waste were created in the population. What are the possibilities of smart solutions.*

Keywords: *Smart Technologies, Waste Management, Municipalities, Eco-innovations, Separated waste*

1. Introduction

The purpose of this paper is to clarify the facts that describe the current state of waste management in the Slovak Republic.

First of all we have to acknowledge what are smart technologies?

Author Oh (2020) in Smart city as a tool of citizen-oriented urban regeneration: Framework of preliminary evaluation and its application [1]. He finds smart technologies being the idea base for smart cities. Those are technologies that not only collect in first place, but also effectively evaluate data for the future.

Different point of view is having Ranchordás (2020) in the article Nudging citizens through technology in smart cities [2]. It brings an interesting view not only from the environment of behavioral economics. He considers smart technology as the penetration of personal and public welfare. The data is not only passively collected and processed, but also helps to improve the urban environment. It points out the benefits of smart solutions to city dwellers for the benefit of all.

We also present publications investigating the waste management in Slovak Republic and what is it focusing on. In order to be able to propose appropriate measures, we must first know the data on waste management. There are several suitable solutions. Also, they have the advantage that they can be applied both separately and in combination. It means they have a much greater effect on environmental protection.

2. Current state of the issue in the literature

The authors Lacko and Andrejovský (2020) in the article Interregional differences in waste management within the Slovak Republic [3] point to different approaches in individual regions of Slovakia in the handling of municipal waste. They use statistical methods to compare the amount of waste produced in households and businesses in the period 2002-2018. A continuously growing line is clearly definable.

The author Stričík (2020) examines the differences in the composition of municipal waste between the years 2010-2017 in the work Composition of municipal waste in Slovakia [4]. It also focuses on the shortcomings associated with waste management.

Another publication is Motivation of Citizens to Sort Municipal Waste in Slovakia [5]. Stričík, Bačová and Čonková (2019) compare the goals of the Slovak Republic in the field of waste management with the goals of the European Union. They look at the issue from the point of view of citizens, trying to find motivational factories to meet environmental goals.

3. Condition assessment

The change in the volume of waste is not directly dependent on the GDP growth rate.

The amount of waste is constantly growing regardless of the phase of economic cycle in the Slovak Republic.

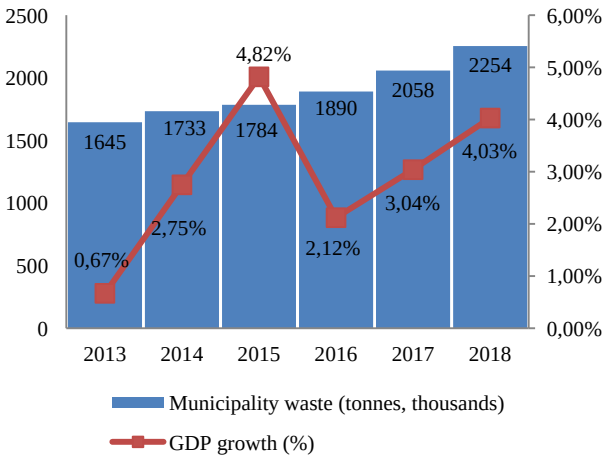

Figure 1: Amount of municipality waste comparing with GDP rate, years 2013-2018 [6,7]

The increase is continuous and, despite modern approaches to waste (eg zero waste movement), it is not possible to stabilize the amount produced at the national level.

In the period 2013-2013, there was a 37.02% increase in the production of household waste in Slovakia. The difference between the amount produced in the range of 3 decades - (1998: 1,740 thousand tons and 2018: 2,254 thousand tons) is even more pronounced: 129.54%, which is approx. 4.32% increase each year.

As the volume of waste grows, so does the percentage of sorting, which unfortunately is also affected by legislative changes. In recent years, the growth rate of sorting has increased compared to the increase in total municipal waste, but compared to other countries, this is not a gratifying level.

I must state that the possibilities for waste sorting are different from municipality to municipality, and sometimes the differences are very abysmal. This may also be the reason why satisfactory results are not being achieved with the growing awareness of waste sorting among an increasing part of the population.

The Slovak Republic has set a goal in waste management: Envirostrategy 2030 - it will sort up to 60% of the total amount in 2030 at the latest. But if it was less than half in 2018, it is not certain whether this will be achieved without major interventions by the Ministry of the Environment of Slovak Republic.

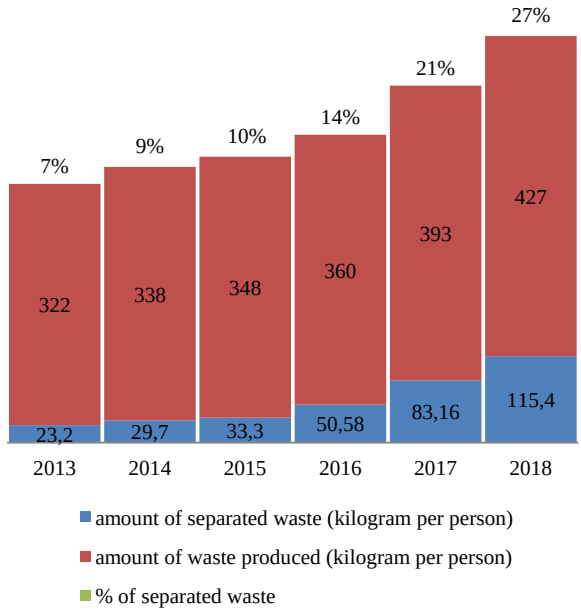

Figure 2: The ratio of municipal waste to the amount of separated waste and quantified ratio, years 2013-2018 [8,9]

4. Suggestions for possible solutions

The connection of (not only) smart technologies is possible in several stages and can be applied separately or as an integrated system (if interoperability allows it).

The three most used approaches are: container-interval collection, token collection and different types of codes [10].

Container-interval: the amount of the citizen's fee is calculated according to the frequency of exports and the size of the container he uses. Residents can choose the size of the container as well as the number of exports. The amount of the fee depends only on the size of the container and the frequency of export. The amount of waste has a weaker effect on the fee compared to the collection through tokens or marked containers.

Token: with this type of fee, the citizen buys a token, which he hangs on a trash can if he is interested in emptying it. The waste carrier hangs the token and hands it over to the municipality. The price of the token is determined by the size of the container and the cost of exporting it. The citizen thus regulates the fees according to the number of tokens used.

Different types of codes: this method represents the most smart solution. This type of collection works on the same principle as the token system. In this case, the citizen has a container marked with a specific line - QR code or RFID chip. If citizen is interested in emptying it, he/she unloads the container to the designated place. The rubbish man scans the code and empties the container. Export data is recorded in the system.

Combined method: it is a combination of a lump sum (local tax) and one of the quantity types of collection in one municipality. It is usually a matter of distinguishing the inhabitants living in family houses, for which some form of mass collection is introduced. Residents in apartments have a flat fee.

6. Conclusions

The most effective form is a combination of the above-mentioned methods, which maximizes the utility for each element. The citizen pays proportionally as much as he produces waste. The municipality makes a minimum of hauling, so vehicles and staff are well occupied. More emissions do not get into environment than would be the case with a very busy collection system.

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MARKET INTEREST RATES AND THE DYNAMIC CHANGE OF CREDIT QUALITY - AN EMPIRICAL STUDY

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Abstract: *Driven by different capital market factors and the ongoing interest rate policy of the European Central Bank - in line with the interest rate policies of other major international central banks - market interest rates in Europe - and other economics - have fallen significantly over the past two and more decades. Against the background of this development, there are increasing estimates that parts of the economy are increasingly able to survive partly or even only because of cheaper credit financing. Thus, there is sometimes talk of so-called "zombie companies". This article analyses the relevant perspective in relation to the development of key financial figures in the German automotive industry in the period from 1997 to 2017. Using the analytical approach of Altman's Z-indicators, the average credit quality of the sector concerned is assessed. The correlation of the Z-values determined in this process with the values of the market interest rate level is then analysed. The results confirm, firstly, the presumed deterioration in the indicators and, secondly, a relevant correlation with the trend in market interest rates. However, it should be noted that in the course of the analysis carried out and in evaluating its results, a few important limitations must be considered. As a result, this contribution can only be introductory in its linking of the observation of the development of the market interest level with the assessment of credit quality in relation to a sector; further analyses should then follow.*

Keywords: *interest rate, Altman's Z-score, credit quality, zombie company, discriminant model*

1. Introduction

Interest rates in many of the world's economies have been falling continuously for a long time - although fluctuating. This applies to both capital market interest rates and money market rates. A recent study by the Bank of England [12] shows that interest rates have been falling continuously since the 13th century. Macroeconomic theory takes different views on the possible interactions between the real and financial economy. Proponents of a mutual influence of both areas sometimes argue that the financial economy influences the real economy or vice versa - or both [7].

In this contribution, the detailed discussion of alternative theoretical approaches to macroeconomics is excluded. The analysis presented here simply follows the view that there is - or may be - an interaction between the financial and real economy. On this basis, the paper examines how a set of indicators relevant for assessing the credit quality of companies has developed in Germany over the period 1997 to 2017. The approach of Altman's Z-Score, which is already more than five decades old, will be employed. This approach is applied here to aggregated values from the annual financial statements of the automotive sector in Germany. The identified key figures are then compared with the development of the market interest rate level and finally the derived results are evaluated and interpreted.

This chapter introduces the topic under consideration. The following chapter 2 provides a brief overview of the theoretical background relevant here. First, the development of the interest rate level and its evaluation are discussed. This is followed by an introduction to the discussion of so-called zombie companies - as a possible subsequence of the interest rate development. Finally, the Altman Z-approach used in this paper is presented. Chapter 3 then presents the research approach of this paper and its reasoning. Following, chapter 4 discusses the empirical analysis and the results obtained. Chapter 5 concludes this paper with a short summary and an outlook on further research.

2. Theoretical and literature background(s)

2.1 Theories of falling interest rates

The Bank of England's 2020 study "Eight centuries of global real interest rates, R-G, and the 'suprasecular' decline, 1311-2018" [12] describes and documents the general decline in market interest rates across several economies, which has been ongoing since the 13th century. Looking ahead, the prospect of a continued negative market interest rate is still held out.

As part of the analysis of possible explanations for the fall in market interest rates, a study by the Institut der Deutschen Wirtschaft (Institute of the German Economy) [8] focuses on the real interest rate. It also focuses on the interest rate between the savings and investment decisions to be made in the market. Consequently, this tends to be an interest rate for at least the medium term. Five alternative explanations are given in detail:

- The first explanation for the fall in market interest rates is the "global savings glut hypothesis". According to this hypothesis the desired savings globally exceed the planned investments. Consequently, the market interest rate level would then fall.
- Secondly, the secular stagnation hypothesis states that lower interest rates result from lower investment, which in turn is due to declining population growth,

lower capital intensity and a further decline in the relative price of capital goods.

- Thirdly, the scarcity hypothesis regarding secure assets considers a divergence between the supply of and demand for relatively secure assets. According to this hypothesis, the growing demand for secure assets, combined with a limited supply of secure assets, makes it possible to reduce the returns on secure assets and hence interest rates.
- Fourthly, it is argued that demographic change combined with increasing life expectancy will lead to a fall in interest rates. The explanation for this is that higher life expectancy requires a higher savings rate because a longer pension period must be financed.
- Fifthly, the growing demand by firms for relatively more intangible than tangible assets leads to falling investment costs. As a result, market interest rates would fall as demand for capital is lower than supply.

The five hypotheses presented here share the view that savings on the one hand and investments on the other hand are compensated by the resulting market interest rate. The market interest rate is then the result of the compensation in question.

However, an alternative approach to these five hypotheses sees low productivity growth alone as the reason for the resulting lower market interest rate. On the one hand, it is argued that a slower pace of innovation tends to lead to a lower demand for investment. On the other hand, lower productivity growth tends to lead to a reduction in household incomes, to which households then react by increasing their savings.

The development of market interest rates in the United States of America and Germany - as examples - looks like this:

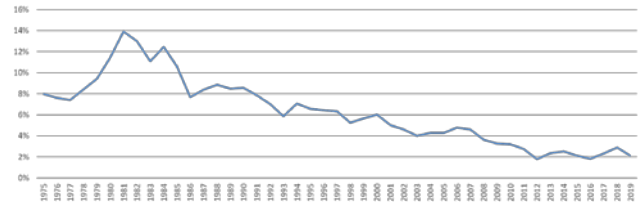

Figure 1: Average capital market interest rate in the USA 1975 to 2019 in % (Source: ECB, Macrobond)

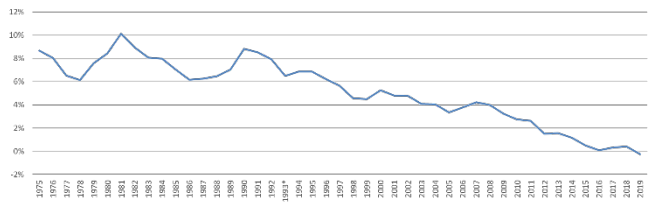

Figure 2: Average capital market interest rate in Germany 1975 to 2019 in % (Source: US Department of Treasury)

The rules of the European System of Central Banks ("ESCB") give priority to the objective of maintaining price stability [9]. In addition to this objective, the ESCB is also intended to support the general economic policies in the European Union. However, this must not conflict with the objective of monetary stability. The general economic policies in question shall have as their primary objective the general objective of sustainable development in the European Union of Europe based on balanced economic growth and price stability. It also aims at a highly competitive social market economy, aiming at full employment and social progress. Despite the primacy of the objective of price stability, the ESCB's objective of achieving positive economic development is also becoming increasingly important. This is because price stability is currently widely regarded as having been achieved and to the desire to strengthen economic activity in the ESCB countries. As a result, the Eurosystem's key interest rates and related money market rates are also expected to decline further, driven by the impact of the financial and economic crisis over the past 20 or so years.

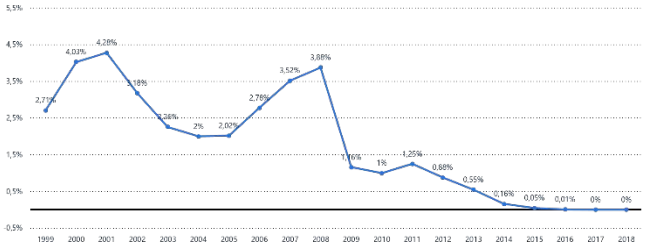

Figure 3: Development of the European Central Bank's interest rates from 1999 to 2018 in % (Source: ECB)

It should be noted that the individual interest rate of companies is determined by adding a - usually - credit rating dependent premium to the market interest rate. In principle, the market interest rate is a good reflection of the interest rate level; individual financing costs are usually proportional to this.

2.2 Theories of zombie companies

Especially in the wake of the expansionary monetary policy in Japan, which began about 30 years ago, some analyses of its - also - negative consequences have been made [6]. While a positive and stimulating effect on the non-banking sector was expected from the expansionary monetary policy with high liquidity supply and low interest rates, in practice negative developments had to be considered. Weak growth and declining productivity were observed at least in parts of the affected economy. It was found that visible parts of the companies only - still – existed because they were supplied with sufficient volumes and cheap liquidity. In a "normal" world, however, they would not have been considered eligible for financing. The term "zombie companies" was coined. It was also noted that monetary and interest rate policies to support the companies prevented necessary restructuring in the economy and led to a general deterioration in the situation of the companies.

Comparable results are now presented for the impact of ESCB monetary and interest rate policies [1][4]. Again, there is talk of zombie companies. These are once again companies characterised by weak growth and lack of profitability and which, due to the lack of independent borrower quality, would not be financed without the expansive monetary and interest rate policy and, moreover, could hardly bear higher interest rates.

2.3 Altman's Z-score

In the theory and practice of financial analysis there are several approaches focused on assessing the financial stability of companies [11]. Great attention and popularity is given to Altman's more than five decades old approach: the Altman Z-score [2][3]. This has been created per se for the evaluation of an insolvency forecast. However, it is also more widely used to analyse the financial stability of companies generally.

Altman's Z-score combines five key balance sheet and income statement figures into a single indicator. In this case, higher scores mean higher credit quality - and vice versa. In the original version, solid credit ratings with values above 3,0 are the hallmark of Altman's Z-score. The critical intermediate range is seen between 1,8 and 3,0. Below this range is the very critical zone. It should generally be noted that Altman's Z-score was developed based on historical annual financial statements of US companies in the manufacturing sector.

The individual factors included in the Z-score represent individual evaluations in relation to the companies to be considered - as follows:

- The first factor assesses liquidity. It compares working capital - the difference between current assets and current liabilities - to total assets.
- The second factor uses retained earnings to quantify the extent to which the company is dependent on external sources of capital or can finance itself independently from generated and retained earnings. The value of retained earnings is considered in relation to the balance sheet total, thus total assets.
- The third factor reflects the profitability of companies. The value of EBIT ("earnings before interest and tax") is considered. This value is also set in relation to the balance sheet total, thus again total assets.
- The fourth factor puts the equity value in relation to the credit liabilities of the company under consideration. It is assessed to what extent the debt capital is "covered" by the equity value of the company.
- The fifth factor looks at how efficiently the company concerned uses its own asset base. It puts turnover in relation to the balance sheet total - or more precisely again, to the "total assets".

Factor		Weighting
Working capital/Total assets	X1	1,2
Retained earning /Total assets	X2	1,4
EBIT/Total assets	X3	3,3
Market value of equity/Total liabilities	X4	0,6
Net sales/Total assets	X5	1

Figure 4: Z-score for public companies

The Z-score then is calculated according to the following formula:

$$Z = 1{,}2\ X_1 + 1{,}4X_2 + 3{,}3X_3 + 0{,}6X_4 + 1{,}0X_5$$

Altman derived the original Z-score from the data basis of American stock corporations listed (public) on the stock exchange from the manufacturing industry. In order to be able to also present a calculation for companies not listed on the stock exchange (private), a further Z-score for private companies was subsequently derived. For this, the book value of the equity capital is used instead of its market value. Alternative factor weightings are also used. Finally, the separations of the resulting values regarding credit quality are also put into perspective to some extent.

Factor		Weighting
Working capital/Total assets	X1	0,717
Retained earning /Total assets	X2	0,847
EBIT/Total assets	X3	3,107
Book value of equity/Total liabilities	X4	0,42
Net sales/Total assets	X5	0,998

Figure 5: Z-score for private companies

The Z-score then is calculated according to the following formula:

$$Z = 0{,}717X_1 + 0{,}847X_2 + 3{,}107X_3 + 0{,}420X_4 + 0{,}998X_5$$

Omitting the fifth factor, another Z-score has been developed to make the approach more applicable to different sectors and country specifics. However, this will not be considered further here.

Altman himself recommended over time that the derived Z-scores should not be interpreted rigidly within the bandwidths determined for their original version. A comparison of the values determined with the ratings of rating agencies is also recommended, whereby so-called bond rating equivalents should be determined [5].

3. Chosen research method

Regarding this study, the methodology chosen and the restrictions to be observed in the process will be presented here. The present research approach uses the Altman Z-score for the analysis of key company figures in Germany over the period 1997 to 2017. The modified approach for unlisted (private) companies is used. The sector under consideration is the automotive industry.

As a limitation, it should be noted that the data used here are aggregated sector data derived from the Deutsche Bundesbank [10]. The Z-score, which is intended for individual companies, is used for cumulative values of about 80% of the companies in the sector concerned as a whole. It is not considered that individual companies in the sector are actually listed on the stock exchange, the majority are not. There are no concrete distribution values for the data aggregation used in this respect. It should also be noted that the value of retained earnings from the retained values was interpolated over the time period considered, as specific values were not available; a share of 62% retained earnings in equity is calculated.

In view of the restrictions on the transferability of the American Z-score to international - in this case German - companies, the only conclusion to be drawn from the values determined is that higher Z-scores should be regarded as better than lower ones. Mapping to rating equivalents is expressly not carried out and should be reserved for further analysis.

The aim of this contribution is to look at the value characteristics over time and their relationship to the market interest rate. Accordingly, the analysis of the correlation of the determined series of Z-scores to the development of the market interest rate is carried out. The 10-year interest rate is used here because the market considers it to be of good significance for justifying investment decisions. Further studies may also consider the development of the money market - thus short term - interest rates.

4. Applied empirical analysis

As described in the presentation of the research approach chosen here, the Z-scores are now calculated using the aggregated data of the German automotive sector for the years 1997 to 2017. The Z-score adjusted for unlisted companies is used according to the following formula:

$$Z = 0{,}717X_1+0{,}847X_2+3{,}107X_3+0{,}420X_4+0{,}998X_5$$

Factor		Weighting	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Working capital/Total assets	X1	0,717	0,500	0,538	0,520	0,477	0,459	0,478	0,456	0,457	0,455	0,471	0,496
Retained earning /Total assets	X2	0,847	0,170	0,208	0,202	0,180	0,177	0,196	0,179	0,175	0,171	0,166	0,184
EBIT/Total assets	X3	3,107	0,243	0,257	0,235	0,235	0,215	0,218	0,174	0,169	0,170	0,186	0,232
Book value of equity/Total liabilities	X4	0,420	1,156	1,539	1,481	1,112	1,052	1,339	1,103	1,061	1,040	0,962	1,126
Net sales/Total assets	X5	0,998	1,416	1,272	1,399	1,396	1,417	1,351	1,274	1,255	1,258	1,247	1,225
Z-scores			**3,156**	**3,277**	**3,292**	**3,085**	**3,002**	**3,097**	**2,753**	**2,698**	**2,691**	**2,703**	**2,928**

Factor		Weighting	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Working capital/Total assets	X1	0,717	0,496	0,477	0,510	0,520	0,518	0,519	0,508	0,519	0,515	0,524	0,520
Retained earning /Total assets	X2	0,847	0,184	0,166	0,154	0,179	0,177	0,177	0,169	0,174	0,161	0,161	0,163
EBIT/Total assets	X3	3,107	0,232	0,204	0,152	0,198	0,200	0,199	0,169	0,180	0,196	0,191	0,183
Book value of equity/Total liabilities	X4	0,420	1,126	0,913	0,770	0,887	0,892	0,784	0,722	0,760	0,707	0,693	0,664
Net sales/Total assets	X5	0,998	1,225	1,156	0,914	1,015	1,082	1,044	0,998	1,024	1,050	1,033	0,981
Z-scores			**2,928**	**2,652**	**2,205**	**2,524**	**2,599**	**2,511**	**2,332**	**2,419**	**2,461**	**2,428**	**2,337**

Figure 6: Market-Z-scores for companies of the German automotive sector 1997 - 2017

When looking at the values determined, it becomes clear that they start with a Z-score of 3,156 in 1997. This is reduced continuously to the Z-score of 2.337 in 2017.

It is emphasised once again here that no rating mapping has been carried out on this basis. Furthermore, the direct transferability of the value ranges from the US calculations to German companies is only possible to a - quite - limited extent. However, there is nevertheless an ongoing reduction in the sub-figures determined as meaningful for the credit quality of companies and the resulting overall Z-score.

The aim of this contribution was then to put the course of the calculated Z-scores in relation to the market interest rate level. Using the 10-year market interest rate in Germany in the years 1997 to 2017, the following picture emerges:

Figure 7: 10y Market interest rates and Z-scores 1997-2017

This first analysis already gives an indicative parallelism of market interest rates and Z-scores. Both values show falling trends over the period under consideration here.

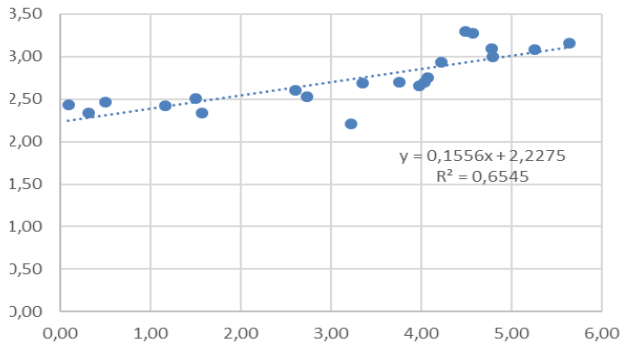

Figure 8: Correlation analysis of 10y Market interest rates and Z-scores 1997 - 2017

Then, performing a linear correlation analysis yields the following picture. With the function y = 0.1556x + 2.2275 it can be determined that a corresponding correlation exists, which - based on the coefficient of determination R^2 = 0.6545 - also has a relatively high informative value.

When analysing the set of annual financial statement data of companies in the German automotive industry, it was found that their Z-scores are decreasing in correlation with the decreasing values of market interest rates in the same economic area.

It should be noted that the correlation shown cannot be equated with a causality. Further analysis is required to determine this. It is conceivable, however, that the assessment discussed in the discussion of zombie companies is that falling interest rates can be accompanied by a deterioration in the economic situation of an economy. The low interest rates that emerge on the market could then lead to an expansion of low profitability and weak growth. It is also conceivable, however, that interest rates could be reduced indirectly via the central bank's money market policy because the economic situation is to be strengthened - needs strengthening.

6. Conclusions

The aim of this research contribution was to analyse the development of corporate credit quality and market interest rates over time. As a field of observation, - very - aggregated values of the German automotive industry over a period from 1997 to 2017 were chosen. The interest rate level was examined based on the 10-year market interest rate. The variant of Altman's Z-scores adapted to private companies was used to assess credit quality. No adjustment or calibration to German conditions - accounting, financing and others - was made in this basic research approach.

The analyses performed confirm a correlation between the development of market interest rates and the Z-scores determined. The associated coefficient of determination indicates a meaningful correlation.

For further interpretations, it is now necessary to question where the cause of the correlation in question lies. Does the falling interest rate level lead to a weakening of the economy or is a money market policy geared to low interest rates because the economy is weakening?

Regarding the German automotive industry, it should finally be noted that, on average, it has been in a fairly good economic situation over the last 10 years. However, the Z-scores calculated do not reflect this.

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Index of Author(s)

THE DIGITAL ERA IN LOGISTICS OF SELECTED COMPANY

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Abstract: *The Fourth Industrial Revolution, which is also known as Industry 4.0, is changing the development and direction of every company. In the ongoing revolution we are witnesses of rapid development of modern technologies. These technologies are fundamentally changing the way today´s world works and affect the quality and flexibility of business processes. The new digital era associated with the development of Industry 4.0 aims to achieve the level of "smart factory" through the internet, robotics, smart technologies and production automation. Logistics has an important role in the smart factory, which is also subject to fundamental changes. In the digital era, we can expect revolutionary changes in logistics and its digital transformation, because it will undergo significant implementation of new technologies in the form of artificial intelligence, robotics, augmented reality, 3D printing, big data and other technologies related to Industry 4.0 as a representative of the Fourth Industrial Revolution. The main aim of this article was to explain the digital era in the logistics of a selected company. The object of research was a selected international transport company. The research tool was a structured interview, which consisted of multiple questions concerning the digital era, the benefits of digitalization, factors of digitalization, key technologies in digitalization and customer´s digital skills.*

Keywords: *digitalization, the Fourth Industrial Revolution, Industry 4.0, smart logistics*

1. Introduction

The digital transformation of logistics is becoming a necessity for development of a company in the Fourth Industrial Revolution, but also for the long-term sustainability of business processes. New technologies in digitalization help optimize capacity, enhance performance and improve quality while ensuring supply chain efficiency. More and more companies are looking for innovative solutions that can harness the potential of digital technologies. Business practices confirm that the digitalization of logistics usually develops in three basic areas: warehouse management, production logistics, transport logistics and distribution logistics. The dynamic environment of the logistics industry is constantly creating requirements for quality, flexibility and the type of services offered. In order to minimize operating costs, companies are forced to revaluate their business models to ensure the continuity and reliability of the supply chain. Digitalization and innovative technologies are quickly becoming irreplaceable tools for the necessary transformation of corporate logistics.

2. Literature review

Over the last decade, the combination of a large number of new technologies and related application such as Industrial Internet of Things, augmented reality, big data analytics and cloud technology was labelled with the term of Industry 4.0. In the context of logistics and supply chain management (SCM), the application of Industry 4.0 will probably lead to an increased level of supply chain flexibility, transparency, visibility and control [1].

In the current turbulent business environment and progressive globalization, the importance of flexible adaptation of economic organizations to change is growing [2]. Due to the fundamental changes in both the economy and society caused by the so called Fourth Industrial Revolution (Industry 4.0), it is necessary to consider the logistics as a discipline and science because it is a key element and impetus to the development. The logistics has transformed from purely service activity such as delivering of the necessary products to the right place at the right time into the trigger of digital and social changes [3].

A substantial merit of the new approach may be that the idea of Industry 4.0 is predicated on the assumption that it is supposed to make a significant contribution to logistics management, thus making it possible to solve problems related to complexity of contemporary manufacturing and logistics [4].

Industry 4.0 as explained "is a fourth industrial revolution of high technology strategy plan introduced by academia, industrials and the German government to achieve comprehensive transformation of the entire industrial production through the emergence of internet and information as well as communication technologies with traditional processes in order to strengthen competitiveness of manufacturing sector" [5].

Industry 4.0 represents current industrial revolution which digitalises process of industrialisation. Industry 4.0 is controlled by technical innovations, cyber-physical systems in production and logistics processes [6].

Authors Pfohl, Yahsi and Kurnaz [7] define Industry 4.0 as a set of innovations implemented in a value chain that exhibits features of digitization, automation, transparency, mobility, modularity, virtual collaboration and socialization of products and processes.

Industry 4.0 is represented especially by information technology representatives, telecommunication companies, new media, machinery, electro technology and industrial production and electronics. They enforce concept of intelligent factories, which are characterised by flexibility, effective utilisation of sources and materials, ergonomics and including customers into production and value making [8].

Technologies specific to Industry 4.0 (e.g. Big Data Analytics, Cloud Services, 3D-Printing, Cyber Security, Autonomous Robots, Internet of Things, Augmented Reality) supporting physical logistics processes increase computational and communication capabilities [9].

The authors Porubčinová and Fidlerová [10] attention on the shift towards examining the design features of technologies and tools that support the wellbeing of Human-Robot collaboration can be identified within the current analyses.

Lasi et al. [11] consider the characteristics of Industry 4.0: interoperability, virtualization, decentralization, real-time operations, modularity and flexibility.

Nenadál et al. [12] include among the basic elements of Industry 4.0: cyber-physical systems, the Internet of Things, internet services and the digital economy.

Digital process transformation and implementation of new technologies is collectively referred to as Industry 4.0 or Smart Industry. The modularity of intelligent logistics solutions designed according to the principles of cyber-physical systems allows the gradual (evolutionary) transformation of the supply chain [13].

Digitization and the growth of new technologies such as the "Internet of Things", 3D printing, robotics, predictive analytics and artificial intelligence, have a significant impact on the processes all along the supply chain. During this process, decision-making, at the stages of the manufacturing and distribution process, can be accomplished using sophisticated and complex analyzes that decrease the human intervention [14].

According to Buhr and Stehnken [15], the potential of digitalisation seems enormous and affects a large number of industries, from agriculture and energy, logistics, IT and communications, to mechanical engineering and vehicle manufacturing.

Blecker et al. [16] talk about intelligent logistics. Under this phrase meant as processes supported by radio frequency waves, voice, light, computers and other advanced technologies for the purpose of automating a logistics distribution centre. The aim is to create an intelligent control system to achieve complete coordination in the flow of goods, information and finances. This is how smart logistics is created.

Smart logistics refers to use in implementation of logistic tasks, new intelligent technologies, understood as equipped in intelligent systems of computer support, that lets to fully automate processes [17].

The new industry organization model is based on specialized manufacturing, horizontal integration within cooperating networks and digital integration of the supply chain [18].

3. Methodology

The main aim of this article was to explain digital era in the logistics of a selected company. The object of research was a selected international transport company. The research tool was a structured interview which consisted of several questions concerning digital era, benefits of digitalization, factors of digitalization, key technologies of digitalization and customer´s digital skills.

The method of abstraction was used in creating this article when unnecessary information was singled out and only relevant information was taken into account. Furthermore, the method of analysis was used in the theoretical and practical part of the article. Using the synthesis method, the obtained and collected data were assimilated into each other. The comparison method was used to compare the views of foreign and domestic authors concerning the digital era. In the practical part of the article, structured interview was used, through which the current state of digitalization of the selected company was obtained. Information and knowledge were clearly visually displayed using pie charts.

4. Results

We examined the impact of the digital era in logistics on the basis of a structured interview with the logistics manager of a transport company operating in Slovakia. In the next part of the article, selected key knowledge and information concerning the digital era in the logistics of the selected company will be processed.

The first question that interested us was how the selected company perceives the digital era in logistics. Based on the answer we found out that company perceives the digitalization and overall digital transformation of business processes as a certain standard and also as a necessity in the company´s ability to maintain leading position in the competitive struggle of the market. Especially in the case of a transport company, it is necessary to apply digital transformation across all processes. The importance of digitalization was presented by the logistics manager on three levels:

- The first level represents the application of digital transformation within the internal processes in the transport company, the purpose of which is mainly to simplify and speed up communication between individual departments, branches and divisions. This level also represents an improvement in data transfer within the branches and the head office in order to

improve the headquarters ability to understand processes taking place in individual branches.
- The second level represents the application of digitalization within communication (especially the transmission of various data) between the transport company and service providers such as law firms, etc.
- The third level represents the application of digitalization within the services offered to customers. According to the logistics manager, the transport company is aware that digitalization will play an increasingly important role in customer service. Customers are increasingly using digital technology when shopping. The manager noticed the trend that customers are less and less likely to use direct channels for communication, such as face-to-face meetings or telephone conversations, but more often use digital communication via online chat. The manager sees increasing customer satisfaction as the primary motivation for digitizing of services.

The logistics manager informed us about the benefits of full digitalization in the transport company. According to the manager, digitalization is expected to be an important factor in optimizing the physical flow of shipments between the carrier and the broker, resulting in a reduction in existing waiting times. Through better planning, which is made possible by the information transmitted before the arrival of the truck, it is possible to shorten the waiting time and thus achieve a faster process. Planning leads to more efficient use of staff and thus speeds up the handling of goods in the warehouse. Reducing delivery times increases the use of storage space for trucks, so that the overall capacity of the equipment can be increased. Digitization reduces the number of errors made. These errors can be detected sooner and this leads to lower costs and higher customer satisfaction.

According to the manager, digitization is expected to be an important factor in optimizing the physical flow of shipments between the carrier and the intermediary, resulting in a shortening of existing waiting times. Thanks to better planning which is made possible by the information transmitted before the arrival of the truck, it is possible to shorten the waiting time and thus achieve a faster process. Planning leads to more efficient use of staff and thus speeds up the handling of goods in the warehouse. Reducing delivery times increases the use of storage space for trucks, so that the overall capacity of the equipment can be increased. Digitization reduces the number of errors made. These errors can be detected sooner and this leads to lower costs and higher customer satisfaction.

During the structured interview, we learned from the logistics manager that four factors are needed to digitize the entire supply chain: Industry 4.0, Big Data, Additive Manufacturing and Advanced Shipment Tracking Systems. These four factors enable digital planning, digital resource handling, digital freight management, and digital industrial production.

Under the influence of the digital era in corporate logistics, the selected transport company presented seven key technologies in the field of process digitalization as part of its development strategy. These key technologies included: application programming interface, intelligent automation of physical operations, intelligent automatic administrative support, blockchain, data analysis, data lake, internet of things.

Based on Figure 1, we can see the percentage of importance of selected key digital technologies in the selected transport company. The largest percentage (20%) affects the data analysis of the selected company. In the second place, with a share of 15%, the transport company influences Internet of Things. The same percentage (15%) obtained by the technology - data lake, blockchain technology and intelligent automation of physical operations. In third place, with a share of 10%, was application programming interface and intelligent automatic administrative support.

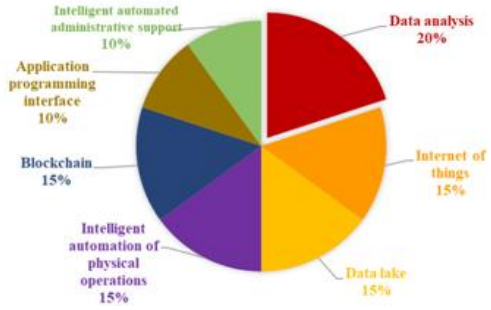

Figure 1: Percentage of importance of key digital technologies

Based on the previous chart, we wanted to know why the transport company uses data analysis as the largest percentage (20%). The logistics manager substantiate this percentage by saying that the transport company is evolving rapidly and the dynamic environment of the digital era also contributes to this. It is also based on a survey of the company. Based on the survey, it was found that up to 78% of managers consider data analysis to be a key technology in the field of digital transformation. Only 22% of managers do not consider it important in the current digital era.

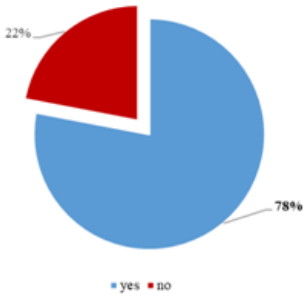

Figure 2: Percentage of importance of data analysis for the transport company

The survey also found that managers devoted up to 75% of their time to collecting information and 25% of their time to managers analysing and processing information. These percentages are shown in Figure 3.

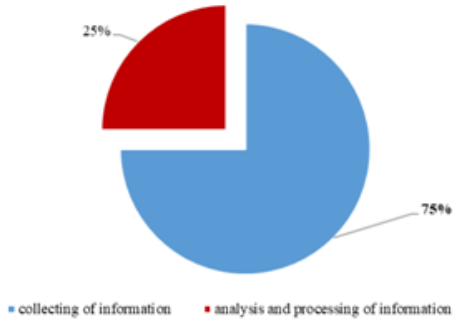

Figure 3: Percentage of time spent collecting information, analysing, and processing information

Furthermore, we wanted to know whether Slovak customers are sufficiently digital skilled and will be able to use the services of a transport company within the digital era. Through a structured interview, the logistics manager stated that the majority of customers using digital services, that are fully available, consist of a segment with an average age in the range <20 - 32>. This generation of people is generally known for their preferences in the field of information and communication services. The customer center providing support and advice in the field of digitalization does not register this group of customers as problematic in terms of the number of calls or e-mails. The segment of customers with a higher average age has a growing tendency to use the customer center. These customers are interested in digital services, but they have a problem in the process of using them and they cannot deal with it.

5. Conclusion

Innovation is of great importance today. Firstly because of their importance for individual companies as a means to achieve a competitive advantage and on the other hand as a means to streamline individual business activities [19].

The main aim of this article was to explain digital era in the logistics of a selected company. The object of research was a selected international transport company. The research tool was a structured interview which consisted of several questions concerning digital era, benefits of digitalization, factors of digitalization, key technologies of digitalization and customer´s digital skills.

Based on the structured interview, we found that the selected transport company perceives digitalization through three levels. The first level represents the application of digital transformation within the internal processes in the company. The second level represents the application of digitalization in communications between company and service providers. The third level represents the application of digitalization within the services offered to customers. The benefits of full digitalization a transport company include, for example, optimizing the physical flow of shipments between the carrier and the broker, which will result in shorter waiting times. Digitalization reduces the number of errors made. Four factors are needed to digitize the entire supply chain: Industry 4.0, Big Data, Additive Manufacturing, and Advanced Shipment Tracking Systems. Due to the digital era in logistics, the selected transport company presented seven key technologies in the field of process digitalization as part of its development strategy. The biggest influence (20%) on the selected company has data analysis. The segment of customers with a higher average age has a growing tendency to improve digital skills.

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THE COURSE OF DEVELOPMENT OF THE GERMAN ECONOMY INNOVATION

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Abstract: *The considerations are about innovation in Germany. The main goal was to analyze the development of innovation in the German economy over the centuries. The work is theoretical and consists of 5 parts connected in a logical whole. The proper part was preceded by a short introduction, and the whole was crowned with a summary. Throughout history, German ideas have shaped not only the world but also many aspects of society. Germany experienced a dynamic growth in innovation at the turn of the 19th and 20th centuries. It is worth noting that in terms of innovation, the country has become the center of Europe. During this period, many apprenticeship programs or research institutes such as the Max Planck Society were established, as well as many large and well-known companies that had a huge impact on the innovation of the German economy.*

Keywords: *innovations, enterprises, German economy*

1. Introduction

According to the German Center for Research and Innovation, the success story of innovation in Germany began with the invention of the printing press by J. Gutenberg in 1440 [9]. Moreover, H. Nelson stated that the printing press was an innovation that changed the world and brought many positive things related to it [18]. Since then, people have been able to quickly print and disseminate information. At the same time, the invention had a fundamental influence on another revolution, namely the religious reform. Martin Luther used print to spread his ideas, and the German language was standardized. Access to knowledge became more common and the prices of books decreased, thanks to which the poorer segment of society could buy them.

Many scientists worked on inventions, thanks to which they created, among others: a refrigerator, a car, a diesel engine, submarines, aspirin and toothpaste.

2. Innovation in the 19th and 20th centuries

A particularly important invention was the creation of a car by Carl Benz, the patent of which was registered on January 29, 1886 in Berlin. Innovation has significantly changed Western society, has become synonymous with wealth and gave people a sense of freedom. Thanks to the car, it was possible to move faster from one point to another. The economy underwent a great revolution as it made the transport of goods easier [5].
According to R. Rojas, it should also be noted that the predecessor of today's computer is the Z1, invented by Konrad Zuse in the years 1938-1939. The initial use of Z1 was related to the computation of mathematical problems. Later, engineers developed the functionality of the Z1. These studies gave impetus to the spread of computers, which can be found in almost every household nowadays. Currently, they are an integral part of everyday life, and are used at work, at home or at school [20].

The rushing process of innovation in the German economy was not even interrupted by the period of World War I and II. However, it should be noted that it was put into a military setting. In the period 1914–1918, the Germans created, inter alia, mustard gas, and during World War II, the research center in Peenemünde worked, among others, on the V1 and V2 missiles, a new radar system. The chief engineer of these undertakings was Wehrner von Braun, who worked for NASA after the war [22]. Another important scientist was the Nobel Prize winner Werner Heisenberg, who worked on building an atomic bomb [3].
It is worth adding that many scientists, including Albert Einstein, fled Germany before the outbreak of World War II. However, after the end of the conflict, the Americans and the Soviets began operations to capture the most talented scientists. As part of the "Paper Clip" [13] operation, the aforementioned von Braun, Kurt Blome, Walter Schreiber and Hans von Ohain were transferred to the United States.

After World War II, the German economy was destroyed. The country was divided into four militarized zones, and reparations of intellectual property began. The United States has confiscated patents, licensing all German claims both at home and abroad. This affected both those who lost their patents and successfully suppressed the nation's "gene" for innovation. From 1945 to 1947, no German citizen could file a patent, and therefore no German would be able to acquire the copyright for his own invention. During that period, five million pages of German patents were published. The United States and the United Kingdom collectively grabbed intellectual value equivalent to $ 5-10 billion [10]. However, the US government realized that to fight communism, it needed a strong Germany which could act as a catalyst for the revival of the European economy [8].

This situation ended in 1948, and from that year Germany's economic growth was noticeable. The reason for this state of affairs was, among others, the replacement of Reichsmark with the "Deutschmark" mark, as well as significant tax cuts and aid from the Marshall Plan [12], a large part of which was allocated to the development of

new technologies. This change is known to this day as the Wirtschaftswunder. From that moment, West Germany "grew" to the rank of an innovative power. Since the 1950s, they have become one of the world's greatest economic powers, in part because of the advanced state of science and technology. However, some argue that this result is due to German innovators [2]. D. Breznitz believed that Germany had earned such a position because there was a stronger integration between various sectors. For example, in the United States there is a kind of isolation related to the fact that graduates of a given field of study rarely leave the industry they come from, while in Germany they often change it [2].

An example of a German innovation that had global, post-war importance was the creation of a smart card. A. Mahajan, A. Verma, D. Pahuja pointed out that this invention revolutionized the financial and banking sector. As a result, it is possible to store data on a small chip card. It all started in 1968 when Helmuth Gröttrup and Jürgen Dethloff presented the first chip card. Today, every large financial institution takes advantage of this innovation. Chip cards are currently used, among others, on phones, on bank cards and in many other aspects of everyday life. The option of storing personal data on such a small device has revolutionized the world, especially the financial one [16].
In 1949, the Soviet zone of occupation was transformed into the GDR, which was under the political and military control of the Soviet Union, which then introduced the planned centralized economic system. In 1961, East Germany built the Berlin Wall to prevent its citizens from fleeing to West Germany. After almost 30 years of separation, the socialist system collapsed in 1989 due to serious economic problems [19]. When analyzing East Germany, even after reunification, it lagged behind the Federal Republic of Germany in terms of the pace of innovation. The government tried to stimulate science and technology in East Germany with large subsidies. In 1996, around 60% of innovative enterprises in the Länder of the former East Germany received funding for research and development in the field of public finances. This was six times more than the government subsidies allocated to West Germany [1].

3. The role and importance of research institutes in the development of innovation

Various types of research institutes, which were subjected to political and economic pressure, especially in the 20th century, have a significant impact on the innovativeness of the German economy. Among the most important are the Max Planck Society, the Fraunfoher Society, and the Leibniz Scientific Society.

The Max Planck Society was founded in 1948 as an independent non-profit research organization. Although it was founded only after World War II, its origins date back to 1911, when the Kaiser Wilhelm Society existed. Max-Planck-Gesellschaft grew from 25 research institutes in 1948 to 78 institutes and research centers in Germany in 2007. In addition, it has three institutes and several branches abroad. In total, the Max Planck Society employs approximately 22,000 people and the budget for 2016 was € 1.8 billion [17]. The common goal of the society's research institutes is to conduct basic research in the interest of the general public. By carrying out such research, these institutes strive to create innovative research programs that German universities cannot cope with in terms of finance and personnel. In addition, the Max Planck Society tries to conduct research of a more interdisciplinary nature than that often done at German universities. It is also worth paying attention to the fact that institutes provide equipment and devices to a wide group of researchers.

Founded in 1949, the Fraunhofer Society initially had an advisory and administrative role to provide public funding to scientists carrying out research projects with the potential to make a significant contribution to industry. In the 1970s, its role changed, which meant that it began to be co-financed by the federal government to conduct its own research. The Society's activity is to conduct applied research that directly benefits private and public enterprises, and has a positive impact on society as a whole. Fraunhofer conducts contract research for private individuals (both manufacturing and service providers) and the public sector. There are 56 Fraunhofer institutes in Germany employing around 24.5 thousand people. In addition, the company has research centers outside the country: in Europe, USA, Asia and the Middle East. In 2016, Fraunhofer had a budget of € 2 billion [7].

The task of the Society is to fill the gap in the German research sphere. For example, university research often focuses on basic science which is funded almost entirely from public sources. Industrial research, on the other hand, aims to generate commercial solutions, most of which are financed by private companies. Therefore, the Fraunhofer Society (which relies on both public and private funding) maintains a much stronger relationship with the industry than other research institutes in Germany [7].

The Leibniz Science Association is funded by the federal and state governments as an independent research center. Its main role is to conduct its own research and to provide assistance, which may include advice on the transfer of knowledge and use of equipment to other scientists and research institutes. The latter role means that it plays an important role in coordinating university-led research projects. In this way, they constitute the main and unambiguously close link between a broad spectrum of research systems. This does not mean that research conducted in the association's facilities is carried out solely in cooperation with universities, the support is also provided, for example, to researchers from the Max Planck or Fraunhofer Society, as well as to national and international companies. As the activities of the association's centers are related to basic and applied research, the organization aims to establish a relationship between them. In order to facilitate the emergence of innovation and cooperation between different research

centers, the institutes of the Leibniz Scientific Association focus on [14]:

- regional cooperation with universities to form clusters;
- interdisciplinary research in areas that may be extremely important in the future (infectious diseases, climate change, optical technologies);
- interdisciplinary working groups.

The focus on interdisciplinary research reflects the nature of the Association. Among the five fields covered by the organization are the following sciences [15]:

- humanistic and educational;
- social and regional infrastructure research;
- natural;
- mathematical and engineering;
- environmental science.

4. Innovation in the 21st century

In 2001, the federal government launched an activation program to streamline technology commercialization initiatives (BMBF / BMWi).

There has been an offensive in innovative research in the following four areas [4]:

- exploitation, which focuses on faster transfer of research results to commercial products and services;
- increasing the number of research start-ups;
- partnership, in collaboration between research institutes and the private sector;
- competences that are to facilitate the use of research results in the innovative processes of enterprises.

Technology policy in Germany addresses three main aspects. The first is related to the pressure exerted by government on setting research goals in both the public and private sectors. The second element of technology policy focuses on improving the research and development of "infrastructure" (research institutes and equipment requiring high capital expenditure). Finally, technology policy aims to improve the skills and capabilities of scientists and researchers who work in Germany or may pursue a career in innovation [21].

In order to create the right conditions for researchers, scientists, engineers and organizations to lead the way in technology markets, the federal government announced in August 2006 the High-Tech strategy. For the first time, a national strategy which covered all ministries in Germany, was developed. Its content was shaped during consultations with representatives of industry and science. The government in Berlin assumes that the strategy will accelerate efforts to transform Germany into a country that will be able to provide the most favorable conditions in the world in terms of research and innovation [21]. In doing so, Berlin aims to achieve sufficiently high economic growth. The High-Tech strategy for Germany focuses on four main aspects, as presented in Table 1.

Table 1 Four Aspects of High Tech Strategy for Germany [21]

No.	*Description*
1	The High-Tech Strategy defines goals for 17 technology domains that may be relevant in the future in terms of both employment and welfare. For each of these areas, several initiatives are planned that focus on promoting research and creating the conditions for it. Moreover, the strategy aims to establish new markets for innovative products and services or to increase the economic importance of existing markets. There were also presented three fields of technology that should have a key position in the future, namely: health, safety and energy.
2	The federal government wants to use innovative opportunities from both science and the private sector in its strategy. To this end, cooperation projects will be promoted to a much greater extent than in previous years, the initiation of research projects will be encouraged, and more support will be given to facilitate the creation of high-tech clusters.
3	The High-Tech strategy aims to increase efforts to convert research results faster into innovative products, services and processes. To this end, new measures have been introduced to simplify the assessment of the economic viability and value of ideas and research results. The strategy also supports private sector efforts to develop industry standards and norms faster. This, in turn, should increase competitiveness.
4	By implementing the High-Tech strategy, the federal government aims to improve the conditions for SMEs and innovation-driven entities. The strategy aims to facilitate access to markets for business founders, improve the relationship between commercial actors and research institutes, facilitate the transfer of own research into new products, and simplify the various systems used to help SMEs. One of the measures is the reform of the corporate income tax. Other planned activities include the promotion of venture capital.

Table 2 lists the most innovative German companies, and also discusses their characteristics.

Table 2 List of the five most innovative German companies in 2017 [6]

No.	*Enterprise*	*Characteristic*
1.	Bayer	Value of $ 94.4 billion. Number of employees 115 thousand. A company operating in the chemical industry, which allocated almost EUR 4.7 billion to research and development in 2016. Currently, Bayer conducts research, among others, on: plant metabolism and genetic markers.
2.	BMW	Value of $ 57.7 billion. Number of employees 124 thousand. In 2016, the automotive industry company allocated EUR 5.6 billion to research and development. In its 7-series limousine, BMW has introduced an innovative solution for remote control of parking using a key.
3.	Daimler	Value of $ 76.1 billion. Number of employees 282,000. An automotive company that spent EUR 7.6 billion on research and development in 2016. The innovative Vision Van is a new project of the German car manufacturer.
4.	BASF	Value of $ 91 billion. Number of employees 113 thousand. A chemical industry company that allocated USD 2.2 billion on research and development in 2016. BASF is currently researching the Sustainable Cities project.
5.	Alianz	Value of $ 83.7 billion. Number of employees 140,000. An insurance company that spent $ 2.2 billion on research and development in 2016. Allianz has created a modern online claims settlement platform.

It should be emphasized that each of these enterprises has a budget of over a billion for research and development.

5. Conclusions

The innovation system in Germany should be seen as a relatively coherent set of regulations and practices supporting the development of certain organizational capabilities. For this reason, the government has taken several steps to promote innovation. The creation of elite universities and research institutes as well as cooperation between them and economic entities with the participation of the government turned out to be essential. The importance of large and well-known enterprises, which also had a huge impact on the innovativeness of the German economy, such as BASF, Daimler, Hoechst and Siemens [11] should be emphasized. Thanks to such a system, Germany is one of the most innovative economies [23] in the world.

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Session: Applied Informatics

Index of Author(s)

OPTIMAL ACTIVITY NETWORK OF INFORMATION SYSTEM WITHOUT TIME RESERVES

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Abstract: *Improving the efficiency of information system design is an actual problem. This paper uses methods of linear programming and network system of planning and control. An activity network for the implementation of a set of works when creating an organization's information system has been developed. The optimal solution of the mathematical optimization model is determined. Optimization of the activity network is performed at a cost by increasing the execution time of all operations. The results of research allow to reduce financial expenses at designing information systems of the organizations.*

Keywords: *information system, activity network, critical path, mathematical model, time reserves, optimum decision, direct expenditures*

1. Introduction

The development of information systems is a priority. Information systems are based on hardware and software. Improving the efficiency of information systems design is an urgent task [1-4]. Operations research methods are used to solve this problem. Mathematical models allow you to study phenomena, processes and objects of the subject area with the lowest financial costs [5-19]. In this paper, we consider the optimization of the network schedule at the cost of performing a set of works by increasing the execution time of all operations when creating an organization's information system.

2. Statement of problem

Develop a network model for performing a set of works when creating an organization's information system and optimize the activity network in terms of cost by increasing the execution time of all operations of the complex. Determine the start and end times of the activity network. The execution time of network operations is not less than the minimum duration of the work. The completion time of the complex of works does not exceed the specified period.

3. Development of activity network and mathematical model

The list of stages of performance of works and time is defined for creation of the activity network. The maintenance and time of performance of network activities are resulted in table 1.

Table 1 List and time of network activities

Activity code	*Statement of activity*	*Minimal time* $t_{ij}^{\min}$
1-2	Development of technical specification. Development of technical design. Coordination of technical specification with technical design. Adoption of technical specification. Adoption of technical design	7
2-3	Inspection and analysis of administrative buildings of management in Kurgan	4
2-4	Inspection and analysis of administrative buildings of management in regional departments	6
3-5	Realization of groundwork in management in Kurgan	2
4-5	Realization of groundwork in regional departments	4
5-6	Development of structure of computer network. Choice and justification of network architecture of computer network. Choice of satellite Internet provider. Purchase of computation, network equipment. Purchase of satellite equipment. Purchase of software	8
6-7	Delivery of computation, network equipment into management. Delivery of satellite equipment into management in Kurgan. Delivery of software into management	5
6-8	Delivery of equipment into regional departments. Delivery of satellite equipment into regional departments. Delivery of software into regional departments	9
7-9	Installation of computer network in management. Installation of satellite equipment in management. Connection of network equipment in management in Kurgan. Connection of satellite equipment in management in Kurgan. Software installation in management in Kurgan	25
8-9	Installation of computer network in regional departments. Installation of satellite equipment in regional departments. Connection of computer network in regional departments.. Connection of satellite equipment in regional departments. Software installation in regional departments. Hardware setup in regional departments	31
9-10	Personnel training. Computer system testing. Personnel examining. Acceptance of information system into service	9

The activity network is shown in figure 1. Arrows of the activity network have minimal time of network activity $t_{ij}^{\min}$.

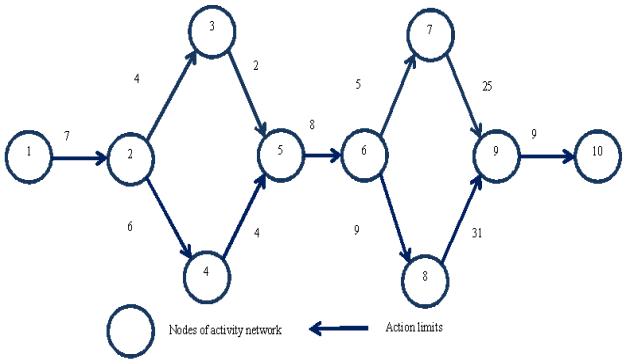

Figure 1: The activity network

Time parameters of events of the activity network count for definition of a critical path.

Earliest expected event time is calculated according to the formula

$$ES_j = \max_{i,j}\{ES_i + t_{ij}\}$$

where, ES_j = earliest expected time of event j and ES_i = earliest expected time of event i and t_{ij} = time of network activity i, j .

Latest event occurrence time is calculated according to the formula

$$LC_i = \min_{i,j}\{LC_j - t_{ij}\}$$

where, LC_i = latest occurrence time of event i and LC_j = latest occurrence time of event j .

The algorithm of critical path includes stages.

1 Stage. Earliest expected time of event i is equal to latest occurrence time of event i .

$$ES_i = LC_i$$

2 Stage. Earliest expected time of event j is equal to latest occurrence time of event j .

$$ES_j = LC_j$$

3 Stage. Difference between earliest expected time of event j and earliest expected time of event i is equal to difference between latest occurrence time of event j and latest occurrence time of event i . Difference between latest occurrence time of event j and latest occurrence time of event i is equal to time of network activity i, j .

$$ES_j - ES_i = LC_j - LC_i = t_{ij}$$

Let $t_{ij}^{\min}$ be minimal time of network activity i, j . Let t_i be activity start time. Let t_j be activity finish time. Let $c_{ij}^{\max}$ be maximal expenses. Let T_{cr} be time of critical path. Let T_{dir} be directive time. Let n be quantity of nodes of the activity network. Let k_{ij} be additional cost factor.

Cost of performance of network activity i, j is calculated according to the formula

$$c_{ij} = b_{ij} - k_{ij}(t_j - t_i)$$

where, $t_{ij}^{\min}$ = minimal time of network activity i, j and k_{ij} = additional cost factor and b_{ij} = parameter, $b_{ij} = c_{ij}^{\max} + k_{ij}t_{ij}^{\min}$ and t_j – activity finish time and t_i – activity start time.

The mathematical model of cost optimization of the activity network looks like.

$$\min \leftarrow Z = \sum_{i,j} c_{ij} = \sum_{i,j} b_{i,j} - k_{i,j}(t_j - t_i)$$

under restrictions

$$\begin{cases} t_j - t_i \geq t_{ij}^{\min} \\ t_1 = 0 \\ Tcr \leq Tdir \\ t_n = T_{dir} \\ t_i \geq 0, t_j \geq 0, i = \overline{1, n-1},\ j = \overline{2, n} \end{cases}$$

First restriction – limitation on the duration of activity i, j . Second restriction – limitation on the start time of the first operation.. Third restriction – limitation on the time of performing a set of works. Forth restriction – the time limit for the end of the last network activity. Fifth restriction – limitation of non-negativity of the decision variables.

4. The decision of problem

Earliest expected event times and latest event occurrence times are calculated to determine the critical path network diagram.

$ES_1 = 0$;

$ES_2 = \max_{1,2}\{ES_1 + t_{12}\} = \max_{1,2}\{0 + 7\} = 7$;

$ES_3 = \max_{2,3}\{ES_2 + t_{23}\} = \max_{2,3}\{7 + 4\} = 11$;

$ES_4 = \max_{2,4}\{ES_2 + t_{24}\} = \max_{2,4}\{7 + 6\} = 13$;

$$ES_5 = \max_{3,5;\ 4,5}\{ES_3 + t_{35};\ ES_4 + t_{45}\} =$$

$$\max_{3,5;\ 4,5}\{11 + 2; 13 + 4\} = \max_{3,5;\ 4,5}\{13; 17\} = 17;$$

$ES_6 = \max_{5,6}\{ES_5 + t_{56}\} = \max_{5,6}\{17 + 8\} = 25$;

$ES_7 = \max_{6,7}\{ES_6 + t_{67}\} = \max_{6.7}\{25 + 5\} = 30$;

$ES_8 = \max_{6,8}\{ES_6 + t_{68}\} = \max_{6,8}\{25 + 9\} = 34$;

$$ES_9 = \max_{7,9;\ 8,9}\{ES_7 + t_{79};\ ES_8 + t_{89}\} =$$

$$\max_{7,9;\ 8,9}\{30 + 25; 34 + 31\} = \max_{7,9;\ 8,9}\{55; 65\} = 65$$;

$ES_{10} = \max_{9,10}\{ES_9 + t_{910}\} = \max_{9,10}\{65 + 9\} = 74$.

$LC_{10} = 74$;

$$LC_9 = \min_{9,10}\{LC_{10} - t_{910}\} = \min_{9,10}\{74 - 9\} = 65;$$

$$LC_8 = \min_{8,9}\{LC_9 - t_{89}\} = \min_{8,9}\{65 - 31\} = 34;$$

$$LC_7 = \min_{7,9}\{LC_9 - t_{79}\} = \min_{7,9}\{65 - 25\} = 40;$$

$$LC_6 = \min_{6,7;6,8}\{LC_8 - t_{68}; LC_7 - t_{67}\} = \min_{6,7;6,8}\{34 - 9; 40 - 5\} = \min_{6,7;6,8}\{25; 35\} = 25;$$

$$LC_5 = \min_{5,6}\{LC_6 - t_{56}\} = \min_{5,6}\{25 - 8\} = 17;$$

$$LC_4 = \min_{4,5}\{LC_5 - t_{45}\} = \min_{4,5}\{17 - 4\} = 13;$$

$$LC_3 = \min_{3,5}\{LC_5 - t_{35}\} = \min_{3,5}\{17 - 2\} = 15;$$

$$LC_2 = \min_{2,3;2,4}\{LC_3 - t_{23}; LC_4 - t_{24}\} = \min_{2,3;2,4}\{15 - 4; 13 - 6\} = \min_{2,3;2,4}\{11; 7\} = 7;$$

$$LC_1 = \min_{1,2}\{LC_2 - t_{12}\} = \min_{1,2}\{7 - 7\} = 0.$$

Critical action limit 1-2:

$$ES_2 - ES_1 = LC_2 - LC_1 = t_{12} = 7 - 0 = 7.$$

Critical action limit 2-4:

$$ES_4 - ES_2 = LC_4 - LC_2 = t_{24} = 13 - 7 = 6.$$

Critical action limit 4-5:

$$ES_5 - ES_4 = LC_5 - LC_4 = t_{45} = 17 - 13 = 4.$$

Critical action limit 5-6:

$$ES_6 - ES_5 = LC_6 - LC_5 = t_{56} = 25 - 17 = 8.$$

Critical action limit 6-8:

$$ES_8 - ES_6 = LC_8 - LC_6 = t_{68} = 34 - 25 = 9.$$

Critical action limit 8-9:

$$ES_9 - ES_8 = LC_9 - LC_8 = t_{89} = 65 - 34 = 31.$$

Critical action limit 9-10:

$$ES_{10} - ES_9 = LC_{10} - LC_9 = t_{910} = 74 - 65 = 9.$$

The activity network with critical path and time parameters of events is shown in figure 2.

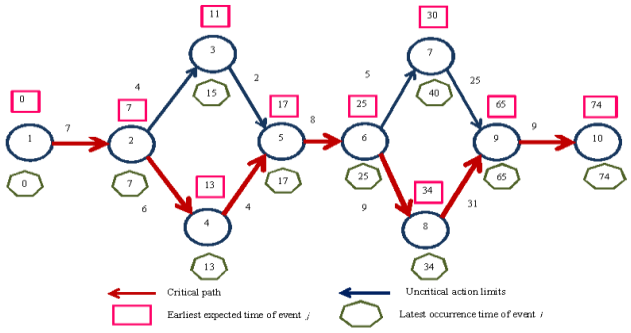

Figure 2: Activity network with critical path

The critical path of activity network 1->2->4->5->6->8->9->10 is represented by red color. Earliest expected event times are represented in squares of pink color. Latest event occurrence times are represented in hexagons of green color. Time of a critical path is $T_{cr} = 74$ days.

The source data are presented in table 2.

Table 2. The source data

Activity code	*Minimal time* $t_{ij}^{\min}$	*Additional cost factor* k_{ij}	*Parameter* b_{ij}
1-2	7	2	39
2-3	4	2	18
2-4	6	2	30
3-5	2	3	17
4-5	4	3	29
5-6	8	4	6
6-7	5	3	30
6-8	9	3	43
7-9	25	8	325
8-9	31	16	748
9-10	9	2	37

The directive time for completing the complex of works on the network schedule is $T_{dir} = 76$ days. Operation start time (1,2) is $t_1 = 0$ days. The end time of work (9.10) is $t_{10} = 76$ days.

Mathematical model of cost optimization of activity network looks like

$$\min \leftarrow Z = \sum_{ij} c_{ij} = 39 - 2(t_2 - t_1) + 18 - 2(t_3 - t_2) +$$
$$30 - 2(t_4 - t_2) + 17 - 3(t_5 - t_3) + 29 - 3(t_5 - t_4) +$$
$$6 - 4(t_6 - t_5) + 30 - 3(t_7 - t_6) + 43 - 3(t_8 - t_6) +$$
$$325 - 8(t_9 - t_7) + 748 - 16(t_9 - t_8) +$$
$$37 - 2(t_{10} - t_9) = 2t_2 + 1t_3 + 1t_4 - 2t_5 + 2t_6 +$$
$$5t_7 + 13t_8 - 22t_9 + 1170x_9$$

under restrictions

$$\begin{cases} t_2 \geq 7; t_3 - t_2 \geq 4; t_4 - t_2 \geq 6; t_5 - t_3 \geq 2; t_5 - t_4 \geq 4; \\ t_6 - t_5 \geq 8; t_7 - t_6 \geq 5; t_8 - t_6 \geq 9; t_9 - t_7 \geq 25; t_9 - t_8 \geq 31; \\ t_9 \leq 67; x_9 = 1; t_1, t_2, t_3, t_4, t_5, t_6, t_7, t_8, t_9 \geq 0 \end{cases}$$

The optimum decision of mathematical model is presented in table 3.

Table 3 Optimum decision of mathematical model

Item number	*Parameter*	*Variable*	*Value*	*Dual estimation*
1	t_2	x_1	7,0000	0,0000
2	t_3	x_2	11,0000	0,0000
3	t_4	x_3	13,0000	0,0000
4	t_5	x_4	17,0000	0,0000
5	t_6	x_5	25,0000	0,0000
6	t_7	x_6	30,0000	0,0000
7	t_8	x_7	34,0000	0,0000
8	t_9	x_8	67,0000	0,0000
9	—	x_9	1,0000	0,0000
Minimum of criterion function $Z = 342$. Number of iterations 12				

The execution times of the optimal network diagram are shown in table 4.

Table 4. Optimal activity network execution times

Item number	*Activity code*	*Time t_{ij}*
1	1-2	7
2	2-3	4
3	2-4	6
4	3-5	6
5	4-5	4
6	5-6	8
7	6-7	5
8	6-8	9
9	7-9	37
10	8-9	33
11	9-10	9

Earliest expected event times and latest event occurrence times are calculated to determine the critical path optimal network diagram.

$ES_1 = 0$;

$ES_2 = \max_{1,2}\{ES_1 + t_{12}\} = \max_{1,2}\{0 + 7\} = 7$;

$ES_3 = \max_{2,3}\{ES_2 + t_{23}\} = \max_{2,3}\{7 + 4\} = 11$;

$ES_4 = \max_{2,4}\{ES_2 + t_{24}\} = \max_{2,4}\{7 + 6\} = 13$;

$$ES_5 = \max_{3,5;\,4,5}\{ES_3 + t_{35};\, ES_4 + t_{45}\} = \max_{3,5;\,4,5}\{11 + 6; 13 + 4\} = \max_{3,5;\,4,5}\{17; 17\} = 17;$$

$ES_6 = \max_{5,6}\{ES_5 + t_{56}\} = \max_{5,6}\{17 + 8\} = 25$;

$ES_7 = \max_{6,7}\{ES_6 + t_{67}\} = \max_{6,7}\{25 + 5\} = 30$;

$ES_8 = \max_{6,8}\{ES_6 + t_{68}\} = \max_{6,8}\{25 + 9\} = 34$;

$$ES_9 = \max_{7,9;\,8,9}\{ES_7 + t_{79};\, ES_8 + t_{89}\} = \max_{7,9;\,8,9}\{30 + 37; 34 + 33\} = \max_{7,9;\,8,9}\{67; 67\} = 67;$$

$ES_{10} = \max_{9,10}\{ES_9 + t_{910}\} = \max_{9,10}\{67 + 9\} = 76$.

$LC_{10} = 76$;

$LC_9 = \min_{9,10}\{LC_{10} - t_{910}\} = \min_{9,10}\{76 - 9\} = 67$;

$LC_8 = \min_{8,9}\{LC_9 - t_{89}\} = \min_{8,9}\{67 - 33\} = 34$;

$LC_7 = \min_{7,9}\{LC_9 - t_{79}\} = \min_{7,9}\{67 - 37\} = 30$;

$$LC_6 = \min_{6,7;\,6,8}\{LC_8 - t_{68};\, LC_7 - t_{67}\} = \min_{6,7;\,6,8}\{30 - 5; 34 - 9\} = \min_{6,7;\,6,8}\{25; 25\} = 25;$$

$LC_5 = \min_{5,6}\{LC_6 - t_{56}\} = \min_{5,6}\{25 - 8\} = 17$;

$LC_4 = \min_{4,5}\{LC_5 - t_{45}\} = \min_{4,5}\{17 - 4\} = 13$;

$LC_3 = \min_{3,5}\{LC_5 - t_{35}\} = \min_{3,5}\{17 - 6\} = 11$;

$$LC_2 = \min_{2,3;\,2,4}\{LC_3 - t_{23};\, LC_4 - t_{24}\} = \min_{2,3;\,2,4}\{11 - 4; 13 - 6\} = \min_{2,3;\,2,4}\{7; 7\} = 7;$$

$LC_1 = \min_{1,2}\{LC_2 - t_{12}\} = \min_{1,2}\{7 - 7\} = 0$.

Critical action limit 1-2:

$ES_2 - ES_1 = LC_2 - LC_1 = t_{12} = 7 - 0 = 7$.

Critical action limit 2-3:

$ES_3 - ES_2 = LC_3 - LC_2 = t_{23} = 11 - 7 = 4$.

Critical action limit 2-4:

$ES_4 - ES_2 = LC_4 - LC_2 = t_{24} = 13 - 7 = 6$.

Critical action limit 3-5:

$ES_5 - ES_3 = LC_5 - LC_3 = t_{35} = 17 - 11 = 6$.

Critical action limit 4-5:

$ES_5 - ES_4 = LC_5 - LC_4 = t_{45} = 17 - 13 = 4$.

Critical action limit 5-6:

$ES_6 - ES_5 = LC_6 - LC_5 = t_{56} = 25 - 17 = 8$.

Critical action limit 6-7:

$ES_7 - ES_6 = LC_7 - LC_6 = t_{67} = 30 - 25 = 5$.

Critical action limit 6-8:

$ES_8 - ES_6 = LC_8 - LC_6 = t_{68} = 34 - 25 = 9$.

Critical action limit 7-9:

$ES_9 - ES_7 = LC_9 - LC_7 = t_{78} = 67 - 30 = 37$.

Critical action limit 8-9:

$ES_9 - ES_8 = LC_9 - LC_8 = t_{89} = 67 - 34 = 33$.

Critical action limit 9-10:

$ES_{10} - ES_9 = LC_{10} - LC_9 = t_{910} = 76 - 67 = 9$.

The critical path time is $T_{cr} = 76$ days. All optimal network paths are critical paths.

Optimized network diagram on time of performance of the activities is resulted in figure 3.

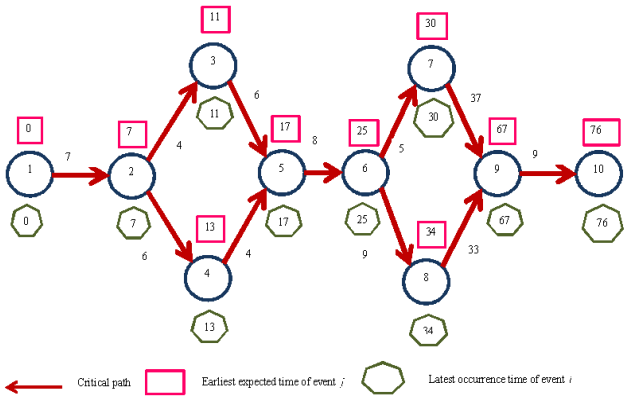

Figure 3: Optimized activity network of information system

To complete a set of works with a minimum cost of 342 units, it is necessary to change the execution time of works (3.5), (7.9) and (8.9) by 4, 12 and 2 days, respectively.

5. Results of research

The results of the research allow us to draw the following conclusions.

1. The network model of information system is developed.
2. Time parameters of events of the activity network are calculated.
3. Critical path of network diagram is defined by Kelley-Walker‘s method.
4. The optimal solution of the mathematical model of optimization in terms of the cost of performing a complex of works by increasing the execution time of all network schedule operations has been determined.
5. Application of the received results allows to reduce financial expenses and to raise validity of the made decision at designing information systems of the organizations.
6. The received results can be used in the further researches on the this topic.

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Session: Natural Sciences

Index of Author(s)

IRON IN THE LIVING ORGANISMS – STUDY OF IRON AMINO ACIDS COMPLEXES FORMATION

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Abstract: *Study of iron amino acids complexes with the connection to the living organisms nowadays comes to the front and could bring new information to the treatment and understanding of the neurodegenerative disease development. Studying of ferrous glycinate formation as an analogue to the reaction occurred in the human brain is a great tool to this research. Formation of ferrous glycinate was studied and performed by reaction of the basic amino acid glycine with the Mohr's salt as an iron source with the addition of citric/ascorbic acid. Products prepared were analysed by elemental analysis and infrared spectroscopy. Reaction of glycine and Mohr's salt in the aqueous solution with the addition of citric/ascorbic acid produce mixture of $FeSO_4$-glyH and Mohr's salt and to produce ferrous glycinate wanted the source of iron must be changed.*

Keywords: *iron aminoacids complexes, neurodegenerative diseases, iron aminoacid synthesis, citric acid, ascorbic acid*

1. Introduction

Iron is essential bio element. It appears in many forms, in nature (minerals e.g. hematite (Fe_2O_3), magnetite (Fe_3O_4), limonite ($2Fe_2O_3.3H_2O$), siderite ($FeCO_3$) and pyrite (FeS_2)) and in the living organisms. The essential role of iron in living organisms means that it is contained in every organism. In plants it occurs in chloroplasts and it is important in the process of photosynthesis. The iron deficiency in plants cause yellow colour of the leaves (chlorosis) and longer deficit cause death of its peaks [1]. For living animal iron is stored mainly in the liver and spleen and it is important in the process of breathing, where it occurs in the form of haemoglobin and myoglobin – two iron bio complexes. Proper iron level is essential in living organism and it is tightly regulated by iron absorption, excess iron release and iron recycling processes. Fluctuations in iron content, as deficiency and/or excess can cause many problems and result in serious diseases. Major disease caused by iron deficiency is anaemia. Anaemia is widespread in the population and it is a serious problem. Anaemia as disease is specified by the low haemoglobin levels along with the one or more indicators such as low iron storage content [2]. Iron deficiency is the most prevalent deficiency in population. There are several strategies to increase the iron content in the human body – direct supplementation, food enrichment, food diversification and biological enrichment of crops [3]. Direct supplementation of iron supplements added into the food chain can be done by different iron supplements, but many of them are showing side effects (gastrointestinal problems). The most common iron supplement is NaFeEDTA and ferrous sulphate [4]. Recently there is growing call for the iron supplement exhibiting less side effects and better absorption. One of the most studied iron supplements nowadays is ferrous glycinate – iron (II) chelate with glycine. This substance is important also in the view of treatment of neurodegenerative diseases. Information about the presence of iron oxides and hydroxy oxides in human brain of patients who suffered from such diseases [5-7] needs further study. There is a presumption about oxidation of iron complexes occurred in human body that leads to the oxides and hydroxy oxides production. Studying iron complexes (iron glycinate), its formation and characteristic properties could be used in the further study of mentioned diseases.

2. Material and methods

Synthesis were performed using Mohr's salt ($(NH_4)_2Fe(SO_4)_2 \cdot 6H_2O$, Centralchem) as an iron source and amino acid glycine ($C_2H_5NO_2$, MERCK) to produce ferrous glycinate. Experiments were realised in aqueous solutions with the addition of citric ($C_6H_8O_7$) or ascorbic ($C_6H_8O_6$) acid (Centralchem). Temperature of reaction mixture was kept at 50°C. Final solid product was isolated by solvent removing from reaction mixtures using rotary evaporator (35 mbar, 200 rpm). Elemental analysis was done using FlashEA1112 Automatic Elemental Analyzer. Infrared spectroscopy was performed using FTIR Spectrometer IRAffinity-1 and/or Magna750 FTIR.

3. Discussion

Products were prepared by reaction of aqueous solution of 8 mmol Mohr's salt and solution of glycine amino acid. The ratio of Mohr's salt and glycine was kept at 1:2. Different amount (1 mmol or 2 mmol) of citric, or ascorbic acid was added to the reaction mixture prior to heating. Reaction mixtures were stirred and kept at the temperature of 50°C for three different time ranges. The essential step of the product synthesis was the isolation of product from solution using vacuum rotary evaporator, after the heating under stirring of reaction mixture was accomplished. Ferrous glycinate is known as very hygroscopic substance and there was an assumption that our product might be very soluble. The addition of citric/ascorbic acid to the reaction mixtures should limit the oxidation of iron(II) in solutions. The differences between the experiment sets were seeable in reaction mixture colouring. The mixtures with addition of citric acid were green coloured, while the addition of ascorbic acid caused dark purple colouring.

Some of the solutions changed their colour to darker green/purple. This change of colour confirms ongoing oxidation. Samples prepared were analysed by elemental analysis.

Table 1 Elemental analysis and stoichiometric ratios of samples prepared with addition of citric acid

Sample (CA mmol)	*N% v(N)*	*C% v(C)*	*H% v(H)*	*S% v(S)*
KM59	8.60	7.62	5.02	13.84
(2)	1.42	1.47	11.50	1
KM60	8.06	4.49	5.15	15.28
(1)	1.53	1	13.64	1.27
KM61	9.59	8.09	5.31	12.43
(0)	1.76	1.73	13.54	1
KM62	9.38	8.93	5.08	13.76
(2)	1.55	1.73	11.70	1

Table 2 Elemental analysis and stoichiometric ratios of samples prepared with addition of ascorbic acid

Sample (AA mmol)	*N% v(N)*	*C% v(C)*	*H% v(H)*	*S% v(S)*
KM68	9.88	9.02	5.40	11.53
(2)	1.95	2.08	14.84	1
KM69	9.43	8.02	5.36	12.45
(2)	1.73	1.71	13.66	1
KM70	9.49	7.65	5.46	13.81
(1)	1.57	1.47	12.54	1
KM72	9.27	7.17	5.29	13.06
(0)	1.62	1.46	12.84	1

All samples are very similar in relatively high content of sulphur, that is in all samples (Table 1 and 2) even higher than in both known $FeSO_4$-glyH complexes [8] (Table 3). But the sulphur content is still lower than it is in Mohr's salt (16,35%). Moreover, the sulphur content in our products, with exception of KM60 sample, is lower than the sulphur content in FeGS suplement [9]. So we can partially conclude that composition of our products might be explained by presence of $[Fe_2(glyH)_2(H_2O)_6(SO_4)_2]_n$ as major component (roughly about 80 %).

Table 3 Elemental analysis of $FeSO_4$-glyH complexes

Complex	*N%*	*C%*	*H%*	*S%*	*Ref*
$[Fe_2(glyH)_2(H_2O)_{10}](SO_4)_2$	4.42	7.58	4.77	10.11	[8]
$[Fe_2(glyH)_2(H_2O)_6(SO_4)_2]_n$	4.98	8.55	3.95	11.41	[8]
$[Fe(glyH)(SO_4)]_n$ (FeGS)	6.17	10.58	2.22	14.13	[9]

Ratio of stoichiometric coefficients $\nu(C) : \nu(N)$ in all our products is about 1:1. These data (lower presence of carbon) allow us to say that higher level of nitrogen in our products is caused by presence of mentioned glycine product together with Mohr's salt. To support the idea, infrared spectroscopy was performed. Sample KM60 exhibit the highest sulphur and the lowest carbon content within the group of all our samples and its infrared spectrum is very similar to Mohr's salt spectrum (Figure 1) in all relevant parts. On the other hand, the KM61 sample exhibit the lowest sulphur and the highest nitrogen content, within the Table 1 samples, and its IR spectrum is different mainly in the region about 1500 cm^{-1} (glycine COO vibrations) and about 1580 cm^{-1} (glycine ammine vibrations).

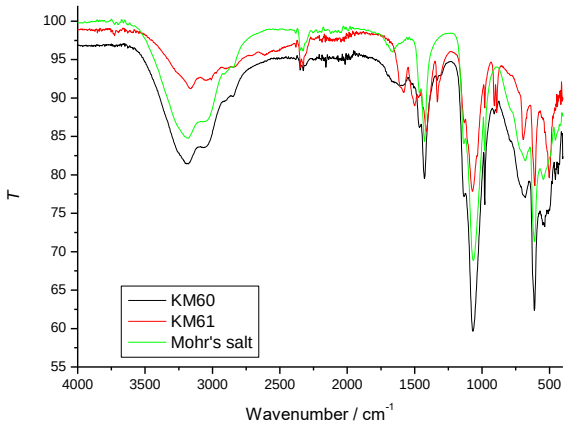

Figure 1: Infrared spectra of samples prepared and spectrum of Mohr's salt used

The spectra of sample prepared with the addition of citric acid (KM59) and sample prepared without citric acid addition (KM61) together with the citric acid spectrum (Figure 2) allow us to conclude that citric acid is not present at very high level in sample KM59 in spite the citric acid concentration in reaction mixture.

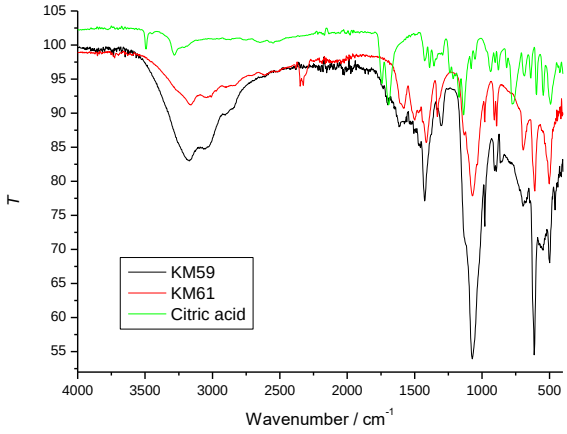

Figure 2: Infrared spectra of samples prepared with/without the citric acid and spectrum of citric acid used

The range of wavenumber 3000-3100 cm^{-1} contain bands that belong to the vibration of glycine amino group. These bands lack in the spectrum of citric acid. The presence of citric acid in the samples is confirmed by the band in the range 3300-3500 cm^{-1}. This bands could be assigned to the vibration of O-H hydroxyl group. In the range of 1000-1100 cm^{-1} is a band that could be assigned to the S–O vibration of the sulphate anion present in Mohr's salt and in all $FeSO_4$-glyH complexes.

The samples prepared with addition of ascorbic acid in general exhibit lower sulphur content (Table 2) and spectra of all samples are significantly different from the Mohr's

salt spectrum, especially by presence of peaks which could be assigned to present glycine vibrations. Moreover, the peaks assignable to sulphate S–O vibrations are weaker and broader than this one in the Mohr's salt spectrum and that might be taken as partial confirmation of lower symmetry of bonded sulphate in $FeSO_4$-glyH complex e.g. $[Fe_2(glyH)_2(H_2O)_6(SO_4)_2]_n$ [8].

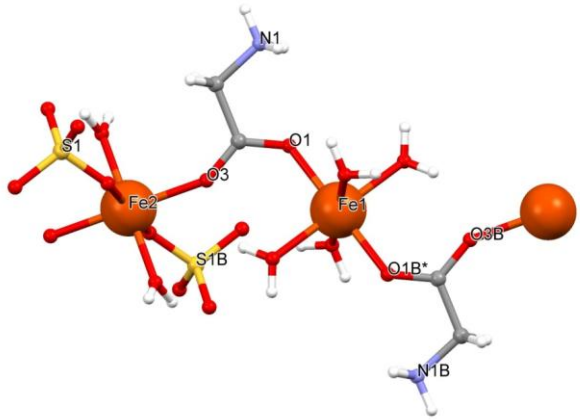

Figure 3: Structure of $[Fe_2(glyH)_2(H_2O)_6(SO_4)_2]_n$ [8]

Figure 4 shows the spectra of samples KM68 (prepared with reaction mixture heating) and KM69 (prepared without heating of the mixture) together with the spectrum of ascorbic acid. Spectrum of ascorbic acid is very different from the spectra of samples and there is low probability of its presence in both samples. The similarity of samples spectra confirm that heating of the reaction mixture does not affect synthesis very much.

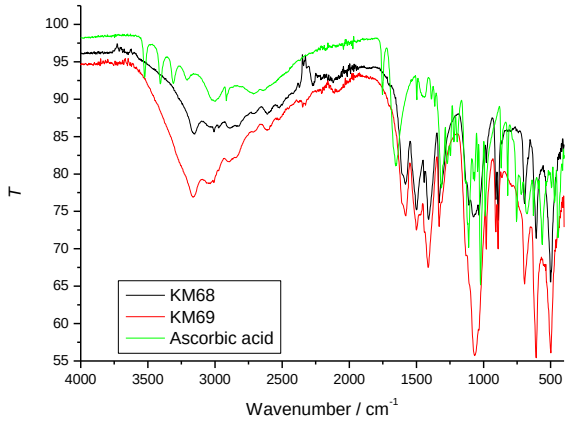

Figure 4: Infrared spectra of samples prepared with the ascorbic acid and spectrum of ascorbic acid used

In the Figure 5 there are shown the spectra of samples prepared with different amount of ascorbic acid. Sample KM72 was prepared without addition of ascorbic acid and for preparation of sample KM70 1 mmol ascorbic acid, or for KM68 sample 2 mmol acid were used. All spectra are in relevant parts very similar with exception of the visible shoulder between 3300-3500 cm^{-1} for KM70 spectrum, that could be assigned to N–H of amonium cation present in Mohr's salt. That is in good accordance with proposed higher Mohr's salt content in sample showing the highest sulphur content in this group of samples.

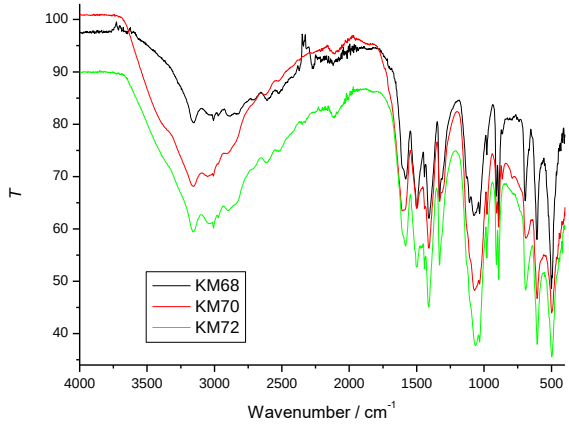

Figure 5: Infrared spectra of samples prepared with the different addition of ascorbic acid

In addition to above, it should be mentioned that the reactions of Mohr's salt and glycine in acidified aqueous solutions led us to nice crystals of Mohr's salt formation [10]. Changing the isolation method to quick evaporation of solvent using the vacuum rotary evaporator products containing $FeSO_4$-glyH complexes could be obtained but with some Mohr's salt admixture. To obtain ferrous glycinate we suggest to use different source iron than Mohr's salt.

4. Conclusion

Study of the iron amino acid reactions and synthesis of iron(II) glycine complexes led us to the ferrous glycinate synthesis. It could bring new information for the treatment of neurodegenerative diseases and also it could be very helpful in the understanding of the development of disease. In the reactions of Mohr's salt and glycine in aqueous solutions with quick isolation, the ferrous sulphate complexes with glycine could be obtained. To produce ferrous glycinate we suggest using the different iron of source than Mohr's salt.

Acknowledgements

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ANTIFUNGAL EFFICACY OF SELECTED *LAMIACEAE* ESSENTIAL OILS AGAINST *CANDIDA ALBICANS* IN VITRO

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Abstract: *Candida albicans as an opportunistic pathogen can cause various infections called candidiasis. This eukaryote causes 50-90% of mycoses and the incidence of candidiasis is constantly increasing. The narrow spectrum of antimycotics and their repeated use leads to an increase in resistance, which contributes to a poor prognosis of treatment. An alternative to conventional antimycotics as well as to adjuvant therapy itself may be essential oils (EOs), which are characterized by diverse bioactivity. The aim of our study was to evaluate the in vitro antifungal activity of five EOs of family Lamiaceae (Hyssopus officinalis, Thymus vulgaris, Origanum vulgare, Rosmarinus officinalis, Salvia officinalis) against Candida albicans yeasts. The investigation was performed by standard microdilution method M27-A3 and the efficacy of essential oils was determined based on the achieved minimal inhibitory concentration (MIC). The lowest MIC value 400 μg/mL as well as the values of MIC50 and MIC90 (400 μg/mL) reached the EOs of Thymus vulgaris and Origanum vulgare that confirms their strong antifungal action among the tested EOs. Slightly lower antifungal activity was found in Hyssopus officinalis EO (MIC 861.5 μg/mL) and in Rosmarinus officinalis EO (MIC 2423.8 μg/mL). Salvia officinalis EO at MIC 3527.5 μg/mL was evaluated as the agent with lowest antifungal efficacy. The obtained results show the potential of essential oils as an adjuvant treatment for candidiasis.*

Keywords: *Candida albicans, Lamiaceae, antifungal effect, antimycotics, essential oils*

1. Introduction

C. albicans, polymorphic eukaryote, which inhabits the mucous membranes of the GIT, urogenital tract, or oral cavity, is the most common commensal, but under suitable conditions can act as a pathogen [1]. The positive importance of colonization of the mucous membranes of healthy people, lies in support of the immune system and in limiting the growth of other opportunistic pathogens [2]. Any disruption of homeostasis in the host has a negative effect on the physiological microflora, causing to its overgrowth [3]. Predisposing factors for candidiasis are mainly immune system failure, neutropenia, contraception, metabolic disorders (eg. *diabetes mellitus*), and long-term use of antibiotics. Urinary and venous catheters, artificial joints and heart valves represent a significant risk because yeasts have the ability to grow on abiotic surfaces [4, 5]. In recent years, EOs have become a subject of interest for researchers because unlike to conventional antimycotics, they are characterized by different mechanism of action, low incidence of side effects, better availability, that predetermine the way how to reduce the resistance development and promote the treatment [6].

Family *Lamiaceae* is characterized by cosmopolitan distribution and includes many species with various bioactivity. For example, *Rosmarinus officinalis* gives antioxidant [7], and antibacterial acitivities [8]. It can be used for treatment of gastrointestinal disorders [9]. Beside of the anti-inflammatory [10] action, the antidiabetic effect of *Salvia officinalis* has been described [11].

This study is focused on the evaluation of antifungal activity of 5 EOs (*Thymus vulgaris, Rosmarinus officinalis, Hyssopus officinalis, Salvia officinalis, Origanum vulgare*) from *Lamiaceae* family against *C. albicans* yeasts.

2. Material and methods

The quantitative standard microdilution method M27-A3 (CLSI, 2008) was used for testing the antifungal susceptibility of *C. albicans*. This method determines the MIC, the lowest concentration of the tested substance at which yeast growth is inhibited. The quality control of the test was verified by the sensitivity of the reference strain *Candida albicans* ATCC 10231 (Czech Collection of Microorganisms, Brno, Czech Republic) to fluconazole. The MIC of fluconazole was 4 μg/mL, which is in line with the criteria of the M27-A3 method (<8 μg/mL – sensitive, 16 – 32 μg/mL – dose-dependent, ≥ 64 μg/mL – resistant) [12].

2.1. Inoculum

Susceptibility testing was performed on 13 clinical isolates (Department of Medical and Clinical Microbiology, Louis Pasteur University Hospital, Košice) and the reference strain *C. albicans* ATCC 10231 (Czech Collection of Microorganisms, Brno, Czech Republic). A 24-h old *C. albicans* cultures were used to prepare a stock suspension of 10^6 CFU/mL that served for preparation of 10^3 CFU/mL yeast inoculum in Sabouraud-dextrose broth supplemented with glucose (10 mM).

2.2. Essential oils

The investigation of antifungal activity of 5 EOs (*Thymus vulgaris*, *Rosmarinus officinalis*, *Hyssopus officinalis*, *Salvia officinalis*, *Origanum vulgare*) (Calendula, a.s., Nova Lubovňa, Slovak Republic) from *Lamiaceae* family was carried out. The efficacy of EOs was determined in concentration range 2.10^5 µg/mL – 400 µg/mL by binary dilution of stock solution (4.10^5 µg/mL).

2.3. Microdilution method

The MIC of EOs against *Candida albicans* yeasts was performed in 96-well microtiter plates. Briefly, 100 µl of EOs and 100 µl of inoculum were applied to each well of columns 1 – 10 in the plates. The plate wells containing only medium (200 µl) served as a negative control (column 11). The positive control (column 12) represented inoculum growth (without EO). MICs were read after 24 h of incubation at 37°C. 15 µl of 0.15% resazurin solution was added into each holes of the plate after 20 hours of incubation, for better visualization of results.

3. Results and discussion

Currently, an increase of candidiasis due to a raising development of yeasts resistance to conventional antimycotics is noticed, which is often associated with treatment difficulties. Resistance development, as well as the narrow spectrum of antimycotics and their toxicity, require the search for new strategic approaches in therapy. Many plants are a source of bioactive substances which are the product of their secondary metabolism. EOs as plant extracts represent a heterogeneous mixture of volatile aromatic natural compounds, usually obtained by hydrodistillation – steam distillation [13].

The *Lamiaceae* family includes plants abundant in essential oils that can be a suitable alternative to antimycotics. The family *Lamiaceae* comprises 236 genera including about 7000 plant species with broad spectrum of biological activity [14].

According to the several studies, all of the 5 EOs tested are characterised by antifungal effect against *C. albicans* [15-18].

Table 1 presents the statistical evaluation of MICs, that characterize the antifungal activity of the individual EOs.

Table 1 Statistical evaluation of EOs MIC (µg/mL) against C. albicans

EOs	*min.–max.*	*x±SD*	*Mo*	*Me*	*MIC50*	*MIC90*
HO	800–1600	861.5±0.22	800	800	800	800
RO	1600–3130	2423.8±0.79	3130	3130	3130	3130
TV	400	400±0	400	400	400	400
OV	400	400 ±0	400	400	400	400
SO	1600–6250	3527.5±1.9	3130	3130	3130	6250

min.–max. – minimum and maximum MIC value; x – average; SD – standard deviation; Mo – modus; Me – median; MIC50/MIC90 – minimum inhibitory concentration inhibiting 50%, resp. 90% of the total of isolates

Terpenoids and phenylpropanoids are typical chemical composition of EOs [13]. For example, alcohol monoterpenes such as carvacrol, p-cymene, thymol, the major substances of *Thymus vulgaris* EO, contribute excellent antifungal effects, among others [19].

Similarly, the EO of *Origanum vulgare* showed the best antifungal activity among the five EOs tested at MIC 400 µg/mL as well.

These results are comparable to the study by Shokrgoo and Madandoust (2018) who attribute the antifugal efficacy of linalyl acetate and γ-terpinene, the major constituents of *Origanum vulgare* EO [20].

Salvia officinalis EO appeared to be the least effective with a MIC 3527.5 µg/mL, which is comparable to the results reported by Sookto et al. (2013) (MIC 2780 µg/mL) [16]. Although *Salvia officinalis* EO was the least effective of the oils tested, the MIC value achieved is higher when comparing to the results of the study by Hayouni et al. (2008) [21], where MIC value reached 9000 µg/mL.

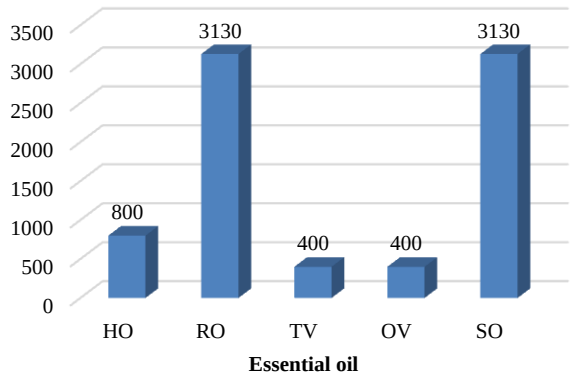

Figure 1 MIC50 (µg/mL) of tested EOs against C. albicans HO – Hyssopus officinalis, RO – Rosmarinus officinalis, TV – Thymus vulgaris, OV – Origanum vulgare, SO – Salvia officinalis

The efficiency of EOs can be evaluated on the base of MIC50 (figure 1) and MIC90 values, respectively. The MIC50 values are identical to MIC90 in all the oils tested, except for *Salvia officinalis* EO (MIC90 = 6250 µg/mL). The figure 1 demonstrates that the highest of MIC50 values were reached by *Rosmarinus officinalis* (figure 2) and *Salvia officinalis* EOs at MICs 3130 µg/mL. The most efficient EOs (*Thymus vulgaris* EO, *Origanum vulgare* EO) achieved the lowest MIC50 values (400 µg/mL).

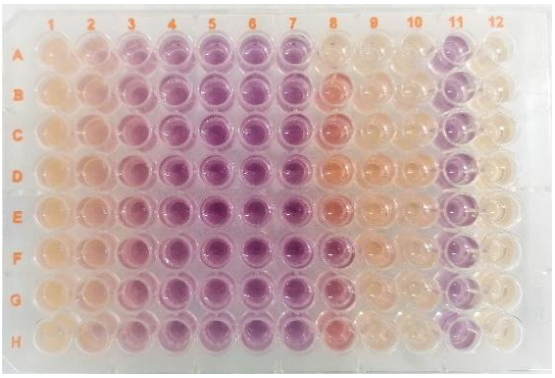

Figure 2 Antifungal effect of Rosmarinus officinalis EO against C. albicans after addition of 0.15 % resazurin

6. Conclusions

In the field of medicine and pharmacy, the research of medicinal plants with as a potential for the use in adjuvant therapy, has become a significant trend. Appropriate choice of herbal medicines can not only improve the quality of patient life, but also positively support the common therapy. The results of this study showed that the most effective EOs of *Thymus vulgaris* and *Origanum vulgare* inhibited the yeast growth of all the tested isolates *C. albicans* at 400 μg/mL.

Acknowledgements

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PREPARATION AND PROPERTIES OF PINCER-TYPE LIGAND NICKEL(II) COMPLEXES PREPARED WITH DIFFERENT NITROBENZOIC ACIDS

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Abstract: *Aim of this work is to focus on the ability of pincer-type ligand, 2,6-pyridinedimethanol, to form structures of single-molecule magnets with nickel complexes in presence of nitrobenzoic acid anions. In addition to that, different anions could add additional structural factor, so the 3,5- dinitrobenzoate, 2-nitrobenzoate, 3-nitrobenzoate and 4-nitrobenzoate anions were used for synthesis. Prepared products were subjected to elemental analysis, infrared and UV-VIS spectroscopy, X-ray analysis and SQUID magnetometry. Complex with 3,5-dinitrobenzoic acid showed the composition of* $Ni\{(NO_2)_2bz\}_2(pydime)_2$ *and based on preliminary results indicates a similar structure in case of all used nitrobenzoic acids (2-nbz, 3-nbz and 4-nbz), independent of the change in synthesis conditions.*

Keywords: *nickel complexes, single molecule magnet, pincer-type ligand, nitrobenzoato anions*

1. Introduction

Tremendous progress in chemistry of pincer-type ligands and their complexes is flourishing in last two decades because of expanding their architecture, changing the type of donor atoms, and the characterization of their steric properties. Since the first complex with pincer-type ligand was introduced in 1976 [1], these compounds went from an "unknown" state into chemical chameleons capable of performing wide range of applications, from chemical sensors [2] to extremely efficient catalysts suitable for activation strong chemical bonds [3] and their use as a synthons for the synthesis of dendrimers and nanomaterials [4] to complexes with potential pharmaceutical usage. [5] In general, these compounds were first synthesized for their potential use in organic transformations, which later included stereochemical centres in their structures and thus a rich variety of chiral species of pincer-type ligand complexes has become capable of effectively performing enantioselective processes. Pincer-type ligands are tridentate ligands that give us in future chance to modify primary coordination sphere of central atoms and to study this influencing factor e.g through analysis of caused structural anisotropy.

Recent research about effects of slow relaxation of magnetization in molecules including one magnetic ion, so-called single-ion magnetism (SIM), confirmed the dominant role of magnetic anisotropy in SMM design. [6] In general, it can be said, that a key influencing property mechanism in SMM is magnetic anisotropy, which is controlled by the ZFS – zero field splitting parameter *D*, which causes dividing the ground-state multiplet into sublevels, so for $S > ½$ they are separated by spin-reversal barrier. [7] This information of slow magnetic relaxation (SMR) and the one-ion magnetism of one transition metal magnetic core is rapidly expanding [8,9]. The most notable is group of mononuclear Co^{II} complexes with coordination number between three and eight. [10] There are also rare publications of V^{IV}, low-spin Mn^{IV}, Ni^{II} and Cu^{II} systems. [11-17]. Great advantage of these compounds is the storage of information directly at the molecular level, which can provide huge space savings especially in the design of new computer storage drives [18,19]. In addition to that, it was found that the possibilities of interactions of the complex particles within the structure can be related to different pathways of SMM relaxation. This specific properties in conjuction with the transition metals led to our interest to specific types of ligands, whose presence in complex compounds led to a certain asymmetry of the coordination polyhedra and thus to potentially suitable magnetic properties of the resulting compound. Complexes of $[M(pydm)(pydc)].H_2O$ (M = Co, Ni, Cu) prepared in our laboratory exhibited interesting structural and specific magnetic properties [14-17,20]. This created the preconditions for the synthesis of other products with ONO pincer-type ligand [21-23]. Later this led to preparation of $[Ni(pydm)_2](3,5\text{-}dnbz)_2$ complex [24] that also exhibited multiple pathways of slow relaxation and exceptional SMM behaviour. Here we present the preparation, spectral, and structure of Ni^{II} complexes prepared with pincer-type ligand 2,6-pyridinedimethanol and various nitrobenzoic acid anions.

2. Material and methods

Materials used for synthesis was 3,5-dinitrobenzoic acid, 2-nitrobenzoic acid, 3-nitrobenzoic acid, 4-nitrobenzoic acid, pincer-type ligand 2,6-pyridinedimethanol, tetrahydrate of nickel acetate and water, ethanol or acetonitrile as a solvent. All materials were 98% purity and more.

Products were subjected to elemental analysis (FlashEA 1112 Automatic Elemental Analyzer), infrared spectra (ATR MAGNA 750 IR (Nicolet) spectrometer in the range 4000-400 cm^{-1}) were used to perform measurements.

3. Results and discussion

Ligand 2,6-pyridinedimethanol used for synthesis can due to its planar structure bind to central atom in *mer*-coordination manner, thus two ligands form symmetric chromophore {NiN_2O_4} (Figure 1). Both bond distances of Ni–N and/or Ni–O are within narrow ranges (Table 1). The coordination polyhedron of Ni is despite symmetric bond distances rather far from the regular octahedron due to the steric limitations of the ligand side arms.

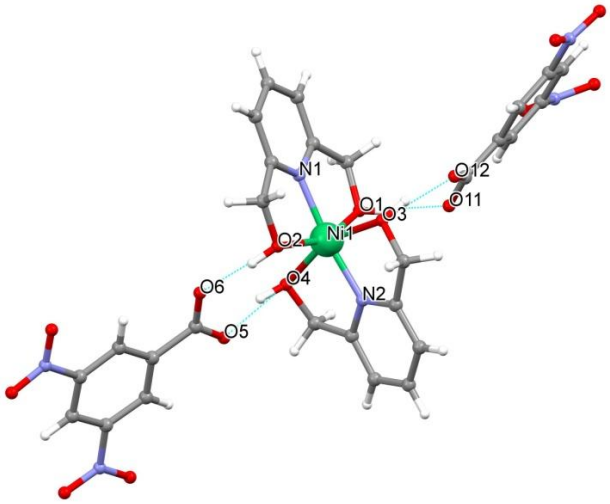

Figure 1: Structure of [Ni(pydm)$_2$](3,5-dnbz)$_2$ complex

Table 1 Bond distances (Å) and angles (°) in [Ni(pydm)$_2$](3,5-dnbz)$_2$

Ni1–N1	1.9808(12)	Ni1–N2	1.9798(12)
Ni1–O1	2.0856(11)	Ni1–O2	2.0924(11)
Ni1–O3	2.1356(11)	Ni1–O4	2.1301(11)
O1–Ni1–O2	157.73(4)	O3–Ni1–O4	157.66(4)
N1–Ni1–N2	171.64(5)		

Structure of complex contains bis(pyridinedimethanol) nickel cations with two dinitrobenzoate anions bounded to complex cation by strong hydrogen bonds (Table 2), thus forming together "neutral molecules" interacting with surrounding "molecules" *via* weaker C–H···O hydrogen bonds, or π-π interactions.

Table 2 Hydrogen bonds in [Ni(pydm)$_2$](3,5-dnbz)$_2$

D–H···A	*d(D–H)*	*d(H···A)*	*d(D···A)*	*<(DHA)*
O1–H1···O11	0.86	1.68	2.536(2)	169
O2–H2···O6	0.87	1.69	2.558(2)	175
O3–H3···O12	0.87	1.75	2.602(2)	163
O4–H4···O5	0.87	1.75	2.580(2)	160

DC susceptibility data were obtained with application B = 0.1 T and were recorded at two temperatures, T = 2.0 K and 4.6 K for increased magnetic induction up to B = 7.0 T. The temperature dependence of the effective magnetic moment shows features typical for hexacoordinated Ni^{II} complexes – linear dependence on cooling and then drop to a constant limit at the lowest temperature. The slope reflects a certain temperature-independent paramagnetism. (Figure 2)

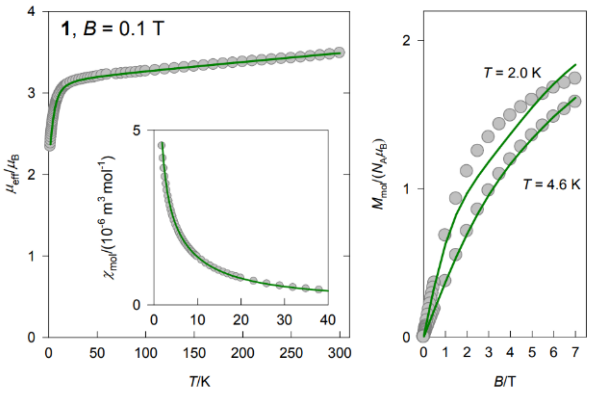

Figure 2: DC magnetic functions for complex [Ni(pydm)$_2$](3,5-dnbz)$_2$. Solid lines – fitted by using of zero-field splitting model

The value at room temperature reached μ_{eff} = 3.49 μ_B and gradually decreased during cooling to T = 15 K and subsequently fell to μ_{eff} = 2.34 μ_B at T = 1.9 K. Two relaxation domains were well separated, the low-frequency relaxation process (LF) at $f \approx 0.15$ Hz represented a relaxation time $\tau = 1/(2\pi f) \approx 1.1$ with significantly negative zero-field splitting parameter D with value D/hc = –15.4 cm^{-1}. [24]

The above results especially exceptional SMM properties despite small asymmetry of coordination polyhedron, rather small asymmetry in hydrogen bonding of both anions and relatively big difference in hydrogen bonds comparing anions one to the other were the base for the preparation additional complexes based on the same complex cation and some other nitrobenzoate anions.

The elemental analysis (Table 3) confirmed the composition of Ni(pydm)$_2$(x-nbz)$_2$ (x = 2, 3 or 4).

Table 3 Results of elemental analysis of prepared complexes

Acid used	Formula	Experimental values	Calculated values
2-nbzH	Ni(pydm)$_2$(2-nbz)$_2$	8.245 (N) 49.599 (C) 3.825 (H)	8.372 (N) 50.253 (C) 3.916 (H)
3-nbz	Ni(pydm)$_2$(3-nbz)$_2$	8.352 (N) 48.847 (C) 3.743 (H)	8.372 (N) 50.253 (C) 3.916 (H)
4-nbz	Ni(pydm)$_2$(4-nbz)$_2$	8.139 (N) 49.142 (C) 3.789 (H)	8.372 (N) 50.253 (C) 3.916 (H)

Infrared spectra showed similar structure of synthesized products in all used solvents. This fact makes sense, since a substantial part of the spectrum contains bands belonging to the used pincer-type ligand. At 3000 cm^{-1} is distinctive

wide peak typically belonging to a system of hydrogen bonds and a peak probably belonging to O-H vibrations. Infrared spectra of all products in "finger-print" region are very similar and it can be concluded that at least the pydm ligand is very similarly bonded to the nickel central atom. Differences within the region of carboxylato group (about 1500-1400 cm^{-1}) are very small and the different acid anions (Figure 3) shows probably very similar binding character.

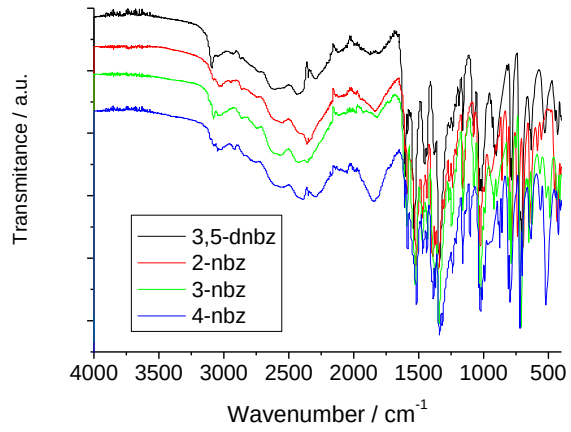

Figure 3: Comparison of infrared spectra of prepared complexes.

All four complexes are of blue-green colour thus their electronic spectra (Figure 4) exhibit two similar peaks in the area of 600 and 1000 nm that are typical peak characteristic for octahedral complexes. Moreover there are more or less significant shoulders at about 700 or 900 nm that the differences in coordination polyhedron deformations are probably very similar and are in good agreement with proposed pseudooctahedral geometry, caused by pincer-type pydm ligands.

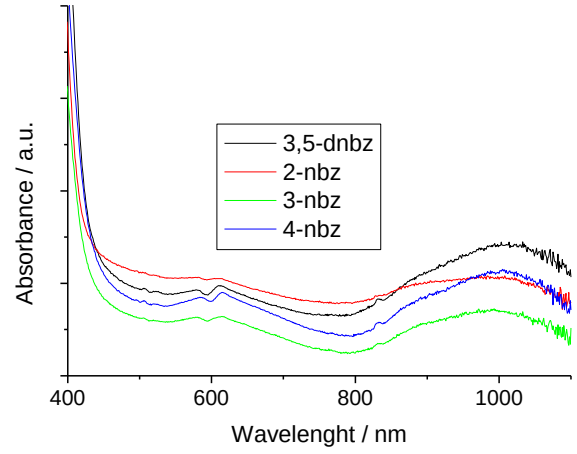

Figure 4: Comparison of electronic spectra of prepared complexes.

4. Conclusions

In addition to known $[Ni(pydm)_2](3,5\text{-}dnbz)_2$ complex [24] three new hexacoordinated complexes of nickel(II) were prepared and subsequently analysed. Prepared products showed the composition of $Ni(pydm)_2(x\text{-}nbz)_2$. Spectral properties indicate a similar structure in case of all used nitrobenzoic acids (2-nbz, 3-nbz and 4-nbz), but the real differences in structure could be found by X-Ray structural analysis. Obtained results indicate, that combination of an almost planar pincer-type ligand, in combination with a carboxylato anion, represents an interesting combination of ligands for potential single-molecule magnets.

Acknowledgements

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Session: Medical Sciences

Index of Author(s)

MULTIPLE SCLEROSIS AS A NURSING PROBLEM

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Abstract: *Multiple sclerosis is a chronic disease that can have a significant impact on a patient's quality of life and survival. For this reason, it is important to pay attention to the provided nursing care, which can increase and improve it, and thus provide a benefit for the patient.*

Key words: *multiple sclerosis, education, nursing.*

1. Introduction

Vališ states that multiple sclerosis was first described in 1868 as a separate disease by the French neurologist Jean-Martin Charcon. He called the disease sclérose en plaques (French multiple sclerosis). Multiple sclerosis, or multiple sclerosis, is an immunopathological disease characterized by inflammatory involvement of central nervous system structures and neurodegenerative changes in the brain. The word sclerosis (from the Greek word scleros, ie solid) in the name of the disease refers to scarring in white matter. These arise in places of inflammatory deposits (professionally plaque or lesions), where the inflammation subsided [1]. The word scattered means that RS can form multiple bearings. According to Šanta, Klímová et al. is multiple sclerosis the most common acquired, non-traumatic neurological disease in young adults. It is caused by an autoimmune disorder, with the target antigens for the autoimmune attack being the antigens of the myelin sheath surrounding the CNS nerve fibers [2]. Seidl defines multiple sclerosis as an autoimmune, chronic inflammation directed against myelin and oligodendroglia of the brain and spinal cord leading to their destruction. MS is a chronic incurable disease, most often diagnosed between the ages of 20 and 40, but it can also manifest itself in childhood or after the age of 50 [3]. It is a disabling disease with a very individual course, which limits the patient's ability to work and later self-sufficiency, and has a significant socio-economic impact [4].

1.1 Epidemiology of the disease

The first epidemiological information dates from the late 19th and early 20th centuries. At that time, it was a question of monitoring the number of cases with a defined neurological deficit in a certain hospital facility, possibly in a given area. John F. Kurtzke was a pioneer in the epidemiology of MS. After studying the epidemiology of MS, he defined his diagnostic criteria and divided the country according to prevalence into high-risk (northern Europe, northern USA, Canada, southern Australia, New Zealand), medium-risk (southern Europe, southern USA, northern Australia) and low-risk. Epidemiology provides basic information about the occurrence and manifestation of the disease. In recent years, the number of patients has risen to the total population in the area. The number of newly diagnosed is increasing due to improved diagnostics, mainly due to better examination methods, due to changing diagnostic criteria and last but not least due to the increased incidence, due to changes in external factors that may affect the development of the disease [5]. The first symptoms of SM appear between 20. -30. year of life. MS has been considered a viral disease in the past. However, research has not found an infectious agent that causes MS. The dependence of the number of patients on ethnic factors points to the genetic influence of the disease. The disease of the three main races mainly affects the Europoid race, while the Negroid and Mongoloid races have a significantly lower prevalence of the disease [6]. MS occurs mainly in the northern hemisphere, in tropical and subtropical areas it is rare. The fewest people affected by this disease live near the equator. Studies have shown that this latitude gradient may explain climate, plenty of sunlight and vitamin D intake. However, there are significant exceptions, such as incidence and prevalence in the Canary Islands [1]. Approximately 20% of patients have at least one family member affected by the disease. Today, the prevailing view is that MS is an autoimmune disease that develops in a genetically susceptible individual under the direct or indirect influence of environmental factors [6].

SM is an extremely variable disease. There are completely asymptomatic forms, benign forms with minimal neurological findings to malignant forms with rapid disability or life-threatening conditions [5]. The acute onset of neurological symptoms is caused by demyelization of the central nervous pathways, which causes a disturbance in the conduction of excitement and results in a loss of function. The site of inflammatory infiltrate determines the form of clinical manifestations [2], possibly a combination of both. There was a need for agreement in the exact nomenclature of individual forms of SM, and since 1996 the following division according to Lublin and Reingold has been used.

- Relapsing-drawing SM (RR SM). It is characterized by a clear neurological deterioration followed by complete recovery or incomplete recovery with neurological deficit. In the period between attacks, the neurological deficit increases.

- Secondary progressive SM (SP SM). After the initial relapsing process, the neurological deficit gradually worsens without the presence of relapses or with occasional relapses with a residue.
- Progressive relapsing MS (PR MS) Progressive worsening of the disease from the beginning, and clear acute relapses with or without complete recovery. The periods between relapses are characterized by the continued progression of neurological deficit.
- Primary progressive SM (PP SM). Persistently increasing neurological deficit since the onset of the disease, sometimes with various lengths of neurological stabilization or inconspicuous fluctuations in the condition [4]. The first manifestation of the disease, which shows the characteristics of inflammatory demyelination but does not meet the criteria for dissemination over time, is called clinically isolated syndrome [7].

1.2 Diagnosis of the disease

There is no specific test that unambiguously confirms or excludes MS. We determine the diagnosis on the basis of clinical examination and course, examination of evoked potentials, magnetic resonance imaging and examination of cerebrospinal fluid. In some countries, urodynamic examination is also performed [8]. The McDonald criteria were published in 2001. Their main goal is to enable an unambiguous diagnosis to be made as quickly as possible. The criteria contain the basic algorithms of the diagnostic procedure. It works with the concepts of clinical picture, attacks and progression, with auxiliary examinations (MRI, examination of cerebrospinal fluid and evoked potentials) and the classic supplement. An attack is defined as the occurrence of new or worsened or newly discovered old neurological problems, separated from a previous event by at least 30 days of remission and lasting at least 24 hours. Progression is defined as a gradual worsening of neurological symptomatology lasting at least 3 months [6]. Magnetic resonance imaging (MRI) is the dominant imaging method for diseases affecting the white matter of the brain. Multiple sclerosis is characterized by the sowing of multiple foci in space and time in the white matter of the brain, in gray matter it is only about 5% [3]. Dissemination over time is due to the occurrence of a new deposit on MR. The new criteria brought the possibility to determine the dissemination in space and time right at the first examination, if a contrast agent is used [6]. This examination is free of radiation exposure with a relatively small number of contraindications, such as claustrophobia (fear of confined or confined spaces) and metal objects in the patient's body such as a pacemaker or ferromagnetic clamps. The frequency of examination is individual and depends mainly on the form and activity of the disease [1]. Evoked potentials can be characterized as electrical changes that can be observed in the nervous system after stimulation of some systems [5].

Examination of evoked potentials is functional, meaning that they monitor the integrity of the entire nervous system from the periphery to the center of the nervous system. They are highly sensitive in the detection of clinically "silent lesions", especially at the beginning of the disease or in the period when no new neurological symptoms are present [3]. With the availability of magnetic resonance, the importance of evoked potentials in the diagnosis of MS decreases. However, visual evoked potentials retain their important role in the diagnosis of optic nerve inflammation [1]. Examination of cerebrospinal fluid is one of the basic examinations in the diagnosis of neurological diseases [2]. Collection by lumbar puncture is a safe procedure performed for diagnostic and less often therapeutic reasons. The main side effects include post-puncture syndrome with signs of cerebrospinal fluid hypotension, which is manifested by headaches. Problems worsen with verticalization [6]. Cerebrospinal fluid is a clear, colorless fluid circulating in the subarachnoid spaces of the brain and spinal cord and in the ventricles of the brain. Before the era of imaging methods such as MRI, his examination was the only method that demonstrated inflammatory changes in the nervous system [6]. Approximately ten milliliters of cerebrospinal fluid are collected, the amount of protein, albumin, IgG, cell number and quality are examined, and in case of suspected SM, especially the presence of oligoclonal bands by isoelectric focusing [3].

1.3 SM therapy

SM treatment is a long-term process that must be started immediately after diagnosis. The aim of treatment is to reduce the activity of the disease and slow its progression. The choice of a suitable drug is essential for maintaining the functional independence and quality of life of the patient [5]. Treatment of MS consists of acute attack therapy, long-term immunomodulatory therapy to reduce the number of attacks and delay disease progression, and symptomatic therapy [3]. The treatment of acute attack is based on therapy given intravenously with high doses of methylprednisolone [5]. Acute relapse is defined as a new or recurring symptom lasting at least 24 hours in the absence of fever or infection [3]. Therapy must be individualized, and the patient monitored for the rate of remission of symptoms after initiation of therapy and during dose reduction. Discontinuation of intravenous therapy may be followed by oral administration of steroids, which will gradually decrease [6]. Increased care in the treatment of acute attacks should be given to patients with dyspeptic disorders, diabetics (glycemic monitoring), cardiac patients, patients with psychiatric comorbidity or patients with thrombophilic conditions. The aim of the treatment of the relapsing-remitting form is to achieve long-term remission of the disease, possibly to stop the activity of the disease and to prevent the occurrence of relapses [1]. From a practical point of view, it is recommended to start treatment at an early stage of the disease, which can at least partially prevent the transition to a progressive form [6]. A crucial step in achieving remission is the selection of an appropriate treatment after the diagnosis of MS has been made. Therapy is usually initiated with a disease modifying drug. In case of its insufficient effect or intolerance, it is recommended to change the drug within the first line or escalation of the

treatment to the second line. lines. First-line drugs include interferons beta (INFβ), glatiramer acetate (GA) and teriflunomide [1]. It is an economically very demanding treatment, the patient applies it himself in the home environment after education [8].

In the treatment phase of the secondary progressive form of the disease, the inflammatory events decrease and the treatment options are significantly limited [1]. Disability is irreversible. If the patient loses the ability to walk, we know that remedial drugs are not effective. Adverse effects of drugs may outweigh their benefits and there is no point in continuing treatment [3]. Rehabilitation and symptomatic therapy then becomes very important in the treatment of SP and PP in the form of MS [1].

the course of the disease, therapy is aimed at eliminating or compensating for the already established permanent functional deficit [4]. The main reason for the treatment of symptoms is the individual wishes and needs of the patient. The goal of symptomatic therapy is to improve the quality of life and prevent possible complications of untreated symptoms. Especially in polysymptomatic patients, it is more appropriate to treat whole complexes of symptoms than just one of them. In an effort to eliminate one problem, we can cause another, and the side effects of drugs can ultimately bother the patient more than the original problem [6]. The symptomatological treatment is mainly the treatment of spasticity and tonic convulsions, the treatment of disorders of urination, sexuality, the treatment of ataxia and tremor, the treatment of depression, pain, fatigue, in later stages also swallowing disorders [2].

2 Nursing care of a patient with multiple sclerosis

Neurological nursing is one of the applied fields. It is based on the field of neurology and nursing and at the same time integrates knowledge from other fields dealing with man. Neurological nursing deals with nursing care of patients with neurological diseases. Its aim is to provide patients / clients (p / k) and their families with nursing care in both health and illness, and to carry out activities that help maintain health, heal or contribute to a peaceful and dignified death. The role of the nurse is also to help gain the greatest possible degree of self-sufficiency. The nurse applies a holistic approach to satisfying biological, psychiatric, social, spiritual and cultural needs [9].

2.1 Management of nursing care in neurological nursing

Slezáková states "Neurological nursing care is currently performed by nurses with prescribed education who meet the qualification requirements in accordance with European standards for nursing education and the law on the profession of nurse and professional competence" [9]. In neurology, nursing care can be divided for outpatient care, institutional care and aftercare. We include outpatient care in the nurse's outpatient care (the nurse keeps records of patients, collects results and findings from examinations in the patient's documentation, processes statistics), diagnostic and therapeutic activities (the nurse collects biological material, cooperates with the doctor during professional procedures, monitors the patient's response to medication) and dispensary activities (the nurse provides nursing care for patients with selected diseases on selected days for individual diseases). Institutional care includes care provided in neurological departments. In the ward, the nurse cooperates with all members of the medical team in the prevention, diagnosis and treatment of detected diseases. "Based on the analysis of data, the nurse formulates nursing diagnoses, according to the formed problems plans independent and cooperative nursing interventions to solve patients' health problems in the field of prognosis, diagnosis, therapy and education [2]. Subsequent nursing care is provided by the nurse in the form of home nursing care and with the help of home nursing care agencies, spa facilities or in the form of stroke centers [9].

Havrdová states that currently the work of a nurse treating a patient with MS includes a wide range of activities. Treatment and care of a patient with MS is provided by a multidisciplinary team. One of its main goals is to enable the patient to achieve the maximum possible degree of independence. The nurse works closely with other team members, providing information and feedback on the physical and mental condition, so she can respond in a timely manner to the patient's current needs. At all times, it supports the patient to independence, care, awareness of responsibility and helps him cope with changes in health and adaptation to new situations. Caring for an advanced stage SM patient requires procedures specific to the immobile patient. Patients may suffer from pressure ulcers, incontinence, and emptying problems. Impaired ability to drink, swallow or cough should be taken into account. Due to MS as an autoimmune disease, caution should be exercised in preventing various infections that can be fatal in the patient. The interventions of the nurse treating such a patient include, in particular, the administration and application of drugs, the resolution of spasms, nursing rehabilitation, skin care, treatment of pressure ulcers, positioning, adjustment and administration of food [2].

The quality of life of patients with MS is lower than in a healthy individual. In addition to timely pharmacological treatment, psychotherapeutic support is also important for its improvement. This should be provided in care centers for patients with MS but also through support organizations. The patient should be educated and referenced to valid sources of information. Like any chronic disease, MS affects not only the patient but also his family, friends. Insufficient problem solving is reflected in the patient's discomfort, which leads to a deterioration of his health. Education of not only the patient but also his family is essential. Adherence to the regime measures and treatment regime requires the support of other family members as well. It is advisable to recommend to the patient that occasionally some of its members take part in check-ups with a doctor [6]. In order to maintain the quality of life, in addition to physiological needs, it is necessary to meet other needs of the patient, i.

psychological, social, spiritual needs. The nurse can offer and mediate psychological, psychotherapeutic, psychiatric care, socio-therapeutic activities, occupational therapy, social activation activities (enabling contact with the natural social environment, trips, participation in cultural or social events, social games), participation in educational lectures (eg. regarding lifestyle, lifestyle, etc.) or spiritual care [3].

3. Conclusions

Educated a patient with MS is an important part of a nurse's job. The nurse must choose an individual approach to the patient with regard to his current condition, find out what his expectations are, provide information clearly and realistically, verify whether the patient understood the information, recommend other appropriate sources of information, sell him written materials, emphasize that he does not have to be afraid to ask for help or further information and, with the patient's consent, to involve his family or careers in education. Through education, the patient should learn and follow the principles of the treatment regimen, monitor and record the state of physical condition, and should also learn to know and follow the principles of lifestyle and some preventive measures.

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INFLUENCE OF SELF - CARE ON QUALITY OF LIFE IN PATIENTS WITH MULTIPLE SCLEROSIS

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Abstract: *The level of self-care affects the overall quality of life of a patient with multiple sclerosis as well as his family. Our paper is a review study in which we analyzed the studies that we searched for in the electronic database PubMed. A total of 533 studies were found during the search, 4 of them met the criteria we entered. The results of the analysis of the studies pointed to the fact that systematic education increases the level of self-care and consequently the quality of life of patients with MS.*

Key words: *multiple sclerosis, education, quality of life, self - care, nursing.*

1. Introduction

Because MS is a degenerative and progressive disorder that reduces the ability to perform daily activities and has negative socio-economic and emotional effects on individuals, family members, and society, medical therapy alone has proven insufficient, which requires psycho-social approaches. to help overcome the problems of this disease. Patients with MS need to acquire more knowledge and skills, improve their attitudes and gain access to adequate resources for better management and adaptation. New educational behaviors that improve self-sufficiency can be implemented through education. Patient education has now become a major part of the work responsibilities of healthcare professionals and includes the provision of healthy lifestyle information and personal care guidelines [1].

1.1 Review study

The paper consists of a review study, where based on the analysis of published scientific articles, we sought an answer to the research question - How does education affect the quality of life of patients with multiple sclerosis? The studies used were searched in the PubMed electronic database. We used as keywords: multiple sclerosis, education, effect of education. The search was focused on the highest quality studies. We looked for systematic reviews, meta-analyzes, randomized controlled trials published in the last ten years. The search criteria included: studies published in the last ten years, patients with multiple sclerosis, type of study is meta-analysis, systematic review, randomized controlled trial. We did not limit the age of the patients, as this is a specific topic, and we worked with patients of all ages. Exclusion criteria: studies older than ten years and full text of the study not available.

2. The results

After entering the keywords: multiple sclerosis, education, the effect of education was found 533 results. After evaluating all searched records based on the name of the study, the available abstract and the full text, 4 studies were included in the overview, which met the criteria specified by us. The studies excluded from the evaluation lacked the necessary data or the full text of the study was not made available.

Table 1 Overview of studies

Author, year and place of study	*Data acquisition method*	*The most important results*
Daniali SS et al., 2016, Irán	Data were collected through a structured questionnaire that included demographic data, awareness, and self-efficacy in pain control. The questionnaire was filled in by patients with MS in the intervention and control groups before and after education.	The study suggests that education can improve awareness and self-efficacy in controlling pain in patients with MS. Educational interventions can be designed to reduce physical and mental complications in patients.
Sahebalzamani M et al., 2012, Irán	A two-part questionnaire was used for data collection. The first part included demographic information and the second part contained the MSQOL-54 quality of life questionnaire. Both questionnaires were completed by patients with MS before the start of education and after the end of educational interventions	A two-part questionnaire was used for data collection. The first part included demographic information and the second part contained the MSQOL-54 quality of life questionnaire. Both questionnaires were completed by patients with MS before the start of education and after the end of educational interventions
Sanaeinasab H et al., 2017, Irán	Patients with MS at baseline, one and three months after education, completed the Standardized Perceived Stress Scale (PSS) and the Jalowiec Coping Scale (JCS).	The results of the study indicate that the tested educational program based on transaction models was successful in reducing stress levels and proper disease management in women with MS. Education can help patients cope better with their illness
Kersten S et al., 2014, Germany	Patients with MS were tested at three test times. Endurance capacity of patients with MS was measured by a six-minute walk test	The study indicates that patients with MS who exercise exercise perform better in terms of muscle performance function, exercise

	(6MWT), physical capacity using a treadmill, mobility by TUG (Timed-Up-Go-Test), fatigue on the FSS (Fatigue Severity Scale). Self-efficacy was measured using the German Sports Activity Self-Efficacy Questionnaire (SSA) and quality of life by the SF-36 questionnaire.	tolerance function, and mobility-related activity compared to patients who do not exercise. By training in physical activity, it is possible to improve aerobic capacity and muscle strength, fatigue, walking, balance and quality of life.

3. Discussion

In 2014 in Germany, Stephanie Kersten et al. [2] in its study, it points out that patients with MS who exercise perform better in terms of muscle performance, exercise tolerance function and mobility activities than patients who do not exercise. Physical activity is a good way to improve aerobic capacity and muscle strength, fatigue, gait, balance and quality of life. However, he points out that the long-term effects of exercise can only be achieved if the exercise is performed in a daily routine. In the study, endurance capacity was measured by a six-minute walk test (6MWT) and physical capacity using a treadmill. Mobility was tested using the TUG (Timed-Up-Go-Test). Fatigue was quantified by the Fatigue Severity Scale (FSS). Self-efficacy was measured using the German Sports Activity Self-Efficacy (SSA) questionnaire and health-related quality of life was analyzed using the SF-36 questionnaire. In the study, fifteen patients (12 females and 3 males) were analyzed before (T0) and after (T1) 12 weeks of patient education. Subjects were tested at three test times (T0, T1, T2) for endurance capacity, mobility, fatigue, self-efficacy in sports activities, and health-related quality of life. Subsequently, participants performed their exercises independently for 32 weeks and were tested on sustainability tests (T2). Table 8 provides an overview of the improvement after 3 and 8 months. Significant improvements from T0 to T1 were found in 6MWT, gait speed, TUG, fatigue and quality of life.

In Iran, Sahebalzamani et al. [3] published an experimental study that evaluated one group of patients with MS before and after education. After completing six 50-minute educational meetings for three months, participants completed the same questionnaire as before the educational meetings. Based on the results, the quality of life has improved in most domains after education. The average values of quality of life in physical health, in the level of pain, fatigue, conception of health, changes in health status, sexual activities, as well as the overall quality of life score differed significantly after training. In addition to cognitive activity, there were significant positive differences in mental health values before and after education.

In Iran in 2016, Daniali et al. [4] pointed to the increasing incidence of people suffering from an incurable autoimmune disease, which is multiple sclerosis. In his study, he tried to evaluate the effectiveness of education based on increasing knowledge and self-efficacy in controlling pain in patients with multiple sclerosis. The study evaluated a group of 86 patients with MS. There were 47 patients (33 females, 14 males) in the intervention group and 49 patients (37 females, 12 males) remained in the control group. During 4 educational meetings, the intervention group learned a lesson in caring for their own pain control. During the education, information was provided about the disease, its causes and complications, basic care and lifestyle, stress management, sleep pattern and the correct use of treatment to prevent and control pain. The control group did not undergo any education. At the end of the study, the control group received the necessary training. Before the start of the interventions and two months later, both groups completed questionnaires. An independent t-test showed that the mean knowledge and self-efficacy scores in pain control in patients before the intervention did not differ significantly between the two groups. After the intervention, the average score of knowledge and self-efficacy in pain control was significantly higher in the intervention group than in the control group. Mean scores of knowledge and self-efficacy in pain control in the control group did not show any significant difference before and after education.

4. Recommendations for nursing practice

Education can provide the patient with a number of useful and useful tips. The nurse in the role of educator provides information, knowledge and skills to help the patient in the daily management of problems that occur during life with this disease [5, 6, 7]. It teaches the patient how to prevent and manage the complications associated with the disease. Education should be an important part of the work of the health care team due to its low financial demands and positive impact on quality of life. Based on the findings, we would like to suggest a few recommendations:

- It is good if patient education is conducted in groups. Patients are more motivated to learn and can also exchange personal experiences and knowledge during educational meetings.
- We recommend the development of an educational plan based on transactional models that can help reduce stress levels and manage the disease properly, thus helping patients to cope better with their illness.
- It is appropriate to educate patients about the need for physical activity and proper exercise to maintain physical fitness. The healthcare professional must take into account the patient's physical capabilities.
- Inform patients that they will only achieve long-term exercise results if they exercise regularly.
- Patients need to be informed about the need to repeat and renew their acquired knowledge and skills. This disease is characterized by memory disorders, so it is important to repeat the acquired knowledge and skills over time.
- Motivate patients to adhere to a treatment regimen to maintain health and prevent complications.
- Ensure sufficient information materials, brochures, educational plans, professional journals so that

patients can recall the information they have acquired through education, even at home.
- Collaborate with all members of the health team (nutrition assistant, physiotherapist, psychologist) to streamline educational outcomes.
- To make patients aware of specialized multiple sclerosis centers, where they can meet specialists in the disease and people suffering from the same problems.

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COGNITIVE IMPAIRMENT IN MULTIPLE SCLEROSIS AND NURSING

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Abstract: *The nurses care for people with MS in a variety of settings and address a range of physical, emotional, and educational needs. The main areas of the MS nursing include adaptation of nursing care to the recognition, monitoring and compensation of cognitive disorders, facilitate and evaluate the impact of MS on quality of life despite uncertainty or disability, providing individualized attention to the complex needs of people with MS. The aim of the paper is to point out the most common cognitive changes in people with MS and the role of nursing as a partner in the management of selected problems related to these changes.*

Keywords: *cognitive impairment, multiple sclerosis, quality of life, assessment, nursing intervention.*

1. Introduction

Prediction of the prevalence of cognitive impairment among people with MS range from 40% to 70% [1, 2]. Cognitive deficits may occur at the onset of the disease, in the presence of minimal physical changes. But some people may have little or no change in cognition despite the severity and duration of the disease. Approximately 20% of patients have severe cognitive deficits that disrupt daily activities, family and social relationships, and work life. About 30% of patients leave their jobs after 10 years from diagnosing the disease. As a reason for termination of employment reported by most patients, physical and cognitive impairment associated with MS. Relatively mild cognitive deficits may have an impact on patients' day-to-day lives, therefore, assessment of cognitive function should be part of assessments of people with MS [3]. The nurse becomes a central source of useful information for the patient and his family.

1.1 Cognitive impairment and patient´s life with MS

Changes in cognitive function observed in people with MS include problems in areas such as comprehension and use of speech, word finding, abstract reasoning, visual perception and construction, calculation skills, attention/ concentration, memory (both learning and recall), and executive functions (as planning, problem-solving, self-control) [3, 4].

The most affected ones are episodic memory and information processing speed [5]. Working memory, executive function, verbal fluency and attention have also been widely described [6], with a recent interest in social cognition impairment [7, 8]. Even mild cognitive impairment can have a significant impact on a patient's capacity to function in their daily lives. A significantly slowed speed of information processing has been linked with an increased risk for car accidents, and also with a greater risk of misunderstanding what's been said, which in turn can lead to an increase in interpersonal conflict. Problem-solving and organising skills can impact greatly on a patient's ability to successfully complete tasks each day. Also patients may have problems with maintaining a busy job, keeping-up with the everchanging after-school activities of their children, and managing their own personal activities which might require scheduled fatigue- or toilet-breaks. Therefore, evaluation of cognitive functioning should be part of the ongoing neurological and nursing assessment of people with MS. The motor, sensory, fatigue symptoms and emotional state may affect a person's cognitive functioning, and these symptoms need to be taken into account when evaluating cognitive impairment [9].

1.2 Cognitive assessment

Early assessment is critical to overall neurocognitive ability, which is important to activities of daily living, social functioning, quality of life, and employment [10].
Although patients have difficulty admitting cognitive changes for fear or for stigma. Every patient with a diagnosis of MS should undergo a complete neuropsychological assessment and routinely repeat a standardized and validated battery to detect clinically meaningful changes, as well as start a timely and effective treatment [11].

Many test protocols have now been developed to identify cognitive disorders recommended by neurologists, neuropsychologists, academics and clinicians. In short, we present proven and valid screening tools. Common cognitive assessment tools used in the clinical practice, such as the Mini Mental Status Exam, have failed to show sensitivity to early MS cognitive impairment. A Brief International Cognitive Assessment for MS (BICAMS) validated in several US and international MS populations exists for clinic use as a quick, sensitive, and reliable tool in this population. This battery of tests is recommended by the American Academy of Neurology Quality Measure group for MS cognitive impairment testing [10]. In literature we meet the other screening instruments such as the Brief Repeatable Battery of Neuropsychological tests (BRB-N), also known as Rao's battery and the Minimal

Assessment of Cognitive Function in MS (MACFIMS) introduced by Benedict et al. [11].

2. Nursing assessment

The inability of healthcare professionals, patients, and patients' families to recognize or acknowledge the presence of cognitive dysfunction in MS may negatively influence adjustment to the disease and can create additional stress for all involved. Therefore, the nurse focuses on the patient's ability to assess to support compensation for his or her limitations [3, 12].

The nurse has a unique position among all health professionals, who often has the most frequent interaction with people with MS. She can detect early signs of new or worsening cognitive deficits. Patients and family members may also identify the cognitive deficits. In assessing congnitive functions, the nurse takes into account the factors that affect them. These include: neurologic changes due to MS (e.g., brain atrophy), stress, anxiety, fatigue, pain, spasticity (e.g., efforts to control spasticity that interferes with concentration), heat, drug side effects, depression, other medical conditions (e.g., thyroid disease, psychiatric conditions), hormonal changes (e.g., menopause), lifestyle issues (e.g., hectic lifestyle, caregiver of the elderly or young children, job stress).

Neuropsychological assessment must be correctly indicated, performed by experienced professionals, as some conditions in patients with MS may be confused with cognitive impairment. People with MS frequently experience stress, depression, and mood swings. The fact that there is no cure, unsure prognosis, can cause emotional distress. Affective disorders (as depression), may cause secondary difficulties with memory and concentration that may be falsely interpreted as direct results of MS. Affective disorders (as depression), may cause secondary difficulties with memory and concentration that may be falsely interpreted as direct results of MS [12]. Patients suffer anxiety and depression about the disease lead to lapses in memory and concentration, and in turn, the actual existence or threat of cognitive dysfunction leads to anxiety and depression. An important part of cognitive assessment is an investigation of medications, their dosages, and their possible impact on cognition. Side effects of some medications may lead to or be mistaken for cognitive problems (e.g. Amantadine, Anticholinergics/ antispasmodics, Anticonvulsants, Tricyclic antidepressants, Anti-inflammatory agents, Baclofen, Benzodiazepines [10].

The assessing the person's cognitive health by nurses is very important activity. The evaluating the patient's functional status, assessing how cognitive changes may be affecting the person's quality creates space for interventions by nursing and other health professionals [11].

Identification of cognitive strengths and weaknesses allows clinicians to give patients and their families a clearer picture of the impact that MS may have on their lives. It also allows all those involved in the care of people with MS to optimize the patient's capacity for living an independent, active life [3].

2.1 Nursing Interventions

Intervention and management of cognitive impairment requirements cooperation by specially trained health professions, such as occupational therapists, clinical neuropsychologists, clinical psychologists, or speech therapists experienced in cognitive rehabilitation. Nurses informe about specialist services of this kind and provide contact with these services, support patient in recommended rehabilitative plans similarly patient's families, carers, and other support people [9]. Nursing care professionals have identified interventions that increase or stabilize congnitive function in patients with MS.

Impaired short-term memory and new learning

- To support the use of external memory aids such as appointment diaries, lists, calendars, handheld computers, electronic diaries, daily activity logs, alarm clocks, wrist-watch alarms, pill dispenser packs, etc.
- To organize an environment (house or office) that supports the main memory prompt systems can be based (eg the diary, calendar, keys, bills that need to be paid etc). Also, ensure that frequently used items are kept in the same place, and put back each time after use.
- For learning an important new information (eg learning a new exercise routine or a new bed transfer technique), is needed to provide both written and visual aids (eg video-tapes, photos, and a written instruction sheet), and allow plenty of opportunity for supervised practice. It is important to ensure family and carers understand and learn this information too.
- To provide for short educational meetings in duration and don't cover more new information than the patient can receive (eg maybe only 3 or 4 'bits' of new information in one session).
- To verify good understanding and learning of new information before moving on to other new information [9, 3].

Impaired speed of processing and complex attention

- To allow longer time for completion of all tasks.
- To support the performance of one task at a time, rather than attempting to do two tasks at once (eg turn off the radio when cooking on a hot stove, avoid holding a conversation whilst practicing new exercises).
- To explain the avoidance of dangerous tasks that require fast reaction times for safety (eg avoid the use of power tools in the backyard shed, or the use of a scooter at high speed etc).
- To provide important information a number of times, if necessary to receive it correctly.
- To provide new instructions slowly with longer breaks between new items.

- To ensure a quiet and non-distracting environment when concentration is required (eg own closed office at work, rather than working in an open-plan environment) [9, 3].

Impaired cognitive flexibility and other executive functions such as planning, problem-solving, and decision-making

- To support the performance of one task at a time rather than switching between tasks,
- In the case of provision important new information, don't switch topics too often (can lead to misunderstanding).
- To help to determine a trusted 'problem-solving partner' for the patient, for help with important and complex decisions (eg considering changing jobs, choosing between MS treatment options, deciding when to move house).
- to appoint an enduring power of attorney or guardian while their decision-making skills are still adequate, and long before it might actually become necessary.
- To provide assistance with driving if safety is uncertain.
- To participate on formal occupational therapy assessment of potentially unsafe activities (eg preparing food, cooking, showering), to ensure safe environments and procedures in there [9, 3].

3. Conclusion

A common symptom in over half of these patients is cognitive impairment, which has economic, social, and quality-of-life implication. Cognitive dysfunction relates to lesions in the central nervous systém and can occur at any time in the disease trajectory, affecting young and older MS patients alike. The aim of health care is reducing the devastating impact over the working status, social interaction, and self-care of MS patients. Also the improvement education to patients, families, and the community should be stated as a priority, and an unmet need, where the nurse has a importatnt role with the cooperation of other members of the multidisciplinary team.

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SCREENING AND EVALUTION TOOLS FOR THE DETECTION OF COGNITIVE IMPAIRMENT IN PATIENTS WITH MULTIPLE SCLEROSIS

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Abstract: *The prevalence of cognitive impairment in multiple sclerosis (MS) is estimated to be between 40 and 65 percent. The cognitive abilities most often affected include episodic memory (recall of previously studied information, like a shopping list or story), working memory (temporary on-line maintenance and manipulation of information), divided attention (multi-tasking ability), and speed processing. Language, executive, and visuospatial functions are relatively spared. The article presents an overview of the assessment tests of cognitive impairment in multiple sclerosis, recommended by many experts in multiple sclerosis research.*

Keywords: *cognitive impairment, multiple sclerosis, detection, research, tools.*

1. Introduction

MS is commonly diagnosed during a patient's productive life period (employment years). Cognitive impairment supposes a severe problem in patient´s life. It impacts over a patient's behavior, social functioning, adaptative strategies, and profound functional limitations affecting the activities of daily living and employment [1, 2]. The large European study showed that only 35.8% of MS patients were employed. In this study was reported that low mood and cognitive impairment affecting domains like memory, attention, and slowed information processing as frequent determinants of work-related difficulties. Working memory impairment was responsible for higher unemployment rates [3]. Work life is very important for human. Employment provides higher quality of life, independence, social participation, personal and professional affiliace, financial income, health insurance, financial support for medication, and in some countries access to work benefits and social security [4]. Cognition should be a priority in treatment reducing relapses and new lesions (disease modifying treatments).

1.1 Neuropsychological assessment

It would be best if each patient underwent repeated neuropsychological assessment using validated tests to detect and monitor congnitive changes and initiate early and effective treatment. In many articles on this issue, we can read about tools designed to measure cognitive function, but not all tools are quite sensitive and useful in patients with MS.

Mini-Mental State Examination (MMSE) by Folstein in 1975, which was used for dementia, is not sensitive to MS cognitive disorders [5].

Today, testing protocols are used in neurology to assess the cognitive status of patients with MS in detail. The three most frequently used neurocognitive batteries in MS are:

- The *Brief Repeatable Battery of Neuropsychological tests (BRB-N)*, also known as Rao's battery [6], is designed for use in office practice. Approximate filling 20 – 30 min.
- The *Minimal assessment of cognitive function in MS (MACFIMS)* introduced by Benedict et al. [7], was used by neuropsychologists and in research studies as a sensitive instrument to diagnose cognitive dysfunction and detect changes in cognition over time and in response to treatment. Approximate filling 90 min.
- The *Brief International Cognitive Assessment for Multiple Sclerosis (BICAMS)*, a shorter version that was developed in 2012 by an expert team, and is recommended for small centers with one or few staff members who may not have neuropsychological training, approximate filling time 5 - 15 min. [8].

All these screening batteries meet the criteria are: sensitive, specific, and cover the most frequently affected cognitive domains and also brief.

Macías Islas and Ciampi [9] state that BICAMS should not be used within one month of recovery from relapse or within one month of steroid therapy. They recommend the order of administration as the first the Symbol Digit Modalities Test (SDMT), then the California Verbal Learning Test (CVLT-II T1-5), and then the Brief Visuospatial Memory Test Revised (BVMT-R T1-3). Multidisciplinary team (e.g., neurologists, nurses, psychologists, speech therapists, ...) to be trained to use short MS cognitive assessment batteries, such as the BICAMS.

The subtests that make up specific evaluation batteries are listed below.

The *Symbol Digit Modalities Test (SDMT)* was first published in 1982, is intended for the domain - visual processing speed and working memory. SDMT is reliable

and sensitive tool to assess information processing speed. SDMT with the possible addition of the California Verbal Learning Test-Second Edition and the Brief Visuospatial Memory Test-Revised learning trials, are preferred tests over others for psychometric qualities (reliability, validity, and sensitivity), an international application, ease administration, feasibility in the specified context, and acceptability to patients. The SDMT consists of single digits paired with abstract symbols. The patient must say the number corresponding with each symbol. The test can be administered and scored within 5 minutes. It is recommended for clinical practice and research. It is a sensitive test of information processing speed that is preferentially affected in MS patients. It is well validated against multiple MRI measures and has minimal practice effect [10, 11].

The *California Learning Verbal Test (CVLT),* is intended for the domain - auditory or verbal episodic memory, consists of a 16-item word list, with four items belonging to each of 4 categories. The list is read aloud five times in the same order to the patient, at a slightly slower rate than one item per second. Patients are required to recall as many items as possible, in any order, after each reading. The test can be completed in 5–10 min.

The *Brief Visuospatial Memory Test-Revised Learning T1-3* (BVMT-R T1-3), is intended for the domain - visual or spatial episodic memory, requires the patient to inspect stimulus array of abstract geometric figures. After three learning trials lasting ten seconds, the array is removed and the patient is required to draw the array from memory, with the correct shapes in the correct position. It is also recommended for clinical and research use and has high sensitivity, it is time efficient, and is well tolerated by patients (except for motor impairment) [11].

The *Paced Auditory Serial Addition Test (PASAT-3)*, is intended for the domain - auditory processing speed and working memory, is presented using audio cassette tape or compact disk to ensure standardization in the rate of stimulus presentation. Single digits are presented every 3 seconds and the patient must add each new digit to the one immediately prior to it. Shorter interstimulus intervals, eg. 2 seconds or less have also been used with the PASAT but tend to increase the difficulty of the task. Two alternate forms have been developed to minimize possible familiarity with the stimulus items when the PASAT is repeated over more than one occasion. The score for the PASAT is the total number correct out of 60 possible answers. Administration time is approximately 10-15 minutes including practice sessions. Although it has been widely used in clinical research and clinical trials, and it has been included within the MSFC, there are several disadvantages (limited reliability due to practice effects, susceptibility to ceiling effect, poor tolerability due to a patient's math ability, and test-related anxiety). It is not recommended for cognitive monitoring in clinical practice, nor for clinical trials designed with multiple administrations [12].

The *Controlled Oral Word Association Test (COWAT)*, is intended for the domain - expressive language, is an verbal fluency test in which the participant is required to make verbal associations to different letters of the alphabet by saying all the words which they can think of beginning with a given letter. Three letters of progressively increasing associative difficulty are presented successively as stimuls. The COWAT uses the three letter set of C, F, and L to assess phonemic fluency. Individuals are given 1 min to name as many words as possible beginning with one of the letters. The procedure is then repeated for the remaining two letters [13].

The *Judgment of Line Orientation (JLO)*, is intended for the domain - spatial processing, test is a widely used measure of visuospatial judgment that was originally conceptualized by Dr. Arthur L. Benton et al. in 1978. This test measures accuracy of angular orientation based on judgments about a pair of angled lines that visually match an identical pair immersed within a semicircular array of 11 lines. Patients are asked to indicate which two lines from the array on the bottom page of the spiral-bound stimulus book are in exactly the same position and point in the same direction as the two lines on the top page. Feedback is provided during five practice trials prior to initiating test items. Compared to the practice trials, lines in the test items have part of the line erased to increase task difficulty. A response is scored as being correct only when both lines are identified correctly [14].

The *Delis-Kaplan Executive Function System (D-KEFS)*, is intended for the domain - executive function, is the standardised set of tests to evaluate higher level cognitive functions in both children and adults. With nine stand-alone tests, comprehensively assess the key components of executive functions (including cognitive flexibility, problem-solving, conceptual reasoning, inhibition, multitasking, and nonverbal and verbal creativity) believed to be mediated primarily by the frontal lobe [15].

Oreja-Guevara et al. [16] describe two other battery bateries of tests such as *Brief Battery of Portaccio* as a short version of BRB-N that includes SRT, SDMT and PASAT-3 and *Short Neuropsychological Battery (BNB)* as a Spanish version which includes a verbal episodic memory test, SDMT, several verbal fluency tasks and an adapted version of the PASAT test in which the patient is allowed more time. Visual-spatial memory is not evaluated. It requires a shorter time of application than the BRB-N.

Kalb et al. [17] state validated screening and evaluation tools used in MS processing, following *Speed Test (PST)* – 5 minutes, it is a self-administered iPad®-based tool, *Computerized Speed Cognitive Test (CSCT)* - 5minutes, performed orally, correlates highly with the SDMT and has high sensitivity for predicting processing speed impairment and *Multiple Sclerosis Neuropsychological Screening Questionnaire (MSNQ*) - 5minutes, includes a self-report component that correlates more highly with

anxiety and depression than cognitive performance and an informant component that correlates more highly with cognitive performance.

1.3 Main reasons for assessment of cognition state in patients with MS

Cognitive impairment:

- predicts limitations in the workplace and in social settings independent of level of physical disability and change in vocational status seven years later,
- patients are more likely to be unemployed and to score lower on measures of quality of life,
- is related to work problems (verbal reprimands and the need for extra training in employed MS patients) - at risk condition prior to job loss,
- patients perform more poorly on everyday life tasks (e.g. internet use),
- in children and teens is associated with lack of age-appropriate cognitive development and school difficulties, including grade retention, social challenges, depression, and behaviour problems,
- slowed processing speed and impaired visual–spatial memory impair driving ability and safety,
- patients with mild physical disability perform less well on some tests of driving functions - higher risk of an accident,
- deficits are associated with poor adherence to treatments,
- patients have significantly reduced money management skills compared to the cognitively unaffected,
- causes distress of caregivers and a reduced quality of life related to their partner´s cognitive impairment and psychiatric symptoms,
- causes slowed information processing speed in patients and can be possible associated with more severe depressive symptoms and reduced quality of life in their family caregivers [17].

2. Conclusion

Cognitive function assessment should be included in the standard clinical evaluation and clinical trials involving MS patients, and treatment strategies should be implemented as supported by current evidence. According National Multiple Sclerosis Society, the establishing high standards for the assessment and treatment of cognitive dysfunction is it possible to bring treatment of cognitive dysfunction up to the standards set in other areas of MS care and ensure that people with MS and their families receive adequate care in this critical domain. After the discovery of barriers in the diagnosis and management of cognitive deficits, experts in this field propose:

- to raise awareness of patients, their families, clinicians, school personnel about cognitive changes and their impact on daily activities, participation, and relationships, medical decision-making, and adherence,
- to intensify cooperation between the patient and the provider for the early and ongoing evaluation of changes and problem solving,
- to increase a numbers of adequately trained clinicians to offer screening, assessment or remediation [17].

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WOUND MANAGEMENT OF PERISTOMAL SKIN COMPLICATION

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Abstract: *To ensure the quality of life of the ostomy patient, systematic help of nurses is key in rehabilitation and prevention of complications (retraction, hernia, peristomal dermatitis). Objective: The paper focuses on a clinical case for the treatment of a dermatitis complication in ileostomy. Method: A qualitative study, case-study describes a patient admitted to the Department of Surgery for postoperative peristomal dermatitis after diverticulum perforation and subsequent peritonitis with underwent temporary ileostomy, based on an individual interview and physical examination. Results: Indifferent patient access to health treatment and disrespect (nursing) procedure necessitated repeated hospitalization. Conclusion: Before releasing the patient to home care and regular check-ups, the nurse should check the social conditions of the patient-ostomist and his ability to manage the care of the stoma or his family members. In the case of a risk patient, to provide treatment at home by a nurse who will continuously monitor the willingness and participation in ostomy treatment, or offer the help of another specialist in order to address addictive behaviour.*

Keywords: *periostomal dermatitis, ileostomy, treatment, nursing care*

1. Introduction

Peristomal skin complications affect 18%–73% of patients [1]. Keeping the peristomal skin intact proves to be a challenge for the patients, their caregivers, and the health care teams that work with them [2]. Ileostomies (particular loop ileostomies), are responsible for the greatest proportion of peristomal skin complications. Complications cause mild irritation or full thickness ulcerations leading to pain, anxiety, and in some cases significant social isolation related to the pouching system leaks. Choice of treatment strategy range from simply using different pouching systems, to a change in local care regimen, to applying systemic medications if the cause of the complications is related to a systemic disease process, and in in exceptional cases surgery may be necessary [3]. Common characteristic of peristomal skin complications is leaking of the pouching system, but there are a many of variables that can cause this problem (as stoma type, size, improper placement of the stoma on the abdominal wall) and consequently irritation of the skin. Loop ileostomies represent the greatest proportion of peristomal skin complications in patients, because often empty effluent close to the skin because the stoma itself frequently does not protrude sufficiently, it is too flat. It is not uncommon for the loop ileostomy to further decline in the abdomen against an end ileostomy.

Skin complications can related to the pouching system products. Mechanical trauma on peristomal skin or the hair follicles may occur due to repeated removal of the adhesive flanges and skin barrier products. Patients with sensitive skin or allergies may find that any number of the pouching system products may cause dermatitis. Flanges, paste, barrier rings, even the plastics of the drainable pouch clips may cause burning, redness. Peristomal skin complications may evolve from immunological or disease-related processes. Fungal infections, peristomal fistulae, peristomal pyoderma gangrenosum are next pathological lesions cause difficulty in adhering to the bag and may be complicated by the discharge coming into contact with the skin [4]. Skin-related complications are the most common type of stoma complications, considerably disrupt quality of life [5]. Peristomal skin complications require from patients a adaptation to their new life, to long-lasting pain; in some cases to social isolation. Changes in life can include reduced contact with family and friends, disruption in sleep, reduced general activity, and financial burden. Patient is exposed many stressful factors that cause anxiety and embarrassment [6].

2. Objective and method

The paper focuses on a clinical case for the treatment of a dermatitis complication in ileostomy. A qualitative study, case-study conducted in March 2020. In the case report, we analyze a 62 - year - old man who developed a skin complication due to neglect of nursing care in the home environment. Patient selection was targeted. The criteria for the selection of respondent were: a person older than 18 years, a person with a peristomal skin complication, the patient's written consent to participate in the study, a patient hospitalized in FNsP J. A. Reiman, Slovakia.

3. Case study

3.1 Anamnesis

A 62-year-old man, he lives with his wife, unemployed, in the past he worked as a mason.

Main medical diagnosis: Colon diverticulitis with perforation, abscess and bleeding (2020), other medical diagnosis: Chronic obstructive pulmonary disease, unspecified, Arterial hypertension, without hypertensive crisis, Varices of lower limbs, Mild anemia, Postoperative condition for gastroduodenal ulcer disease (2006), Condition after stroke with left mild hemiparesis (1/2019),

mobile alone, Alcoholic liver disease (alcohol is used regularly), Nicotinism (40 years 20 cigarettes a day).

3.2 Katamnesis

On February 12, 2020, the patient observed the presence of blood in the stool, abdominal pain intensified, the patient had a fever of 39°C, he could not even move due to the pain, he was generally conceived. The wife called the emergency ambulance and the patient was brought to the emergency department. On urgent intake, painful plate abdomen (defense musculaire), shock, patient with arterial hypotension, tachycardia and hyperpyrexia. Signs of diffuse peritoneal irritation were present and fluid resuscitation was performed on the patient. Biological material was taken from the patient for laboratory examination tests - biochemical and hematological (pathological indicators: CRP - 259 mg / l, WBC - 2400x109 / l, ALP - 15.42 μkat / l, GMT - 5.10 μkat / l, HBG - 104g / l, RBC - 3.2x1012 / l). The patient underwent a chest and abdomen X-ray. An X-ray of the abdomen shows a picture of pneumoperitoneum and an indicated urgent laparotomy, with the finding of a perforated diverticulum in the area of the sigmoid colon, with a roll of intestinal contents into the abdominal cavity. The patient underwent lavage of the abdominal cavity, resection of the affected part of the colon, and subsequently the patient underwent a temporary ileostomy. The patient's condition after surgery had a normal postoperative course, without complications. On February 27, 2020 (15th postoperative day), the patient left home at his own request, despite instructions from doctors about the occurrence of possible complications, he still demanded discharge and signed a reverse.

During education, the patient was unable to learn how to treat stoma on his own, due to an inability to understand information and an apathetic approach. Therefore, his wife, who lives in the same household with him, was approached to come to the education and presentation of all the aids that the patient receives in the starting bag for ostomists after leaving for home care. The bag contains aids for one month. The patient's wife was invited to education, who came in a drunken state. Education passed without apparent interest, and the patient went home nevertheless.

After four days, on March 2, 2020 (19th postoperative day), the patient went to the hospital for hospitalization due to complications in a drunk condition and without an ostomy bag. According to the patient, the peristomal skin was inflamed, macerated, erythematous, the used ostomy bag did not hold and undeflow. In the patient thus developed contact irritant dermatitis due to an unreliable approach to stoma treatment, because the skin was constantly exposed to the irritating contents of the small intestine from an ileostomy.

3.3 Analysis and interpretation

Nursing procedures are varied and individualized as well as different types of stoma. It is very difficult to establish cooperation with patients who refuse information. Difficult surgery and finding out the postoperative consequences is a psychologically demanding life situation. After 8 days hospitalization at the surgery department, patient had a significant improvement in the peristomal area.

1st - 2nd day of hospitalization

Patient re-admitted to the surgery department to treat a skin defect around the stoma. The patient complained of redness, itching, burning and wetting of the skin around the stoma. The patient answered the staff's questions hesitantly or inappropriately. Large erythema was observed near the performed stoma.

Intervention

- was informed about the house rules in the ward,
- the patient was ordered to exercise regimen B,
- had a prescribed diet - low-residue and observed fluid balance,
- was inserted a permanent urinary catheter by doctor,
- had an inserted peripheral venous catheter under aseptic conditions,
- were performed input samples of biological material and measured vital functions (values were recorded: BP -130/90 mmHg, P - 74/min., TT - 37.1°C, B - 16/min., height: 183 cm, weight: 85 kg),
- was showered with povidone iodine soap and body foam (twice a day), subsequently was applied superoxidized solution compresses to the affected skin every 2 hours (for antimicrobial, anti-inflammatory and regenerative effect),
- the stoma drained the mustard-yellow stool (4 times a day, in an amount of about 100 ml),
- after treatment of the peristomic skin, a protective film based on 100% silicone was applied (protects the skin from aggressive intestinal contents and at the same time improves the adhesion of the device),
- was glued an one-piece drain bag with a filter,
- patient was thoroughly instructed in every nursing act,
- patient was given prescription therapy (s.c.: Fraxiparine 0.6 ml, per os: Ebrantil 60 mg 1-0-1 tbl, Oxazepam 10mg 0-0-1tbl, Reasec 2.5 mg 1-1-1 and i.v.: Novalgin 1 gv 100 of 0.9% NaCl as necessary to control pain).

3rd - 4th day of hospitalization

- ordinary samples of biological material were performed - blood count, Cl, Na, K, CRP,
- clean bed linen was replaced,
- patient showered with clean water without the use of foam,
- was used an ostomy bag with a shapeable technology, stomy treatment was supplemented with a healing and filling paste (prevents underflow and protects the skin),
- patient cooperated in the treatment and asked questions,
- he ate independently,

- patient´s diets was prescribed a protein supplement once daily.
- he was constantly offered fluids,
- the peripheral venous catheter was replaced (prescribed treatment applied),
- the stoma drained the mustard-yellow stool (2 times a day, in an amount of 60 ml),
- stoma and peristomal skin treatment was continued according to standard procedures,
- patient reported relief of burning and itching in the peristomal area,
- due to the circumstances that preceded the patient's deteriorating condition and his regular alcohol consumption, a psychiatric counseling was held for him,
- during the night, the patient slept peacefully, did not wake up.

5th - 7th day of hospitalization

- the stoma and skin care process continues unchanged (showered and washed with cleansing foam, superoxide solution applied every 3 hours, skin applied with a protective film, used bag with mouldable technology, used paste to fill the gaps between the pad and the stoma area),
- changes in the remission of dermatitis were observed, which was also confirmed by the patient. bed linen has been changed,
- the patient's pharmacotherapy was unchanged,
- permanent urinary catheter still functional,
- the stoma drained the thin contents and did not underflow (2x-3x daily in an amount from 100 ml),
- he patient was involved in ostomy care with each treatment, but the patient did not show interest,
- an interview was conducted with the patient regarding the issue of treatment and adaptation to a new way of life, not only in the area of the stoma but also in the overall lifestyle,
- communication with the patient was poor, and his behavior was rather passive,
- the patient was provided with brochures with information on ostomy treatment and home nursing agencies.he patient's emotional state was variable.

8th day of hospitalization

- objectively, a significant remission of erythema in the peristomal area was observed, without inflammatory manifestations, the skin was dry and the patient verbalized the disappearance of burning sensations,
- the patient was transferred to the long-term care unit with a recommendation on how to continue to treat the ostomy.

4. Discussion

Patients with a stoma face a variety of physical and psychological challenges. Adapting to life with a stoma after surgery is not easy. It is widely accepted that correct stoma marking, surgical construction and careful follow-up are important factors in the prevention of stoma related complications. It has also been proved that instruction by a stomatherapy nurse prior to surgery leads to significantly better results in physical and psychological domains [7]. Proper preparation, advice, the right products and support lead to success. The stoma for the patient became a life-saving procedure that was acute. The preparation and necessary education before the operation in the patient was not performed due to the urgency of the operation. We suppose that this has also contributed to to resign the patient and not participate in ostomy care. The patient did not have the space to make decisions and ideas about a possible way of life with stoma. The treatment chosen for the patient was tolerated by the patient and effective in the outcome. In this case, we have confirmed the fact that we can achieve healthy peristomal skin through responsible approach in self-care, regular hygiene measures, careful daily treatment. The skin treatment was performed by nurse – specialist on the basis of the current knowledge from research, clinical practice and the recommendations of world societies for ostomy prevention and management. Patients with intestinal stomae may report more impaired self-image and relationships with family and friends than patients with urostomy. The assumption may be related to the excretion from the stoma. From the urostomy, the excretion is more tolerable on the skin and visually, has less effect on personal hygiene and is easier to handle in case of leakage. Intestinal stoma also have the problem of audible flatus, which is absent in urostomy [8].

The level of self-care was disturbed before the operation due to the trivial lifestyle. This lifestyle problem has led to neglect of self-sufficiency and inability to take care of oneself, and despite efforts to help the patient, he refuses to change his lifestyle, making it impossible to cooperate. Alcohol dependence plays an important role in a patient's life, what leads to apathy attidue and non-compliance of instructions in ostomy care.

Another factor that contributed to the lack of care for the ostomy is the low support from the family (wife). The family is a support system in coping with a new life change. Family members were not interested in participating in education during the patient's first hospitalization, and during rehospitalization, visiting hours for family members were banned due to the unfavorable epidemiological situation in the Slovak Republic (COVID - 19). Despite the restriction of personal contact with the family, the patient was in contact with his wife through telephone calls. Patients with stoma face potential psycho-social problems, such as impaired body image, impaired social interaction, sexual dysfunction. From the point of view of nursing, we determined the following nursing diagnoses for a specific patient: impaired skin integrity, altered skin appearance, lack of knowledge, self-care deficit, loss of appetite, insufficient cooperation of the individual, lack of interest in information, disrupted family relationships. In order to provide quality nursing care and to create space for complete skin healing and the acquisition of skills in ostomy care, the patient was transferred to the long-term care department.

The mentioned nursing case report presents the important position of the nurse in the management of peristomal complication. The nurse's erudition, clinical experience and knowledge of the number of products (types of coverage) and ostomy care aids and tactful and gentle approach have led to improved skin healing and patient´s quality of life. However, after hospitalization, the patient requires long-term monitoring of health status and acquired skills in ostomy care. Comprehensive care should also include the intervention of a psychiatrist or psychologist, a field nurse providing home nursing care.

5. Conclusion

A peristomal skin complication could be prevented in a patient if he followed a proper lifestyle and if he had someone who could take care of him. Willingness to change attitudes towards one's own health and follow the recommendations of health professionals can help to improve the quality of life. In the future, in order to increase the patient's self-sufficiency in care and regular control of the stoma, it is necessary to provide a nurse from a home nursing care agency as a key person who helps to accompany the patient through life with the stoma.

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MOBILITY AS AN IMPORTANT FACTOR OF QUALITY OF LIFE IN THE ELDERLY

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Abstract: *Introduction:* Quality of life in older people is significantly influenced by their mobilization. Using the statistical comparison of observed groups we found out that the mobilization of elderly and geriatric patients improves their quality of life. *Methodology:* We used nonparametric Mann - Whitney test as an evaluation method. To determine relations between variables we used the Spearman correlation coefficient. *Results:* Geriatric patients have shown rates of mobility in the BREF questionnaire (item 15) and ADL test at the same level. *Discussion:* Physical activity represents a significant attribute of mobility in seniors, which confirmed the results of foreign studies. Reduced mobility is a maximum barrier in hospitalized geriatric patients. The positive overall impact of physical activity was reflected in increased confidence of seniors in their own abilities. *Conclusion:* In nursing there must be a continuous mobilization of geriatric patients according to their degree of dependence.

Keywords: *mobility, quality of life, geriatric patient, ADL test.*

1. Introduction

Currently, about 650 million people over the age of 65 live in the world. In 2050, for the first time in human history there will be more seniors than children under 15, and one in five people in the world will be a senior. At the present rate, seniors over 65 will make up 35% of the population of Slovakia in about 50 years. With an ageing population and improved quality of health care, the needs of seniors' lives have changed and there is now an assumption of integration through active ageing [1].

Limitation of physical activity, presence of chronic illness and old age does not always mean a decline of life quality. Benefits for the old people can produce the supporting factors, such as social integration, optimism, confidence and desire to lead a fulfilling life and so on. It means in practice that the objective medical findings may not explicitly agree with the current psychological and social state of geriatric patients. Patient satisfaction is one of the important indicators of health care quality. The current philosophy of nursing care is a priority focuses on meeting the needs of the patients, especially as they relate to the actual disease. Quality of health care and patient satisfaction tracking results are good feedback for caregivers and health facility management. It is well documented that physical activity (PA) can reduce the risks of chronic diseases and contribute to the enhancement of physical function and maintenance of independence for older adults [21–23]. Overall, the PA level decreases with ageing, and only 12%. With a rapid increasing numbers of older adults in the next centuries, lowcost and home-based rehabilitation programs need to be examined to decrease the factors associated with needy elderly being able to live independent and self-reliant of health-care services [2, 3].

The physical and mental quality of the individual gradually decline and old age is burdened by polymorbidity and deterioration of physical fitness and self-sufficiency. For seniors living in the institutional environment the ability to be independent is a very important factor that affects their quality of life [4, 5].

1.1 Methodology

Our goal was to identify the extent to which mobility is correlated with quality of life of geriatric patients and residents in facilities for seniors. We assumed that the mobility of geriatric patients and residents in facilities for seniors is an important aspect of their overall assessment of quality of life and will significantly differ between groups.

In our work we used the causal comparative research. To confirm the results of the research methods we used descriptive statistics. Our research was carried out with a total number of 346 patients in the geriatric departments at the University Hospital with Policlinic of J. A. Reiman in Presov and the Hospital of St. James in Bardejov, together with facilities for elderly people in the same cities. To determine the individual components of research, we used the method of obtaining data using a standardized questionnaire: quality of life questionnaire WHOQOL - BREF questionnaire and the daily activities of daily living - ADL test. The two questionnaires were filled in with each patient/seniors individually and we respect the particularities of senior age, especially sensory impairment (changes in vision, hearing, etc.). The average length of stay in facilities for the elderly was 13.8 months (SD 1.29). For statistical comparison of observed groups, we used the test for 2 independent selections, Mann - Whitney test. This non-parametric methodology has allowed us to detect statistically significant differences between groups in measured parameters. To determine relations between variables, we used the nonparametric Spearman correlation coefficient.

1.2 Results of the study

Here are the results of the examination of significant differences between the groups in mobility, saturated No.15 item questionnaire WHOQOL - BREF and mobility item ADL questionnaire (tab. 1).

Table 1 Statistical results of difference investigation between the two groups identified by Mann - Whitney test

	Geriatric patients		*Facilities for seniors*		
Variable	M	SD	M	SD	z
BREF 15	2,64	1,25	3,22	1,17	- 4,761***
ADL moving	2,64	1,45	2,33	1,48	- 2,541**

Legend: significance level: * p < .05; ** p < .01; *** p < .001.

Based on the above results we can conclude that patients in facilities for the elderly are clearly better moved (item No. 15), but currently show a lower rate of mobility in the ADL test due to greater use of assistive devices in walking (crutches and wheelchairs). We assume that this is a consequence of chronic medical complications in this group. Geriatric patients have shown rates of mobility in the BREF questionnaire (item No.15). and ADL test at the same level. This demonstrates that the mobility and self-sufficiency in these patients are equally perceived items (tab. 2 and tab. 3).

Table 2 Statistical results of Spearman correlations among the survey items as WHOQOL - BREF 15, ADL mobility and total score of WHOQOL - BREF in geriatric patients

	BREF 15	*BREF gross score*	*ADL mobility*
BREF 15	-	0,647***	- 0,674***
BREF gross score	0,647***	-	- 0,432***
ADL mobility	- 0,674***	- 0,432***	-

Legend: significance level: * p < .05; ** p < .01; *** p < .001.

Table 3 Statistical results of the survey items among Spearman collerations as WHOQOL - BREF 15, ADL mobility and total score of WHOQOL - BREF for residents in facilities for seniors

	BREF 15	*BREF gross score*	*ADL mobility*
BREF 15	-	0,475***	- 0, 785***
BREF gross score	0,475***	-	- 0,319***
ADL mobility	- 0, 785***	- 0,319***	-

Legend: significance level: * p < .05; ** p < .01; *** p < .001.

From the above results in geriatric patients we can see that greater mobility in the questionnaire WHOQOL - BREF, line 15, it is positively correlated with the overall quality of life scores of the questionnaire and negatively correlated with the value of mobility in the ADL questionnaire. Similar findings were confirmed in a group of residents in facilities for seniors. It follows that greater mobility increases the overall value of quality of life in both examined groups.

2. Discussion

Physical activity represents a significant attribute of mobility in seniors, what was confirmed by the results of foreign studies. Those aspects (impact of physical activity on quality of life) in a community of old people were found by White et al. in USA [6]. He assessed the physical activity, personal productivity, global quality of life, ranking their own values and boundaries of disability in a sample of 321 participants. The author found in the surveyed sample that the ranking of personal values affect the relationships between physical activity and quality of life in seniors. Another author, McAuley et al. tested a number of alternative models of physical activity and relationships of life quality in the community of old men and women. Physical activity scale was valued by PASE (Physical Activity Scale for the Elderly). Values of life were measured by a modified version of ESS (Exercise Self-Efficacy Scale). Physical health was measured by the instrument of LLF-DI (Late Life Function and Disability Instrument). Global quality of life was valued by the standard range SWLS (satisfaction with life scale). Using descriptive statistics he found that age (p = .05) was significantly associated with physical activity (β = .34), with its own performance (β =.30), with personal values (β = .22) and satisfakciou (β = .12). He pointed to the fact that personal values play an important role in the results of physical activity and subject to the quality of life indicators. However, investigated relations dependent on the impact of demographic factors. Based on these findings, the author proposes programmes to improve physical activity. It also reaffirms the values that seniors get physical exercise, change their view of their disability status.

The above-mentioned foreign studies, show that mobility is a central aspect of quality of life in all seniors. They agree with an evaluation of our research, where mobility is essential to the quality of life in seniors, the level of significance: p <.001. High probability of finding "provokes" us to create the similar programmes to improve mobility as autor suggested in research [7]. Physical activity is important for the health and quality of life of the elderly.

Turkish study included 214 voluntary elderly individuals who were living in the nursing home or in the community. Inclusion criteria were a) age ≥65 years, b) literate. Exclusion criteria were a) dementia or cognitive disorders, b) bedridden, c) acute illness. Individuals living in nursing homes were evaluated by visiting nursing homes.
Participants completed the PABS-E, International Physical Activity Questionnaire (IPAQ) and Nottingham Health Profile (NHP). The mean PABS-E total score was 49.6±14.3. The PABS-E test–retest correlation was 0.869 (p<0.001). The test–retest correlation scores for the personal factors, environmental factors and daily routines subscales were 0.833, 0.866 and 0.538, respectively (p<0.001). Cronbach's alpha coefficients for the PABS-E, personal factors, environmental factors and daily routines subscales were 0.918, 0.906, 0.863 and 0.655. PABS-E is

advantageous because it evaluates physical activity barriers multidimensionally and is suitable for elderly people with different characteristics. The higher scores were taken from item 24 (tiring quickly), item 26 (fear of falling), item 12 (inadequate physical condition) and item 1 (difficulty in walking). Autors found a positive correlation between QoL and the PABS-E score. In particular, the correlation coefficient between personal factors and NHP score was high. This suggests that excessive physical barriers exert greater effects on QoL. Actions directed at increasing QoL should focus on physical and move barriers [8].

Mobility declines and balance are important modifiable risk factors associated with falls in seniors. Preserving functional mobility and independent lifestyle in later years depends to a large degree on how well older adults maintain functional capacities such as muscular strength, aerobic endurance, flexibility, agility, and dynamic balance. The representative cross-sectional study included 802 individuals, 401 males and 401 females (69.8 ± 5.6 years) from Madeira, Portugal. The Fullerton Advance Balance (FAB) scale was used to assess balance. Mobility in terms of gait velocity, cadence, stride length, and gait stability ratio (GSR) were assessed using the 50-foot Walk test. Physical activity was assessed through a face-to-face interview using the Baecke questionnaire, and functional fitness was assessed with Senior Fitness tests. Bivariate correlations showed that balance (FAB) was negatively associated to age, sex, and BMI, and positively related to physical activity and all three functional components, example., body strength, flexibility, and aerobic walking endurance. For cadence, the correlations were negatively related to age and were non-significant for BMI [9].

Movement is the basis of quality of life of older people. We propose to create a movement therapy group, which would be carried out under the supervision of senior nurses and physiotherapists. The role of nurses would be the monitoring of physiological functions the overall health of senior, but also his positive motivation. Responsibility of physiotherapists would be drawing up by plans for senior exercises. Nurses woud be carried out the selection of seniors sent for completion of therapy by the available functional tests.

When investigating a specific geriatric patients (compared with those obtained by children and young patients) comprehensive geriatric examination includes internal clinical examination, mental health examination, examination of functional skills - self-sufficiency in activities of daily living (ADL test) and activities, ensuring independent functioning of the elderly (IADL test) and social situation and living way - relationships, finances, social environment and other [10].

In the framework of a comprehensive geriatric examination many measurements and scales are used. Screening test for mobility is known to determine mobility, muscle strength, stability and agility. Specific interventions comprehensive geriatric examination could be transformed into a nursing course within the competence of nurses. As Assessment scale indicator is used assessing changes in health status of people, while changes can be measured directly or indirectly, and evaluation is often performed by the numerical sum. Individual assessment of geriatric patient intervention in the nursing process should be included in the particular practice of his examinations.

The authors showed that most people refer physical activity but also autonomy, interest in life, coping with challenges, and keeping up with the world [11].

3. Conclusions

Geriatric age is characterized by many specifications, but the satisfaction of hospitalized patients is an important indicator of quality care from the perspective of nursing. In nursing there must be a continuous mobilization of geriatric patients according to their degree of dependence. It is also necessary to develop training programmes for geriatric patients in collaboration with physiotherapists to create so-called movement therapy group and to ensure enough tools to increase self-sufficiency in activities of daily living (their continuous use).

The Active Ageing Model. The concept of active ageing is based on three pillars mentioned in the definition: participation, health, and security. The proposed model encompasses six groups of determinants, each one including several aspects:

1. health and social services (promoting health and preventing disease; health services; continuous care; mental health care);
2. behavioral (smoking; physical activity; food intake; oral health; alcohol; medication);
3. personal (biology and genetics and psychological factors);
4. physical environment (friendly environment; safety houses; falls; absence of pollution);
5. social (social support; violence and abuse; education);
6. economic (wage; social security; work), embedded in cultural and gender context,with recommendations for health policy for old people, to be implemented through national health plans all over the world, during the first decade of the XXI century [12].

Chaves et al. [13] studied the predictors of normal and successful ageing in urban old Brazilians and found 62% successful old people that fulfill the criteria of health and independence, differing from “normal” ones, namely, in the amount of leisure activities. When explicitly exploring the concept of active ageing [13]. Autor] reported that a third of respondents rated themselves as ageing “very actively” and almost a half as “fairly actively.” The most common perceptions of active ageing were having/maintaining physical health and functioning (43%), leisure and social activities (34%), mental functioning and activity (18%), and social relationships and contacts

(15%). The predictors of positive self-rated active ageing were optimum health and quality of life. According to the WHO document on active ageing, the key aspects of active ageing are:

- autonomy which is the perceived ability to control, cope with, and make personal decisions about how one lives on a day-to-day basis, according to one's own rules and preferences;
- independence, the ability to perform functions related to daily living—that is the capacity of living independently in the community with no and/or little help from others;
- quality of life that is "an individual's perception of his or her position in life in the context of the culture and value system [14].

In overall, successful ageing, active ageing, and other related terms as positive ageing or ageing well are viewed as scientific concepts operationally portrayed by a broad set of biopsychosocial factors. The challenge of active ageing is functioning health and independent [15].

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CORRELATION BETWEEN DYSLIPIDEMIA AND INFLAMMATORY MARKERS IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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Abstract: *Cardiovascular disease (CVD) is a major cause of morbidity and mortality in patients with systemic lupus erythematosus (SLE). The necessity to improve patient survival has led to the definition of the cause of coronary artery disease in these patients. The basic features of CVD include accelerated atherosclerosis and hyperlipidemia, the prevalence of which occurs in the range of 30-73% in SLE patients. The common denominator in atherosclerosis and SLE is chronic inflammation. Accelerated atherosclerosis is observed to a greater extent in SLE patients with lupus nephritis (LN). In our work, we observed correlations between lipid levels (TC, TG, HDL, LDL, VLDL, APOA, APOB, LPA) and CRP and markers that stimulate CRP production, as IL1, IL6 and TNF α. The group of patients consisted of 89 patients (19 men and 70 women) with SLE diagnosed on the basis of ACR SLE criteria at the National Institute of Rheumatic Diseases in Piešťany. We divided the patients into groups with and without lupus nephritis, while we statistically evaluated the measured values in these two groups. Statistical evaluation of lipid parameters with inflammatory factors and cytokines in patients with LN showed a positive moderate correlation between CRP and VLDL (R = 0.44), CRP and TG (R = 0.44), CRP and ApoB (R = 0 , 43) and a moderate negative correlation was between HDL and CRP (R = -0.41). We did not measure any correlation in patients without LN. Among patients with LN and without LN nephritis, we did not observe any statistically significant difference in the lipid profile.*

Keywords: *SLE, cardiovascular disease, dyslipidemia, inflammatory markers*

1. Introduction

Systemic lupus erythematosus (SLE) is a heterogeneous disease that mainly affects young women (90%). In modern society, cardiovascular disease (CVD) is the leading cause of premature mortality. SLE is associated with a shorter life expectancy compared to the general population. Overall, the excessive risk of CVD has been shown to be 2- to 10-fold higher than in the general population. The standardized mortality ratio (SMR) is 2.4, which is comparable to diabetes. Accelerated atherosclerosis is generally thought to be the underlying cause of SLE-related CVD [1]. Atherosclerosis is a chronic disease of the arterial wall involving congenital and adaptive immune-inflammatory mechanisms involved in the formation of early fatty streaks, activating the endothelium, which expresses chemokines and adhesion molecules, leading to monocyte and lymphocyte uptake and infiltration into subendothelium. It also acts at the onset of adverse vascular events, when activated cells in the plaque secrete matrix proteases, which degrade extracellular matrix proteins and weaken the fibrous occlusion with rupture and thrombus formation. Cells involved in the atherosclerotic process secrete cytokines. The mechanisms of atherosclerosis provide evidence that the immune inflammatory response in atherosclerosis is modulated by regulatory pathways in which IL10 and the transforming growth factor TGF-β play a critical role. Cytokines, the major regulators of the innate and adaptive immune response, which are known to regulate and coordinate many conditions of atherosclerosis, especially IL1, IL6, IL10, IFN-gamma and TNF-alpha, are highly expressed in atherosclerotic regions [2]. Among traditional atherosclerotic risk factors, dyslipidemia is believed to decisively affect the long-term prognosis of lupus patients, not only with regard to cardiovascular events but also by influencing other manifestations, such as lupus nephritis. The prevalence of dyslipidemia in systemic lupus erythematosus (SLE) ranges from 36% at diagnosis to 60% or even higher after 3 years, depending on definition. Dyslipidemia has a clear impact on clinical cardiovascular disease and surrogate markers for subclinical atherosclerosis. Moreover, it negatively affects end-organ damage (kidneys and brain) [3]. Although risk factors for CVD have been identified, the pathophysiological mechanism is not fully elucidated and the link between SLE activity and atherosclerosis is missing. There are similar features in the pathogenesis of both diseases. The common denominator is chronic inflammation - the role of pro-inflammatory cytokines. Circulating TNF alpha levels are elevated in patients with SLE and are also associated with the presence of calcifications in coronary arteries [4] and higher triglyceride (TG) levels and low levels of HDL [5]. Controlling levels of lipid metabolism parameters may be useful in treatment strategies and may favorably affect patient survival.

2. Material and Methods

The group of patients consisted of 89 patients (19 men and 70 women) with SLE diagnosed on the basis of ACR SLE criteria at the National Institute of Rheumatic Diseases in Piešťany, with an average age 45 years. We divided the patients into groups with and without lupus nephritis, After blood collection from the patients, the parameters of lipid metabolism, CRP and cytokines were determined. Lipids were assayed on Cobas Integra with reagents from

Roche Diagnostic. TC, HDL, LDL, VLDL and TG are determined by enzymatic colorimetric method-photometry. Apo A, ApoB and Lp(a) were measured by immunoturbidimetry. We calculated the atherogenic index (IA) according to the formula:

$$IA = (TC\text{-}HDL)/HDL$$

Where, *TC*= Total cholesterol and *HDL*= High density lipoprotein

CRP and cytokines. We determined CRP and cytokines on Cytokine & Growth Factors High Sensitivity Array and Metabolic Syndrome Array II biochips from RANDOX on a RANDOX Evidence Investigator. VLDL Data were recorded, analyzed and expressed as mean ± standard deviation. For statistical analysis was used fTEST and Pearson´s corelation coeficient, "p" values less than 0,05 were considered statistically significant.

3. Results

Table 1 shows the complete mean results of lipid metabolism, CRP and cytokines in SLE patients with and without LN. The above data show that in our group we did not observe any statistically significant difference between the average values of the parameters in these two groups. Statistical evaluation of lipid parameters with inflammatory factors and cytokines in patients with LN showed a positive moderate correlation between CRP and VLDL (R = 0.44), CRP and IA (R=46), CRP and TG (R = 0.44), CRP and ApoB (R = 0 , 43) and a moderate negative correlation was between HDL and CRP (R = -0.41). We did not measure any correlation in patients without LN.

Table 1 Statistical evaluation of SLE patients with and without LN

Parameter		*Average ± SD*	*Median*	*Min - max*	*P - value*
TC	With LN	5,56±1,07	5,63	2,60-7,52	P>0,05
	Without LN	5,39±1,36	5,35	3,04-9,23	
HDL	With LN	1,60±0,56	1,52	0,71-3,53	P>0,05
	Without LN	1,58±0,54	1,53	0,76-2,98	
LDL	With LN	3,59±1,02	3,81	1,60-5,44	P>0,05
	Without LN	3,59±1,18	3,81	1,60-5,44	
VLDL	With LN	0,68±0,40	0,54	0,22-1,96	P>0,05
	Without LN	0,68±0,30	0,61	0,21-1,47	
IA	With LN	2,79±1,28	2,53	0,70-6,54	P>0,05
	Without LN	2,69±1,37	2,36	0,73-7,00	
TG	With LN	1,50±0,87	1,20	0,48-4,31	P>0,05
	Without LN	1,49±0,66	1,35	0,47-3,24	
APOA	With LN	1,65±0,34	1,58	0,96-2,61	P>0,05
	Without LN	1,65±0,38	1,72	1,10-2,67	
APOB	With LN	1,22±0,41	1,23	0,63-2,80	P>0,05
	Without LN	1,11±0,34	1,05	0,62-1,77	
LPA	With LN	56,32±90,70	18,20	0,80-358,20	P>0,05
	Without LN	72,03±117,90	19,20	0,50-630,20	
IL1A	With LN	0,37±0,11	0,39	0,06-0,63	P>0,05
	Without LN	0,39±0,15	0,37	0,12-1,01	
IL1B	With LN	1,66±0,27	1,64	1,22-2,36	P>0,05
	Without LN	1,55±0,44	1,59	0,43-2,87	
IL6	With LN	2,20±1,36	1,71	0,64-6,88	P>0,05
	Without LN	3,30±1,08	2,12	0,69-16,26	
TNFA	With LN	2,49±1,01	2,17	1,19-4,92	P>0,05
	Without LN	2,53±1,16	2,15	0,85-6,00	

4. Discussion

Mortality in patients with SLE represents a 3-fold increase in the risk of cardiovascular death in patients with SLE and an 8-fold increase in the risk of mortality associated with renal failure compared to the general population. [6]. The basic definition of dyslipidemia is a disorder of lipoprotein metabolism, including lipoprotein overproduction or deficiency. Dyslipidemias can be manifested by an increase in total cholesterol, a low-density lipoprotein, an increased concentration of triglycerides, and a decrease concentration of HDL in the blood, which some authors refer to as a lupus model of dyslipoproteinemia. Several studies of dyslipidemia in SLE patients and its effect on CVD have shown that elevated TC levels are an independent predictor of CVD, but unexpectedly LDL was not an independent factor for CVD [7]. Studies following SLE patients with LN reported elevated TC levels in 55.4%, LDL in 30.8%, and TG in 58.5 [8], Wijaya et al., 2005 [9] reported elevated TC levels at 43%, LDL at 26.4% and TG at 44.2% of patients. In our study group of patients with LN, we measured increased levels of TC in 69.4%, LDL in 25% and increased levels of TG in 75% of patients. Low HDL levels in our test group were found in 13.9% of patients and Sajjad et al., 2017 [8] measured reduced levels at 21.5%. Ali Abdalla, 2016 [10] in his study observed significant differences in LDL and TC parameters between patients with and without LN, which contradicts our measurements, in which we did not observe any statistically significant difference in lipid parameters. In the statistical evaluation of the correlation of lipid parameters with inflammatory factors and cytokines in patients with LN, we found a positive moderate positive correlation between CRP and VLDL (R = 0.44), CRP and IA (R = 0.46), CRP and TG (R = 0.44), CRP and ApoB (R = 0.43) and a moderately negative correlation was between HDL and CRP (R = -0.41). There

was a negative correlation between HDL and CRP in a study of 110 SLE patients, and they also observed a negative correlation between IL6 and IL6, respectively. TNFα and HDL, which we did not observe in our study. At the same time, there was a positive correlation between CRP and TG [11].

5. Conclusions

Accelerated atherosclerosis attracts considerable attention and is of great importance because it is an important cause of morbidity and mortality in patients with SLE. Studies have confirmed correlations between inflammatory parameters and lipid levels. It has been shown that inflammatory mediators, e.g. CRPs suppress HDL and increase TG levels, which are also affected by lipoprotein lipase (LPL) activity, which tends to be reduced in patients with SLE. Lower LPL activity leads to the accumulation of TG-rich particles. Inflammatory mechanisms in SLE lead to intense oxidative stress, which can induce a wide range of proatherogenic lipid changes, including the conversion of anti-inflammatory HDL to pro-inflammatory and the production of oxidized LDL. Therefore, controlling the levels of lipid metabolism parameters (cholesterol, HDL, LDL, VLDL, triglycerides Apo A, Apo B, Lp (a)) and a better understanding of the correlation between inflammatory parameters and lipids can help improve patient survival and improve their lives through well-targeted treatment

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Index of Author(s)

EDUCATION OF A PATIENT WITH MULTIPLE SCLEROSIS

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Abstract: *Multiple sclerosis is a disease that mainly affects younger people aged 20-40 years. It is an autoimmune disease of the central nervous system. Multiple sclerosis is an unpredictable disease and has various forms of manifestation that vary from patient to patient. Patient care requires the cooperation of a multidisciplinary team. Its role is to maintain functional independence and maintain the patient's quality of life. Education of a patient with multiple sclerosis is an important part of the treatment process, so we pay attention to it in this paper.*

Key words: *multiple sclerosis, education, nursing.*

1. Introduction

Multiple sclerosis (MS) is an immune-mediated inflammatory disease that attacks myelinated axons in the central nervous system, destroying the myelin and the axon in variable degrees and producing significant physical disability within 20–25 years in more than 30% of patients. The hallmark of MS is symptomatic episodes that occur months or years apart and affect different anatomic locations [1].

Patient education is an important responsibility for any disease, but is especially important with sclerosis multiplex (MS), where there can be such a wide variety of symptoms. Knowledge of what to watch for enable early treatment with reversal of problems before they become severe. Knowledge of what to expect allows approaching the disease with a reasonable attitude, without unnecessary fears, and with a positive outlook. Knowledge of how others cope with various problems allows maximal functioning with a given disability. Promotion of understanding from family and friends prevents unnecessary suffering and establishes a valuable support system [2].

1.1 Management treatment of patients

Treatment of MS includes medication management and monitoring of disease progression by a physician or nurse practitioner. There is also a significant amount of research supporting the benefits of a multidisciplinary approach to MS management, including nursing, rehabilitation experts, social workers, nutritionists and mental health practitioners, and others. Due to the wide range of clinicians involved in care, there is potential for education to be completed in various settings and depending on the healthcare system, there may be little to no communication between providers. The goal of this research is to standardize the timing of education provided to patients newly diagnosed with MS to maximize their ability to act as their own advocates for healthcare needs [3, 4].

Diagnosing relapses of MS in clinical practice can be difficult due to the multiple subtypes of MS, variations of symptomatology, and pseudo-relapses. Managing relapses also presents its own set of challenges, for example, evaluating if treatment is appropriate and determining which agent would be most effective for a patient if treatment is recommended. Patient education is essential for achieving optimal outcomes for patients with MS and improving patient QOL, and should increase awareness of: (1) the disease itself and its progression; (2) the signs and symptoms of MS; (3) current treatment strategies and plan of care; (4) the recognition and management of relapses; (5) the value of treatment adherence and impact of non - adherence; and (6) hope for the future. The management of active MS may be further complicated by the complex variety of pharmaco-therapeutic options, and in some instances, by having to switch between agents and drug classes. Newer agents in development (eg, alemtuzumab, ocrelizumab, laquinimod) offer the opportunity to expand the therapeutic armamentarium, although further long-term data are required to evaluate any safety concerns associated with newer agents [4, 5].

2. Educated patients can be of a valuable help to healthcare

The system in Slovakia defines a patient as a recipient of healthcare services. In developed countries, however, the patient is already seen as a partner, a professional who can provide advice on how to make the healthcare system more efficient.

The ambition of patients´ organisations in Slovakia is to participate in different types of decision-making processes, join categorisation commissions and co-decide on the type of medicines, medical devices and services that would be covered by public health insurance. The issue has recently come into focus also in connection with the so-called re-examination of medicine coverage by public insurance and permanent (media-covered) disputes over co-payment for medicines. To become partners of experts and other participants of decision-making processes, the patients must have the necessary knowledge and educational background. Nevertheless, today one can still hear the opinion that patients and patients´ organisations act as agents of pharmaceutical or food industries who, if being let in, will promote commercial interests, or push for the

best and the most expensive medicines and treatments. Nothing could be further from the truth. Working and communicating with the patients or patients´ advocates, it becomes clear that based on obtained information they are perfectly capable of rationally assessing their needs as well as the possibilities of the system.

There are three main reasons why we need to educate the patients:

- Many patients are people of working age and their education is necessary in terms of their integration in employment processes.
- The education allows patients to better manage their disease.
- The education enables "patients´ advocates" representing patients in decision-making processes to become partners in the source distribution, health system creation etc.

The aims of the education programme are as follows:

- teaching patients to understand what actions are necessary to ensure the availability of treatment;
- explaining the legislation, pricing and payment system as well as the roles of individual players in the healthcare sector;
- clarifying the principles of creation and distribution of economic sources, the limits of public sources in healthcare and a potential role the patient in the source distribution [5,6,7,8].

3. Modern communication technology skills of patients with multiple sclerosis

The way people retrieve health information has changed due to an enormous proliferation of new media technologies and a tremendous growth in health information being available online [1-3]. Two studies investigating online information sources about MS in English and German reported variable quality [4, 5]. In addition to accessing traditional static information websites, patients can also generate and share their health information with peers and participate in electronic health records for the self-management of disease, with mainly positive results [4]. Such online communities can also support research, such as the development of a self-report questionnaire to quantify MS patients' adherence to treatment [2, 3]. Other studies reported the benefits of testing cognitive functions of MS patients online, including better availability and accessibility than with traditional methods [3, 5]. Research suggests that MS patients retrieve information about their disease and their physicians online before and after their medical visit, especially before the initial consultation due to potentially high information needs in the early course of the disease [11, 6, 7]. This may influence patients' adherence to treatment and their coping styles, and may lead to greater patient empowerment [3,11], thereby altering the physician-patient relationship [3,7,8]. The observed benefits of new media may have raised the acceptance of eHealth in medicine, but concerns remain such as the digital divide (inequality of access to new communication technologies) and concerns about the security and confidentiality of sharing health data online.

4. Regimen measures in a patient with multiple sclerosis

The basic regime measure for a patient with MS is the care of physical and mental condition. It is very important to guide the patient to this active approach to the disease as soon as the diagnosis is made. It is in the patient's interest that his or her ability to work is maintained for as long as possible. Maintaining work ability is especially important for maintaining the patient's cognitive abilities. The regular regime and the need to adapt, to learn at work leads to the maintenance of functional synapses of neural networks. If the patient falls out of this regimen and cognitive activities are not replaced on average, there is a faster decline in cognitive function. However, the work should not be physically demanding and stressful. A regime is suitable where the work is balanced by leisure activities and the patient is left with enough space to take care of his mental and physical well-being [9, 10]. Patients should spend time daily exercising. He should exercise both sides of the body during exercise. Simple breathing, stretching exercises, gymnastic ball exercises, etc. are recommended. The exercises should be repeated, but not until complete exhaustion and fatigue.

Patients with MS may suffer from sleep insomnia. Therefore, advice should be given to the patient on how to prevent this. The patient should get used to getting up at a certain time of the morning (even on weekends), should not exercise before going to bed, should not sleep during the day, drink coffee, energy drinks, tea just before going to bed and also do not recommend heavy food. Sufficient attention should be paid to preventive measures, because MS significantly reduces the body's defences. The patient becomes more susceptible to various diseases of infectious or viral origin, which can result in worsening of the course of the disease. During influenza epidemics, patients should not stay in places with a large number of people such as theatres, cinemas, shopping malls or public transport [11, 12]. In the progressive stage of MS with reduced mobility, there is a high probability of developing osteoporosis. Osteoporosis is complicated by fractures, which can impair the patient's mobility. Therefore, prevention is needed in the form - exercise, vitamin D, magnesium, calcium and a balanced diet. It is recommended to follow the PUFA diet (Polyunsaturated Fat Acids) in the diet. This diet is rich in unsaturated fatty acids that the body cannot make on its own. The patient should eat a diet high in B vitamins, E, which is sufficiently energy-rich, with an adequate amount of protein and a higher content of plant proteins. The volume of animal fats in the diet should be reduced, patient should prefer whole grain foods. Adequate intake of vitamin D and calcium is also important. The patient should eat a lot of vegetables and fruits, more often eat legumes, cereals and rice. Many patients with multiple sclerosis complain of constipation. If dietary measures

with a higher fibre content are not enough, it is recommended to drink mineral waters such as Šaratica. In this way, it is possible to avoid the use of chemical or plant laxatives, which damage the natural activity of the intestine [12].

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METHODOLOGY PROPOSAL FOR EVALUATION OFQUALITY OF LIFE OF PATIENTS WITH MULTIPLE SCLEROSIS

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Abstract: *Multiple Sclerosis (MS) is a serious progressive disease affecting all dimensions of quality of life. Patients require a specific approach to addressing various psycho-social problems. The aim of the project is to investigate the multidimensionality of quality of life of patients with MS.*

Key words: *nursing, needs, education, multiple sclerosis, quality of life*

1. Introduction

Multiple Sclerosis (MS) is a serious progressive disease affecting all dimensions of quality of life. Patients require a specific approach to addressing various psycho-social problems. The aim of the project is to investigate the multidimensionality of quality of life of patients with MS. Based on the current state of the subject matter, there is no evaluation tool (its subsequent verification for Slovak conditions), which takes into account the specific needs and perception of changes in the quality of life of the patient with MS. By examining the multidimensionality of the quality of life of patients with MS, the aim of the project will be to develop, verify and make available a uniform, internationally accepted and recommended methodology for its evaluation. The project focuses on the university education environment in the field of nursing, midwifery and health sciences, where the verified tool and its implementation into practice will serve students, clinical and scientific-pedagogical staff in clinical education.

The expected contribution to the social area is to verify and validate a unified and internationally accepted methodology for quality of life assessment of MS patients, specifically MSQOL-54 (Multiple Sclerosis Quality of Life Questionnaire), accepting its bio-psycho-social needs. The benefit of educating in nursing, midwifery and health sciences is the application and implementation of assessment method of the MS patients ‘quality of life. The application of a unified and complex methodology for the quality of life assessment of patients with MS will enable the comparison of the assessment results at national and international level to be mutually reinforced, thereby significantly enhancing the competitiveness of Slovakia in the scientific field. The process of validating the questionnaire will become part of the teaching of nursing students and other health care disciplines in both the theoretical and practical parts of the educational process.

1.1 Current state of the issue

The concept of quality of life includes the dimensions of physical and mental health. It has a clearly multidimensional character and intervenes in various areas of an individual's personality. It is in line with the generally defined focus of nursing, midwifery and other health sciences, using knowledge not only from medical but also from humanities, which ultimately intervenes in its complexity in the field of social, educational and educational. Knowledge from these disciplines allows a comprehensive view of man in his bio-psycho-social unity in the context of pedagogy, psychology, sociology, as well as the participation of other disciplines [1].

The current state of quality of life assessment in patients with MS is characterized by considerable inconsistency and numerous differentiation in connection with the use of assessment tools [2]. Generic questionnaires designed primarily for clinical practice include: Short Form 36, Sickness Impact Profile, Nottingham Health Profile [3, 4, 5].

Clinical practice, demographic changes in terms of population aging, an increase in polymorbidity and chronicity of disease, the need to take into account the needs of the individual and a holistic view of the individual requires the use of specific questionnaires that monitor the patient's health and quality of life. These are specific questionnaires for patients with MS: MSQOL-54 (Multiple Sclerosis Quality of Life Questionnaire) and MusiQOL (Multiple Sclerosis International Questionnaire) [6, 7]. The MSQOL-54 questionnaire was originally designed for English-speaking patients with MS by Dr. Barbara G. Vickrey et al. and consists of two parts. The first part consists of questions evaluating general health, which are based on the SF-36 questionnaire. The second part consists of eighteen questions, created especially for patients with MS to describe their specific problems and are based on the opinions of experts and a search of the literature. Skilfully, the fifty-four questions are divided into several areas and find out data on respondents 'physical, mental and emotional health, their cognitive abilities, social activities, limitations resulting from physical and affective indicators, pain intensity, fatigue, energy, respondents' sexual life, questions focused on the subjective perception of health, health burden and quality of life [6]. Due to its multidimensional and content focus, their validation and incorporation into clinical practice is desirable [5]. The validation process of the questionnaire will be carried out after consultation with prof. Barbara

Vickrey of the University of California, Los Angeles, US. The validated questionnaire itself will be used in the educational process of university studies in the field of nursing, midwifery and other health sciences. The student will be able to personally gain experience with scientific work directly in the teaching process in its theoretical and practical level.

1.2 Focus of project

The project is focused on summarizing, classifying, clarifying evaluation systems focused on the quality of life of patients with MS and their subsequent publication and introduction into pedagogical, scientific research and clinical practice. To this end, it is necessary to complete the wide range of evaluation systems available in the world literature. Draft recommendations of evaluation methodologies for this issue will be published in electronic and printed form, and thus available to a wide range of potential users from various disciplines (students, teachers, clinicians, scientists, etc.). In addition to the practical application of evaluation tools, another goal of the project is to publish a monographic work on the topic of validation of the evaluation tool MSQOL-54. For its use in the specific linguistic and cultural conditions of the Slovak Republic, a precisely defined process of linguistic and cultural adaptation will take place within the project, in cooperation with the main author of the questionnaire prof. Vickrey, in collaboration with the institution - University of California Los Angeles (Department of Neurology Los Angeles, University of California UCLA). The main result will be the Slovak version of the questionnaire, which will allow comparing the results and quality of life of patients with MS equivalent and comparable with other studies in the world, which will represent a significant increase in competitiveness of the Slovak Republic in science.

2. Management and organization of the project

Management and organization of the project implementation will be managed by the lead investigator and his / her representative through working meetings of the project team (workshops) in regular periods with regard to the time allocation of the whole project. The project will be implemented within 3 years.

2.1 Preparatory phase

In the preparatory phase of the project, a working meeting of the research team (workshop) will be initiated in order to differentiate tasks, solve the drawdown of financial resources and delegate tasks to individual members of the research team. It is planned to provide logistics to ensure the conditions necessary for launching research. Research and clarification of studies to assess the quality of life of patients with SM will be conducted. Based on the identification of specificities potentially affecting the quality of life of patients in the context of meeting the needs, a monothematic textbook for students of the bachelor study program of nursing and other health sciences is elaborated. It will focus on the specific human needs of patients with MS. Based on consultations and cooperation with the author of the questionnaire, prof. Vickrey and the Institution - California University of Los Angeles, Clinical Professionals (Eleonora Klimova, MD, PhD.), FNsP J. Reiman, Presov, Sv. Jakuba, n. about. in Bardejov, selected neurological outpatient departments of the Prešov and Košice regions, the methodological preparation of the research will be carried out by the certified translation agencies (obtaining the author's consent to use the selected MSQOL-54 questionnaire, certified questionnaire retrieval, research population identification). The process of implementing the linguistic-cultural adaptation of the MSQOL-54 questionnaire will take place in the following phases: 1. translation into the target language, 2. synthesis, adaptation and resolution of discrepancies within language and culture, 3. back translation into English, 4. evaluation of the commission of experts - a doctor, a methodologist, a researcher, a linguistic professional, with a view to reaching consensus and developing a final version; 5. a pilot study on a selected sample of patients with its evaluation and the necessary correction; University of California Los Angeles (Department of Neurology). The target group will be SM patients.

2.2 Implementation phase

In the implementation phase, the working team of the research team (workshop), differentiation of tasks, re-evaluation of drawing of financial resources, delegation of tasks to individual members of the research team will be launched. The research team will propose a step-by-step methodology for organizing and conducting research: distribution of MSQOL-54 questionnaires; data colle ction, sorting, data aggregation; statistical data processing; psychometric data testing, analysis and synthesis of results. There will be a presentation of partial results, publishing knowledge by participating in scientific, professional conferences. As part of the implementation team's work under the leadership of the project leader, a university textbook will be elaborated. Focused on research in clinical practice, as a teaching material for nursing students and other medical sciences.

2.3 Dissemination phase

In this phase there will be a working meeting of the research team (workshop), differentiation of tasks, re-evaluation of drawing of financial resources, delegation of tasks of individual members of the research team. The MSQOL-54 Evaluation Tool will be verified. Presentation of final results at scientific and professional events. At the end of the project, a scientific monograph will be prepared in the home publishing house, on the quality of life of patients with MS new validated methods in the Slovak population.

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THE PERCEPTION QUALITY OF LIFE IN GERIATRIC PATIENTS IN NORWAY

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Abstract: *Aim: The aim of this work was to determine how the perceived quality of life of geriatric patients. We made the study a particular institutional facilities in Norway. Methodology: We are used to determine the components of research item quality of life questionnaire OPQOL – 35. We used the Friedman test data analysis for multiple dependent choices and Spearman correlation coefficient. We were in the study group of 41 patients in the senior age. Patients were currently hospitalized in Geriatric Department at University Hospital in Oslo. Results: We identified the analysis of the data relationships between quality of life and other items whose difference is statistically significant, sig. 0.014. We found that the highest proportion of the perceived quality of life is satisfaction with life (M=3,75). Statistically significant correlation was found between relationship of health and move and physical enough energy for everyday life. Sense of their own lives (M=3,90) fills the greater the perception of overall quality of life of people surveyed. Conclusion: We have identified research findings obtained satisfaction with life the potential energy for everyday life in relation to quality of life. The quality of life of hospitalized patients is an important indicator in terms of nursing care and its domains have different priorities in selected countries.*

Keywords: *quality of life. geriatric patient. satisfaction with life. the meaning of life.*

1. Introduction

An aging population is an accelerating phenomenon these days. At the end of the 1960's, the United Nations Organisation suggested that a demographically old population be perceived as those that are characterized by more than 7% of the population being above the age of 65 [1]. Apart from this fact, the ratio of elderly people above 80 years old should increase four-fold over the next 50 years (in 2050 growth above 4.1%).

In evaluating the dependence in a group of 1028 respondents, Nemeth et al. found the worst results among the group of seniors with impaired self-sufficiency (in score range 60-41 which meant value $p<0.05$), as well as in the group of seniors with the worst impairment of self-sufficiency (score less than 40 points). This proves the fact that physical activity in advanced age is very important [2].

The aim of the research was to identify how quality of life is perceived in geriatric patients in particular institutional facilities in Norway. Our interest was to determine if statistically significant differences exist in the perception of quality of life in seniors related to potential exercise and physical energy in tested individuals.

1.1 Methodology

The chosen locality for our study depended on aspects of living standards (other possibilties for health services, exercise culture of seniors, and others), social politics (social benefits for the elderly), and also the possibility for internships of expert assistants from university. Individual living standard, the possibility for exercise activities and securing self-management are proven to be specific predictors for the aim of research in other studies.

The questionnaire was distributed to respondents in its original version and completed in the presence of a health care official (involutional changes, oncological changes in patients and others) from the research institution. Forty-five seniors above the age of 65 participated in the research. At the time, they were hospitalized in the geriatric department of the hospital in Oslo. The facility was the Department of Geriatrics at Akershus University Hospital, Kirkeveien. From a quantitative research strategy, we selected a group of seniors that were recommended by hospital workers in Oslo. They did not exhibit signs of dementia, depression, or any other psychological disorders that would otherwise disqualify them from our research. The aim of our study was to probe the problems in perception of certain aspects of quality of life in Norwegian seniors.

The OPQOL-35 questionnaire is a generic tool for measuring the quality of life of seniors above the age of 65 and is used to determine overall quality of life [3]. Cronbach's alpha was in the range $\alpha = 0.75$-0.90 for the whole questionnaire. The test proved to be intrinsically consistent with satisfactory reliability for the entire questionnaire in Kacmarova's research carried out on 82 seniors between ages 65-75 in 2012 ($\alpha = 0.86$) [4]. The standardized questionnaire for quality of life OPQOL determines quality of life associated with health. Overall, the average age of the tested seniors was 74.2. The duration of hospitalization was on average 6.73 days. In terms of gender, we noted that women made the majority of participants. For statistical processing of empirical data, we used Friedman's method as the test for components of perception of quality of life for various dependent samples. We used Spearman's rank correlation coefficient to determine the mutual relationships between variables.

1.2 Results of the study

Considerable results from observing Norwegian groups show if individual items in perception of quality of life will significantly vary on a scale of importance for the patient. Using Friedman's test for a number of related options, we found that in perception of quality of life, satisfaction with life has the highest quotient (M=3.75). Health and mobility have a major influence on quality of life among Norwegian respondents (M=3.52) which proves a relationship between health and perception of potential mobility. Satisfaction with life (Ranks=2.98), dominates in the relation between the listed items and quality of life, as well as the relation between health and mobility (Ranks=2.94) which proves that mobility substantially influences satisfaction in geriatric patients (table 1).

Table 1 Results of the relationship between quality of life and investigated features

	satifaction with life	*limited health status*	*sufficient physical energy*	*sufficient time*	*relation between health and mobility*
M	3,75	2,52	3,32	3,26	3,52
SD	0,57	1,34	0,83	0,73	0,63
Ranks	2,98	2,00	2,52	2,55	2,94

The difference in researched items in table 1 is statistically important and subsequently confirms the signifcance of the results in table 2 (sig. 0,014).

Table 2 Results of Friedman's test for related items in evaluating differences in factors in perceived quality of life

N	31
Chi – square	10,625
Df	4
sig.	0,014

For determining the statistical significance between individual features for investigation of quality of life, we used Spearman's correlation coefficient (tab. 3), where we present features related to the questionnaire.

Table 3 Significance of relations between individual features related to quality of life perception, as determined by Spearman's correlation coeficient

	satisfaction with life	*limited health status*	*sufficient physical energy*	*sufficient time*	*relation between health and mobility*
satisfaction with life	-	0,164*	0,109*	0,042*	0,202*
limited health status	0,164*	-	-0,419*	0,078	-0,054
sufficient physical energy	0,109*	-0,419*	-	0,281	**0,594****
sufficient time	0,042*	0,078	0,281	-	0,101
relation between health and mobility	0,202*	-0,054	**0,594****	0,101	-

*p≤0,05, **p≤0,01

Perception of satisfaction with life was monitored to the greatest degree which correlated to all those tested (limited health status, sufficient physical energy, sufficient time, relation between mobility and health). A statistically significant correlated relationship was found between the relationship of health and mobility and sufficient physical energy for everyday life. This means that physical mobility and self-reliance affect the energy necessary for everyday tasks in life.

2. Discussion

In the field of treating the elderly, clear rules have not yet been defined for improving their quality of life. It is very much related to the definition of the term "the quality of life" as well as to the effort of supporting the patients' treatment rules which have proven successful in everyday life.

In Norway, a complex study including 3069 people above the age of 65 has been carried out. The purpose of the study was to find the relations between socio-demographic factors, stress-handling factors**,** self-respect, health conditions and the ability to move. It is a known fact that strolls and slow walks have a positive effect on health conditions and subjective well-being in senior populations as well as preventing frailty and disability syndromes. The most intense associations have been found via the Pearson's test and t-test between the independent variable – health care, and the dependent variable – the ability to move. The most significant result shows that excellent ability to move (1 km) was typical for the significantly younger individuals, (mostly men rather than women) who confirmed feeling pain and discomfort when walking. There is a significant statistical correlation between the age and work ($r = 0,61$; $p < 0,001$); there has also been the decreased self-respect score ($r = x0.13$; $p = 0,00$), the higher levels of pain ($r = x0.13$; $p = 0,00$) and depression ($r = 0,09$; $p = 0,00$) as well as the greater intensity of anxiety ($r = 0,06$; $p = 0,00$). The most profound association has been discovered between opinion of own health and the dependent variable – the ability to move [5]. Very interesting research for the sake of comparing the long-term care and the short-term care values was carried out in Norway with patients of over 66 years of age between 2002-2006. The highest percentage of long-term hospitalizations was done among men of the age of 85-105 (553) and women of the age of 80-105 (581). As far as the hospitalization values are concerned, this was higher with men of 85-105 years of age (5643) rather than women of 80-105 years of age (4063). The authors of the study have

pointed at using the DRG system as a part of the health-care. The long-term care services are provided to persons who have lost functionality and self-sufficiency. The outcome has confirmed that the utilization of long-term care in smaller communities and remote regions is purposeful from the point of view of the financial costs and demographic changes [1]. In several EU countries, the issue of long-term care for senior population has not yet been resolved. There is an absence of readiness in society for demographic changes. The geriatric institutions are under-equipped both from the material and personnel resources point of view [7].

The quality of life is a multi-layer term. Carr et al. confirms that a functionality status is not only synonymous to the quality of life, but it also very much dominates it. Psychological phenomena, such as adaptation, optimism, self-control and others, may dramatically change how an individual perceives quality of life. The authors stress that social and health-care services are designed to enhance people's quality of life [8].

Demographic indicators motivate us to perform the analysis of life of the senior population. The aging population is a challenge for national governments, but especially in the field of healthcare [7]. Given that we record the growth of the elderly population worldwide, it is necessary to pay close attention to the aging population and their quality of life. In our research probe, we were not concerned with a broad representative sample, but our observed results are specific to the medical facility in Oslo. The Eurofound foundation continuously recognizes the prospect of living conditions and perceived quality of life in the European Quality of Life Survey. The surveys are known for their reliability and validity and the Eurofound foundation selects a representative sample of the entire population, which includes at least 95% of the target population. The European Survey questionnaire about quality of life covered a broad spectrum of life domains which were focused on education, housing and local environment, family relationships, work, health, balance between work and financial situation, the quality of social services and the quality of the society. The working version of the questionnaire was tested in a pilot survey carried out in 2007 in the UK and the Netherlands performing 100 interviews in each country. Results of the pilot survey were subsequently analyzed to detect any problematic features. The actual European Quality of Life Survey (EQLS) was carried out from late September 2011 to early February 2012 in the 27 member states of the European Union. The results confirmed more than a 20% level of perception of optimism and happiness in the surveyed EU countries, and more than a third of people surveyed reported deterioration of their financial situation over the last five years. The conclusions of the study reflect, among other things, the economic reality, where the highest optimism was recorded in Denmark, Sweden and the lowest level in Greece, Italy and Portugal. Confidence in public institutions was highest in Denmark, Finland, Luxembourg and Sweden, mainly due to unrivalled levels of assurance aimed at national political institutions in these member states [9].

6. Conclusions

Satisfaction with life is an important attribute in the perception of quality of life and an important indicator of old age, even if, when compared to other components, it is a feature difficult to assess. Attributes of quality of life are inevitably linked to the evaluation of health perceptions. A decrease in the quality of life of seniors is reflected by an atmosphere of burden, dependency on others, loss of autonomy and lack of meaning in life. A survey of health, ageing and retirement, conducted in Europe and named SHARE (Survey of Health, Aging and Retirement in Europe) studied aging, health and life satisfaction among the oldest people in Germany (those aged 75 and older). Analysis of the level of life satisfaction showed a big drop in rating of life satisfaction which can be attributed (proportionally with age) mainly to reduced interest in perception of life and the lowest absolute level of life satisfaction was recorded among the oldest. Many studies confirm that primary exposure to serious health problems such as myocardial infarction, diabetes, arthritis and Parkinson's disease affects satisfaction with life and, consequently, the objective health status depends on this [10, 11].

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TWO DEPICTIONS OF SENIORS ON THE CURRENT SLOVAK DISCOURSE

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Abstract: *Based on the results of my research, I characterise two types of elderly people in the current public Slovak discourse. Subsequently, I present examples from my qualitative research (interviews) with elderly people, which reflect said two types of elderly people. I state what factors influence when we perceive someone as an elderly person, while these factors also influence the current definitions of seniors. At the end of the article, I formulate a new definition of elderly people, which stems from the results of my research.*

Keywords: *Redefinition, Social Group, Elderly People, Intergenerational Communication, Interactive Sociolinguistics.*

1. Introduction

The presented paper aims to reflect the image of elderly people in the current Slovak linguistic and cultural environment, and to propose a new definition of this social group. Common stereotypes included in the definitions of people over 65 are morbidity, passivity, or conservatism. Such definitions of the older generation support the ageistic (generalizing) image of the elderly. In fact, this demographic group is not homogeneous, but very much differentiated, and these differences are influenced by several factors, which I will present in this paper. I aim to introduce a new definition that would better reflect the real image of seniors today.

2. The image of elderly people in Slovak public discourse

The term senior has been used in recent decades in both public and scientific discourse as a synonym for the designation of an elderly person. At the same time, we can state that no emotional evaluative connotations are yet related to the given term. The term senior replaces and serves as a blanket term for other terminological definitions that have emerged in the medical, psychological, sociological field, and other scientific disciplines to refer to the elderly [5]. One such naming is the term *geront* (In the database of the Slovak National Corpus (prim-8.0-public-sane) the term *geront* is found only in 306 cases (on 29.4.2020). [15]), which refers to a person of the post-productive age [16]. Etymologically, the term is derived from the Greek *γέρος – gerón* (old person). The term is also found in the names of various disciplines, e.g. gerontology (within the medical sciences) or social gerontology (within the social sciences it deals with social, economic, legislative, and other aspects of life in old age), we also encounter it in the naming of the linguistics branch dedicated to the language of the elderly – gerontolinguistics [1]. It is precisely in the case of the term *geront* that we can speak of the gradual layering of negative connotations because in everyday language the term is used with a rather pejorative tint, e.g. "*It is a sick state that supports geronts at the expense of adolescents!*" [15]. The pejorative tint is the reason why the term senior is used more frequently both in everyday discourse and in scientific literature. However, the aim of this paper is not to summarize what terms are used to refer to seniors in scientific discourse, but to evaluate what is the content of the synonyms that are used to describe the elderly. So, the question is who the seniors are.

In 2019, I made a research in the form of a discourse analysis. The research material consisted of eight television commercials ([22], [23], [24], [25], [26], [27], [28], [29]), which took the form of audio-visual advertisements and were broadcasted on Slovak television stations in the Slovak language. The analysed television commercials conveyed the traditional portrayal of the senior – as an experienced, ill, unnecessary, conservative elderly person, but on the other hand, some television advertisements also pictured a modern senior who uses modern technologies and is active. Thus, advertisements use the motif of tradition and the motif of the modern senior to attract recipients. The most common argumentative strategy that was used was: If you buy the product, you will be "rejuvenated", "you will be active", in which I perceive the opposition of young - (active, healthy) good vs. old - (passive, ill) bad [2].

At the forefront of the political discourse was the depiction of the senior citizen as an easily influenced and poor person who unduly burdens the state budget. Such image, consequently, unfavourably affects the intergenerational relations and creates a negative attitude towards seniors in society. Within the political discourse, there were stereotypes of seniors as unnecessary, useless people who must vacate their jobs to younger people. In this case, it is a matter of favouring young people, who are more important, necessary, and more active compared to the elderly.

I also researched the depiction of seniors, respectively old age in Slovak fixed expressions, i.e. in phraseology. I have excerpted individual examples from works that contain Slovak idioms (e.g. *Malý frazeologický slovník* [17]; *Človek v zrkadle frazeológie* [7]; *Frazeologický slovník, Človek a príroda vo frazeológii* [8]; *Slovenské príslovia,*

porekadlá, úslovia a hádanky [21], etc. The most often depicted traits in Slovak fixed expressions relating to the old age were: conservatism, uselessness, passivity, sickliness (physical and mental) of seniors, resp. their wisdom and experience [2].

Based on the results of the analysis of selected partial discourses about seniors, we can encounter in several cases such a discourse on seniors, characterised by common negative stereotypes, which helps to create an unfavourable image of seniors [2].

I gave examples of the depiction of seniors in media discourse, political discourse, or Slovak phraseology. This portrayal of seniors is usually based on standardized stereotypes that affect the social image of seniors, respectively attitudes towards this social group, and thus all elderly people are consequently perceived as sickly, passive, unnecessary, trusting, and conservative.

3. Different types of elderly people based on examples from the research

I presented two images of seniors in public (political, media) discourse, namely the traditional senior who identifies with the usual standardized stereotypes and the modern senior who uses information technology, is active, communicates with younger users of the language, knows frequently used neologisms, resp. anglicisms.

In non-public discourse, we can also encounter various seniors, both passive and active, and we can identify them through communication with them. From July to November 2019, I made a research based on interviews with 22 respondents over the age of 65 (based on a qualitative research methodology according to the theses of J. Hendl [10], or also H. Garfinkel [6] and conversational analysts.) The quantitative research is not a question of finding statistically relevant opinions in the opposition "yes-no", it is about delving into case studies based on personal interviews between the researcher and respondents in an effort to find thorough empirical probes into the social phenomena of everyday life.

My research confirmed that an active senior usually uses anglicisms and neologisms in communication with younger communication partners or understands such expressions. Passive senior does not understand anglicisms, resp. neologisms, and therefore does not use them in communication and does not want younger communication partners to use these terms in their communication. On the contrary, a passive senior wants younger people to adapt their speech in communication, e.g. avoid anglicisms [3]. In the following section, we exemplify two types of elderly people over the age of 65, identified by their modes of expression (especially by the use of anglicisms in their speech and the use of the first person plural or the third person plural when talking about seniors).

a) An example from the verbal manifestations of "passive" seniors who do not use anglicisms

Some seniors stated that they did not want young people to use anglicisms in communication with them because they did not understand them. At the same time, one respondent reacted with anger when she encountered goods with only English inscriptions while shopping: Respondent no. 1 (85-year-old retired woman. She lives in Bratislava. The author did not know the respondent prior to the interview. The interview was recorded in the long-term patients' ward at the Specialized Geriatric Hospital in Podunajské Biskupice (Bratislava II): *"it makes me angry because we don't understand it." "I don't understand it and it makes me angry! even the shop signs! when it's a shop sign, hell, I don't care, but if the goods are also in English and there is nothing in Slovak, then I want to throw it into a corner*" (I present transcripts based on scientific literature [11]). In her speech, the respondent generalises and speaks from the perspectives of the senior group in the first person plural.

b) Examples from the verbal manifestations of active elderly people using anglicisms in their speech

Several elderly people within the research group travelled, not only within Slovakia but also abroad for holidays, e.g. within Europe, America, Africa, or Asia. Respondent no. 2 (a 65-year-old respondent who still works and travels. She did not know the author before the interview.) states that she did not have to speak English during her holiday in Turkey: *"taking into account that there were eight or ten of us - we had the Slovak communication and we didn't need to communicate with them, what you need for food, lunch, breakfast, and dinner there was everything ultra ʌl inkluzi:v* ((meaning ultra-all-inclusive))*"*. In her next statement, she uses several new expressions: E.g. respondent no. 2: *"I eat, for example, tʃia* ((chia*)) seeds (...), I will first put it in the smu:ti: ((smoothie))"*.

We also encountered ageism (age discrimination) in verbal manifestations of some elderly respondents. When asked if a dictionary of anglicisms would help the elderly understand the anglicisms that are nowadays present in everyday communication, he answered: Respondent no. 3 (is a 65-year-old senior who is active, travels. He meets with younger people. The author did not know the respondent before the interview.): *"I don't think so, because it's a problem for seniors to turn on their mobile phones and look it up on there and more so to look it up in a dictionary."* The respondent is 65 years old, but does not yet perceive himself as a senior, he does not identify with the stereotypes associated with the social role of seniors, and therefore does not even consider himself a member of this social group. We can observe that he refers to seniors in the third person plural: "they".

Several factors influence the definition, respectively perception of people as seniors. We will introduce them in the following chapter.

4. Factors influencing the perception of people as seniors

The definition of seniors can be approached from several aspects. There are four primary factors. Although these factors are in a complementary relationship, they may not be included in all definitions at once. However, it is important to realise that these factors affect the definitions. The most significant factors are:

a) the biological factor – consists of external and internal changes that indicate the aging of an organism. According to these definitions, seniors are those elderly people who have experienced external changes in the aging of the body (grey hair, wrinkles) or internal changes caused by aging (forgetfulness; slower speech, understanding, and movement; illnesses) [14].

b) the administrative factor – definitions influenced by the administrative factor characterise seniors as people who have reached a certain chronological age. Some authors [18] state the age of 60 as the limit from which we can consider someone a senior. In recent years, the age limit has shifted to 65 years. This is stated by many authors (e.g. [9] or [1] and others). This age limit is influenced by the retirement age and is also based on the average life expectancy. Within this administrative boundary, we are constantly facing a shift.

c) the social factor – definitions influenced by the social factor characterise seniors on the basis of their social image, which is closely related to the social roles of seniors. These social roles consist of standardised stereotypes pertaining to seniors that change with time and vary from culture to culture. This means that in the past, other stereotypes might have been associated with seniors, e.g. they were considered sages who passed experiences from generation to generation, but today, under the influence of the emergence of new information technologies, this stereotype has been reconsidered. At the same time, in other cultures (e.g. in Africa or Asia) seniors might be perceived differently than in Slovakia. These stereotypes co-create a social image of seniors, which also affects communication with them. However, it must be stated that they affect not only the form of communication between young people and older people, but also the way seniors themselves communicate. The social image of seniors is also influenced by their self-image [2]. A. Kruse and E. Schmitt [13] or L. Vidovićová [20] or T. Tošnerová [19] state the following stereotypes of elderly people: *"many old people cannot navigate the world today; elderly people are lonely, the elderly are past their prime; elderly people are too much of a burden on the state budget; most elderly people expect too much support and care from their families."*

d) the psychological factor – while the social factor in the definitions considers the image of seniors in the discourse, the psychological factor emphasises the self-image of seniors. The self-concept of a senior is influenced by their individual personality, whether they are active/passive, but also by the social image of seniors, because people are evaluated, among other things, based on how other people perceive them, how the society perceives them. This phenomenon is called reflective evaluation [4]. The self-perception of seniors is influenced on the one hand by standardised stereotypes of seniors, on the other hand by their personality. More active seniors may have a more positive self-image and a more positive attitude towards new things, and conversely, more passive seniors may be more depressed and may tend to slip into the role of elderly people dependent on others, they feel unnecessary, and do not consider it necessary to learn new, foreign expressions. [2].

5. Previous findings and redefinition of seniors

It can be stated that whom the society perceives as seniors is influenced mainly by the four primary factors, namely a) the biological age (biological changes, external and internal changes caused by the aging of the organism), b) the chronological age (administrative age limit), c) the social image of seniors (standardised stereotypes) and d) the self-concept of seniors (the type of personality, whether a person is active/passive). In the scientific literature, we most often encounter the definition of seniors based on their chronological age, but as the chronological age represents a social construct, this definition is insufficient. At the same time, I think that it is inadequate to state only that a senior is a person associated with the social stereotypes attached to the social role of a senior. The most important factor turns out to be the psychological factor that influences self-perception, the self-image of a particular elderly person. It should be noted that in Slovakia there is currently a large group of people over the age of 65 who are active, financially independent, fully participating in society and employed, who have maintain a standard contact with the progress of modernization, and thus acquire common new expressions associated with these innovations, e.g. teachers or doctors. Ordinary language users would not simplify their speech in communication with such people, because such need would not even arise. Thus, we cannot perceive the age of 65 as a strict limit, only as an administrative milestone. We cannot perceive grey hair or weakened senses as indicators of such a limit. What is important is the self-concept of a senior, who may not perceive himself/herself as a member of this social group even when he/she is over the age of 65, as proven by the examples from my research.

Therefore, we perceive seniors as those elderly people who are usually retired (no longer working) and are passive, which in turn increases their social isolation and causes that they do not keep up with "progress" and do not acquire expressions related to this "development". These seniors feel that they are a part of this social group and identify with the age stereotypes associated with the social role assigned to this generational group. Whether people feel that they belong to the senior social group can also be observed in the subconscious expressions used when they speak about seniors – they either perceive seniors as "them", which also appeared in examples from our research, e.g. a 65-year-old spoke about seniors in the third person plural *"seniors can't learn anything*

new", and vice versa, if they consider themselves members of the group of seniors they use the first person plural: *"we can't learn those new things anymore"*.

6. Conclusions

The presented paper aimed to reflect the image of seniors in the current Slovak linguistic and cultural environment and to propose a new definition of this social group. In the beginning, we presented two depictions of seniors in Slovak public discourse and we have identified the image of a traditional senior and the image of a modern senior depicted in the television advertisements. A rather traditional image of seniors has emerged in the political discourse and Slovak phraseology. Subsequently, in private discourse, in an interview with selected seniors, we identified a traditional senior (passive) and a modern (active) senior. The active group used modern terms and understood them. The passive group did not recognize these terms and did not want younger communication partners to use these terms in conversation with them. Subsequently, we presented and characterized four basic factors that affect the definition of seniors, namely biological, administrative, social, and psychological factors. We concluded that whether people feel like seniors depends mainly on their personality and whether they are active/passive, whether they are interested in public events, whether they travel, and so on. Based on our findings, at the end of the article, we redefined the social group of seniors as follows: These are elderly people who are usually retired (no longer working) and passive, which in turn increases their social isolation and causes that they do not keep up with "progress" and thus do not acquire expressions related to this "development".

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[24] Kotlíkové – Slovakia chips: https://www.youtube.com/watch?v=ZdbZFBlKai8

[25] Mobilný operátor Orange: https://www.youtube.com/watch?v=KndaWoleZ2g&index=4&list=PLtBrxkdlmB1m3bjlVe_B6 GXKk7CcmHMO

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SEX-BASED DIFFERENCES IN THE ADAPTATION OF PUPILS AT THE BEGINNING OF SCHOOL ATTENDANCE FROM THE PERSPECTIVE OF THE LEVEL OF MOTIVATION FOR SCHOOL

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Abstract: *There are situations in school education that specify the sex-based differences of students. Their existence also determines the course and success of the adaptation process. The sex of first-year students has an impact on the success of adaptation and the occurrence of adaptation difficulties. Girls and boys have different characteristics in the socio-emotional area. One of the indicators of its development is the individual level of motivation, which has an impact on the form of adaptation of the beginning schoolboy. The presented paper is focused on the comparison of the adaptation of girls and boys in terms of the level of motivation to school. The chosen research method was a questionnaire and the research sample was comparably made up of both sexes of beginning schoolchildren. The results show that there are differences in the level of motivation according to the sex of pupils at the beginning of schooling. Girls are characterized by a high level of motivation, which is related to successful adaptation and the absence of adaptation difficulties. On the contrary, the least boys in the research sample achieved a high level of motivation, and the last level was also present, which included the existence of difficulties in school education. Knowledge of gender specifics in pedagogical practice is helpful in identifying the individual adaptation process of each student. Providing adequate support is a tool to prevent adaptation difficulties.*

Key words: *adaptation, adaptation difficulties, socio-emotional area, motivation to school, beginning pupils*

1. Introduction

Starting school is an expected challenge for some children, and for other beginning schoolchildren it sometimes becomes a source of concern, uncertainty and fear. Entry into school therefore requires comprehensive preparation, which is a prerequisite for a successful start to primary education and at the same time the prevention or elimination of adaptation difficulties. The emergence of adaptation difficulties is caused by a wide range of causes that affect all aspects of the child's personality (Vágnerová, M. 1997, Zvalová, M. - Zvalo, P. 1999, Vilčinskaja, B. J. 2000, Kovalevová, L. M. - Tarasenko, N. N. 2001). The causes and manifestations of adaptation difficulties are different due to the individual peculiarities of the child in the field of physical, mental, social-emotional development. Several research points to the different nature of adaptation of children according to gender (Mertin, V. - Gillernová, I. 2010, Slezáková, T. 2004, Jánošová, P. 2008). In our paper, we focus on the socio-emotional dimension of adaptation, specifically the level of motivation to school from the perspective of girls and boys.

2. Theoretical background

In several scientific areas, the term adaptation is used, the meaning and content of which is based on the focus of the area. There is a broad-spectrum view of adaptation in pedagogy, which is concretized by three aspects. Socio - psychological aspect means adapting the individual to the requirements of the school, which result from the socially obligatory role of the student. The main indicators include the formation of appropriate behavior, establishing contacts with teachers and classmates, creating learning habits. The concretization of the pedagogical aspect is the adjustment of the school environment in the interest of eliminating and reducing the occurrence of adverse effects. In the context of humanistically oriented concepts, it also includes taking into account the individual peculiarities of the child. The health condition of the child, the possibilities of the organism and the different level of his workload are part of the theoretical approach, physiological aspect of the concept of adaptation. During it, pedagogical practice presupposes the management of the teaching process in accordance with their knowledge. (Slezáková, T. - Tirpáková, A. 2006)

A child's life at the beginning of school is subject to many changes that affect the quality of the adaptation process. Due to the specificity of the period, we consider it necessary to pay increased attention to its theoretical and practical knowledge. Existing theoretical approaches and research findings regarding school adaptation point to the occurrence of adaptation difficulties affecting the health and academic success of the student.

The term school maladaptation is used in the professional literature, which means the pupil's inability to cope with the requirements of the school and thus the occurrence of adaptation difficulties. In this context, there are also names "adaptive disease, school stress", which in their meaning correspond to the adaptation difficulties of beginning pupils. Thus, phenomena are present at the beginning of school attendance, when the possibilities and abilities of children do not correspond to the conditions of the educational process at school. In the professional literature we find several classifications of children's adaptation difficulties and identified causes. Based on the research findings of selected authors (Vágnerová, M. 1997, Zvalová, M. - Zvalo, P. 1999, Vilčinskaja, BJ 2000, Kovalevová, LM - Tarasenko, NN 2001, Slezáková, T. -

Tirpáková, A. 2006) they apply in particular to the mental, physical and social spheres.

2.1 Socio-emotional area of adaptation

Several studies confirm that more and more children at the beginning of school face difficulties in the socio-emotional area. The presence of such problems prevents successful adaptation and social integration, which at the same time weakens the psychosocial development of the personality. Research findings point to the fact that existing problems affect relationships in the classroom - with peers, with teachers. The authors cite problematic behavior, inability to cooperate, passivity, social closure, insufficient skills in interpersonal relationships as examples of difficulties. (Kourkoutas, E. et al. 2011)

In our paper, we want to draw attention to the level of pupil´s motivation to school, which is one of the factors determining the success of adaptation, respectively. the emergence of adaptation difficulties.

The beginning pupil should have motivational prerequisites, interest in learning activities, school activities. B. Kasáčová and M. Cabanová (2011) add that socio-affective predispositions relate to experiencing joy and responsibility, building will qualities in order to achieve school success, the level of motivation to school. In the interest of successful adaptation, it is important to increase the motivation of the future pupils before starting school and subsequently strengthen at the beginning of schooling. M. Franclová (2013) sees the basis for supporting motivation in satisfying basic needs, which also conditions the success of adaptation to new conditions.

The development of social skills supports the improvement of the cognitive component of the student's personality. Socio-emotional skills are important for existence in today's society. The teacher should know the appropriate options for strengthening these skills. In educational practice, it is a matter of combining knowledge with social-emotional skills, which represents an important basis for existence in school, in the family and in society. The concretization of the given skills in pre-primary and primary education enables their comprehensive acquisition in terms of the permanent characteristics of the individual. (Raptis, I. - Spanaki, E. 2016)

A. Kruszewska (2018) emphasizes the need for social and emotional development of the child before entering the 1st year of primary school, where its content becomes a frequent reason for pupils' adaptation difficulties. The author (2018) focused her research study on social development concretized by prosocial attitudes, contacts with peers, adherence to rules and emotional development within the control and manifestations of emotions, coping with difficulties.

The importance of the socio-emotional area of development of beginning schoolchildren is the subject of theoretical and research interest of several authors who draw attention to its improvement in preschool, school and family environment (M. Burchinal et al., 2019, I .Raptis - E. Spanaki, 2017, E Kourkoutas - G. Maria - X. Maria, 2011).

2.2 Adaptation according to the sex of beginning pupils

The course of adaptation and the nature of adaptation difficulties is conditioned also by the sex of beginning schoolchildren. Several researches confirmed the differences in the adaptation process of boys and girls (Marko, 1965, Marková - Vítovská, 1980, Vojáček, 1977, Antalová - Velická, 1986, Kuchárska, 1996, 1999, Mertin-Gillernová, 2003, Slezáková, 2004, Jánošová, 2008).

Some authors cite a higher sensitivity to exercise in the first year, a more frequent presence and the need for physical activity as the cause of adaptation difficulties in boys. S. Gabľasová (2006) sees the essence of more successful adaptation of girls in the overall earlier maturation compared to boys. More difficult adaptation to school also results from a relationship with a teacher with whom the boys cannot identify. The girls transfer a good relationship with their mother to the teacher's personality, which facilitates the adaptation process.

Current education includes requirements, the fulfillment of which requires in particular the characteristics typical of girls more - obedience, responsibility, diligence. At the beginning of schooling, expectations are met, especially for girls. In order to achieve school success and a smooth transition to school education, boys often have to suppress typical manifestations. P. Jánošová (2008) states that difficulties at the beginning of school attendance are more common in boys. Compared to girls, they are more often diagnosed with school immaturity, which is considered to be one of the causes of adaptation difficulties. Manifestations in boys include easier fatigue, disturbance, problematic behavior. School requirements place a higher burden on boys who may subjectively experience stress and neurotic problems. Generalized, typical characteristics of boys and girls also condition the demands and ideas concerning entry into the 1st year. The occurrence of adaptation difficulties in boys is often considered temporary, which results in a reduction in expectations towards the student.

Deficiencies in the socio-emotional area hide the potential for pupil adaptation problems at the beginning of schooling. In order to prevent their occurrence, we emphasize the need to close the "gap" between the school environment and the conditions of preschool facilities or families. Increasing it brings challenging challenges and risks for the child when entering primary school. By minimizing the factors of adaptation difficulties, adaptation will be individually successful.

3. Research part

The research activity was focused on the course of adaptation of 1st year pupils, while we draw attention to the level of their motivation to school. The main goal of

the presented study was to identify and compare the level of motivation to school for girls and boys at the beginning of schooling.

The research method was a questionnaire with ten items, to which pupils answered by choosing from three options. The compiled questionnaire was a modified version of the questions, which assessed the level of motivation of 1st year students N. L. Rumjanceva (2012). For the purposes of differentiation, she compiled a scoring system, which was adapted and applied for the evaluation of the questionnaire. Three points were set for the answer expressing the positive attitude of the pupil to the school, one point was set for the neutral answer and zero points were given for the negative attitude towards the school situations. According to the number of points, students were differentiated into five levels. The highest number of points means a high level of motivation, the lowest number represents a negative attitude towards the school. The questionnaire was processed according to the characteristics of 1st year students, the focus of our research study.

The selection of the research sample was available and intentional according to age and education. In the research study, there were 77 active respondents- 1st year pupils who were from selected primary schools in the Slovak Republic. Given the aim of the research, there were 36 girls and 41 boys among the respondents, which we consider to be a comparable set. The implementation of research activities was at the beginning of the second half of the school year.

The items in the questionnaire focused on the student's relationship to school, social relations in the classroom, attitude to the new role of student and classmate. We also found out the reasons for joy at school, perception of the importance of self-learning, characteristics of home preparation, communication of the student with parents about school, feedback from the family environment, compliance with the rules of school education.

4. Results

The obtained data were evaluated according to the scoring system for individual questions, the identified level of motivation of individuals was according to the total number of points. The results are differentiated according to gender, they express the number of girls and boys in individual levels of motivation. The illustrative form is in the form of a graph, which shows the number of students within a given level of motivation. The last graph is devoted to comparing the number of girls and boys according to the level of motivation to school. The achieved results are also expressed by the description of the most important findings concerning the level of motivation of girls and boys in the context of adaptation at the beginning of schooling.

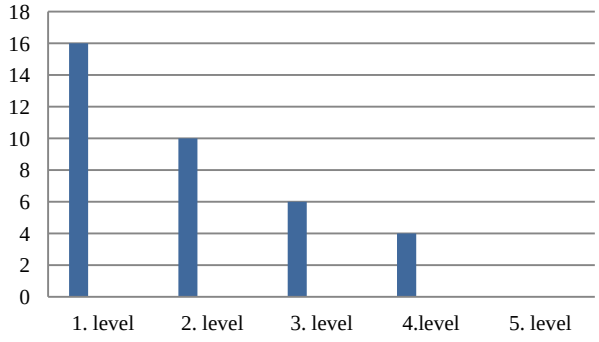

Figure 1: The level of motivation for school in girls

The graph shows that most of the girls scored points corresponding to the first level. Based on the results of the questionnaire, we know that 16 girls have a high level of learning motivation. The group is characterized mainly by cognitive motives, interest in learning. In general, there is a motivation for beginning pupils to perform typical school activities. In the social-emotional area, students are characterized mainly by a feeling of joy and responsibility, adequate willpower to fulfill school obligations. 10 girls have similar characteristics that are formed at a lower level. This is a good or average level of motivation. In the third level, there are six girls who are more interested in extracurricular activities, social contacts, typical school supplies than in learning. A low level of motivation is present in four girls who are engaged in their own activities during their education and there are problems in meeting the requirements of school education. No girl is in the fifth level, which represents the absence of adaptation difficulties in the girls in the research sample.

According to the approximated results, we can state that the presence of the first and second level dominates in the girls in the research sample. More than half have a high or good level of school motivation. The results also show that the adaptation of girls at the beginning of school attendance is mostly successful, there are no adaptation difficulties and weaker support is needed, resp. stimulating the cognitive interests of girls.

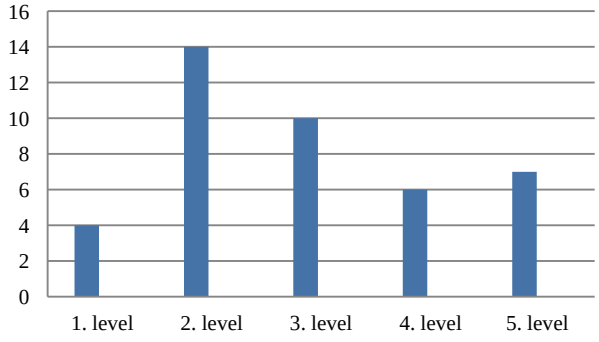

Figure 2: The level of motivation for school in boys

In the graph we can see the lowest number of boys, only four of them are in the first level of motivation to school.

In school education, they show an interest in acquiring new knowledge, their own efforts for the successful implementation of learning activities and compliance with school obligations. Most boys achieved the second level of motivation to school, which is an average norm. Beginning pupils have similar characteristics as at a higher level, but the rate of development of individual indicators is lower. According to the evaluation based on the scoring system, there are ten boys in the third level, whose motivation is not based on learning activities and cognitive interests. The focus is on extracurricular activities, contact with classmates and interaction with teachers. A low, fourth level is present in the six boys in the research sample. Less than ten points, the fifth level was achieved by seven boys, which is the third highest number of points. Boys at a given level have a negative attitude towards school, difficulties in meeting the requirements of school education, establishing social contacts in the class team or with the teacher.

From the point of view of the graphic representation, we can see that the second and third levels of school motivation are most present. In the context of adaptation, it is necessary to stimulate boys' interest in learning activities, the development of cognitive motives and the formation of efforts to cope with the requirements of school education. Attention must be paid to the least represented first level and the existence of the fifth level of motivation to school, which presupposes the provision of adequate intervention for the students. In pedagogical practice, it is necessary to eliminate the occurrence of adaptation difficulties of pupils at the beginning of school attendance, the causes of which exist in all areas of the personality of a beginning pupil and based on the family, preschool or school environment.

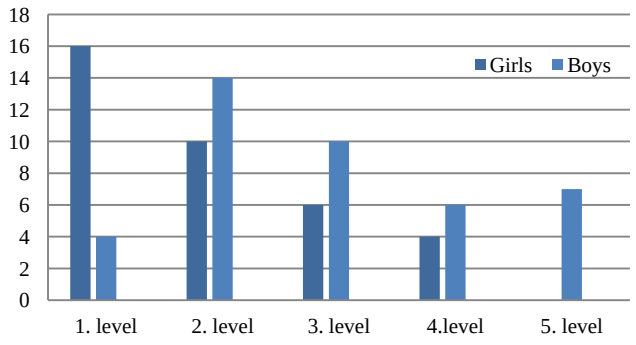

Figure 3: The comparation of the level of motivation for school in girls and boys

According to the Figure 3, the results of the research study show the largest differences in contrast levels. For girls, the first level is the most represented and the last is not present at all. Conversely, boys have the lowest number recorded in the first level and there are individuals in the fifth level of school motivation. If we understand the motivation to school as one of the factors determining the success of a pupil's adaptation at the beginning of schooling, then the comparison shows a better and more successful adaptation of girls. In boys, the period of adaptation is more difficult, there may be adaptation difficulties requiring support and intervention.

Research findings point to differences in the adaptation of pupils at the beginning of schooling within selected areas. The level of motivation affects the emergence of adaptation difficulties. We consider the course of adaptation to be more successful for girls who have less difficulty in the socio-emotional area. Motivation becomes a prerequisite and an indicator of the success of the adaptation of a beginning pupil. The subject of our research interest was the differentiation of students with respect to the level of motivation to school. The main goal was achieved, because by implementing the questionnaire, evaluating individual questions according to the scoring system and interpreting the research data, we identified and compared the course of adaptation of girls and boys according to the level of motivation.

5. Conclusion

The successful course of adaptation of a student at the beginning of school attendance is conditioned by many factors that have an individual degree of influence on the personality of a pupil. Entry into the 1st year of primary school may thus include the occurrence of adaptation difficulties, the causes and manifestations of which also differ according to gender. Girls and boys come to the school environment with different expectations that do not always copy reality. In our paper, we tried to point out the gender differences in the adaptation of students at the beginning of school in terms of individual levels of motivation to school. Research findings show a different adaptation of boys and girls, whose adaptation process is more successful in terms of motivation. The attention paid to increasing and maintaining a sufficient level of motivation supports the success of adaptation, prevents the emergence of adaptation difficulties and forms the basis for further school education.

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APPROACHING THE PROFESIONAL PREPARATION OF FUTURE ART TEACHER

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Abstract: *Preparation of arts teachers has been a matter of intense discussions over the past few years, emphasising the educational and artistic needs of different school types and stages. As a part of their college education, students are expected to undergo a quality preparation for their professional role and future occupation. This entry deals with the professional preparation of future arts teachers at the Department of Visual Arts Education, Faculty of Education, University of Ostrava.*

Keywords: *art education, art teacher, teacher training, preparation of arts teacher, model of education planning.*

1. Introduction

Didactical and subject-related research, as well as professional discussions or college practice which is a matter of interest at many faculties of education, help refine answers to issues of the professional preparation of arts teachers. Essential topics which can be described as factors influencing the optimisation of the outputs of arts education include primarily the issue of learning, teaching, and schooling.

2. Type of Study Programme: Teacher Training for Primary Art school and Secondary Art school (Master's studies)

New requirements and high demands are placed on the higher education preparation of future teachers for the profession of teacher. The aim is to prepare the teacher for his demanding profession. Vocational training is aimed at ensuring the teacher's expertise in the exercise of his profession. These requirements imply that the teacher should be not only a professional professional in the field, but also a great personality.

In the course of vocational training, conditions and interventions should be created that will promote the authentic professional development of a university student in the field of Teacher training for Primary art school (hereinafter referred to as the PASch) and Secondary art school (hereinafter reffered to as the SASch). A university student should realize that being a Teacher means teaching his pupils respect for certain values. The teacher must first and foremost be a respected person able to defend his own strategies of learning, attitude, decision-making and action in a pedagogical situation.

Students in the field of Teacher Training for PASch and SASch at the Department of Visual Arts Education, Faculty of Education (hereinafter reffered to as the DoVAE, FoE), University of Ostrava undergo continuous pedagogical practice in primary schools, primary art schools, grammar schools and secondary art schools.

Students in the field of Teacher Training for PASch and SASch (single-subject study of Teacher Training) choose the school for continuous practice themselves, on the basis of a preliminary agreement with the school head and a qualified art teacher.

Formal and legislative provision of the practice is provided by the FoE officer. The student hands over to the Assistant Professor (i.e. Didactics of Art Education) a copy of the confirmed "Document for the implementation of continuous pedagogical practice", also the student consults with the Assistant Professor on preparation for teaching in art education. The student with the Assistant Professor also negotiates the conditions for granting credit for continuous pedagogical practice. The usual requirements of the DoVAE, FoE include:

- Completion of continuous practice at a particular school in the required scope and quality (Confirmation and evaluation of the course of practice by metor present during the implementation of the practice);
- set of preparations carried out in the course of practice with reflections and documentation (Comprehensive preparation for arts education);
- student's assessment of experience in terms of benefits for the development of professional competences.

3. Approaching the Professional Preparation of Future Teachers

The aim of professional preparation is for students to master the curriculum which is the main tool of implementing the goals of visual arts education, as set by a curricular document. All facts pertaining to teaching visual arts are learned by students over the course of their artistic-theoretical preparation and practice. Practical preparation for specific visual arts teaching units is presented to students, emphasising individual levels so that students are able to consider all components of the education process to which these levels relate:

- Education goals and content;
- cooperation between the teacher and pupils;
- methods and organisational forms;
- didactic means and circumstances under which education takes place [1].

The process of planning educational activities itself is very difficult and utilises a student's acquired knowledge of art

subjects (art fields) as well as their didactic knowledge. Working with a comprehensive knowledge basis, didactic knowledge of content consists of these categories:

- Content-related knowledge (content knowledge, didactic knowledge, knowledge of curriculum);
- general rules of group organisation and management;
- knowledge of pupils (and their characteristics);
- knowledge of the context of education, as well as of the education's purpose, goals, and values [2].

4. Model of Education Planning

There are many education planning models. Kalhous et col. suggest that the following questions be asked when drawing up a preparation for the education process (edited):

- What are my goals and what do I want to achieve?
- By which means do I intend to fulfil these goals?
- Is there any special didactic perspective I need to take into account?
- What are the education options?
- How can I organise a teaching unit?
- How much time do individual stages of the teaching unit require?
- How will I determine that goals were fulfilled? [3]

Example of an education planning model: Comprehensive preparation for arts education — a model used for a continuous practice in the subsequent master's programme of Teacher Trainong for PASch and SASch:

Comprehensive Preparation for Arts Education

1. Educational Environment

Explanation: School address, year, number of pupils in the group, length of art meeting.

2. Objectives of the Lessons and its Planned Educational Content

Explanation: Goals aimed at the complex development of the pupil's personality and with emphasis on his individuality, identity, communication, his developing aesthetic, artistic attitudes.

2.1 Learning

2.1.1 All-sense

Explanation: Emphasis on visual or haptic experience with nature and culture.

2.1.2 Cognitive Goals

Explanation: Emphasis on content and meanings that are hidden behind shape, light, color, linear, area, spatial, etc. characteristics of phenomena in culture, i.e. behind the sign systems of artistic communications of own and other people. Development of sensitive artistic perception: Sensitive perception of shapes, colors, lights, surfaces, composition, etc., with emphasis on the development of sensitive acceptance of elements of visually figurative speech of cultural artifacts, their content contexts and forms.

2.1.3 Experience Goals

Explanation: Emphasis on experience, experiences accompanying artistic expressive creation and self-realization and cognition.

2.1.4 Conative Objectives

Explanation: In relation to artistic practical and theoretical knowledge, artistic creation, social and cultural contexts, subsequent transformation into learning conditions of pupils in art education.

- Emphasis on the effort to create art.
- Verbal and nonverbal expression.
- Strengthening the characteristics of cognitive, study and personal.
- The pursuit of mental balance.
- Studying the history of visual culture and its historical and contemporary content.

2.1.5 Speech - Visual Communication

Explanation: Communication through elements of artistic speech and their compositions develop their own abilities of visual communication within the framework of original visual creation.

- Development of verbal and nonverbal communication, ability of artistic communication and understanding of another author. Total cultivation of social communication and use of communication in creating a favorable atmosphere [4].

2.1.6 Other Motivational Goals

Explanation: The need to art self-realize, to exercise its interests, attitudes towards art creation and to continuously study art history.

- Development of independent decision-making and artistic self-realization.

2.1.7 Knowledge

Explanation: Knowledge of the history of culture with emphasis on visual culture in relation to nature, aesthetics, etc., acquisition of new theoretical and practical skills.

3. Transform Content into Individual Points

3.1 Title of the Art Theme

Explanation: Name for the artistic processing of the task.

3.2 The Relationship between Content and Form

Explanation:

- Development of all-sense perception, visual memory, imaginative activities, visual thinking, skills of visual expression, e.g. visual-visual (graphic, color, spatial, etc.) transcription of the experience, (fantasy) ideas,

creative ideas, solving problems defined by the subject and its meanings.
- Development of artistic creation and communication, fine art as an experimental practice in terms of innovation of means, content and effects.
- Emphasis on the worldview, religious, philosophical and scientific and technological background of the historical styles of the European cultural circle. Development of artistic means of expression essential for understanding current visual communication.

3.3 Plane of Art Activity
Explanation: Emphasis on artistic expression through visual form, i.e. method of expression in artistic-figurative expression and its sign system.

- Emphasis on open artistic expression.
- Presented art technique.
- Tools and organizing (teaming).

4. Ways to Connect Educational Content with Art and Culture

4.1 Knowledge Level in Relation to Art Culture
Explanation: Development of understanding and experience of content and form of expression, aesthetic and artistic manifestations, expression and aesthetic values, development of understanding of concepts and their contents.

4.2 Social and Cultural Values of the Art Task
Explanation:
The plane of social, values and recreational; Development of the ability to:

- Create with other people;
- to perceive and solve creative situations;
- to evaluate the work in the group, etc.

The pupil should perceive:

- Uniqueness of the expression of a classmate, his feelings and perceive his human values.

4.2.1 Plane of Value
Explanation: The plane of value consists in the perception of images of good and evil, the perception of lies and justice, the search for truth and the discovery of its form in visual culture, etc.; as well as the protection of the child's mental health, reduced psychological burdens, etc.

4.2.2 Plane of Knowledge in Relation to Art Culture
Explanation: Developing an understanding of artistic expressions and aesthetic values of nature and culture; developing an understanding of concepts and content, within the knowledge of the history of culture with an emphasis on fine arts and visual culture.

4.2.3 Plane of Recreation
Explanation: The pursuit of mental balance and emphasis on aesthetic experience.

- The joy of individual artistic expression and artistic work, etc.

5. Solving educational situation-art lessons
Explanation: The student prepares the concept of preparation for art education in the context of an art theme. The student realizes the concept of art education at a selected educational institute (within the course of continuous pedagogical practice).

5.1 Motivation
5.2 Clarifying an art theme and entering into an art activity
5.3 Independent work (or collective work)
5.4 Reflective dialogue and final evaluation

The above-mentioned form of written preparation for education-related situations in visual arts education is very extensive in regard to a teacher's day-to-day needs, but its purpose is to serve those who embark on practical experience in an art field as a part of their master's teaching programme.

4. Conclusions
The text emphasises essential components which serve as vital structures and need to be respected by students acquiring practical experience, as well as key issues which determine the understanding of learning processes as a part of acquiring pregraduate teaching experience. Finally, it should be mentioned that teaching visual arts requires endowment in terms of personality or social, cultural, and artistic ability.

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PRACTICAL USE OF INNOVATIVE DIDACTIC TOOLS IN DANCE EDUCATION

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Abstract: *This study deals with the practical use of innovative didactic tools, such as tablets, dance mats, or the Kinect, in the teaching process of dance. It presents specific movement activities that make an efficient use of modern technologies integrated into classical teaching. Since we are of the opinion that we should not shy away from technological progress but, instead, we should make use of it to our advantage, we conducted a research at primary schools of arts. The research included the exercises presented below and led to the conclusions specified in the text.*

Keywords: *innovative didactic tools, modern technologies, dance education, movement activities*

1. Introduction

As already mentioned in the annotation of this study, the specific exercises and movement activities described below are based on the research conducted as part of the following dissertation: HUBINSKÁ, Z. - *Inovatívne didaktické prostriedky v hudobno-tanečnom vzdelávaní* [Innovative Didactic Tools in Dance and Music Education], 2019. The aim of the dissertation research was to assess the influence of the use of selected innovative didactic tools – tablet, dance mat, Kinect – along with classical music on the educational climate in the class during the pupils' musical and dance activities in the dance specialization of the primary level of art education.

The research was carried out in two phases. In the first phase, teaching took place in a classical way, without the use of ICT. We worked with second and third graders of the primary level (ISCED 1B) within the dance preparation subject whose aim is to prepare the pupils for the subsequent compulsory subjects by elementary exercises. We met the students of both groups once a week and each lesson lasted 65 minutes. Teaching took place in the same way in both groups. The second phase of the research consisted of lessons with an experimental group (with which we carried out movement activities prepared in advance), enriched with innovative didactic tools (tablet, dance mat, Kinect) used along with selected samples of classical music. Lessons with the control group involved regularly used didactic tools (CD player, computer, projector etc.) within the teaching process. The movement activities performed with both groups were identical. The teacher was Mgr. art. Zuzana Hubinská, PhD.

The purpose of this study is to bring practical examples of the use of ICT in the teaching process, which might inspire dance teachers working in various educational institutions.

2. Movement Activities

We worked with each didactic tool for three lessons, while the first lessons were dedicated to familiarizing the pupils with the given multimedia device and its functions. We used a specific application in each device: the Paint application in the tablet, the StepMania game in the dance mat, and the Let's Dance game in the Kinect. Further below, we describe the specific, tried-and-trusted movement activities that we carried out in the teaching process with the experimental group during the second phase of the research. The movement activities were the same with the control group, but innovative didactic tools were not used.

2.1 Tasks with a tablet device

First task: the pupils are divided into groups (based on the number of available devices; in the original research, we had three tablets, so the pupils were divided into three groups). A musical sample, The Elephant from The Carnival of Animals by Camille Saint-Saëns, is played to each group. The musical samples may vary depending on the teacher's preferences and needs. In our case, we wanted to work with classical music and promote a positive attitude with didactic tools specifically to this genre.

The introduction to this activity is static, focused on working with the music, specifically on active listening, which develops the pupils' perceptive skills. The pupils were not told what animal is depicted in this movement of the composition and we told them in advance that whatever they would draw would be correct, and they should not be afraid that they would make a mistake. The sample is played, the pupils listen and, based on whatever the music evokes in them, they can start drawing various pictures in the Paint application. In the original research, the pupils in the first group drew an elephant, a bear, a tree, rain, and a piano, and a girl wrote the word ELEPHANT in capital letters (the images are show below). The next step was to render these pictures in movement. The pupils had to be able to get inspired by the lines, directions, colours, or even the specific image (animal, occupation, person etc.) and transfer these perceptions into movement. Such expression of improvised movement develops the pupils' creativity, imagination and, in a sense, even their motor literacy. It is good to repeat the individual presentation at least twice, so

that, after the first round when the pupils' movements may be restrained because of their shyness, they can overcome stress and begin to fully utilize the entire sphere of movements on the spot and in space. The teacher may direct the pupils verbally on how they could work with their body, e.g. by some specific instructions (alternating the spatial levels, using hops, rotations, runs, minimal movements on the spot etc.). However, the teacher should not correct the pupils. Instead, he or she should encourage them to be creative.

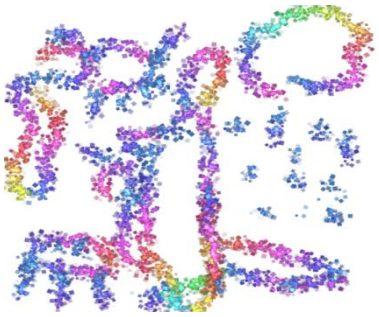

Figure 1 drawing on a tablet device

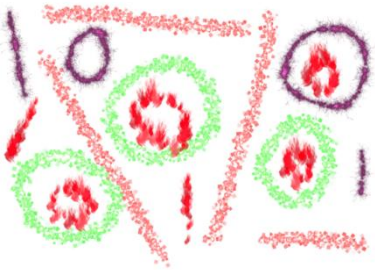

Figure 2 drawing on a tablet device

Second task: the introduction takes place in the same way as in the case of the previous activity, i.e. a musical sample is played to the pupils (in the original research, we used Wild Donkeys Swift Animals from The Carnival of Animals by Camille Saint-Saëns). The selection of the music is up to the teacher and it depends on the purpose of the lesson. However, it is advisable to choose a contrasting composition to the one used in the first task. Inspired by the music, the pupils draw various pictures in the Paint application and then transfer them into movement in individual presentations. However, the aim of the second task is that the pupils should be able to create their own short dance pieces from improvised movements. The pupils may be given some time for inventing their choreographies using their improvised movements. Besides the development of perceptive skills, the purpose of this exercise is to develop the pupils' motor memory and their ability to perceive body movements in space. If the pupils are unable to invent combinations independently, the teacher may help them e.g. by selecting movements from their initial improvisation. If they do not remember these, they can take a look at the picture they drew and dance some movements anew based on this visual source of inspiration. Subsequently, they are left to come up with ideas of how to combine the selected movements into a final form. Again, we try not to direct the creative process but, instead, encourage the pupils to process the task creatively and independently. The teacher may use the resulting choreographies in various ways, and even include them in a final public performance.

2.2 Tasks with the dance mat device

First task: the pupils work independently and are divided based on the number of available devices (in the original research, we had only one dance mat, connected to one laptop computer. To prevent the rest of the pupils standing idly during the lesson, we had made paper copies of the dance mat. We placed the pupils in a way that each of them had a good view of the laptop. In this way, we made all the pupils participate in the task actively). At the beginning of the lesson, when the pupils see the device for the first time, it is necessary to familiarize them with the rules of the StepMania game, best by demonstration (it is important for the teacher to know at least the basic musical materials available in the game to choose a piece in a tempo that suits the particular age group). In our research, we used the Zodiac piece for the demonstration. After the initial familiarization with this multimedia device, we go on to practice rhythmic combinations of the lower limbs invented in advance (the combination is invented by the teacher inspired by the movements of the lower limbs in the StepMania application). The practice takes place first in silence, without the dance mat, and the combination is then tried to a selected musical sample (in the research, we used Aquarium from The Carnival of the Animals by Saint-Saëns, The StepMania application offers the option to insert and use any piece of music in an MP3 format). Subsequently, the pupils are made to stand on the dance mat and we observe whether, after their initial work with the composition, they achieve a higher, lower, or identical score with similar movements of their lower limbs based on the StepMania game.

Second task: the aim of the lesson is to develop the pupils' ability to invent individual pieces and to promote the development of their sense of rhythm in movement based on a particular piece of music. At the beginning of the lesson, the pupils repeat a rhythmic combination for the lower limbs that they learnt during their previous lesson (to the music of Aquarium from Saint-Saëns's Carnival of the Animals). They take turns on the dance mat, where they try to achieve the highest possible score without the teacher's help. Subsequently, the pupils are given enough time to independently come up with their own original, coordinated lower limb movements to the mastered rhythmic combination. The rehearsal takes place outside the mat with no musical accompaniment. After a few minutes, the musical sample is played to the pupils to enable them to try their choreographies to music, too. This is followed by presentation. If the pupils are too shy in front of each other, the whole group can present the choreography at the same time at least twice. The next task is to try the coordinated lower limb movements along with the upper limbs on the dance mat. This brings a moment of

heightened concentration on the correct position of the feet (the ability to step on the arrows) while having to focus also on the invented upper limb movements. For an even more difficult task, we can change the musical sample and, for example, increase the tempo (in the original research, we used the Finale from Saint-Saëns's Carnival of the Animals). The rehearsal proceeds in the same way.

2.3 Tasks with the Kinect device

First task: the teacher must familiarize himself or herself with the device and the choreographies available in its Let's Dance application in advance. Based on the music selected by the teacher, the pupils learn the variation of movements associated with it (in the research, we worked with How Far I'll Go by Auli'i Cravalho from the animated film Moana). Each pupil then steps in front of the Kinect and dances along with their avatar. The performers receive points for correct movements, and these are added up as their score. To make it more attractive, and to slightly promote competitiveness in the class, the teacher may record these scores and evaluate them after all the samples in the end. The teacher observes the accuracy of the pupils' movements and to what extent they can perform them correctly. The aim of the next task is to assess the pupils' ability to control their bodies based on immediate repetition of the movements demonstrated by the character/avatar in the Let's Dance game to a new musical sample – a change in the choreography (In collaboration with an IT specialist, we inserted The Swan from Saint-Saëns's Carnival of the Animals into the Let's Dance application). The teacher again records the scores achieved by each student and saves the video recording of the first round. Subsequently, the movements of the specific choreography are practised and improved without the Kinect, so that the pupils become more confident in what they have to dance. The teacher should learn the movements displayed on the screen for the given composition in advance, because he or she must be able to perform and demonstrate them correctly. The teacher explains to the pupils which lower or upper limb leads the given movement, when the limbs are bent/stretched etc. After some time, the pupils take turns in front of the Kinect and dance the mastered variation. Their scores are compared to those they achieved in the previous round.

Second task: at the beginning of the lesson, the pupils revise the dance combination to a selected composition, all of them take turns in front of the device, and try to repeat the movements of the avatar in detail. Subsequently, they are divided into two groups – spectators / performers (one of the features of the Kinect, and of the Let's Dance game in particular, is the option to have a number of players participate actively at the same time. In this case, we can motivate the pupils to perform best by comparing their various performances). The aim of this task is to develop the pupils' self-examination skills and their ability to observe and verbally describe movements. Every performer steps in front of the Kinect and dances the mastered combination along with the character in the Let's Dance game. The rest of the pupils (the spectators) note down in their workbooks any errors if they think the performers have made a mistake. The teacher takes notes in the same way. After each presentation, we discuss together who noticed an error and what error it was. The performers can also comment on their performance if they are aware that they made a mistake somewhere. After the presentation, the video recording in Let's Dance can be played to double-check. In this way, we can find out who was right, who noticed whether the performer had made a mistake or who (on the contrary) only thought that there had been a mistake when in fact there had been none, etc. This enables us to verify, from another perspective, whether the pupils remember the choreography to the extent that they can visually identify and name the mistakes. In this task, it is important to teach every movement of the choreography to the pupils thoroughly and to demand that they execute the movements accurately, because the Kinect can identify the figure in front of the camera but accepts even imperfectly executed movements as accurate ones. E.g. when the avatar on the screen shows their outstretched right arm opening to the right, the device accepts this movement even if the pupil's elbow is bent but moves in the right direction. With this in mind, we must ensure that they follow the principles of right posture, conscious control of the body parts (isolation, impulse, muscle chains) etc.

3. Conclusion

In our effort to map how innovative didactic tools combined with classical music influence the educational climate, we presumed that a positive atmosphere during the learning process would give scope to creative thinking and realization, i.e. it would have a positive impact on the development of the pupils' creativity and self-realization in their movement activities to music. The analysis of the results, which refer to the factors that have an influence on a positive educational climate, revealed that the selected didactic tools combined with classical music had a significantly positive impact on the course of the lesson in the experimental group. Based on the results of this research we may conclude that the introduction of innovative didactic tools with classical music into the movement activities had a positive effect and influenced the attributes of a positive educational climate. In such an environment, the pupils had the chance to get a hands-on experience of a spontaneous creative process, of working with others in a group, and of getting to know themselves. The results of the research show that tablets are a suitable didactic tool for older pupils who have a richer movement vocabulary and whose visualization and imagination skills are adequately developed. Although younger pupils have a vivid imagination, they are not able to work with it in a way that would utilize it as a source of inspiration for movement. In our opinion, tablets could be used with pupils from the fifth grade of the first level of arts education onward. The dance mat was a suitable tool for the original research sample (third grade of the first level, ISCED 1B) since the option to increase the difficulty with faster compositions is suitable even for older pupils. Also, dance mats acted as a motivating factor for the pupils to

invent their own movement combinations and had a positive effect on the development of their rhythmic skills. Similarly, the Kinect and the selected Let's Dance game worked as a suitable innovative tool. The functions of this device offer a wide range of ideas for integrating it into the teaching process in a suitable and efficient way (it contains also more difficult choreographies in terms of movement). All the devices used in the research have the potential not only to develop the motor competencies of the pupils at various levels of arts education but, in some respect, they can even promote classical education and motivate the pupils to perform better [1].

Literature

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MUSEUM: SPACE FOR EDUCATING SOCIALLY HANDICAPPED CHILDREN

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Abstract: *Research will deal with the phenomenon of museums as educational institutions which develop their social mission and respect the diversity of their audiences. Attention will be paid to socially handicapped children as a specific target group of museum education. The aim is to analyse current education options offered by museums to socially handicapped children. The research will include an analysis of eight education options, using observation and structured interviews with lectors. These options will be subsequently compared. The research will focus on the educational intent of education programmes. The author is especially interested in learning how the educational aspect of special requirements of the group's education is taken into account when education programmes are being drawn up.*

Keywords: *museum, museum pedagogy, education programmes, social handicap, children*

1. Introduction

Proposal of research activity focuses on museums as educational and guidance institutions which preserve national values and strive to present them to future generations.

1.1 Social Handicap

For the purposes of the Education Act, social handicap is defined:

- as a family environment of a low cultural and social standing, one which is endangered by socially pathological events;
- compulsory institutional care or imposed juvenile rehabilitation;
- or a status as an asylum seeker and a party to proceedings on granting an asylum in the Czech Republic as per specific legislation.

This group of children from a disadvantaging environment includes children:

- whose family does not support education and does not sufficiently meet their material needs;
- lives on the margins of society or is socially excluded;
- follows cultural patterns which differ from those of the Czech society;
- speaks a language which is different from the one used for education [1].

Many vocational publications link social handicap, especially with an environment with certain characteristics. A socially disadvantaged environment is considered to be "a social environment where basic pedagogical, psychological, material, cultural and demographic factors that contribute to the integrity of the personality are lacking." [2] The most serious cause of social disadvantage in children is considered to be living in an environment, so-called socially excluded localities [3].

1.2 Museum pedagogy

"The museum as an institution and as a spiritual value is a completely unique cultural and social phenomenon of our time." [4] The design of the research activity will address the phenomenon of the museum as an educational institution that preserves national cultural values and seeks to convey them to future generations so that these values do not disappear. The educational objectives of the museum have been transformed in the process of historical development and have played an important educational role for mankind since its inception. From the 2nd half of the 20th century, the scientific field of museum pedagogy began to develop. At present, significant attention is paid to the educational potential in Czech museums and galleries, which is understandable along the lines of foreign institutions.

The museum education is considered by Juva as a "basic category of museum pedagogy" and in its characterization is based on the "concept of contemporary museum and pedagogy." [5] Furthermore, Juva considers the effect of museum pedagogy "positive changes induced in an individual by the action of the museum, its material and intangible contents and their arrangement." [6] It is typical for museum pedagogy that the so-called functional (indirect) educational activity prevails here, as opposed to school education, which is characterized by the action of an external factor (teacher). The functional educational activity in the museum is related not only to the art work of exhibits, exhibition units and exhibitions, but also to the influence of museum architecture or the social climate of the institution [7].

The Museum pedagogy is a discipline of education which studies all aspects of using museums and their collections for education purposes. It strives to remove physical, sensory, psychological, and social barriers. Visitors with social handicap (hereinafter referred to as the SH) fall into the sphere of interest of inclusive museum pedagogy.

Museum and galleries offer various types of programmes, e.g. gallery animation which consists of animating

activities where visitors use different materials and objects to create art works whose technology or subject relates to the artefact under observations.

Another framework of museum pedagogy is the link to the Framework Educational Programmes (hereinafter referred to as the FEP) for individual types and grades of schools, the area of Arts and Culture, which is represented by two subjects, namely art and music education (with drama education as a supplementary educational field). These educational content can be combined and strengthened in interaction. In this respect, further links are offered with cross-cutting themes of FEP and other creative subjects (from multicultural education and personality social education, through media and environmental education, to thinking in European and global contexts).

2. Education of pupils with special educational needs

The basis of successful education of pupils with special educational needs is mutual cooperation of the school, family, relevant counselling facility, experts from special doctors and cooperating organizations. Education should be viewed in aspects:

- educational;
- development of the pupil in terms of social adaptation;
- development of social communication skills;
- development of physical and psychological aspects.

The causes of social disadvantage are always linked to the wider context of the pupil's life, which may not always be known to school staff. It is therefore essential that more actors be involved in assessing the needs of a particular pupil [8].

For socially excluded pupils, the focus should be on the strategy of learning how to learn. Teachers must try to influence positive changes in the pupil's learning style. In doing so, account must be taken of factors affecting the style of learning (i.e. attitudes towards education, family background, conditions in which the study takes place).
Other specific conditions in education may be group teaching, which can be taken according to Mares as: cooperative learning, where one pupil is in a group as an "expert", partner learning where two pupils work, while the more advanced, more experienced teaches weaker and collaborative learning represents peer-to-peer cooperation [9].

Kaleja mentions the most important forms and methods of working with pupils with social disadvantage, which should be included in education in museums or galleries:

- Emphasis on the acquisition of the Czech language and familiarization with the Czech environment, cultural traditions, customs;
- use of elements of multiculturalism of topics in FEP;
- classification of optional items, i.e. afternoon rings with a given theme;
- use of activating activities;
- in teaching based on real situations of everyday life;
- extended interpretation of the course;
- necessary feedback, if the pupil understands the information communicated entrepresented (based on other values, different experiences), i.e. checking the correct view of the assigned task, illustrative aids, auxiliary questions;
- respect for work pace and reduced resistance to load,
- movement release and alternation of activities of different kinds [10].

3. Design of the research model

The author decided to study the current condition of selected Czech museums, focusing on the application of current trends in museum education to the target group.

Research goal:

- To learn what role museums play in the process of educating socially handicapped children;
- find out what the education strategies of education options are.

Research questions:

- What kind of role do museums play in the process of educating children with SH?
- What do education programmes under the Ministry of Culture of the Czech Republic look like in relation to the particular museum group?
- How efficient is the museum's strategy of educating socially handicapped children?
- How do education programmes take inclusion into account?
- What are the strong and weak points of children's education programmes?

The research sample will be given:

- Representative representation of museum and gallery institutions in the Ministry of Culture (hereinafter referred to as the MoC) and their educational potential, i.e. the sucing for a varied sample, which will make it possible to present a varied picture of the current educational offer for children with SH.
- The author selected examples of museums that have long been devoted to the education of children, pupils and students with special educational needs. These are museums and galleries in the resort of the MoC: Moravian Regional Museum; Museum of Roma Culture in Brno; Olomouc Museum of Art; Silesian Regional Museum; Museum of Applied Arts in Prague; National Museum; Moravian Gallery in Brno; National Gallery in Prague.
- Interest of museums to collaborate on research.

Methodological procedures:

- A qualitative methodology will be applied in the investigation;

- the basic research strategy applied in this research will be a case study;
- methods of data acquisition – questionnaire survey, structured interview, observation, content analysis of text materials, photo documentation of educational activities.

Methods of data processing and analysis:

- The final form of the case studies will refer to the current educational programmes aimed at children with SH.

4. Conclusions

Education programmes are expected to aim for implementing the idea of social inclusion and give socially handicapped children an option to participate in cultural and educational activities. Museums provide equal access to culture and education on their premises or in their exhibition areas. The research survey's output is to analyse education and guidance principles which affect the formulation of education programmes, and assess the weak and strong points of the education being discussed. The research's final form is supposed to record the existence of the phenomenon under study, and moreover present a typology of children's education programmes, based on acquired data.

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THE SCOPE OF CREATIVE AND CRITICAL THINKING IN PSYCHOLOGY

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Abstract: *Nowadays, pupils are surrounded by information affluence from various sources, the processing and evaluation of which increase the demands on pupils' cognitive functions. The school system is also adapting to current changes in society by emphasizing the development of the level of creative and critical thinking skills. In the effort towards stimulation of creative and critical thinking, knowledge of its basic psychological background is essential, since it enables teachers to correctly apply other components involved in increasing the level of creative and critical thinking. The aim of this paper is to present the scope of creative and critical thinking in psychology and to elaborate on their theoretical characteristics.*

Keywords: *cognitive psychology, constructivism, creative thinking, critical thinking*

1. Introduction

Life in today's society brings many unforeseen situations that an individual must be able to tackle. It is a sufficient level of creative and critical thinking that helps to face the threat of information boom and various demands of society. The effort to promote the development of key competencies of pupils through the educational process in the Slovak Republic is long-term and it is based on the Council Recommendation on Key Competences for Lifelong Learning, which is a reference document for EU member states on development in the field of education, vocational training and competency-based learning [3]. The list of key competencies in the Slovak Republic is defined in the State Educational Programme of the Slovak Republic. In addition to creative and critical thinking, it also defines other competencies such as communication skills and competences, competences in the field of information and communication technologies, etc. [3].

The main prerequisite for the development of pupils' creative and critical thinking is the personality of a teacher, who should be acquainted with the psychological background of this issue. Sound knowledge of the issue is necessary for teachers in order to properly understand students' cognitive processes in creating new knowledge and increasing the level of creative and critical thinking skills. The scope of creative and critical thinking can be found in cognitive psychology, which explains the process of enhancing new knowledge through thinking. Individual theories of constructivism emphasizing the activity and social aspect of education are also based on cognitive psychology. Within cognition itself, it is respected that the child's thinking has individual stages of development and is influenced by the environment and experience. Teaching based on constructivist theories makes it possible to shape and develop pupils' key competencies. The teacher's mission is to motivate students to activity, and thus stimulate their creative and critical thinking.
The aim of the paper is to present the scope of creative and critical thinking in psychology and to encapsulate their theoretical characteristics.

2. Cognitive Psychology

The research of creative and critical thinking is closely linked to cognitive psychology. The basis of cognitive psychology is cognitive science, which is an interdisciplinary study of the mind and intelligence. It includes philosophy, psychology, neuroscience, linguistics and anthropology [23]. Cognitive psychology deals with the study of how people receive information, learn, remember and think in other words, the study of what characterizes thinking [20]. Novotná and Jurčíková [11] state that the subject of cognitive psychology is the human mind and thinking. Cognitive psychologists focus on the human mind and thinking mainly from the viewpoint of cognitive processes. Cognitive processes include perception, imagination, thinking, speech, memory and learning [20]. Through cognitive processes, an individual receives stimuli from his/her external and internal world. Cognitive processes are a means of processing information, evaluating and responding to stimuli appropriately, as well as recognising and explaining them [6]. The information received by an individual creates knowledge or expertise. In cognitive theory, knowledge represents symbolic mental structures in the mind of an individual [16]. The mental (cognitive) schema is an internal knowledge structure that contains information and knowledge received and processed in the past. Each new piece of information received by pupils is compared with the existing and hitherto accepted knowledge from the mental scheme. If the information does not fit into the pupil's mental schema (the information is not understood), it may be more difficult for a pupil to remember this information. Likewise, what a pupil remembers and how he/she imagines the information may be influenced by his/her current mental schema [17].

Another aspect that cognitive psychologists deal with in students are cognitive skills that enable an individual to process and solve problems through reasoning, analysis and synthesis, deduction and induction, generalization, categorization, sorting, creation of own terms and conceptual constructs [14]. These cognitive skills are

defined as cognitive processes in critical thinking, the overview of which was defined by Lai [18]. The level of cognitive skills is most clearly reflected in the process of thinking. It is thinking that ranks among the highest cognitive processes characterized as mediated and generalized knowledge of reality. In addition, thinking is understood as an analysis of processes in mind that is part of cognitive psychology. This process allows for the synergies of many cognitive activities, such as abstraction, reasoning, imagination, problem solving, generalization and creativity [28], [16]. Košč [In 10] emphasizes that thinking focuses on revealing and realizing the relationships and dependencies between phenomena, and thus makes it possible to learn about the essential and general attributes, as well as to discover new ones. Through thinking, the individual is able to express concepts, recognize and find relationships between them, draw conclusions, create new products and solve problems in various areas of everyday life [10]. Thinking and reasoning in everyday situations have come to the forefront abroad. Based on this context, different approaches to thinking are developed, such as creative and critical thinking. The increase in the level of creative and critical thinking is most frequently stimulated by assigning a problem in which individuals formulate new solutions. Based on the knowledge gained so far, individuals analyze new solutions, make judgments and evaluate them. In connection with the focus of the paper on the scope of creative and critical thinking in psychology, it should be noted that the above-mentioned skills are among the characteristics of creative and critical thinking in cognitive psychology [20], [21], [9]. Creativity is generally defined as the cognitive ability to create new solutions to a problem. During creative thinking, we generate new ideas and create new relationships. Furthermore, thanks to creative thinking, we can evaluate the outcomes of thinking processes. This means the evaluation of what is the quality of the solution or how well is the problem solved. The process of critical thinking begins when a problem arises and an individual is able to phrase questions leading to evaluation, argumentation, statements and conclusions. This process includes problem solving, probability calculation, creation and drawing of conclusions [5].

Theories of constructivism emphasizing the active role of the subject and criticizing transmissive teaching, which presents pupils with ready-made knowledge, are also based on the concept of cognitive psychology. The founder of constructivism Piaget is considered a representative of the so-called constructivist position in cognitive psychology [24].

3. Constructivist Theories

The foundations of constructivism can be found in research on cognitive psychology dealing with various aspects of learning and education. Constructivism emphasizes the process of enhancing knowledge through the active participation of the learner. Within the cognition process, it respects that the child's thinking goes through individual developmental stages and is influenced by the environment, experiences and everything that surrounds the child [12]. Teaching based on constructivist theories allows us to shape and develop pupils' key competencies, including creative and critical thinking. The member of cognitive constructivism group, Piaget, is considered to be the founder of constructivism [26]. His findings led to the advancement of a developmental theory explaining how children create concepts that they work with in thinking. The starting point is the relationship between the organism and the environment. A pupil adapts to the requirements of the external environment in the adaptation process consisting of assimilation and accommodation. The assimilation process is characterized by the creation of assimilation schemas - it is the essence of learning. In the accommodation process, on the other hand, a pupil adapts to the pressure from the environment. Both processes are in balance. Assimilation schemas change with the pupils' age. They reflect the particular developmental stage of children's intelligence and at the same time the current way of enhancing the knowledge of the world. Vygotsky proceeded from Piaget's findings, but he criticized Piaget for his lack of interest in the cultural and historical determination of an individual. Vygotsky distinguished two levels of pupil development a current (present) level and a higher level which the student is approaching. The main vehicle to achieve a higher level of knowledge is speech. Vygotsky clarified that intellectual development is a product of both internal and external social processes. The general principles of Piaget's and Vygotsky's concepts work in contemporary pedagogical practice in mutual interaction and are one of the main pillars of creative and critical thinking in the educational process [22]. Concepts of constructivism seek to overcome traditional teaching, which is characterized by transfer of learning content in the final form. They criticize traditional education for overrating deliberate education at the expense of children's natural learning based on their experience [27]. The theory of constructivism is currently one of the most important psycho-didactic theories emphasizing the activity and social aspect of school education. Constructivist approaches take into account the knowledge already acquired by the pupil earlier [1].

Within the constructivist theory, we recognize several theories that bring different aspects to the forefront [26]. Uherová and Horňáková [26] cite the following theories of constructivism: cognitive constructivism, social constructivism, and pedagogical constructivism, which arose by the unification of social and cognitive constructivism. Piaget and Bruner are among leaders of cognitive constructivism. In terms of this theory, learning is based on the fact that a pupil has a certain idea of the world. He/she has a certain created schema, which is the basis of his/her perception and understanding of other information. In the application of cognitive constructivism, it is necessary for the teacher to know in advance what ideas do the pupils have about the new learning content. These ideas may be different, even inaccurate or incorrect. Piaget focused his attention on the knowledge creation

through the manipulation of the subject with physical reality [26]. Social constructivism is connected with the works of Vygotsky. Within this theory, he emphasizes the social context with which cognition and individual human development are related. Moreover, he stresses the importance of child's activity within his environment, which is manifested in its own way, and not by the activity of the environment (teacher). In order to describe the course of pupils' learning development, Vygotsky uses the term zone of proximal development, which is the gap between the level of current development (a pupil is able to solve problems unaided) and the level of development when he/she needs the support of another person such as a teacher [13]. Constructivism in pedagogy is based on the theory of learning, in which a specific problem is solved. It seeks to remove transmissibility from schools and to overcome traditional teaching by building the educational process on learning about the pupil's independent work, his/her knowledge and understanding. This concept considers learning to be the result of enhancing mental structures. It promotes the view that people learn best when they actively shape their own understanding of things, phenomena and contexts [25]. Held et al. [7] emphasize that the enhancement of the scope of knowledge is an individual process in which the child, through personal psychological conditions, forms his/her own knowledge, while, in the background of this process, his previous personal meanings and experiences interact. Pedagogical constructivism works with the child's experience. It builds on the fact that a child is constantly acquiring knowledge thanks to the teacher's support (or without it) in the school environment (or outside of it). A starting point is the knowledge that a child already brings to school, on which further work of the teacher aimed at stimulating the overall personal development of the child should depend [24]. Pedagogical constructivism stresses that the solution of concrete, authentic problems, creative and critical thinking, group work, visual aids and manipulation of objects should be used in teaching [25].

3.1 Teacher in the Constructivist Approach

The work of a constructivist teacher is based on the principles of learner-centred teaching. In this sense, the teacher acts as a facilitator. He/she helps pupils on their learning journey but cannot structure the required knowledge for them. A pupil has to work on these through his own activity. According to Rogers [15] the role of a teacher is not to provide motivation, information, organize teaching materials to pupils, whilst always leading and controling them at all costs. In teaching based on the constructivist approach, it is assumed that the teacher applies such strategies and methods that activate the pupil's cognitive processes. Zormanová [29] argues that these strategies and methods should be focused on the development of independence, imagination, fantasy, logical thinking and creativity. According to Uherová and Horňáková [26] the methods of critical and creative thinking should be used in the teaching process, as well as problem-based, project, group and cooperative teaching. The application of methods for the development of creative and critical thinking results from the requirement to develop the key competencies of pupils defined in the State Educational Programme of the Slovak Republic [4]. When applying the theory of constructivism in teaching and practical use of these methods, there is a more permanent acquisition of knowledge and a better understanding. The main role of a teacher applying a constructivist approach is to motivate pupils to an activity that he/she can stimulate in several ways, such as by asking appropriate questions or by solving a problem [19]. The teacher encourages pupils to shape their own ideas, opinions and objections. In the context of creating new knowledge, it is important for the teacher to take into account the cognitive development of his pupils and to adjust the choice of appropriate questions, strategies and methods. If he/she succeeds, the cognitive process is initiated – pupils create their own ideas and build their own knowledge structure. One of the prerequisites for a correct understanding of pupils' cognitive processes while creating new knowledge is sufficient awareness of the theoretical basis of cognitive psychology. This can help the teacher to work more effectively in increasing pupils' level of creative and critical thinking. Turek [25] summarized the fifteen characteristics of constructivist teaching that a teacher should follow. He considers the main feature to be the understanding of the learning process as an active and deliberate social process of meaning formation from the presented information and experiences. The presented information and experiences are processed differently with regard to the characteristics of cognitive processes of each pupil and are influenced by his/her emotional mood, opinions and expectations based on previous pupil's experiences [29]. We agree with Sámelová's [18] opinion that the teacher must be a bearer of traits and qualities that need to be developed in pupils.

4. Conclusions

In this paper, we dealt with the theoretical elaboration of the scope of creative and critical thinking in psychology. We have explained the basics of cognitive psychology, which examines the process of acquiring new knowledge through thinking. In relation to the creative and critical thinking, we have focused on thinking, which is the highest cognitive process. Creative and critical thinking is connected with many cognitive activities that are applied during thinking, for example, creation, proving, constructive problem solving, proposing solutions, reasoning, acceptance, etc. Stimulating the level of creative and critical thinking by teachers is conditional on the respect for the cognitive development of pupils and the adherence to the principles of constructivist approach in teaching, which is based on cognitive psychology. The constructivist approach in teaching seeks to innovate the educational process, the aim of which is to create more comprehensive knowledge with a focus on practical applicability in various situations of everyday life. In addition, it enhances the development of creative and critical thinking, the ability to access and sort information, while respecting the individual needs of pupils. At the same time, it is participating in increasing the level of

social and communication skills [2]. For this reason, an elaborated theoretical overview of the scope of creative and critical thinking in psychology is a useful source of information for teachers who try to stimulate the development of creative and critical thinking of pupils in the educational process.

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FOOD STYLING AND NEUROMARKETING RESEARCH

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Abstract: *The paper deals with the influence of food styling on the evaluation of dishes by the respondent and the ability of dishes prepared according to food styling to attract the attention of respondents. The aim of the neuromarketing survey was to find out the influence of food styling on attracting the respondent's attention. For this purpose, 2 pairs of dishes were prepared, the photographs of which were tested using the eye tracking method, which was supplemented by a questionnaire survey. Using the eye tracking method, it was found that dishes prepared according to the principles of food styling attract more attention of respondents, but respondents would choose to eat dishes prepared without food styling. However, this may be affected by the color of the food tested.*

Keywords: *food styling, eye tracking, color, attention*

1. Introduction

In today's highly competitive marketing environment, it is very important for companies to be able to engage customers with their product and better understand their customers' needs. Based on this, there is an interest in combining cognitive neuroscience methods and consumer behavior research. [2] It is possible to use neuromarketing as one of the relatively newer approaches. Basically, neuromarketing connects psychology, neuroscience and marketing. [6] Neuromarketing „uses investigation of brain imaging and clinical psychology to discover what people think and feel when they look at prints, are exposed to messages from different brands, watch TV, shop, and browse internet, play video games or are trained in various activities.“ [3] Heart Rate (HR), electroencephalography (EEG), galvanic skin response (GSR) or Eye Tracking [7] are very often used as research methods in neuromarketing. Many of these methods therefore have their origins in medicine. [10] Thanks to these methods, neuromarketing research can be used to monitor brain activity in situations such as the purchasing decision-making process, the evaluation of variants or the selection of variants. [5] Firms and marketers thus obtain much more objective data compared to classical marketing research on consumer psychological reactions. [1]

2. Methods

As part of the neuromarketing survey, 2 pairs of dishes were prepared and photographed, with one dish always prepared according to the principles of food styling and the other not. Photographs of the food were presented to the respondents on a computer monitor and the behavior of their eyesight when viewing the food was determined using the eye tracking method. Furthermore, the methodology was supplemented by a short evaluation questionnaire. The aim of the survey was to determine the effect of food styling on attracting the respondent's attention. The sample of respondents was selected by a combination of random selection and self-selection on the basis of respondents' voluntariness to participate in the survey. Students of the Secondary School of Marketing (changed name due to anonymity) in Most in the age range of 17 to 18 years were the target group. Respondents were always carefully acquainted with the course of the survey and at the same time they signed an informed consent to participate in the survey. A total of 14 respondents participated in the main phase of eye tracking data collection.

3. Creation and description of dishes

Within this step, the goal was to select and make 2 pairs of dishes (respectively take their photographs), while always one dish from the pair was prepared according to the principles of food styling and the other worked as a control one. The aim was to choose such dishes that the target group of respondents normally consumes so that the evaluation of dishes in the research will be influenced only minimally by the respondents' preferences. Based on this, a short pre-questionnaire survey was conducted first, in which 31 respondents from the target group (but other people than subsequently participated in the main phase of data collection) had the task of listing the five most frequently eaten meals and the five most popular salty meals. The questionnaire was therefore formed only by open types of questions without the possibility of choosing answers, so that the respondents were not influenced in any way. The most frequently mentioned answers are summarized in Table 1.

Table 1: Results of a preliminary questionnaire survey on food selection

The most commonly eaten dish		*The most popular salty dish*	
Dish	%	Dish	%
pizza	45 %	sirloin cream sauce	29 %
spaghetti	26 %	spaghetti	23 %
pancakes	16 %	pizza	23 %
pasta	13 %	steak	16 %

The results obtained from the above preliminary research provided very valuable information about the eating habits

(favorite meals) of adolescents, which was taken into account in the selection of tested meals in the following main survey of this work. Based on the above results, two categories of dishes were prepared, each focused on a different cuisine, but both categories fell into salty dishes.

The first pair of dishes consisted of spaghetti Carbonara subject to food styling rules, and homemade pizza, which should attract attention with its colors rather than by serving The spaghetti was prepared according to the principles of food styling, specifically the arrangement on the plate was in the spirit of contour serving and the spaghetti was served using a spiral style. The spaghetti plate had relatively wide edges and thus made the dish stand out. For the pizza, the intention was to present the dish in a rustic style, including capturing the incident sunlight evoking the impression of sunny Italy.

The second pair of dishes was focused on salty Czech cuisine. For this reason, sirloin in cream sauce with dumplings was chosen for the preparation of food styling photographs and fried steak with mashed potatoes were chosen as the second dish. The first dish - sirloin in cream sauce, is subject to the rules of food styling, and on the contrary, the steak with mashed potatoes tries to attract the respondent with its color, not the way it is served on a plate. For the first dish, the rules of food styling were applied, first pouring arc-shaped sauce on a plate, then adding two slices of meat to the so-called six o'clock, and then adding dumplings, which were cut into chunks. Thanks to this, visual dynamism was added to the food. Decorating in separate bowls - cranberries garnished with lemon and whipped cream was also included. Here, however, a food styling trick was used and the classic whipped cream was replaced by shaving foam, which did not melt during the photo shoot. The preparation of the second dish was in the spirit of emphasizing structures and colors, which was achieved by a crispy golden fried crust of steak. The composition was diversified by adding of vegetables in the form of a minimalist cucumber salad, which differs from the classic serving and is supposed to act more like a dot of the course.

First of all, the necessary ingredients had to be bought, then all the above meals cooked and in the last phase everything arranged and photographed, because the respondents were presented with only photographs of dishes to evaluate only the visual component of food, which is essential for food styling.

4. The course of data collection

The main phase of this research deals with the action and effect of food styling on respondents, including the extent to which a dish prepared according to the principles of food styling is able to attract attention and influence the decision of its choice. To achieve the required purpose, the eye tracking method was used, supplemented by a questionnaire survey to explain the choice and motive of respondents when choosing dishes. [8] In the questionnaire survey, which followed the eye tracking research immediately, it was found out which dish the respondent would prefer from the two submitted visuals. This question was supplemented by photographs of dishes that have been tested using the eye tracking method. Furthermore, a specific evaluation of the presented photographs was ascertained in the questionnaire, using the semantic differential method. This method included a 5-point scale, and it was essential to determine the extreme answers of the scale in the form of adjectives evaluating the photo. The selected adjectives were to evaluate the selection criteria, which included color, taste, healthiness, photogenicity, temptation or, on the contrary, ordinary appearance of the food. Photographs of the food were presented to respondents on a 22-inch Full HD Philips monitor, on which a Gazepoint static eye camera was attached. Using this eye tracking method, the eyesight of the respondents when viewing photographs of the given dishes was monitored. Data collection took place in the VŠFS building in a room that was free of external noise and its windows were oriented to the northern world side, so that the sun's rays did not affect the quality of data collection and no bright lighting was used in the room. [9] Respondents were invited individually not to influence each other. [8] The administrator with the laptop was placed behind the respondent so as not to disturb him by operating the technician. Respondents were exposed to one visual for four seconds, because if they had more time to view, they would just try to anchor their eyes somewhere. Here, an attempt to capture the initial behavior of sight after displaying a photo with food was made. After the end of data collection using the eye tracking method, there was a short questioning to find out the subjective evaluation of the presented stimuli by the respondent. [9]

5. Research results

The results of the eye tracking measurement were evaluated in the Gazepoint 4.2.0 program, to which the prepared photographs with heatmaps which provide quick, very intuitive and in some cases objective visual representations of eye tracking data were first exported. [4] Furthermore, it was essential to set Areas of Interest (AOI) for each of the photographs, i.e. areas of the stimulus that the researcher is interested in by gathering data about participants eye movements like time viewed of the areas, returns etc. [4] For these AOIs, detailed statistics on viewership of selected parts of the photograph were calculated for each photograph. Data obtained using the eye tracking method will be presented within individual pairs of photographs.

5.1 The first pair of photos

The first pair of dishes consists of Italian cuisine, i.e. spaghetti and pizza, while the spaghetti was prepared according to the principles of food styling and pizza wasn´t. The prepared photo of spaghetti was subject to food styling rules and had three main areas of interest, which included the spaghetti itself, salt and pepper in the background and tomatoes in the right corner, as can be seen in Figure 1. The heatmap indicates that the biggest focus of interest in the first picture is the spaghetti itself in

the middle of a large plate, in the case of pizza, most attention is focused on cheese and sauce. It is important to note that each picture of the dish was presented to the respondents separately, but in this paper the pictures of the pairs of dishes are inserted together to make it easier to compare the resulting heat maps.

Figure 1: Heatmap of spaghetti and pizza

From Table 2 it is possible to read that all respondents looked at spaghetti right at the beginning of the photo presentation. They devoted 56.3 % of their time to this area of interest, which is more than the remaining AOIs of the photo. An interesting finding is that the respondents returned the most to the place with salt and pepper, which attracted them much more than spaghetti. It is also worth mentioning the area of tomatoes, which individuals devoted only 11.1 % of their time and apparently did not catch their attention because no one returned to it. The photos of the pizza were presented to the respondents as second, with four places of interest, which were pizza, oil, a pizza slicer and tomatoes in the background. Again, all respondents stared at the pizza at the beginning of the presentation, for 46 % of the time out of the available 4 seconds, which is the most in this photo, as confirmed by Table 2. They also inspected the slicer, to which they devoted 19.4 % of their time, then the oil, to which they returned several times, and as the last tomatoes, which was seen by up to 93 % of respondents. The heat map of the pizza, on which the pizza itself makes the biggest focus, confirms the results from the mentioned table.

Table 2: Areas of interest (AOI) of the first pair of dishes

	The name of the AOI	*Seen by the respondents*	*Tracking order*	*Browsing time*	*Return to the area of interest*
Spaghetti	spaghetti	100 %	1	56.3 %	2.000
	salt and pepper	79 %	2	25.2 %	3.500
	tomatoes	79 %	3	11.1 %	0.000
Pizza	pizza	100 %	1	46.1 %	1.462
	oil	71 %	3	13.9 %	2.333
	pizza slicer	64 %	2	19.4 %	1.000
	tomatoes	93 %	4	7.2 %	1.000

From the given data it is possible to conclude that spaghetti attracted the attention of respondents more and it is also possible to discuss to what extent the attention of respondents was influenced by the fact that spaghetti was served using a spiral style. However, it should be noted that the pizza was more colorful compared to the spaghetti, however, the subjective evaluation of the dishes is addressed in a follow-up questionnaire survey, the results of which are presented in a separate subchapter.

5.2 The second pair of photos

The other two dishes belong to traditional Czech cuisine and are food stylized sirloin in cream sauce in contrast with fried steak. The festive course, or sirloin in cream sauce, was prepared according to the rules of food styling in order to attract respondents by a relatively unconventional way of serving. The heat map of the first dish, sirloin in cream sauce, shows that the area of dumplings is the most attractive of the whole photo, and at the same time individuals returned to it most often. Dumplings, which subject to food styling, are supposed to attract with their height, therefore attracted individuals and it is possible to claim that the positive effect of the food arrangement manifested itself here. The heat map for the second dish, steak, suggests that most respondents' eyesight was focused on the center of the photo, where the mashed potatoes and steak are located.

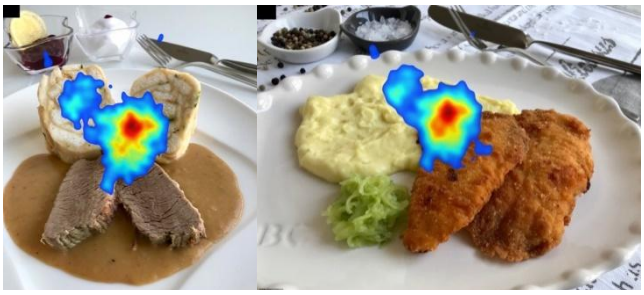

Figure 2: Heat maps of sirloin on cream and cutlet

Table 3 below shows more detailed tracking statistics for both photos. Several areas of interest have been identified, in which it is possible to observe not only how many respondents focused on the position, but also for how long. This is the area of the dumplings themselves, which 93 % of the respondents stared at, for the longest period of 38.7 % of the time, which means that this area is the most attractive of the whole photo. It is also worth noting that 86 % of respondents looked at meat and decorative cranberries on meat, but it is fascinating that only 14 % of respondents looked at the sauce. Not only did no one return to the place with the sauce, but the length of the view lasted only 0.2 % of the available photo presentation time. The decorative cranberries themselves formed a kind of "icing on the cake" of the prepared dish and were also the healthiest ingredient on the plate. Their sight return was the third highest, so the respondents were interested, not in terms of health, but for the contrast they created. Figure 2 and Table 3 the data confirmed the rule of thirds, and therefore the respondents initially looked at dumplings and vision gradually headed up into the upper right corner, where it took second in the ranking cutlery. On the

contrary, the last place they noticed were the cranberries with lemon in a translucent container located in the upper left corner. It should also be mentioned that, apart from the sauce, which had zero return, other points of interest have at least the same or rather higher return to the areas of interest than the fried steak. In essence, this means that the respondents returned to the given places, because they were more interested in the structure and distribution of the food than at the second dish. As Table 2 confirms, dumplings have the longest time of the view with the highest return, which were served according to the rules of food styling. It follows that the respondents were interested in food styling in this prepared photo.

Table 3: Areas of interest (AOI) of the second pair of dishes

	The name of the AOI	Seen by the respondents	Tracking order	Browsing time	Return to the area of interest
Sirloin in cream sauce	dumplings	93 %	1	38.7 %	2.250
	meat	86 %	5	19.4 %	1.250
	cranberries on meat	86 %	4	13.9 %	1.286
	cranberries with lemon	79 %	7	14.1 %	1.500
	whipped cream	79 %	6	9.2 %	1.000
	cutlery	50 %	2	8.1 %	1.000
	sauce	14 %	3	0.2 %	0.000
Fried steak	steak	93 %	3	31.5 %	1.333
	mashed potatoes	93 %	1	21.9 %	1.818
	cucumber salad	71 %	4	8.9 %	1.000
	salt and pepper	71 %	2	18.4 %	1.800
	cutlery	57 %	5	10.8 %	1.000

In addition to the above-mentioned neuromarketing data obtained using the eye tracking method, data were also collected using a short evaluation questionnaire.

5.3. Data from the supplementary questionnaire survey

As part of the questionnaire survey, respondents were first asked which of the dishes in both pairs they would choose to eat. The results of this question are shown in Table 4.

Table 4: Respondents' preferences when choosing food to eat

Pair	*Dish*	*Answers*
First pair	Spaghetti (FS)	36 %
	Pizza	64 %
Second pair	Sirloin in cream sauce (FS)	29 %
	Steak	71 %

Table 4 shows that 64 % of respondents would prefer pizza, after which 36 % would prefer food-styled spaghetti. Although spaghetti was prepared according to the principles of food styling, fewer respondents would choose it to eat than pizza. This may be influenced mainly by the lower color of the photo with spaghetti, because from the data obtained using the eye tracking method (see Table 2), spaghetti was able to attract more attention from respondents. For the second pair of dishes, 71 % of respondents preferred steak and the remaining 29 % voted for sirloin. It follows that the prepared photograph could have influenced their decisions. This could be due to the fact that the respondents perceived the sirloin as a traditional dish, but heavier and less digestible than the steak, which is supplemented on the plate with vegetables, which could be another reason for the choice.

The questionnaire also used a 5-point scale and the semantic differential method to find out how respondents verbally evaluate the submitted photographs of dishes. Table 5 shows the average values from the 5-point scale, including the evaluated criteria, with the lower the value approaching the number 1, the more positive the evaluation.

Table 5: Semantic differential results

	Colorful	*Tasty*	*Photogenic*	*Healthy*	*Tempting*	*Total*
spaghetti	2.9	2.0	2.4	2.4	2.3	2.4
pizza	1.5	1.6	1.9	3.4	2.2	2.1
sirloin in cream	3.4	2.1	2.9	2.9	2.5	2.8
steak	1.7	1.8	2.1	3.0	1.9	2.1

The data show that the dishes, which were prepared according to the principles of food styling, were rated as less colorful, which could be influenced by the choice of food. However, it is interesting that, in contrast to the trend in other criteria, dishes prepared according to food styling are perceived as healthier. Nevertheless, respondents would consume meals prepared without FS principles, as mentioned in Table 4.

6. Conclusion

Based on the survey, it was found that dishes prepared according to the principles of food styling achieved better results in the data obtained using the eye tracking method than conventional dishes. Parts of dishes prepared according to the principles of food styling achieved a higher viewership compared to the other dish, which is evident, for example, in spaghetti. Nevertheless, most respondents would choose to eat dishes that were not prepared according to the principles of food styling. However, the question is to what extent the colors of the food and their vividness have affected it. This trend in the evaluation was also confirmed in the last question of the questionnaire, when dishes that were not prepared according to the principles of food styling were evaluated more positively. It would be appropriate to pay attention to the comparable color of the dishes in a possible follow-up investigation.

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TEACHING OF THE GERMAN LANGUAGE AT THE ENGLISH SCHOOL ZLÍN DURING THE INTERWAR PERIOD AND DURING WWII

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Abstract: *This paper deals with the teaching of the German language in the environment of Zlín during the interwar and war periods, i.e. during the time when both the city of Zlín, and the field of education were significantly influenced by the Baťa Corporation. The paper focuses specifically on the English School Zlín, whose medium of instruction was Czechoslovak, English, French and German, it discusses the circumstances of the school's foundation, existence and closure. In addition, this paper focuses on the teaching of the German language in the nineteen thirties and forties as German played an important role during this period. Germans formed the largest minority group in Czechoslovakia, and due to the subsequent German occupation, German language became a compulsory subject in schools.*

Keywords: *English School, Baťa, Zlín, German language*

1. Introduction

In 1894, the Baťa siblings established a shoe factory, which was before and during World War II one of the largest companies in Czechoslovakia and later in the Protectorate of Bohemia and Moravia. The Baťa Corporation focused not only on its business, but also on other aspects of daily life in the city of Zlín (healthcare, education, culture, and housing). The article focuses mainly on the position of the German language at the English School in Zlín, which was in a way unique Czechoslovakia, as half of the subjects were taught in a foreign language, and therefore it was a bilingual school. In the interwar period, similar schools existed only in Prague, but these schools were intended only for children of foreigners or diplomats. The English School was a private school, sponsored by the Baťa Corporation, because during the interwar period this type of school could not be financed through the state budget.

1.1 Research Design

The aim of this paper is to introduce the English School using the descriptive and the historical-analytical methods. This article should answer the following question: What did the teaching of German at the English School look like? First, available book sources were examined, however, these did not deal with the English School in detail, then the archive sources in the State District Archive Zlín, which unfortunately did not form a complete archive fund, so information about the school was fragmented into various archives and folders. Missing information was completed from periodicals from that time.

2. The Establishment and Evolution of the School

The first (English) branch of the school was opened on 1 February 1934, and in September of the same year, two more branches (German and French) were established. At first the school principal was Stanislav Vrána, and then later on it was Ladislav Vlček and the subjects were taught in both Czech and foreign languages [1]. The main subjects (Czech, civics, history, religion, handicrafts) were taught in Czech, but other subjects (geography, natural sciences, mathematics, geodesy, drawing, painting, singing, physical education) were in a foreign language [2]. There were also native speakers that worked at the school [3]. Teaching was carried out according to the official curriculum, which essentially did not differ from the curriculum of regular secondary schools [4].

The establishment of the school was accompanied by both positive and negative reactions, some people were of the opinion that Czech children should go to a Czech school, while at the English School a significant part of the curriculum was taught in a foreign language. The school was, however, supported by T.G. Masaryk and E. Beneš [5].

As was already mentioned, the English School was a private school, i.e. students had to pay tuition fees, however, even children from poorer families had the opportunity to study at this institution, as the Parents Association (actually sponsored by the Baťa Corporation) paid for the tuition fees of these students, as well as for their textbooks and other school supplies [6].

After the start of World War II, teachers from Great Britain and France had to leave the school [7]. In the 1942/43 school year, history lessons were replaced by German lessons, two years later the school had to move several times, and therefore classes took place on weekdays from 13:40 to 18:10 and every Saturday from 8:00 to 11:45. From 5 January to 16 April, 1945, classes were held only twice a week, so students were given more homework. After 16 April, there were no classes, teachers sent homework to students by mail and visited them in person to check the completed assignments. On 31 August, 1945, the school closed down [8].

3. The Didactic Concept of the School

The English School aimed to teach students German (or English, French) to acquire the knowledge of foreign languages necessary for their future employment, even the management of Bať a acknowledged at its meeting that knowledge of foreign languages is necessary for their international business [9]. Teachers thought that learning foreign languages is easiest while young, and therefore the motto of the school was: *"Learn languages thoroughly during your youth!"* [10].

3.1 Principles Necessary for the Acquisition of the German Language

The teachers were aware that it would take a lot of time for the students to learn German, which mainly required the will to learn and mastery of the language habits of the native speakers. One of the most important aspects of foreign language teaching was the student's interest in the school and the subject, so the thematic content of the lessons had to be interesting for the student and close to their hobbies and environment. Teachers therefore tried to arouse individual interest in students, for which they did not use abstract material, but subjects as specific as possible and related to real life [11].

Another important aspect was the student's attention, it is clear that the students were unable to do just one task for the entire lesson, and therefore the teachers switched activities during the lesson, they tried to offer students new impulses so that they would not get bored and their activities were not monotonous. It was customary that German lessons took place in the morning, when the students still had energy and were not tired, as was the case, for example, after a physical education class [12].

Other important factors during the lesson included repetition, because a large number of words that students did not use regularly were forgotten [13]. For this reason, the student had to repeat the new material the very next day, then in three days, in a week and in two weeks. When repeating the older curriculum, students were supposed to be aware of its connection with newly acquired information [14]. In the lesson, the teacher either repeated the previous subject with the whole class, or the students repeated the material in pairs or in groups of three [15].

3.2 Course of a Lesson Taught in German

At the beginning of the lesson, the teacher wrote a work plan and the tasks to be completed on the board. Students knew in advance not only the plan for the given lesson, but also for the entire month and semester [16]. In the first year, students had to speak German as much as possible, use German words and German phrases, minor grammatical or phonetic errors were tolerated, using Czech words was still allowed, but in the second and higher years speaking in Czech was forbidden [17].

In the first minutes of the lesson there was a short recapitulation of the older curriculum, then the teacher read a part of a text aloud, then he read each sentence separately and students repeated the sentences after him, after that the students studied the paragraph themselves, then the students could discuss any ambiguities amongst themselves and with the teacher, and in a few minutes, the teacher asked the students if they understood everything. Students also had to make an oral presentation where they summarized the main idea of the text, if they made a mistake during their presentation, they were first corrected by their classmates, only then by the teacher. The reason was not to correct all errors, but only the important ones (e.g. a wrong article before the noun) [18]. The teacher did not interrupt the student during his oral presentation, he wrote notes on a special paper and after the student's speech was done, he explained to him what needed to be improved. At the end of the lesson, the teacher went through the new words with the students, wrote them on the board and read them aloud, so that the students knew exactly which words were key and needed to be learned [19].

When teaching natural sciences, geography and mathematics, teachers tried to use as many illustrative examples, tables, models and pictures as possible, while topics from these subjects were discussed even in normal German lessons, for example, if in the natural sciences class the topic of discussion was the fruit of a pear tree, and the students talked about its color and its shape, where it can be found, when it ripens, etc., and in a later German language class they discussed among themselves whether they like the fruit, what dishes they bake from it at home, whether they grow it in their garden, etc., so that the individual lessons were interconnected [20].

Singing was also taught in German. This which played an important role in improving the pronunciation of students, and teachers believed that German songs were a good complement to teaching German. Each of the students had their own songbook, where they wrote down songs, and this songbook was expanded every semester by new (more linguistically demanding) songs [21].

3.3 Textbooks Used

Before the school even started, the English School teachers discovered that there were no textbooks on the market that were suited for teaching at this bilingual school, which is why the teachers themselves prepared suitable textbooks and teaching materials. In subjects that were taught in German, workbooks were used to facilitate the work of both teachers and students. The workbooks contained various texts, followed by practically oriented exercises, e.g. students had to answer two questions concerning the content of the text and describe its main ideas [22].

The workbooks contained not only short texts, but also illustrative pictures, drawings, sketches and concise tables. Sometimes students had problems with certain words, such as if in a natural science class, they confused the words *"Blume (flower)"* and *"Blüte (bloom)",* and so the teacher drew a flower with many blooms and a simple flower on

the board next to each other, thus explaining the difference between the words [23].

In 1940, the existing textbooks were banned because their content did not correspond to the ideas of the Third Reich, so teachers had to make specific notebooks containing the changed curriculum. Because of the situation, the number of these notebooks was limited, so students were not allowed to write in them as they were used to doing it before, when they took notes directly in the workbooks. In practice it meant that the students first had to rewrite the given text with tasks in one workbook and in another workbook, they completed these tasks and any follow-up exercises. The teachers constantly tried not to explain the new material only with the use of austere texts, so they brought sketches, drawings, models, miniatures and pictures with them to the lesson, so that the curriculum could be introduced to the students at least in this way [24].

4. Conclusion

The aim of this article was to introduce the English School during the interwar period and during the Protectorate of Bohemia and Moravia, the research question dealt with what German language teaching looked like in the specific setting of this school. The very establishment of the school was influenced by the Baťa Corporation, which financially supported it during its existence. The teaching of German was emphasized by J. A. Baťa, who required perfect knowledge of foreign languages from the students (future employees of Baťa), as the corporation also had factories abroad. The English School was a bilingual school, so some subjects were taught in a foreign language (in German, English or French), and in addition to Czech teachers, there were native speakers at the school.

When the school was established, the essential aspects affecting the teaching of German were defined: the student's interest, the student's attention and the regular repetition of the curriculum. The course of lessons taught in German was very similar, working with textbooks written by the English School teachers, which consisted of shorter texts and related exercises and tasks. In the first minutes of the lessons, the teacher read the text aloud to the students, then the students worked alone or in pairs, and at the end of the lesson the teacher highlighted the key words that the students had to learn.

During World War II, the situation at the school changed due to the influence of socio-political conditions, their textbooks were banned, so the teachers had to create other teaching materials, history lessons were replaced by German lessons. The school moved several times, classes did not take place at standard time, but on weekday afternoons and on Saturday mornings. After 16April, 1945, there was no contact teaching at all, students received assignments by mail, or they were visited by a teacher to check their work.

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PUPIL'S CREATIVITY AS A FACTOR INFLUENCING READING OF ARTISTIC TEXTS

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Abstract: *The paper focuses on the current problem of pupils' creativity as a factor influencing reading of artistic texts. The article aims to reflect, describe, analyse, evaluate different manifestations of pupils' creativity (e.g. visual, literary, musical) and their relationship to the development of reading strategies of secondary technical schools in the Moravian-Silesian Region of the Czech Republic pupils. The text presents the selected results of the quantitative questionnaire research focused on identifying the relationship of pupil's creativity as a factor influencing their reading strategies. The partial goal is to point out the factors contributing to the development of creative and critical thinking in the current representatives of the so-called digital generation in 21st-century society.*

Keywords: *reading literacy, pupils´ creativity, factors of reading strategies development, secondary technical school pupil*

1. Introduction

The paper deals with creativity, a factor influencing the reading of artistic texts by pupils of secondary technical schools in the Moravian-Silesian Region of the Czech Republic. Today, reading literacy is part of everyday life. Reading contributes to the development of other creative activities intervening to, e.g. visual, literary or musical fields in some students. Reading literacy may be understood as a curricular goal, lifelong need and right. The degree of social maturity, communicative and reading competency, cultural curiosity and creativity of technically oriented youth in the industrial region of the Czech Republic is a question.

2. Reading literacy as a curricular goal

Reading literacy is one of the crucial parts of functional literacy. Reading literacy development across the diverse subject focus of teaching is the goal stated by binding curricular documents on the national level, mainly Framework educational programmes (FEP BE, FEP GE, FEP STVE, FEP BAE etc.) and further on the level of individual schools. i.e. in school education programmes.

Currently, the primary educational challenge and social need is to enrich knowledge by factors affecting the development of pupils' reading, their reading competencies. International PISA surveys (2000, 2009, 2018) repeatedly brought alarming news on the level of reading literacy, thus also on the level of reading strategies of the Czech 15-year-old pupils, mainly boys. The level of 15-year-old boys' reading literacy steadily shows below-average characteristics compared to the age-matched generation of 15-year-old boys in other European countries over twenty years.

Reading literacy has more definitions. According to Najvarová [8], *"reading literacy is the most important subarea of functional literacy."* Her statement suggests that it plays an irreplaceable role in our life. It allows us to acquire, to master and memorise much knowledge we apply to everyday life. Straková [13] defines it as *"Ability to understand written text, think about it and use it to achieve one's goals. Reading literacy leads to the development of own knowledge, a set of skills and a cultivated life."* The authors understand the reading literacy similarly but more specifically focuses on reaching goals in each individual.

3. Reading as a lifelong need

Reader-defined problem areas, e.g. social maturity, communicative and reading competency, cultural curiosity and creativity of pupils of selected secondary technical schools in the Moravian-Silesian and the range of factors affecting the level of reading strategies in this technically and digitally focused group of pupils are discussed and thought about. Can they think creatively in variously focused daily and school activities? Does this generation exhibit strategic thinking, strategic acting, strategic reading? Is the group of boys able to reflect the reading activity with its subsequent generalisation and derivation of information leading to the creation of experience, the so-called learning from mistakes and modelling the reading experience? The relationship to reading is a lifelong process. Humans think semantically. The more read-inspiring moments the reader experiences in reading, the richer they are in reading. A wide range of factors, both external and internal, exists, influencing the level of pupils' reading strategy. By reading various texts, we acquire reading skill. By thinking and understanding information read, discussing data read, their processing, evaluation, we become more competent in reading.

4. Thoughtful reader and creativity

A thoughtful reader is an independent, free reader who can manifest as a creative individual. The reader's curiosity can also be a bridge to a diverse range of creativity, and a creative individual can be a creative reader of a technically, research-wise, artistically oriented text. Every human possesses a particular personality and creative potential developed by stimulating creative environment in which they live and educate. It is thus essential to create prerequisites and opportunities for effective growth of an

individual's reading literacy in school, out-of-school and the family environment by supporting their creative thinking, creative activity and critical thinking. Lokšová, Lokša [6], based their research on the definition of creativity by Guilford, who asserts that creativity is *"ability to create new, unusual, original solutions"* [6]. Psychologist J.P. Guilford (1897–1987) defined structural components of creativity in connection with divergent thought processes. According to him, six categories belong to creative skills including fluency, the flexibility of thinking, originality of ideas (originality in thinking), a certain degree of sensitivity, e.g. in related to a problem communication situation, ability to tell known knowledge in a new way (redefining), ability to focus on detail which is a necessary prerequisite for solving the whole problem situation. Pecina [12] classified creativity into specific (e.g. technical, artistic, social, etc.) and non-specific (with manifestations of the quantitatively comprehensive utterance of various ideas, without precise specification). From the education point of view, creativity subjective and objective can be distinguished, with Opatová [10] characterising an individual with manifestations of subjective creativity as a person which *"associates things individually through their thinking and activity" and the individual with manifestations of objective creativity assesses the problem based on "certain features, i.e., novelty, originality, usefulness, adequacy to the needs of the situation"*. The manifestation of individual's creativity is a significant factor potentially developing pupils' reading strategies, their reading imagination, uniqueness, depth, reading originality, sensitivity, empathy, assertiveness, flexibility and fluency, etc. Creativity may be understood as an ability contributing to successful learning together with involving memory, ideas, thinking, observation and other abilities.

5. Aesthetic reading and critical thinking

Teaching at the Czech secondary schools should focus on work with text across a diverse subject focus. Creative reading, critical reading is an integral part of the development of critical thinking across age. Aesthetic reading, reading of professional texts as well as reading of texts from authentic everyday life form a complex of quality teaching resources which cannot be separated from each other. Currently, pupils should have sufficient experience with reading and comprehension of texts in paper and electronic (digital) texting. The emotional experience, the experience of "beautiful" when reading are stimuli and conditions for the transformation of the non-reader into a reader. Accurate reading with comprehension is a prerequisite of successful application of the future secondary school graduates on the Czech and foreign labour market. The ability of educators to teach pupils through critical thinking (RWCT) methods and other methods that help pupils to read with comprehension, e.g. in the three-phase model of E-U-R learning and loud thinking about the text, personal reaction to reading, productive writing contribute to valuable aesthetic and critical thinking, readers' attitudes. Pre-reading, reading and post-reading activities are crucial. A complex reading experience can be achieved by regular joyful reading of variously focused comprehensive texts at school and outside it so that the reader cultivates a relationship to reading, literally decoding of written characters, ability to conclude from what has been read, reflection on the intention of reading.

6. Topic-related authors and researches

Research in *Family, school, library: our relationship to reading and what influences it* [15] deals with the problem of reading literacy. The research surveyed the Czech population over the age of 15 and examined what kind of texts, and how frequently readers read, how they obtain books, other media to read. The researchers observed a slight decline in Czech reading culture, a significant decline in magazine reading, readers use e-books and audiobooks, the family is one of the factors influencing reading and reading in the Internet environment is becoming more frequent. Authors [12], [9], [16], [7], [3], [2], [14] deal with pupils´ creativity. Blažíček [11] focused on pupils' work with artistic text.

7. Research methodology

The Faculty of Education (Department of Pedagogy and Andragogy) of the University of Ostrava carried out partial research within the project SGS01/PdF/2020 focusing on selected factors influencing the level of reading strategies of secondary technical school pupils in the Moravian-Silesian Region of the Czech Republic. A partial quantitatively oriented questionnaire survey was conducted on a sample of 163 pupils aged 15–19 in May - September 2020. The questionnaire contained 70 closed items and six open items. In this study, we present nine items, the wording of which is formulated within selected research outputs in descriptive and statistical form. The study aims to point out certain statistically verified links between variables.

8. Selected research questions

1. What is the relationship between the idea of a pupil as a creative student and the idea of pupils is a non-traditional reader?
2. What is the relationship between pupil´s fondness of the environment where the plot of the book (read by the pupil) takes place and the artistic (musical) authorial focus of the pupil's reading creativity?
3. What is the relationship between the pupil's idea of the writer's career and the pupil's artistic (literary) authorial-oriented reading creativity?

9. Selected hypotheses

H4 Pupils who stated they consider themselves creative students in the structured questionnaire, consider themselves non-traditional readers more frequently than pupils, who stated they do not consider themselves creative students.

H5 Pupils who stated they like the environment where the plot of the book (read by the pupil) takes place, wrote the song based on the information from the book more

frequently than pupils who stated they do not like the environment where the plot of the book takes place.

H6 Pupils who stated they sometimes think about the writing career write their thoughts or knowledge in connection with the given text more frequently than the pupils who stated they do not consider the writing career.

10. Research results and their interpretation

10. 1 Descriptive analysis results

Question C7: Do you like to read in a similar environment, which is described in the book (e.g. in nature, in the park, etc.)?

The first item found out whether pupils like to read artistic texts in an environment similar to that described in the book (e.g. in nature, in the park, etc.).

Table 1 Frequency of responses (question C7)

	relative frequency %	*frequency*
yes	21.5%	35
no	78.5%	128
does not occur	0%	0
TOTAL	100%	163

Source: self-processing

Table 1 shows that the majority of pupils (78.5%) do not prefer a similar environment in book reading, and 21.5% of pupils like to read in a similar environment as in book writing.

Question G2: Have you ever considered writing career?

The second item found out whether pupils had ever considered a writing career.

Table 2 Frequency of responses (question G2)

	relative frequency %	*frequency*
yes	16.6%	27
no	83.4%	136
does not occur	0%	0
TOTAL	100%	163

Source: self-processing

Table 2 shows that 16.6% of pupils consider a writing career, and the majority of pupils (83.4%) do not consider this type of career.

Question G5: Do you write down your thoughts or knowledge in connection with the given text in the book?

The third item found out whether pupils write down their thoughts or knowledge in connection with the given text while reading the book.

Table 3 Frequency of responses (question G5)

	relative frequency %	*frequency*
yes	12.9%	21
no	87.1%	142
does not occur	0%	0
TOTAL	100%	163

Source: self-processing

Table 3 shows that 12.3% of pupils write their thoughts or knowledge in connection with a given text while reading, and most pupils (87.1%) do not engage in this activity when reading.

Question G6: Have you ever written a song?

The fourth item found out whether pupils had ever tried to write a song.

Table 4 Frequency of responses (question G6)

	relative frequency %	*frequency*
yes	21.5%	35
no	78.5%	128
does not occur	0%	0
TOTAL	100%	163

Source: self-processing

Table 4 shows that 21.5% of pupils have ever tried to write their song and 78.5 pupils have not attempted it.

Question CH1: Do you consider yourself a creative student?

The fifth item found out whether pupils thought they were creative students.

Table 5 Frequency of responses (question CH1)

	relative frequency %	*frequency*
yes	38.7%	63
no	61.3%	100
does not occur	0%	0
TOTAL	100%	163

Source: self-processing

Table 5 shows that 38.5% of pupils consider themselves creative students, and 61.3% of pupils do not consider themselves creative students.

Question CH3: Do you consider yourself a non-traditional reader?

The sixth item found out whether pupils thought they were non-traditional readers.

Table 6 Frequency of responses (question CH3)

	relative frequency %	*frequency*
yes	38.7%	63
no	61.3%	100
does not occur	0%	0
TOTAL	100%	163

Source: self-processing

Table 6 shows that 38.7% of pupils consider themselves a non-traditional reader, and 61.3% do not consider themselves non-traditional readers.

10.2 Results of processing selected hypotheses and their verification

Hypothesis 4 „Pupils who stated they consider themselves creative students in the structured questionnaire, consider themselves non-traditional readers more frequently than pupils, who stated they do not consider themselves creative students ", was confirmed.

Table 7 Observed and expected frequencies (H4)

Pivot table			
Pearson chi-square = 4,8257528	*sv= 1 significance*	*p= 0,028038*	
question CH1	*question CH3 - yes*	*question CH3 - no*	*line totals*
yes	31 (24.35)	32 (38.65)	63
no	32 (38.65)	68 (61.35)	100
column totals	63	100	163

Conclusion: Since the calculated chi-square value is larger than the test criterion value and the significance value is less than the chosen significance level of 0.05, it has been shown that there is a statistically significant relationship between the answers to both questions.

Hypothesis H4 is accepted at the significance level of 0.05.

Hypothesis 5 „Pupils who stated they like the environment where the plot of the book (read by the pupil) takes place, wrote the song based on the information from the book more frequently than pupils who stated they do not like the environment where the plot of the book takes place.

Table 8 Observed and expected frequencies (H5)

Pivot table			
Pearson chi-square = 4,3397662	*sv= 1 significance*	*p= 0,037232*	
question C7	*question G6 - yes*	*question G6 - no*	*line totals*
yes	12 (7.515)	23 (27.485)	35
no	23 (27.485)	105 (100.515)	128
column totals	35	128	163

Conclusion: Since the calculated chi-square value is larger than the test criterion value and the significance value is less than the chosen significance level of 0.05, it has been shown that there is a statistically significant relationship between the answers to both questions.

Hypothesis H5 is accepted at the significance level of 0.05.

Hypothesis 6 „Pupils who stated they sometimes think about the writing career write their thoughts or knowledge in connection with the given text more frequently than the pupils who stated they do not consider the writing career."

Table 9 Observed and expected frequencies (H6)

Pivot table			
Pearson chi-square = 4,9045716	*sv= 1 significance*	*p= 0,026786*	
question G2	*question G5 - yes*	*question G5 - no*	*line totals*
yes	7 (3.48)	20 (23.52)	27
no	14 (17.52)	122 (118.48)	136
column totals	21	142	163

Conclusions: Since the calculated chi-square value is larger than the test criterion value and the significance value is less than the chosen significance level of 0.05, it has been shown that there is a statistically significant relationship between the answers to both questions.

Hypothesis H6 is accepted at the significance level of 0.05.

11. Conclusions

The main conclusions of the partial research showed that:

- most pupils do not prefer the same environment for reading as described in the book they read,
- most pupils do not consider a writing career,
- most pupils do not work with the book while reading, do not write down their thoughts or knowledge in connection with the given text,
- most pupils did not write their own song,
- most pupils do not consider themselves a creative pupil and a non-traditional reader,
- pupils who consider themselves creative students also consider themselves non-traditional readers,
- pupils who liked the place where the story of the book (read by the pupil) took place wrote a song based on the information included in the book more frequently,
- pupils who sometimes consider a writing career write their own thoughts or knowledge in connection with a given text in the book more frequently.

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THE RELATION BETWEEN LISTENING TO THE SOUNDS AND DRIVERS' BEHAVIORS

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Abstract: *Listening to music is a common habit in cars, this article studies if the sounds are related to drivers' behavior and alertness. This paper is a result of experiments were done on 23 students. Each student drove two continuous hours in a simulator with a Highway-night scenario. The probands underwent four types of sounds. Silence, Alpha Waves, Death Metal, and Familiar Music. We studied the correlation between listening to these types of sounds and the changes in Reaction Time Averages, Blink Interval Averages, and Blink Duration Intervals. Then we used the t-test to test the correlations between listening to these sounds and the averages. T-test results illustrated the correlations between changing the parameters' values by changing the sounds' type. This article will focus on the numerical values of the averages and the results more than t-tests results. Results illustrated that the drivers who listened to Familiar music and Silence had better results, faster Reaction Time Averages, longer Blink Intervals Averages and, shorter Blink Durations Averages. Death Metal Music was helpful in the first hour, and Alpha Waves lead the drivers to drowsiness and the drivers' who listened to Alpha waves had the worst numerical results.*

Key words: *Music, Drivers' behavior, Drivers' reaction time, Drivers' eye movements.*

1. Introduction

A giant number of Drowsy-Driving accidents is recorded every year [9]. Enormous, horrible, and unexpected spirits loss, leave behind it feelings of sadness and sorrow, in addition to significant costs, due to the souls and Infrastructure losses. This issue of Drowsy-Driving accidents is crucial, but also complicated, because of the fact that sleep, psychological, and physiological factors are the causers of this issue. Drowsy driving's accidents have been increasing, with convert the world to connected areas of businesses. The companies hired more drivers and adopted on "The assistant driver" concept in every one long driving shift, allowing the drivers to take rests during driving when the assistant driver continues the long task [5]. The companies also went to schedule the driving shifts, after considering the drivers' life schedule to give the drivers days off during the week to help their bodies to rest and be ready for the next travels. These actions decreased this type of accidents, but the problem still obvious. However, the researchers started to go further into the psychological and neurological studies to have more knowledge about the awareness, brain and the habits of the drivers while driving such long-term driving.

The technical development in the neurological field helped the scientists to collect more facts about the mysterious human brain and its complicated functions, by knowing more the electricity of the brain and by seeking deeper our senses and stimuli's effects on the brain and on our reactions and awareness [4]. It can be said that the truth behind sleep is not well known and that sleep science is relatively new when it started Nathaniel Kleitman, who is known as "Father of American sleep research," who focused on the sleep and the circadian rhythms in the 1920s [6]. Many researching papers on human senses in the car cabin were found useful and the pioneered car companies took these researching projects' results and applied them in designing their car cabins, like the studies of the proper size and position of the smart system display in the car cabin. Where was found that the bigger screens and the closer to the sight field of the driver led to less distracting from tracking the street while driving and decreasing the probability of accidents occurring [4].

Visual and acoustic stimuli attracted scientists, and car manufacturing companies. Military researches spent abundant worth in these fields. Research in the field of nervousness and the field of drowsiness studies was not only limited to driving vehicles on land but also extended to aviation [2].

In order to be close to real-life driving, and depending on cameras' existence inside the car cabin, it is possible to monitor the drivers' eyes and study the frequencies and durations of the blinks, in order to study more about the drivers' vigilance, this method was used in researches especially to detect the micro sleeps while driving.

Although, the music and sounds are ancient as human history and always linked to beauty, language, history, civilization, dancing and more historical concepts of humanity, the science of music is considered a modern science. Especially, the modern neurological field of science that focuses on music effects on the human brain. Whether the instant effects of music (The active brain lopes and regions while listening to music) or long-term effects (differences between the brains musicians and none-musicians) [11]. These effects can be noticed but still mysterious and hard to be specified properly in a scientific way. Since the 60s of the last century, scientists started to test the music and its effects on the drivers' behaviors, especially to answer the question if the music has any

effect on car control or not! If is it helpful in decreasing human errors and improving the driver mood and his respect for the rules of transportation on the roads or not! Many studies of music effects on drivers did not identify the types of music and just mentioned the two conditions, of music presence and music absence, or "With music" condition and "Without music" condition [12]. Other researches, were more obvious about the included music types, as an example, one of the early studies in this field, Konz and McDougal [1] clarified that the participants drove under three conditions of, Silence, slow music and Tijuana brass music, in addition, to specify the measured activities as controlling activities, (i.e. steering wheel movements, accelerator usage, and brake usage). The differences in behavior were clear when the driving was accompanied the Tijuana brass music, but still at that time and because of the uniqueness of these studies as well, analyzing the changes in drivers' behavior and the car controlling, was hard. In general, the studies focused on music types and the strength which reflect the loudness, rhythm, tempo, contour and, timbre. The deeper studies must identify the sound's elements more precisely for each type of music, to have better results. As in some studies, were found that Mozart's playing had an effect on our brains [3], which called later, Mozart's effect. On the other hand, music's studies also focused more on the performance of the drivers. A question arose if the music have a role on delay the drowsiness or do it have any significant causer to lead the driver for faster sleep? If the music has such effects, which type of music or sounds could have such effects? Many wonders are to be asked about the music and sounds as stimuli, and their relations to the drivers' awareness, mood, vigilance.

In this study, we have tested 23 subjects. Six subjects had just silence and the engine's sound from the simulator in the background. Seven subjects listened to Alpha Waves, which are some repeated sounds, usually, people listen to them to focus while working, and other people listen to them in order to relax. Seven subjects listened to Death Metal Music, which is noisy music. The last three subjects listened to Familiar music, the three subjects prepared their own playlists and listen to them while driving[1]. Each subject drove for continuous two hours, in dark laboratory and night scenario on the highway. We monitored the eye movements of the drivers; we collected the data of blinking and reaction time during two hours. The two hours of the study divided into eight quarters (Q)s each quarter is fifteen minutes. We mined the data of the reaction time, eye-blink interval time and eye-blink duration time. From these data, we studied three parameters. From every quarter (Q) we studied the reaction time average, the average of the eye-blink interval times, and the average of the eye-blink duration times. We studied the averages of these three parameters for the six subjects who had silence, the seven subjects who listened to Alpha Waves, the seven subjects who listened to Death Metal Music and the three students who listened to the Familiar music. Then we formulated graphs to illustrate the averages' changing quarter by quarter from the first quarter (Q1) to the last quarter (Q8). The graphs illustrate the parameters averages during the two hours or the eight quarters from Q1 to Q8.

2. Results Description

Table 1 Final Conclusions, Reaction Time Averages

RT	*Better*	*Worse*	*Period*	*Average (Better)*	*Average (Worst)*
S-AW	S	AW	Q2 to Q8	S: 996.57	AW: 1065.71
S-DM	S	DM	Q2 to Q4	S: 984.33	DM: 1053.67
S-FM	FM	S	Q1 to Q8	FM: 865.62	S: 1032.88
AW-DM	DM	AW	Q3 to Q8	DM: 1000.17	AW: 1063.83
AW-FM	FM	AW	Q1 to Q8	FM: 865.62	AW: 1082.25
DM-FM	FM	DM	Q1 to Q8	FM: 865.62	DM: 1028.12

Table 2 Final conclusions, Blink Interval Averages

BI	*Better*	*Worse*	*Period*	*Average (Better)*	*Average (Worst)*
S-AW	S	AW	Q2 to Q8	S: 6841.29	AW: 3659.14
S-DM	S	DM	Q4 to Q8	S: 6473.2	DM: 4990.2
S-FM	S	FM	Q1 to Q8	S: 7008.5	FM: 5678.25
AW-DM	DM	AW	Q2 to Q8	DM: 6578.29	AW: 3659.14
AW-FM	FM	AW	Q2 to Q8	FM: 5415.43	AW: 3659.14
DM-FM	DM-FM	FM-DM	Q1 to Q8	DM: 6747.38	FM: 5678.25

Table 3 *Final Conclusions Blink Duration Averages*

BD	Better	Worse	Period	Average (Better)	Average (Worst)
S-AW	S	AW	Q1 to Q8	S: 362	AW: 388.12
S-DM	S	DM	Q1 to Q8	S: 362	DM: 388.5
S-FM	FM	S	Q1 to Q8	FM: 339.62	S: 362
AW-DM	AW-DM	DM-AW	Q1 to Q8	DM: 388.5	AW: 388.12
AW-FM	FM	AW	Q1 to Q8	FM: 339.62	AW: 388.12
DM-FM	FM	DM	Q1 to Q8	FM: 339.62	DM: 388.5

From the previous three tables we can study the global conclusions of the three basic parameters, the Averages of (Reaction times, Blink Intervals, and Blink Durations).

[1] The limited number of the sample is because of the epidemic situation of coronavirus (COVID-19).

2.1. Silence

- It is clear that silence, kept the drivers' awake for longer time better than Alpha Waves and Death Metal. From Table 1.S-AW relation, we can see the effect of Silence started to have a role after the second quarter. Drivers who had silence (Just the engine's sound) in the background, reacted with about 69 milliseconds faster than the drivers who listened to Alpha Waves.
- From Table 1.S-DM relation, we can see the Reaction Time averages of the drivers correlated to the sounds in the background only from Q2 to Q4, after that, it is likely the fatigue had more effect than the effects of the background's effects in this case. At that period (last forty-five minutes of the first hour), drivers who had silence reacted averagely faster by 70 millisecond than the drivers who listen to Death Metal Music.
- From Table 2.S-AW relation, we can see that the drivers who drove with Silent background, survived averagely with no blinking for longer time by 3182 milliseconds, which means more than three seconds for each interval more than the drivers who listened to Alpha Waves. In addition to have more information that they blinked less times than in the drivers who listened to Alpha Waves while driving. This parameter (Blink Interval averages) gave useful information. Where we noticed the high blinking frequency, when the subjects were tired, sleepy, and drowsy while the experiments.
- From Table 2.S-DM relation, we can see that the drivers who drove with Silence in background, survived averagely with no blinking for longer time by 1483 milliseconds. These averages were taken when the listening two acoustic backgrounds started to have a significant role, which mean after the first forty-five minutes. This means the Blink Interval Averages while listening to Death Metal Music clearly decreased comparing with silence in this period.
- From Table 2.S-FM relation, unlike the previous parameter of Reaction Time Averages, We can see in this parameter of Blink Interval Averages; Silence helped the drivers to stay for longer time with no blinking more than Familiar Music, averagely by 1331 milliseconds along the two hours of driving.
- From Table 3.S-AW relation, we can see Blink Duration Averages of the drivers who listened to Silence were shorter averagely, which indicates more awareness. The silence helped the driver to blink shorter blinks by 26 milliseconds for each blink. In addition to, blink more blinks as we mentioned previously by having longer interval averages than the case of listening to Alpha Waves.

2.2. Alpha Waves:

- From the previous three tables, Alpha Waves were always the worst for all correlated relations and in all the parameters. The biggest Reaction Time Averages, the smallest Blink Interval Averages, and the biggest Blink Duration Averages.
- The numeric results came to confirm the real life results from the experiments. Listening to the continuous slow rhythmic sounds could be a real killer on the highways. Many subjects could not complete the two hours of driving and stopped driving experiments. Micro sleeps were obvious while driving while Alpha Waves. Many people listen to this type of music to focus more, but from the clear results, we have found that these sounds led to relaxation and drowsiness. We can say this type sounds have an effect on the face muscles, were the subjects blinked longer blinks and more frequently than the other types. The total number of the accidents due to drowsiness of the accepted students are two accidents. Speed average was 102 km/h. When the probands in the survey were asked about the best backgrounds to be while long drowsy driving, out of 23 students, no one nominated "Alpha Waves", which is expected.

2.3. Death Metal Music

- From Table 1.AW-DM relation we can notice that the Death Metal Music helped the drivers to react averagely faster than in Alpha Waves case, by 64 milliseconds, after the second quarter until the end of the two hours
- From Table 2.AW-DM relation we can see when the drivers listen to Death Metal Music had bigger Blink Interval Averages than the drivers who listened to Alpha Waves, by 2919 milliseconds, after the first quarter until the end of the two hours. This indicator is a good indicator for the Death Metal Music, with generally good Blink Interval Averages.
- From Table 3.We can notice that, Death Metal Music was worse than the other backgrounds; it just had a similar Blink duration average as long as Alpha Waves, which was relatively long.

2.4. Familiar Music

- From Table 1.S-FM relation, it illustrates that, listening to Familiar music helped the subjects to react faster than driving during Silence case, by 167 milliseconds. This could refer the drivers were more alerted while listening to Familiar music in a simple driving situation than having the just Silence in the background.
- From Table 1.AW-FM relation, we can see that, listening to Familiar music led the students to react faster than driving while listening to Alpha Waves, by 216 milliseconds averagely, which is a big difference. This could refer listening to Familiar music improved and shortened clearly the Reaction Time comparing to the Reaction Time Averages while listening to Alpha Waves.
- From Table 1.DM-FM relation, we can see that, listening to Familiar music improved the students' Reaction Time Averages than driving while listening to Death Metal Music by 162 milliseconds averagely. Familiar Music was the best acoustic background to listen according to the parameter of the Reaction Time Averages.
- From Table 2.AW-FM, The subjects who listened to Familiar Music had longer Blink Interval Averages,

comparing to Blink Interval Averages by, 1756 milliseconds.

- From Table 3.We can notice that Familiar Music was the best Acoustic background according to this parameter's results as well. With the smallest Blink Duration Averages, in the relation S-FM had a bit shorter Blink Duration Averages comparing to Silence case by 22 milliseconds.
- From Table 3.AW-FM relation, the drivers who listened to Familiar Music had shorter Blink Duration Averages by 48 milliseconds compared to listening to Alpha Waves.
- From Table 3.DM-FM relation, Familiar Music improved the Blink Duration Averages also comparing to listening to Death Metal Music as the subjects who listened to Death Metal Music had Blink Duration Averages too close to the other subjects who listened to Alpha Waves. That is the difference between the averages FM and DM, Blink Duration Averages is almost 48 milliseconds as the last case.

3. Summary

- Familiar Music had the best result and helped the drivers to resist fatigue, as people believe. Is always good to stay away from the noisy songs, and too slow-tempo songs.
- Silence had very good results to resist fatigue for longer time, these results were contrary to what is prevalent that silence is the worst, and it helped to survive well comparing to the slow monotonous sounds and after a while was better than loud sounds.
- Death Metal Music, Could be good for the short-term driving, however, these type of sounds are not recommended for long-term driving, because they overloaded the brain of the drivers. More studies are required to know if the high noisy sounds is related to longer blinking intervals and is it linked to keep more awareness, and does these types of sounds are related to the stressed face muscles.
- Alpha Waves, led to drowsy driving, the fact which we found by the experiments, subjects' descriptions and the numeric results as well. Alpha Waves and the monotonous sounds led directly to get the drivers fatigued. Which we can consider it as a real danger on the highways.

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THE ISSUE OF INTERGENERATIONAL RELATIONS DEPICTED IN FICTIONAL TEXTS AS A PART WITHIN THE CONTEXT OF THE CZECH CURRICULUM

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Abstract: *The goal of this article is to include fictional texts, which are related to intergenerational relationships, to the context of Czech curriculum. We try to find out about the following: to what extent is the topic of intergenerational relationships overlapping with the Framework Educational Program for Basic Education. For that reason, we use a method called a content analysis of a document. The Framework Educational Programs are one of the most important curriculum documents in the Czech Republic. There are many variations for all levels of the Czech education system. The researching theme is studied at the lower-secondary schools. In the Czech Republic, it is from 6th grade to 9th grade of elementary schools.*

Keywords: *intergenerational relationships, a fictional text, Czech curriculum*

1. Introduction

A teacher can use a fictional text with the theme of the intergenerational relationships in the education process. It is not necessary to have this text in a textbook or a reading book. In the contemporary children's literature, the theme of the intergenerational relationships is often depicted in the family environment. For instance, this topic is typical for the British writer David Walliams.

The theme of the intergenerational relationships belongs to the cross-subject topic called Personal and Social Education, and it is also closely connected with the key competencies. The Framework Educational Program for Basic Education [4] defines them. So, this topic is relevant theme in the school education.

2. The theme of the intergenerational relationships and the Personal and Social Education

A fictional text, which reflects intergenerational relationships, can be used in lessons of literary education or language and communication education. For example, Vladimíra Neužilová writes about possible interconnection of a school subject called Czech Language and Literature with a cross-subject topic called Personal and Social Education. She claims that there are many literary texts describing living experiences which are corresponding to reader's experiences. The author emphasizes that language and communication education are disciplines suitable for implementation of activities from Personal and Social Education [3]. It is also possible to work with the mentioned text in many other school subjects, for instead in Lessons of Civics and Education for Health.

A teacher must choose a suitable way for working with a fictional text when he or she wants to realize goals of Personal and Social Education. Josef Valenta approaches this exercise in the right education process: if we take a text from the book by Romain Rolland called Pierre and Luce, we will read this text with pupils and we will describe relations between main figures. Then, there should be an opportunity for pupils to express their ideas about a life partner. They also can think about the influence of their relations to their life [8].

Vladimír Srb and his group state that "all school subjects make us possible to work with topics from Personal and Social Education. Moreover, for the majority of us it is the most feasible way to apply the Personal and Social Education [5]." Michal Dubec is convinced of that life skills, which pupils have gained thanks Personal and Social Education, have positive effect on their happiness and success in life. Pupils use these skills during the whole life. These life skills, according to him, occupy more important role in life joy and success than all the other that they have learned. He claims that life skills are more important than a subject matter of a particular educational discipline [2].

Josef Valenta is the main author in the Czech Republic who has devoted the topic of Personal and Social Education. This author points out that one of Canadian published works coming from 1980s claims this: a student must also balance with changes in the area of intergenerational relations. Valenta depicted that Personal and Social Education was under period's influence. He emphasizes the role of changes in the society. These changes are related to requirement to educate schoolchildren in life skills and the prevention of undesirable behavior. The next reason for creating the Personal and Social education is seen in the necessity to support democracy. In some countries it was important to connect young people to the politics. Social psychology also has influenced the development of Personal and Social Education. In some countries, the subject called Civics was not implemented. So, in 1980s its content was realized in this cross-subject topic. Some countries had to update their curriculum because of Personal and Social Education. They had chosen different ways. For example, they connected this cross-subject topic with different school subject, or they established Personal and Social

Education as a separate school subject or project [7].

In the Czech Republic we have worked with the concept of Personal and Social Education since the beginning of 1990s. The title was taken from English, the content was inspired mainly by British and Canadian curriculum documents [7]. Since September 2007 Czech elementary schools had to implement the cross-subject topic called Personal and Social Education to their education process. This theme should be realized across the whole elementary education process [2]. Some schools decided to base the Personal and Social Education on their whole School Educational Program. Personal and Social Education is specific because the pupil himself/herself is, in fact, the subject matter of the personal and social education. In the field of Personal and Social Education, teachers can use many different teaching methods, for example games, model situations and discussions [4]. It is possible to use also literary methods [8].

The content of Personal and social education is divided to three parts in the Framework Educational Program for Basic Education. It is called as personality, social and moral development [4]. These areas are broadly specified. We can put the theme of intergenerational relationships into all three parts of the cross-subject topic. In the field of personality development the theme is closely connected with a self-knowledge and a concept of oneself (for example: second people as source of information about my person, my relations to other people), with mental hygiene (social skills for prevention of stress into relations between people) and with creativity (for example: creativity in interpersonal relations). The field of social development is identical in point called interpersonal relations (care of good relationships, behavior supporting good relationships) and in point called communication. From areas of moral development, we can think about theme of solving problems and skills good for decision-making (for example: problems in intergenerational relationships).

3. The theme of the intergenerational relationships and key competencies

The cross-subject topic Personal and Social Education overlaps with the key competencies. They are also represented in the Framework Educational Program for Basic Education. If the teacher uses a suitable way for work with a fictional text and the theme of intergenerational relations, the pupils also develop their key competencies. According to Jana Straková the key competencies are established in the Czech Framework Educational Programs in accordance to their foreign concept [6]. The key competencies were described for the first time by Dieter Mertens in 1974. Horst Belz a Marco Siegrist claim that these competencies asserted more importantly in school education up to end of 20th century [1].

Czech Framework Educational Program for Basic defines six categories of competencies. It is competence for learning, competence for solving problems, communicative competence, social and personal competence, civil competence, and work competence. This curriculum document states that "key competencies represent aggregate of knowledges, skills, abilities, attitudes and values important for personal development and use each of human in the society." Competencies are interconnected [4]. The theme of intergenerational relationships overlaps with key competencies within communication competence (for example: listening and understanding other people), within social and personal competence (for example: a support of good relations between people) and within civil competence (for example: respect for opinions of other people).

4. Conclusions

In the Czech Republic, the teacher is responsible for the form of his/her lesson. He/She plans the lessons; therefore, the teacher can freely work with a fictional text which contents the topic of intergenerational relationships. This theme occupies an important position in the Czech curriculum system. It belongs into the cross-subject topic called Personal and Social Education, into all its three parts. This topic also falls into key competencies, especially into communicative competences, social and personal, and the civil ones.

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COMMUNICATION WITH THE ADDRESSEE THROUGH FINE ART IN CHILDREN'S MAGAZINES IN CENTRAL AND EASTERN EUROPE

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Abstract: *Magazines for preschool children and magazines for children of school age are illustrated magazines illustrations are an integral part of. The hypothesis that they contain at least 30 % of the illustrations has not been confirmed. Out of the research sample of 50 journals published or distributed in Central and Eastern Europe, 4 titles publish illustrations of less than 30 %, representing 8 %. Overall, however, the share of illustrations in children's magazines is significant – up to 86 % of children's magazines publish illustrations in more than 40 % of their total extent. Most children's magazines publish illustrations ranging from 60.1 to 80 % of the magazine's total extent. A qualitative content analysis shows that children's magazines with a universal or religious focus have a larger share of text, children's entertainment magazines usually publish more than 80 % of the illustrations, and therefore a small amount of text. Artistic illustrations are the most published in children's magazines, and motivational illustrations are strongly represented. Documentary illustrations are published to a lesser extent. Technical illustrations represent a minimum number. Research of use of illustrations in children's magazines continues and will be processed afterwards. The research sample of journals will be several times larger and will include children's journals from all European as well as many non-European countries.*

Keywords: *children's magazines, illustration, non-verbal content and formal analysis*

1. Introduction

Children's magazines are published as illustrated magazines, Illustration has a significant role in them. This is due to the fact that pre-school children cannot read and children of younger school age only gradually acquire and develop their reading skills. The communication value of illustrations has a predominant influence on the inclusion of illustrations in the content of children's magazines.

Based on the position of children's magazines in relation to their addressees and the qualitative attributes of illustration as a representative of fine arts, the research presented in this text formulated a hypothesis that children's magazines publish illustrations in at least 30 percent of their total extend. Following follow-up research questions, the research sought answers to the specific proportion of illustrations in children's magazines. The article also partially addresses the importance and position of illustrations and the approach to their creation and publication in children's magazines. The theoretical part was based on the theory of fine arts, media theory, pedagogy and didactics.

The research sample consisted of magazines for preschool children and magazines for younger school children, which are published or distributed in the countries of Central and Eastern Europe. This local definition of the research sample was chosen mainly because in most countries of Central and Eastern Europe – unlike most other countries – there is a tradition of using children's magazines in the teaching process in preschools and primary schools. This places special demands on the content of magazines and, within it, on the illustrative component of these magazines.

2. Theoretical background

Illustration is an artistic representation, but also a supplement or emphasis on the idea and content of the text. It simplifies the perception of the text, its more demanding parts and, in conjunction with the graphic design, facilitates orientation in the text. It affects the aesthetic feeling and perception of the reader. It is a means of non-verbal communication between the author or editorial staff on the one hand and the addressee or reader on the other. Illustration is an integral and irreplaceable part of books and magazines for children.

E.J. Wiedemann recalls that "the purpose of illustration is to illuminate, to add light, but also depth to the manuscript itself." [1]

M. Tokár attaches a higher meaning to the illustration: "The interpretation of illustration can become a 'bridge' to understanding of a free work of art, it does not have to resign only to the 'service' of the text. Insufficiently guided and instructed recipient later, in adulthood, only searches for a 'text replica' in a book illustration and, with this approach, also evaluates the illustration." [2]

Illustration, unlike free creation, arises and exists in connection with text. To a certain extent, however, it also has a distinctive position. "As we read the text carefully, we must 'read' the illustration carefully too, because the illustrator helps us to create or complete our ideas that arise during reading." [3]

Didactics addresses the importance of illustration in terms of the educational process and perception of information that illustration brings.

"The didactic criterion for the creation and selection of illustrations is the goal of teaching, i.e. the topic, curriculum, specific students and teachers. For example, a realistic illustration is more suitable for a conversation in a foreign language, illustrations of art literature are more appropriate in literary classes, and authentic photographs of a documentary nature are more appropriate in geography classes."[4]

Illustration is a means of communication, a communication channel between the authors and the addressee. A Bulgarian artist – illustrator Boris Stojev commented on good illustration as follows: "For the youngest, it is necessary to draw simply, clearly, honestly and truthfully, in proportion to the child's age and mental development. Simple composition, simple drawing. Just like children draw. Simply means economical means of art, but not poor content. It is to comprehend a lot of imagination and fantasy in it." [5]

An important Slovak artist, Professor Dušan Kállay, commented on the approach to illustration: "Each work requires a lot of concentration. Each work is different, new and differently interesting. Sometimes I paint birds, animals, mice or butterflies, other times flowers, trees or machines. Some books are about children, others about adults. Poetry, a novel, a play – each is different. Or if the postage stamp is supposed to show the first plane in the world, as two interesting brothers in America built it from a bicycle, then I have to study everything about it, to learn how it actually was. And if I have a good idea, then everything is easier."[6]

In a broader sense, the relationship between the artist and the addressee can be understood as a dialogue. "Creating and working is an adventure that becomes addictive and brings joy and satisfaction not only to the creator, but also to the consumer of architecture, design and other art. That is, to the person for whom the products or work were created, but also to the person who accidentally discovers the work."[7]

Illustration is a tool of non-verbal, but comprehensive communication, which in children's magazines fulfils primarily an aesthetic, informational and didactic function. From the genre point of view, illustrations in children's magazines can be divided into artistic, documentary, technical and motivational (stimulating creative entertainment, developing imagination, analytical thinking, graphomotorics skills, etc.).

3. Proportion of illustrations in children's magazines

Due to their attributes, illustrations are an integral part of children's magazines. Their specific share in the total range of children's magazines was the subject of the research.

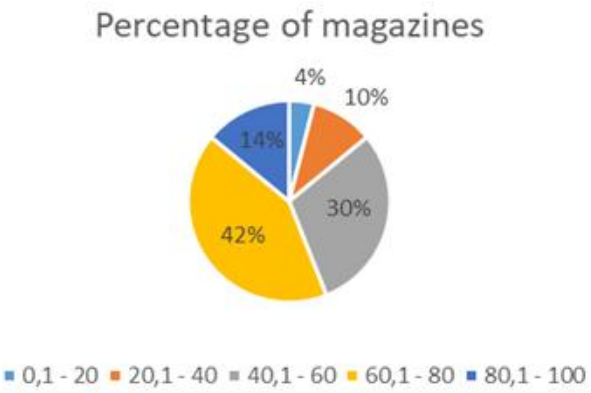
A qualitative and quantitative content and formal analysis of a sample of 50 children's magazines, published or distributed in the countries of Central and Eastern Europe is the basis of the research.

Table 1 Share of illustrations in the total range of children's magazines

MAGAZINE TITLE	*COUNTRY OF ISSUE OR DISTRIB.*	*ISSN/ISBN/IDENTIFICATION NUMBER*	*ILUST. [%]*
Čtyřlístek	Czechia	ISSN: 1213-0141	63
Materídouška	Czechia	ISSN: 0025-5440	44
Matýsek	Czechia	ISBN: 121-358-100-9	60
Pastelka	Czechia	ISSN: 1212-646003	60
Předškolák	Czechia	ISSN: 2336-3444	75
Puntík	Czechia	ISSN: 2570-5768	60
Sluníčko	Czechia	ISSN: 0231-7222	57
Šikulka	Czechia	ISSN 2571-1024	73
Ablakképek	Hungary	nie je uvedené	23
Dormogo Domotor	Hungary	ISSN: 0230-1032	69
Kifestó	Hungary	nie je uvedené	88
Dóra	Hungary	ISSN: 2062-4433	82
Vakáció	Hungary	ISSN: 0239-1457	51
Mia and Me	Moldavia	ISBN: 978-606-651-110-0	78
Neposeda	Moldavia	ISSN: 1991-0568	75
Basteln mit Kinderen	Germany	ISBN: 419-626-530-250-1	11
Benjamin Blumchen	Germany	ISBN: 419-855-650-230-009	69
Bummi	Germany	ISBN: 419-912-700-230-4	54
Diddle	Germany	ISBN: 419-541-490-250-0	55
Lowenzahn	Germany	ISBN: 419-511-840-230-6	24
Pettersson und Findus	Germany	ISBN: 419-585-670-240-9	65
Pumucki	Germany	ISBN: 419-489-490-260-406	63
Rätsels pas	Germany	ISBN: 419-613-760-199-2	17
Tabaluga	Germany	ISBN: 419-484-130-230-3	56
Wissens Rätsel	Germany	ISBN: 378-861-322-X	46
Miš	Poland	ISSN 0137-7698	64
Naucz mnie mamo	Poland	ISBN: 978-837-316-731-5	70
Truskawkowe Ciastko	Poland	ISSN: 2083-1234	74
Zabawy z Tygryskiem	Poland	ISSN: 1640-2286	78
Comunicare	Romania	ISBN: 973-706-082-2	75
Incepe meciul!	Romania	ISBN: 978-606-602-579-9	97
Benny	Romania	ISSN: 1843-5947	33
Cei trei purcelusi	Romania	nie je uvedené	80
Playmobil	Romania	ISSN: 2501-1421	83
Jocuri creative	Romania	ISBN: 978-837-962-387-7	95
Trolii	Romania	ISSN: 2451-4632	82
Maleňkie akademiki	Russia	ISSN: 2313-4666	70
PoniMaška	Russia	ISSN: 1995-8145	65
Skazočnyj mir	Russia	ISSN 1996-496X	29
Uchtyška	Russia	ISSN: 2412-3617	58
Maxík	Slovakia	ISSN: 1336-5029	49
Zvonček	Slovakia	ISSN: 1336-6963	62
Boni	Slovenia	ISBN: 977-185-401-800-8	66
Ciciban	Slovenia	ISBN: 977-035-088-700-2	39
Cicido	Slovinsko	ISSN: 0350-8870	59
Duhec	Slovenia	ISBN: 977-131-891-001-5	80
Geniales	Slovenia	ISBN: 977-140-875-800-8	49
Junior extra	Slovenia	ISSN: 1332-3881	86
Zmajček	Slovenia	ISSN: 1318-7449	60
Kehrypy	Ukraine	ISBN: 482-013-047-016-2	68

Source: own research

According to the research, out of the 50 children's magazines analysed, all publish illustrations, which documents their irreplaceable role in the mentioned printing subsystem.



Graph 1: Proportion of magazines for children with different ranges of illustrations

A more detailed differentiation of magazines by the scope of published illustrations is shown in the graph.

It results from the analysed magazines for children that
4 % of magazines publish illustrations in the range of 0.1 – 20 % of the total extent of the journal,
10 % of magazines publish illustrations in the range of 20.1 – 40 % of the total extent of the journal,
30 % of magazines publish rubrics in the range of 40.1 – 60 % of the total extent of the journal,
42 % of magazines publish rubrics in the range of 60.1 – 80 % of the total extent of the journal,
14 % of magazines publish rubrics in the range of 80.1 – 100 % of the total extent of the journal.

Out of the research sample of 50 journals, 4 titles publish illustrations to a lesser extent than 30 %, which represents 8 %. Overall, however, the share of illustrations in children's magazines is notable, with up to 86 % of children's magazines publishing illustrations on the surface of more than 40 % of their total extent.

Most children's magazines publish illustrations ranging from 60.1 to 80 % of the magazine's total extent. A minimum of children's magazines (only 4 %) publish illustrations of less than 20 % of their extent.

Illustrations in magazines for preschool children as well as in magazines for children of younger school age make up 11 to 97 % of their extent.

A qualitative content analysis shows that magazines for children with a universal or religious focus have a larger share of the text. Entertainment magazines for children usually publish more than 80 % of illustrations, and therefore a small amount of text. Artistic illustrations are the most published in children's magazines, and motivational illustrations are strongly represented. Documentary illustrations are published to a lesser extent. Technical illustrations represent a minimum number.

4. Conclusions

Magazines for preschool children and magazines for children of school age are illustrated magazines illustrations are an integral part of. The hypothesis that they contain at least 30 % of the illustrations has not been confirmed. Out of the research sample of 50 journals published or distributed in Central and Eastern Europe, 4 titles publish illustrations of less than 30 %, representing 8 %. Overall, however, the share of illustrations in children's magazines is significant – up to 86 % of children's magazines publish illustrations in more than 40 % of their total extent. Most children's magazines publish illustrations ranging from 60.1 to 80 % of the magazine's total extent.

A qualitative content analysis shows that children's magazines with a universal or religious focus have a larger share of text, children's entertainment magazines usually publish more than 80 % of the illustrations, and therefore a small amount of text. Artistic illustrations are the most published in children's magazines, and motivational illustrations are strongly represented. Documentary illustrations are published to a lesser extent. Technical illustrations represent a minimum number.

Research of use of illustrations in children's magazines continues and will be processed afterwards. The research sample of journals will be several times larger and will include children's journals from all European as well as many non-European countries.

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SELECTED LITERARY TEXTS OF ITALIAN LITERATURE FOR CHILDREN AS A TOOL OF INHIBITION IN THE PROCESS OF LATENT AGGRESSION IN GROUPS OF PRE-SCHOOL CHILDREN

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Abstract: *Our paper focuses on use of literature in the work with child's aggression among children of pre-school age. We will shortly characterize latent aggression and present two literary works for children by Italian writers, which can be helpful in elimination of aggressive behaviour in groups of children. The paper presents partial results of the project VEGA 1/0452/18, with the focus on identification and analysis of latent aggressive behaviour among children of pre-school age, and at the end provides recommendations of concrete practices for pedagogic-therapeutic practise.*

Keywords: *Children's literature, Latent Aggression, Preschool Children*

1. Introduction

Traits of hidden aggression can be noticed already in pre-school age, when a child signals to another one that he/she does not want to play with him/her [1]. In most cases it is backed by certain latency of aggressive behaviour, the motives of which may look almost invisible. Children of pre-school age are already verbally quite skilful and in most cases they do it in front of a whole group, thus hurting and mocking the other child [2].

The upbringing of a child is nowadays often left to one person – one of the parents or a teacher. It is not infrequent that, when the first manifestations of the child's aggressive behaviour appear, that person is confused and tries to find information about child's aggression, together with ways of its elimination [3]. The person looks for the way how to cope with the aggression. The problem is not only the victim of the aggressive behaviour, but also the aggressor himself/herself, who cannot be left out and who needs to be worked with.

A book is a natural need for a child of pre-school age, similarly as a game [4]. Our paper focuses on use of literature in the work with aggression of children of pre-school age. Along with that, we will present partial results of the project VEGA 1/0452/18 with the focus on identification and analysis of latent aggressive behaviour precisely of children of pre-school age.

1.1 Latent aggression in pre-school age

Podľa According to Říčan, a child changes to an aggressor gradually, storing in mind those ways of acting which brought him/her success. This is confirmed by many psychologists who say that, aggression is adopted often on the basis of personal experience [5]. Creation of aggressive scenarios is freguently influenced by how people act, even by literary characters, in whom the child sees a model to identify with [6].

Kováčová defines latent aggressive behaviour as an intentional and recurrent aim to indirectly hurt another person, whether physically or mentally. It is often well thought-out hurting of one or more persons, the consequences of which become apparent later, in children's mental life and behaviour [7].

1.2 Comparison of aggressions

Based on various foreign authors, Kováčová has characterized types of aggression threatening and devastating social relations. Below we present comparison of indirect and latent aggression.

Table 1

Type of aggression	*Characteristics of the aggression*
Latent aggression	Characterized by direct and indirect attacks against the victim;
	To act aggressively, a simple piece of information is enough, e. g. *We won't play with him/her, we won't sit by him/her*, etc.;
	The type of behaviour is apparent from the start, the victim is informed, even present at the dialogue;
Indirect agression	The behaviour can be characterized as secret, since it is conducted behind the victim's back;
	Rejection of a deliberately chosen person with the intention to reach his/her gradual isolation in the group;
	The victim is not directly confronted with the aggressor;

Source: Kováčová 2020 [8]

2. Selected literary works

A child in pre-school age is barely able to differentiate between reality and phantasy, between what is important, what hurts the other on one side, and what can help him and make him happy on the other side. The work with literary text proves to be very helpful in this developmental stage [9]. As experience shows, it is important that the kids are exposed to listening of stories, since this widens their word stock, helps them to think, and can even significantly enhance their emotional development. Through the stories about others the child

gradually discovers what is anger, love, fear, or how actions of one character can influence others.

Within the context of our VEGA project, which is focused on identification, analysis and inhibition of latent aggressive behaviour of pre-school children, we will present two literary works for children written by Italian writers, which can be instrumental in elimination of aggressive behaviour among children.

2.1. Carlo Collodi - Pinocchio

Pinocchio by Carlo Collodi is a world-famous literary work. A story of a boy going through inner transformation has a very positive message, and is inspirational even for kids of present time. Its author, *Carlo Lorenzini* (1826 – 1890), called also *Collodi,* came from Florence [10]. In spite of his main professional orientation towards musical criticism, political journalism and feature writing for adults, he started to write stories for children, which soon acquired a stable place among masterpieces of the world literature. Today he is mostly known as a writer of literature for children. His first touch with children's literature was in 1875, when he translated *Perolt's fairy-tales* [11]. In 1877 he published a book titled *Il Giannettino,* freely translated as *Johnny,* and in 1883 *Adventures of Pinocchio* [12]. Originally, Collodi wrote the *Stories about Pinocchio* – the wooden doll – to amuse children. He was publishing them from 1881 in a weekly magazine for children *Il Giornale per i Bambini* [13]. Thanks to his high popularity, *Pinocchio* became over the time a new type of child's hero surpassing schematic and stereotypical patterns of traditional folk heroes [14].

Analysis of the work

In the story, *Pinocchio* makes a lot of mistakes and wrong decisions – very spontaneous, emerging from ingorance, inexperience or naivity. In our analysis we focused on Pinocchio's aggressive actions, which are quite frequent in the story.

- Pinocchio is accompanied by a good fairy throughout the whole story and the confrontation between the two often contains aggressive elements. Pinocchio stubbornly asks the fairy to make him a real boy. "*I am tired of being but a wooden doll! It's time for me to become a man like everyone else*" [15].
- Pinocchio's aggression appears in context of lie. When Pinocchio lies, his nose grows long, which consequently makes him angry and aggressive. "*The fairy let Pinocchio cry and scream for over half an hour, not being able to get out of the room because of his nose*" [16].
- Aggressive expressions can be found also in conflict with other boys, when Pinocchio provokes the boys by boasting. The boys react, "*look Pinocchio, you won't boast, you won't talk big here! … At these words he hit Pinocchio's head with his fist. But, as they say, 'a scythe fell on the stone,' and the wooden doll returned a hit… Pinocchio, in spite of being alone, kicked with his feet all around …"*[17].

These examples show situations, thanks to which the aggression would came to surface. Something similar can be found among children of pre-school age. Pinocchio exhibits:

- resistance towards authority, who wants to bring up a good child,
- aggression sparked by outer appearance,
- relational aggression within a group.

When working with children with aggressive behaviour, whe have to be prepared for a long-term process. Here we can see the parallel: the story of Pinocchio is lengthy, just as the work with aggressive child. However, the behaviour and actions of the fairy can serve as a good inspiration: she patiently and persistently helps Pinocchio, again and again explaining how to become a good boy. The fairy paitently reiterates that, *"good boys like to learn and work … they always tell the truth… they like going to school. Pinocchio promises to her, that from this day on he will be a good boy"* [18].

2.2. Sergio Tofano – Cabbage for afternoon snack

Sergio Tofano (1886 - 1973), another Italian writer for children, graduated from law and acting. He had a deep desire to write texts for children free from heavy pedagogical and moralistic colouring [19]. Since he illustrated his books himself, his artwork invoked children's creativity [20]. During the interwar period his texts appeared mostly in *Il Corriere dei piccoli,* the magazine for children [21]. His book with bizzare title *Cavoli a Merenda* (Cabbage for afternoon snack) was published in 1920. It is a satire, almost a nonsense, since in Italy cabbage is never served as an afternoon snack [22].

Analysis of the work

Cabbage for afternoon snack is a book made of ten short stories In connection to the topic of aggression we present a fairy-tale about *King, who was always turned to the same side*. The story is about a king who was always turned to right. Not because he wanted to look important, but because on his left cheek he had the spot in the shape of omelette. One day he decided to marry. He commisioned his minister to find him a spouse with red hair, blue eyes, able to cook meatballs with parsley leaves (which is the most favourite kids' meal in Italy). The king had one more important condition. His spouse should have a specific defect: she should always look from the left side, so that she and the king could see each other. Desperate minister started searching, but could not find the one among princesses. One night he spotted a beautiful red-hair lady, sleeping on her right side, with a spot on her cheek in the shape of cabbage. He took her to the royal palace and the king married her.

One of their wedding gifts, given to them by the judical executioner, was a special soap, invented by the executioner to enhance movement of the rope. Curious king tried the soap and washed his face. Surprisingly, the spot on his cheek disappeared. He washed the face of his

wife, too, and her spot also disappeared. The story ends happily: the minister is rewarded by a holiday, the executioner stops executing people and becomes *exclusive supplier of parsley for meatballs for the royal palace,* and the king with his wife lived happily ever after [23].

Despite the fact that, the story is about ordinary things in life, we can analyze it from the point of view of aggressive behaviour. Often the starter of aggressive conduct is some kind of unavoidable restriction. This makes a person unhappy, nervous, and even aggressive. The story about the king tells us that, it is possible to be satisfied even if one is not perfect, even if not all of the person's requirements are met. This can be seen in three spheres.

- Life does not always go as we want it. King, who in the beginning longed to marry a noble princess, in the end married a simple girl, putting aside her origin.
- Acceptance of our appearance imperfections. Even if the king had a spot on his cheek making him imperfect, he found a spouse with similar imperfection and was happy.
- We don't always have to completely fulfill all the requirements bestowed on us, but we should at least try. The minister tried very hard to find king a princess. He did not succeed, but he did not give up and found him a simple girl, who met king's demands and satisfied his longing.

This story can be used during the conversations with children to provide examples of handling hard situations, to help a child accept his own hardships, and to assist those, who behave aggressively, often in a latent mode.

3. Recommendations

Both mentioned stories offer concrete points to help eliminate aggressive behaviour in groups of children of pre-school age. Vo všeobecnosti by sme mohli zhrnúť nasledovné odporúčania.

- *Telling stories.* Listening to stories is very natural and attractive for children. Through the stories a child can better understand behaviour of others [24]. If an educator or a parent can identify latent aggression within the group, it is precisely stories, which he/she can use to cope with the problem.
- *Discussing the stories.* The child in pre-school age is very curious and asks about the behaviour of characters in the story. He/she wants to grasp the substance of it. It is vital that, the educator or the parent is attentive to questions and willing to answer them. The questions and good discussion can lead to the improvement of the situation in the whole group with latent aggression. The group can learn that, the victim needs help and the aggressor needs to be grounded. It is recommended to ask questions like: Who [in the story] did something good? Who misbehaved? Who should ask for pardon?, etc.
- *Discerning good from bad and promoting good behaviour.* It is vital to teach a child to discern substantial properties of every situation, like identify the good end and possible threats. If a child can share his bar of chocolate with others, he/she gradually starts to perceive the notion of common good. The common good is something beyond single good. It is a good of friendship, of syblings, of family, of joyful community in the kindertarten, etc.
- *Setting up reading rituals.* It is important to set a certain time with certain duration, in the evening or before afternoon nap, to read to children. Books help children discover the substance of a good conduct. Besides reading itself, it is also important to set another time slot for the discussion about the stories.

4. Conclusion

Based on what has been said we perceive that, the stories can help eliminate latent aggression in groups of children of pre-school age, which can improve child's life now and in the future. Thus we agree with Prekopova, who says that, "the most important thing is to lead a child to discover his/her own strong and weak properties, since then he/she can compare him/her-self realistically with others and based on this comparison elicit feeling of his/her own value" [25].

Afiliation

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DETECTION OF CONTEXT BETWEEN ACADEMIC PROCRASTINATION, STATE ANXIETY AND TRAIT ANXIETY IN ADOLESCENTS

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Abstract: *The study aims to identify the mutual connections between academic procrastination, state anxiety, and trait anxiety in adolescents. The research group consists of 162 students (96 secondary school students and 66 university students). The participants' age range from 16 to 21 years, while their average age is 18.4 years. Two questionnaires were used during the research, namely the Procrastination Scale for Student population - PSS and The State-Trait Anxiety Inventory - STAI. We identified a statistically significant correlation between academic procrastination and state anxiety and between academic procrastination and trait anxiety. Furthermore, we also identified a statistically significant difference in the degree of state anxiety and trait anxiety.*

Keywords: *academic procrastination, adolescence, state anxiety, students, trait anxiety*

1. Introduction

An increase in procrastination rate may also occur due to the increased level of state anxiety and trait anxiety when performing academic tasks, such as writing term papers or preparing for an exam [1,2]. Students' levels of state anxiety and trait anxiety can be high, weakening their performance or mood. They postpone their academic tasks only not to be directly confronted with these feelings. If students are upset about the tasks they have to deal with, they are likely to engage in another activity that makes them feel better. Therefore, the state anxiety caused by the evasion of responsibilities is closely linked to the delay in the deadline [3]. However, this does not change the fact that the task that disrupts them must be performed in the foreseeable future [4].

1.1.Procrastination, state anxiety, and trait anxiety

Adolescents perceive procrastination relatively intensely as a source of stress and anxiety in their lives [5,6,7]. According to some authors, academic procrastination involves a tendency almost always to experience the problematic levels of anxiety associated with procrastination due to a sense of inability to meet deadlines [2]. Thus, we can observe a statistically significant correlation between academic procrastination, state anxiety, and trait anxiety [1,2,3,5,8,9]. Academic procrastination is associated with fear of failure, social anxiety, and anxiety as a personality trait [10]. Haycock, McCarthy, and Skay's [11] research suggests that the tendency to procrastinate is higher in students with higher anxiety. Several researchers believe that state anxiety affects students to such an extent that students are disproportionately coping with challenging academic tasks, which further weakens their performance [6]. Other authors proved no connection between state anxiety and academic procrastination, but there is a significant correlation between academic procrastination and trait anxiety. This is because students with trait anxiety as an individual trait perceive the tasks as threatening and, as a result, tend to procrastinate more often [12]. Other studies have found a significant correlation between academic procrastination and trait anxiety [3]. On the other hand, there are studies [13] that did not prove the statistically significant correlation between academic procrastination and state anxiety. This study aims to identify the connection between the modern phenomenon prevalent among adolescents, academic procrastination, state anxiety, and trait anxiety. It also aims to identify the difference in the level of state anxiety and trait anxiety between secondary school students and university students.

1.2 Research hypothesis and question

Based on the research studies mentioned above [1,2,7,12,14] confirming or refuting the correlation between academic procrastination, state anxiety, and trait anxiety, we formulated two hypotheses and one research question:

H1: There is a statistically significant correlation between academic procrastination and state anxiety.
H2: There is a statistically significant correlation between academic procrastination and trait anxiety.
RQ: Is there a statistically significant difference between secondary school students and university students in the degree of state anxiety and trait anxiety?

2. Method

2.1 Research sample

The research sample consists of participants selected for the study through purposive sampling. The primary condition for selecting participants, which made them comparable, was being secondary school students or university students in the first semester at the time of conducting the study. Part of a research sample consists of students from the Grammar school in Topoľčany, Business Academy in Topoľčany, Hotel Academy in Nitra, or Secondary Vocational School in Topoľčany. Further, the

research sample includes students of the Faculty of Arts of the University of Ss. Cyril and Methodius in Trnava and students of Comenius University in Bratislava. They participated in the research anonymously and voluntarily by filling in a battery of questionnaires in writing. The original number of participants was 176, but 14 participants were excluded from the study because of missing or incomplete data. The final research sample consisted of 162 participants, 82 females, and 80 males. The participants' age ranged from 16 to 22 years, with an average age of 18.4 years; they were all in the stage of adolescents.

Table 1 Research sample

Name of School	*Number*	*Number %*
Grammar school	30	18,5%
Business Academy	25	15,4%
Hotel Academy	26	16,04%
Secondary Vocational School	13	8,02%
University of Ss. Cyril and Methodius	34	20,9%
Comenius University in Bratislava	34	20,9%

2.2 Materials and equipment

In the research, we used two questionnaire methods to analyze the rate of procrastination, and state anxiety and trait anxiety. The first method used was the Procrastination Scale for Student population - PSS, which is the modification of the original General Procrastination Scale composed [15]. Using it, we obtain information on whether the individual suffers from procrastination and also to what extent [15]. Lay's procrastination scale for the student population contains 20 items expressing tendencies to procrastinate. The items are evaluated on a 5-point Likert scale. Based on the value of the summary score, the participant falls into one of three categories, from the lowest procrastination rate to the highest rate of procrastination [16]. We proved a sufficient rate of the scale's reliability ($\alpha = 0,75$) in the research.

As another questionnaire, we used the questionnaire for measuring state anxiety and trait anxiety - The State-Trait Anxiety Inventory - STAI, which was created in 1970 by the authors Spielberger, Gorsuch, and Lushen. We used its Slovak version [17]. STAI contains 40 items divided into two self-writing scales, STAI X-1 and STAI X-2. The items are evaluated on a 4-point Likert scale. In the research, the Cronbach alpha coefficient rate was $\alpha = 0.88$ for scale STAI X-1, and the Cronbach alpha coefficient for scale STAI X-2 was $\alpha = 0.74$.

2.3 Procedure

In order to collect data necessary for the research, we selected the questionnaire method (quantitative research). To analyze the quantitative data obtained from the questionnaires, we used mathematical-statistical procedures within the statistical system SPSS 23 (Statistical Package for Social Science) for Windows. In this program, we processed and analyzed the data. Using SPSS software, we generated descriptive indicators of variables (mean, standard deviation, median, minimum, and maximum) and then verified their normality of the distribution. As the value of the shape measures deviates from the typical range from -1 to 1, we can say that there is no normal distribution in our research. Thus, we used a nonparametric form of correlation analysis, specifically Spearman's rank correlation coefficient to determine the relationship between variables, and a nonparametric test for two independent selections (Mann-Whitney U test) to examine differences between groups.

3. Results

H1: There is a statistically significant correlation between academic procrastination and state anxiety.

The analysis pointed to a moderately strong correlation between the variables Academic Procrastination and State anxiety at the level of statistical significance Sig. <0.001. The value of the Spearman correlation coefficient is $\rho = 0.34$. There is a positive linear relationship between the variables, which exists; there is a direct connection between them. If the score of one variable increases, the score of the other variable increases too. Based on the results, we confirm hypothesis H1 about a statistically significant correlation between variables.

Table 2 Correlations between Academic procrastination and State anxiety

		Academic procrastination
State anxiety	Spearman Correlation	0,34
	Sig.	0,000
	N	162

H2: There is a statistically significant correlation between academic procrastination and trait anxiety.

The analysis pointed to a moderately strong correlation between the variables Academic Procrastination and Trait anxiety at the level of statistical significance Sig. <0.001. The value of the Spearman correlation coefficient is $\rho = 0.39$. Even in this case, it is a positive linear connection.

Table 3 Correlations between Academic procrastination and Trait anxiety

		Academic procrastination
Trait anxiety	Spearman Correlation	0,39
	Sig.	0,000
	N	162

RQ: Is there a statistically significant difference between secondary school students and university students in the degree of state anxiety and trait anxiety?

The research question was explored by a nonparametric test for two independent selections (Mann-Whitney U test) with the result Sig. <0.05 for both test variables. We interpret differences in average rankings between groups as statistically significant. Based on the average rankings for State anxiety and Trait anxiety variables, we record significantly higher values for secondary school students than university students. There are statistically significant differences in the level of State anxiety and Trait anxiety between secondary school students and university students. The observed effect rate of the variable State anxiety is 0,18, and the effect rate of the variable Trait anxiety is 0,28.

Table 4 Mann-Whitney U test of State anxiety and Trait anxiety differences in students

		N	Mean Rank	Mann- Whitney U test
State anxiety	Secondary school students	94	85,12	U= 1095,5
	University students	68	59,63	Z= -2,418
	N	162		**Sig. = 0,016**
Trait anxiety	Secondary school students	94	85,19	U= 795,5
	University students	68	47,66	Z= -3,562
	N	162		**Sig. = 0,000**

4. Discussion

4.1 Interpretation of results

In the first hypothesis, we identified that the variables are related in a positive direction. The study results are comparable to the studies of the other authors on which we based our research [2,7]. Furthermore, this correlation has been investigated in another study [18], where it has been shown that the degree of state anxiety increases with an increasing degree of academic procrastination. When examining the correlation between state anxiety and academic procrastination, it is essential to emphasize that state anxiety can be an important factor in failing to complete the academic tasks that lead to procrastination [6]. In practice, this means that students who have a higher degree of anxiety will procrastinate more. Therefore we can interpret state anxiety as an alternative activity to avoid tasks. In the study, we identified a moderately strong correlation between these variables, while in other studies [8] was found only a shallow correlation. Many researchers strive to explain this correlation. According to some, the tendency to look for another alternative activity is typical when experiencing anxiety associated with aversion to the task [13,19]. On the other hand, there are studies [8,3] that have found no correlation between state anxiety and procrastination, contrary to our findings. From our results and other studies [2,7,6], we can confirm that procrastination is related to the experience of state anxiety due to the academic tasks that students have to perform. Although students need a certain level of anxiety, and it is a natural phenomenon in the school environment to progress well in their school work, too much anxiety can lead to intense job avoidance. In this context, it is important to point out that even an individual with only a low rate of procrastination can become a procrastinator with a high rate of procrastination through high demands during academic life [1], as the level of state anxiety and procrastination can be different at the beginning and during semester [20].

Similarly, in the second hypothesis, we assumed a positive correlation between academic procrastination and trait anxiety. When examining numerous variables related to the cognitive process in the academic environment, it is state anxiety conditioned by time and situation rather than trait anxiety, which is a permanent characteristic of a person [21]. Also, the correlation of trait anxiety and procrastination is a very unusual finding in previous research [8]. There are also studies [3] that have found no significant correlation between state anxiety and procrastination but have found a positive relationship between trait anxiety and procrastination. The fact that anxiety as a personality trait is positively correlated with academic procrastination is explained by the fact that the more anxious the student is, the more procrastination due to fear of the task. In the research, we assumed that as the level of trait anxiety increased, so did the rate of academic procrastination. We accepted this hypothesis, and thus a correlation was found between trait anxiety and academic procrastination. The results of the hypothesis are in line with previous findings [3,14,12,10]. Other studies have found a positive correlation of trait anxiety with academic procrastination [14,10]. In our opinion, it is the individual's personality and specifics that are a significant factor affecting either the origin or course of procrastination.

In the research question, we examined whether there is a difference between secondary school students and university students in the state anxiety and trait anxiety. The results showed higher values of state anxiety and trait anxiety among secondary school students compared to university students. We can confirm a statistically significant difference between the levels of state anxiety and trait anxiety experienced by secondary school students and university students. Our findings support research [22], which found increased state anxiety in younger students. The transition to adulthood generally represents a period with a high risk of the onset of depression. Besides, new social and intellectual situations can cause emotional pressure, leading to an increased risk of depression, anxiety, and stress. Furthermore, research [22] points to the fact that the more educated students are, the more they have confidence in performing academic tasks, and therefore state anxiety and trait anxiety do not occur to them to a greater extent. Other research [23] also points to a high rate of state anxiety in schools, but younger students have higher levels of state anxiety compared to older students. Furthermore, it has been shown that the level of

anxiety does not depend directly on the academic degree, but rather on age, with students over the age of 20 experiencing a higher level of anxiety [24]. Stress from a new environment and a new life situation can increase anxiety [23]. High levels of anxiety among secondary school students or university students can have adverse effects on their mental health, development, education, and quality of life [22]. However, our finding that there is a difference in the level of anxiety and anxiety may be skewed by the varying size of comparison groups and the fact that current academic tasks are being performed.

4.1 Limits

After conducting the research, we revealed several limits that shall be mentioned. The first limit concerns the research tools used, and thus the fact that the data were collected through tools that were self-assessing. According to some authors [13], self-assessment scales are unreliable. The results may also have been affected by external variables. Also, the limit of the work may be a research sample. The research results would be more precise if the research sample were more numerous.

4.2 Future intentions and practical application

In future research, it would be ideal to focus on the longitudinal examination of the academic procrastination of secondary school students up to the start of their university studies and their subsequent university studies, which could confirm the increase in procrastination rate during their studies. [25]. The occurrence of procrastination has been present in schools for a long time, but its research has only recently begun. It is not entirely possible to eliminate the occurrence of this phenomenon, but we can mitigate its consequences. Based on the presented conclusions of the research, we can expect that the introduction of learning strategies could alleviate the occurrence of academic procrastination. It is learning strategies that can provide the basis for changing habits in thinking and behavior. These learning strategies can also work when applied by requiring students to create a pre-arranged timetable for all the necessary curriculum, as these techniques have been found to increase performance [1]. Equally useful would be introducing prevention programs for students to control procrastination in their lives effectively.

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PHILOSOPHY FOR CHILDREN PROGRAMME AS A TOOL LEADING TOWARD INDEPENDENT THINKING

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Abstract: *The article deals with the necessity to lead children toward independent thinking and acting during their school life as well as everyday life. Philosophy for Children programme may represent one of the possibilities to support gaining of real knowledge at school. The programme is not focused on application of academic philosophy which is a complex one, full of abstract notions, but on the contrary, it represents a practical way of getting to know the world through application of pre-designed methods and procedures. In order to create one´s own thinking the Philosophy for children uses its user-friendly way, close topics, reading of philosophical literary stories, asking philosophical questions, discussion with clear rules and additional activities interconnected with literary, dramatic, musical and visual arts.*

Keywords: *Philosophy for Children, Independent Thinking, Critical Thinking, Creative Thinking, Caring Thinking*

1. Introduction

School system has long met with criticism due to children and students learning quantity of information instead of learning how to use their own minds and think independently. Anyone might to know why independent thinking is important and why *thinking as such* should be developed in educational process. Although it is suggested that purpose of education lies in teaching students how to think, in many cases the reality of education institutions considerably differs from this intention. Educators devote considerable scope for interpretation and memorization, while students´ own activity in education process is used to a small extent only. Students being occupied with mechanical learning only hinders their ability to think independently, work with information and select facts. Rote learning leads students away from the importance to use acquired skills in practical life. The Philosophy for Children programme covering research-based methods successfully implemented in various countries, may be considered one of the possibilities to support independent thinking, Researches (e.g. Daniel, MF 2002, Dunlop, L. 2015, Yan, S. et. al. 2018, Gorard, S. et. al. 2019) have shown positive impact of this programme on cognitive capabilities, affective and social aspects of personality. Therefore it might be useful to implement this programme in a learning environment. Following chapters present the Philosophy for Children programme, its main objectives, follow-up on development of thinking as such and consideration of the independent thinking issue.

1.1 Philosophy for children methods leading toward independent thinking support

The Philosophy for children programme has been designed to facilitate children or students expressing their own thoughts, learning how to accept or reject other people´s opinions and how to rely on their own judgment. The discussion supports reasonable expression of opinions. Reflecting weaknesses in thinking and speech expression of Matthew Lipman´s university students convinced him to form the Philosophy for children programme in the 1970s. Throughout his life Lipman promoted the idea of philosophy useful to anyone, not a philosophy limited to college and academic life only. In education he did not support philosophy covering technical terms, boring and uninteresting one. He rather focused on the fact that through discussion and philosophical questions it may be based on interests of students and previous experience. He came to conclusion that teaching and practice of "*how to think*" comes too late. He wondered, how he could lead young people toward more logical, creative and critical thinking. With this regard M. Lipman expressed the idea that children and philosophy are natural friends, as the way they perceive the world results from amazement. The author applied philosophical tradition topics (i.e. truth, beauty, goodness, justice) which he implemented into a literary story in a way that the readers could go through it with an amazement and meet there fields of their own experience from logic, aesthetics, ethics and others. (Lipman, M. 2009, In Marsal, E., p. 29).The following points introduce main pillars of the Philosophy for children. They cover reading of a literary story, asking philosophical questions, discussion, facilitator´s personality and teacher´s manuals with additional activities:

Literary story: An example of independent thinking may already be observed in the initial phase of approaching the Philosophy for Children, while reading a philosophical story, which dialogues among characters appearing in the story provide a model to solve doubtful issues. Philosophical story is used as a method to provide space for thinking about various issues of life, it relates to the reader's life, his experience and interests, it is a stimulus for dialogue and discussion, as the community of inquiry may derive questions from the story for its common assessment. The essence of philosophical text can be captured by comparing it with an aesthetic text. The philosophical story does not remain on the surface of problem solving, its aim is to encourage the reader to solve

the problem subsequently. On the other hand the philosophical text is not always at the same level as the aesthetic text, as it does not primarily focus on an aesthetic experience. Philosophical literary story is characterized with its simplicity in the story as well as the language. After reading a story, a group called community of inquiry in this programme makes philosophical questions which may or may not relate to the story. These issues represent an impulse for discussion which is based on interests and knowledge of community of inquiry.

Philosophical questions: Questions represent a supporting tool in the process of philosophizing. Asking clear and relevant questions leads to better core understanding of studied issue. Therefore the capability to construct adequate questions is considered a necessity in contemporary education - in connection with the educator, and also with the educator. The power of a philosophical question lies in its capability to stimulate thinking. The ambiguity it covers may awaken an active discussion. Discussion based on programme methodology represents a move away from traditional asking of questions, when the teacher initiates answers of its students and their correctness is assessed. Instead the classroom and group discussion becomes much more interactive and collective. The community of inquiry members is usually not aware (and in such situation they does not necessarily need to be) that it deals with issues of epistemology, metaphysics, logics, aesthetics or ethics, i.e. main philosophical fields.

Discussion in the community of inquiry: The community of inquiry represents a group of people which has its origins in John Dewey´s pragmatism and work. It represents reflective, experiential education where an individual is educated through a thinking process. An idea of philosophy useful for everyday life is promoted (Millet, S., Tapper A., 2011, p. 548). The community of inquiry undergoes processing, sorting of information and acquisition of knowledge of an individual in an interaction with a group of people. This means that learning involves individual as well as social dimension. Student learns through a process of thinking, i.e. combination of his own as well as collective thinking. In his work (1997, pp. 42-43), J. Dewey emphasizes the fact that education should not be represented by learning of facts, but it shall focus on reflective thinking development. His opinions are still applicable in contemporary school system, which continuously faces the challenges of inefficient receipt and processing of information and low level of mainly critical thinking. The members of community of inquiry are encouraged to think for themselves about their own thinking (Naji, S., 2017, p. 8). The community members is led toward solving the problem in depth, which means that he does not get away from the topic or skip from one topic to another. Discussion in Philosophy for children teaches how to search for facts and not to rely on assumptions.

Facilitator: The community of inquiry process is adjusted in a way to ensure a sense of freedom when expressing one´s thoughts. The role of a facilitator is the key one there meaning that the teacher / educator plays an important role while applying his competence to sensitively guide the course of a discussion. Facilitation literally means facilitation; the facilitator tries to encourage members of community to express their inner thoughts and help them realize the fact that they are capable to learn and progress. Members of the group progress in a mutual respect environment, they are free to express their opinions and thoughts. However, the facilitator makes sure that their opinions are supported with arguments. Within the seeking community the facilitator is not aware in advance what direction the dialogue takes. In order to react and lead community members adequately his knowledge of programme methodology is essential on the other hand. His role is also focused on support of a speech activity balance frequency of individual members, where the facilitator discreetly separates challenging dialogues from those not leading toward solving a problem. Provided the educator wishes to work with the Philosophy for children methodology, it is recommended to complete a course where one can get thoroughly acquainted with the theory and practice of the programme. Besides philosophical literary stories methodological guides described further may also be helpful. Accordingly the facilitator assists in formulating his own methods and tools for independent thinking development.

The teacher´s manual: Philosophical literary stories included in the Philosophy for children have methodological guides elaborated, which represent an important tool for the facilitator. They include issues which the seeking community may handle as well as activities which may be creatively included as part of the meeting. Activities included in the Philosophy for children programme cover various exercises focused on speech, artistic representation, movement or dramatic expression.
Education institutions provide children and pupils with clear and mainly academic knowledge. Based on Philosophy for children methods dialogue and discussion in the seeking community provides students on long-term basis with capabilities which are more sustainable and applicable in their out-of-school life. Among other things students gain the ability of critical, creative, caring thinking out of which their capability to work with information derives (Muchová, L., 2013, In Bauman, P., p. 108. Matthew Lipman, the programme founder developed a theory of three-dimensional model of thinking, which is discussed in the following chapter.

2. Three dimensions of thinking in Philosophy for Children

Increase of critical and creative thinking level in education has been examined over the last decades. It is necessary to find out ways through which one may reach desired improvement. Russel Grigg and Helen Lewis (2019, p. 5) prioritize "to be a good thinker." They state that leading children toward good thinking makes them happier and their lives. As it results from the Philosophy for children programme origin analysis it primarily focuses on the thinking level growth. At the beginning the effort may

seem excessive, but in contrary to mechanical learning it shows long-term effects. M. Lipman formulated a theory which deals with effects of the programme on critical, creative and caring thinking. Three dimensions of thinking represent another concepts which the Philosophy for children works with. They are abbreviated to CCC in literature - critical, creative, caring thinking.

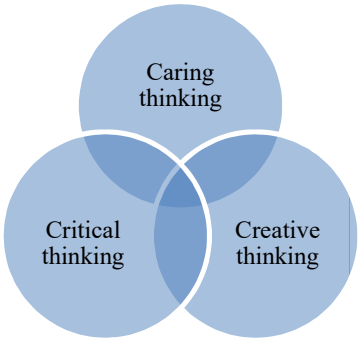

Figure 1: Multidimensional thinking (according to Lipman, M., 2003, p. 200)

These three dimensions of thinking do not work separately from one another, but are mutually interconnected. Critical thinker collects, analyzes, evaluates, examines, and distinguishes between facts and opinions. Creative thinker comes up with an idea, sees and assesses the issue from several perspectives and comes up with innovative solutions. Lipman (2003, p. 259) characterizes creative thinkers in a way that they think for themselves and do not allow others to be drawn into the way they think. These people tend to ask questions where others would not even thing about it, where others would happily continue further. Similarly those who think creatively do not answer mechanically and thoughtlessly, but they carefully consider the question first before answering it.

With regard to development of thinking school and out-of-school education pays attention mainly to creative and critical thinking. After implementing of the program Matthew Lipman started to consider the need to think in a more caring way. The main principle of this concept lies in the fact that caring thinking people should show interest in one another and in the surrounding world. Caring thinking is shown in empathy and respect to various opinions. It concerns thinking which does not ignore discussed issue, course of dialogue and group participants. Caring thinking presupposes participation, reciprocity as human existence is also part of a dialogue (Zbudilová, In Bauman, 2013, p. 146).

Think independently while considering the Philosophy for children methods means that one shall take a critical approach toward his own opinions and opinions of others (expression of critical thinking). Independent thinking is also shown when forming new solutions to the given issue (manifestation of creative thinking). Thinking independently does not necessarily mean a change of an opinion, but rather a rational justification of it. Independent thinking may also be seen when confronting of our own opinions in discussion with other people. There we respect other people´s opinions and do our best to solve the issue together (manifestation of caring thinking).

3. Conclusions

This article draws attention to the fact that philosophy should not represent "learning about thinking" only but rather "learning for development of thinking". Ann Margaret Sharp (In Naji, 2017, pp. 36-39) points out that from adults´ point of view it may seem that students could observe problems as far as philosophical thinking is concerned, however, they are capable to think actively, judge, lead discussions with their peers as well as master Mathematics, mother tongue and other subjects. Independent thinking is described herein with regard to critical, creative and caring thinking. Educator may achieve higher level of independent thinking among people being educated mainly by way of acting as a role model, his level of thinking is therefore very important. The facilitator encourages members seeking the community toward taking the initiative themselves and expressing their views with respect to others. In an ideal case it will not allow the educating people to be cognitively lazy, but to search for truth and not ignore the world and others. According to M. Lipman, A. M. Sharp and F. Oscanyan (1980, p. 185) children may gain confidence in their own thinking capability through individual participation in thoughtful, reflective discussions. As a result of this they are more careful to what they themselves as well as other people say. Lipman, Sharp, and Oscanyan (1980, p. 124) state that philosophy is a gate to alternative possibilities of an individual leading toward better, richer and meaningful life from the quality point of view. This may be an impulse for a teacher or educator to decide for such philosophy being incorporated in the practice. The program may also be inspiring when looking at the role of a facilitator or a child / student as an active subject in acquiring any information.

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Session: History, Sociology

Index of Author(s)

THE INTERNATIONAL SOCIETY AND THE EUROPEAN POLITICAL COOPERATION

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Abstract: *The author analyses the role of a primary institution of the European society in the development of the European Political Cooperation and in the following foreign policy action concertation. The case study looks into the institution of diplomacy as being constitutive and functional for the European order and its expansion. By checking the official documents, it underlines the development of European Political Cooperation. Additionally, the legacy of this foreign policy framework for the European Union is exampled through the Common Foreign and Security Policy, as well as the revised enlargement methodology. Despite the marginal role of the International Society Theory in the study of the European Union, the author concludes that the role of overcoming the intergovernmentalism-federalism divide brings added value, as well as for understanding the processes of cooperation within the current European order.*

Keywords: *International Society, European Union, European Political Cooperation, diplomacy, European integration*

1. Bringing back the International Society Theory

The European Union remains a challenge for the International Society Theory of International Relations, despite the roots of this approach in the European international relations praxis.

Starting from the integration - disintegration evolution of the international society, the aim of this analysis is to explore the role of the English School institutions in the development of European Political Cooperation (EPC). This is done threefold. Firstly, we identify the main institution with theoretical relevance, and show how the institution of diplomacy has been constitutive to the European order. Secondly, based on official documents analysis, we look into the development of the European Political Cooperation in the 1970s and how it evolved and integrated other sovereigns, with the contribution of the above-mentioned institution. Afterwards, we look into the legacy of this integration for the Common Foreign and Security Policy and enlargement process.

Within the European post-1945 states system, the development of a solid international society is visible, with a new regional order. The management of international relations in Europe became more complex and *civilised*, with important solidarist emphasis. The sovereigns established new rules of interaction, new norms and even new identities. Both the collective identity and institutional framework are constructed

Despite its old foundations in the European history, Europe and the European identity has been built by actors and structures, resulted from important interactions between those, exemplifying with Charles de Gaulle's promotion of French nationalism and a Europe based on a thin morality, while the other actors were together guided not only by common interests and values, but also by a sense of belonging, common rules and common institutions.

The six universally recognised fundamental institutions in this tradition of enquiry are sovereignty, diplomacy, international law, balance of power, great power management and war [1]. In the discussion about the European Political Cooperation, the interests fall on the role of diplomacy. Indeed, sovereignty is already recognised, while diplomacy itself reinforces other institutions such as international law or great power management in this context [2]. However, it contributed through associated practices such as the development of the international organization, conference, meetings and other communication channels to the expansion of the society centered on the European project, contributing to the integration of new members.

2. European Political Cooperation: Diplomacy Building Essential Mechanisms

How the European Political Cooperation socialised new members into new institutions and a collective European identity? The role of primary institution, in this case of the diplomacy, is fundamental. Not only it established channels of communication, but it contributed to the development and consolidation of other institutions.

European Political Cooperation emerged from a diplomacy-associated practice: the high-level conference meetings. It was an additional layer of cooperation and coordination, particularly on foreign policy issues. "*The procedures of political cooperation were from the outset characterised by a pragmatic and flexible approach to the development of foreign policy coordination between the Nine*", note the former Irish Foreign Minister and future Taoiseach Garret Fitzgerald in 1976 [3]. It covered foreign policy aspects not coordinated at Community level, bringing the intergovernmental direction in the EEC foreign policy.

This institutional framework was mandated by the 1969 Hague European Summit, a meeting that had on the

agenda the completion of the common market, the deepening of the Community, particularly in the area of economic and monetary cooperation, and political cooperation, and the agreement on the accession of four candidate countries. Guided by the common interests and the collective identity, The Hague Summit mandated the Foreign Ministers *"to study the best way of achieving progress in the matter of political unification, within the context of enlargement*" [4].

One year later, the Davignon Report was adopted. A system of meetings (ministerial and administrative) and an organizational setup is established for the Six. Rules are established for consultation on all major questions of foreign policy. The European Political Cooperation had two objectives: "*to ensure greater mutual understanding with respect to the major issues of international politics, by exchanging information and consulting regularly, and to increase their solidarity by working for a harmonization of views, concertation of attitudes and joint action when it appears feasible and desirable*" [5]. This secondary institution reinforces basic institutions as diplomacy, sovereignty, international law and others.

In relation to the socialisation of other states, it contained a proposal to associate the applicant countries with the works of European Political Cooperation. The possible club members were informed that the membership of the European Communities comes with the commitment to political unification, they were informed on the progress of the work of the Six through an established procedure at ministerial and Political Committee meetings.

Issues such as the Conference on Security and Co-operation in Europe, the situation in the Middle East, the Mediterranean and Asia, cooperation in the event of natural disasters, consultation on the situation in the Indian subcontinent, multilateral consultation were on the EPC agenda in the first years. This mechanism was further developed after a positive reception in Copenhagen in 1973 (correspondents, working parties, expert studies, involvement of embassies, presidency, interinstitutional cooperation) [6].

After the acceptance of the applicant states as members in 1972, participated fully in the meetings of European Political Cooperation, at every level. It can be noted that the participation in ECP is guided by the adherence to the goal and objectives of this mechanism, noteworthy the political unification. Nowadays, the EPC is visible through the Foreign Affairs Council; however similar structures have been developed in other areas where the sovereigns are engaged in closer coordination and concerted action.

This intergovernmental diplomatic system is part of a web of relations and interrelations contributing to a specific relational identity within Europe. In retrospective, it has been a constitutive, functional and issue-specific institution of the order within the European project. In time, new members followed a similar path, firstly being informed and socialised to these practices; afterwards, becoming members, sharing interests and values, and using the institutions already developed, in some cases bringing necessary changes as treaty amendments, new institutions, new practices.

3. Legacy on CFSP and the accession procedure revision

We find an important role of new institutions in a complex international society represented by the European Union or, rather saying, the European project. Various scholars discussed the expansion of the international society, particularly the European one, and the interactions between sovereigns and other entities [7].

The London Report (1981) and the Single European Act (1986) rasterized the functioning of the European Political Cooperation. It survived the Union treaty. With the Treaty of Maastricht (1992), EPC became the second pillar of the European Union, the Common Foreign and Security Policy (CFSP). The Treaty of Lisbon brough additional changes to the foreign policy, including a High Representative for Foreign and Security Policy and the European External Action Service. The annual reports of the CFSP shows extensive areas of action on EU's external action, as well as Common Security and Defence operations.

The role of the Common Foreign and Security Policy is extensive: "*The Union's competence in matters of common foreign and security policy shall cover all areas of foreign policy and all questions relating to the Union's security, including the progressive framing of a common defence policy that might lead to a common defence*" [8]. EPC was aimed at political unification, CFSP is focused on 'enhancing and developing mutual political solidarity'. Political unification in contemporary affairs has had multiple political implications. Nevertheless, the focus on mutual political solidarity on foreign affairs is less politically sensitive.

In this matter, the applicants follow a procedure that can be described as being a 'socialisation' to the CFSP. The negotiation of the acquis is part of this process, including alignment with the EU.

Furthermore, in relation to applicant countries, Chapter 31 of the acquis is dedicated to the foreign, security and defense policy. The applicants whose negotiations started are expected to align with the European Union not only on the international agreements, but also on political documents and the EU concerted measures (e.g. sanctions).

For example, the declaration by the High Representative of the European Union on behalf of the EU on the presidential elections in Belarus was supported by four of the five candidate countries (North Macedonia, Montenegro, Serbia and Albania), as well as by a potential applicant (Bosnia and Herzegovina), the EFTA partner countries and an associated country (Ukraine) [9].

The most recent methodology on enlargement negotiations proposed by the European Commission, designed to enhance the accession perspective for Western Balkans countries, provides an additional example of how additional members of the international society are engaged and integrated in the EU society. The process is centered on 'fundamentals', covering the fundamental reforms. It emerged from the challenges imposed by backsliding on the fundamental criteria for EU accession once a country negotiation chapters have been already opened, on one side, and encouraging the integration processes within the European Union, on the other side. The debate over 'fundamentals' is a debate over EU's collective identity and the basis of an European society.

The negotiations on fundamentals are planned to be opened first and closed last, determining the overall pace of negotiations. The 'fundamentals' contain the requirements for rule of law and democratic institutions, basis of EU identity.

The reform of the accession process introduces also 'positive and negative conditionality'. It allows for countries recording progress to follow a closer integration path, and to benefit from increased funding and investments. The closer integration enables the applicant to accelerate the integration and to 'phase-in' into individual EU policies, the EU market and the EU programmes on a level playing field [10]. The flexibility over the conditionality on 'fundamentals', based on the applicant performances, contains all the other clusters, including external action and CFSP negotiations over accession.

4. Concluding remarks

The International Society Theory remains marginal in the study of the processes of European integration. An important input is provided by this approach, especially on overcoming the traditional European or largely regional integration debates between intergovernmentalism and federalism, when sovereignty is disputed. The institutions of international society provide a framework to systematically understand the processes of cooperation within the current European order.

This discussion introduced the institution of diplomacy and how it generated a set of secondary institutions and associated practices, through the European Political Cooperation, that deepened the cooperation, reinforced the basic premises of the European project and contributed to extensive cooperation within the European society, particularly on issue-specific matters and socialisation of applicants/new members.

It also generated new questions, since there are inconsistencies that have not been studied to an in-depth level. This area of study calls for additional exploration, since the European order has never been based on an absolute understanding of sovereignty, even in the post-1945 and post-1989 contexts, and the EU international society remains under-explored.

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SOCIAL CARE FOR SENIORS IN RESIDENTIAL FACILITIES

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Abstract: *Aging is a natural process in a person's life. Old age comes slowly and each one of us will reach it. The family should therefore be the most important element in helping the senior to cope with the changes that this aging process brings, as daily contact with loved ones has an irreplaceable role in the emotional, psychological or social plane of the senior. The health of the senior is weakening, social contacts are narrowing and dependence on help is growing. Unfortunately, not every family is able to, respectively. and also willing, provide adequate care for the senior (reliant on the help of another person), in natural conditions, so sometimes there is a situation where the senior has to leave the home environment voluntarily or involuntarily, so the family should carefully consider in which social facility to place their senior. At the same time, family members should not forget that their care for the senior does not end with placing the senior in a social facility, but on the contrary, in a way, it only begins.*

Keywords: *senior, social work, social care, residential facilities.*

1. Residential care

Several authors have defined the concept of residential care. One of the authors who deals with this issue is prof. Labáth [6], who speaks of residential care as continuous, resp. 24-hour assistance or protection with a diverse range of "services" under one roof. Jentsche Stöckl [In 2] writes about residential care as an activity that fulfills an irreplaceable part of social services. According to this author, there have always been, are, and will always be people in society who will depend on this type of care and therefore, for this reason, the task of the Ministry of Labour and Social Affairs is to support the quality and availability of this care.

The founder of a residential institution for seniors can be the state (state budget and contributory organizations), self-governing region, local government (municipalities), non-governmental, resp. non-profit organization, church or a natural or legal person [6].

Residential care is recommended, voluntary, alternative or even regulated, plus the care for the elderly can be short-term, long-term or permanent [4]. Placing a client in institutional care represents a change in an individual's lifestyle, therefore, according to Matoušek [7], the focus of the whole process must always be in the interest of the client and not in the interest of the institution. Since without a client, residential care would be meaningless, according to Kuffová [5], we should respect and preserve the human dignity of the client, satisfy his needs for love, safety and security, self-realization, independence or personal growth. It is also important to develop and implement methods of working with the client that would improve the client's life so as to maintain the longest vitality and self-sufficiency, so it is necessary to have quality knowledge, practical experience and the required professional education.

In Slovakia, the system of social services is regulated by Act no. 448/2008 Coll. on social services [12]. From the point of view of providing long-term care, this is a key legislative norm. According to this Act, social services are defined as professional activities, care and other activities or a set of them. Social services are also aimed at preventing, solving or mitigating the unfavorable social situation of the natural person, its family or community.

2. Benefits and risks of residential care

Each type of client care carries with it not only benefits, but also certain risks, and residential care will not be an exception in this regard.

According to Határ [3], the most important element and perhaps the greatest advantage of institutional care can be described as the professionalism of social service providers as well as the quality of the services provided, which are mediated by clients. Another fact that can be described as an advantage of this type of care is the cooperation of a team of experts from several scientific fields in order to increase the quality of life of the client himself. According to Labáth [6], other professions participate in residential care - special, social and medical pedagogues, doctors, secondary medical staff, nurses, pedagogues and andragologists, therapists of various specializations (art therapists, music therapists, dramatotherapists, etc.). In a well-functioning institution, the individual professions complement each other and do not compete with each other. Together, everyone tries to contribute to the treatment, correction and resocialization of the client in their "way". If they want to create a successful RC, they must work together.

In the system of residential care, there are not only benefits, but also many negatives, which represent the emergence of various problems.

Bartošovič [1] advises on the general problems of residential care, a low number of nurses who perform only time-saving activities, missing standards, insufficient number of beds, long waiting times, low flexibility in care, lack of privacy, facilities are located in buildings with architectural obstacles, which impair the movement of paraplegic people. Institutionalization is a serious problem. Seniors are increasingly subject to anonymity, uniformity and the inertia of institutional life. The senior loses his identity, becomes passive and becomes part of the institution.

3. Deinstitutionalisation of residential facilities

In connection with the issue of residential care (intended not only for seniors), we can currently reflect on the term deinstitutionalisation.

Deinstitutionalisation of social services is one of the basic means of transition from institutional to community care, which aims to completely close and abolish institutional care services and, conversely, create, develop and support an effective network of new or existing alternative community services for local residents. A significant change in the process of deinstitutionalisation is the regulation which ended the possibility of establishing and registering large-capacity social service homes with year-round residence by January 1st 2014 [2].

In the context of the raised issues, it is necessary to note that the Government of the Slovak Republic, by its resolution no. 761/2011 of 30 November 2011 approved the Strategy for Deinstitutionalisation of the System of Social Services and Substitute Care in the Slovak Republic. This strategy is based on the global trend of systematically removing the persistent model of institutional segregated care provided to people who have long relied on the help of another person [9]. Such a change of model - the transition from institutional to community care in the social services system is one of the goals of current EU policy. One of the basic tasks of the Strategy for the Deinstitutionalisation of the System of Social Services and Substitute Care in the Slovak Republic was the elaboration of the *National Action Plan for the Transition from Institutional to Community Care in the System of Social Services for 2012-2015* [8]. Based on the results of the pilot phase, there was a need to continue the process and set targets and measures for the continuation. Therefore, in 2014, the Ministry of Labor and Social Affairs of the Slovak Republic elaborated and approved the *National Priorities for the Development of Social Services for the years 2015-2020,* which are a reflection of the real situation of providing social services in the Slovak Republic [9]. *„The transition from institutional to community care is a process of long-term and fundamental change of the system, whose vision and goal is to create and ensure conditions for independent and free life of all citizens, dependent on society, in the natural social environment of the community, with accessible and coordinated network of public services respecting the principles of human rights and equal opportunities in the context of the individual needs of beneficiaries "* [11].

4. Social work in the residential facility SENIRES, n.o. - Likavka in the district of Ružomberok (RK) [10]

Senires is a non-profit organization, which was established on 23 April 2012 on the basis of the Memorandum of Association for the purpose of providing social services through the Home of Social Services and the Facility for the Elderly.

This residential facility is a non-public provider, which is financed by the Ministry of Labor and Social Affairs of the Slovak Republic, from the payments of clients to whom services are provided, from the resources of self-governing regions or from various sponsorship gifts. The funds are then used to improve and enhance social services. Clients who are located in this facility pay fees for individual services according to the provisions of Act no. 448/2008 Coll. on social services, while this price list is also available for viewing on the Senires website (https://senires.com/cennik/).

As already mentioned, this non-profit organization provides two types of social services, namely for persons from reaching adulthood to retirement age in the Social Services Home and for persons who have reached retirement age in the Facility for the Elderly, while providing its services throughout the year. for an unknown period of time.

It is insulated building, with replaced plastic windows and an adjoining attic. This building has 6 floors and in the middle of this building is a staircase and elevator, which is meant for clients. It should be noted that the interior of this facility has been approved and complies with applicable legislation. The entrance to the facility is secured by one barrier-free entrance and the main entrance is equipped with a barrier-free ramp and barrier-free gatehouse. Next to this building there is a garden with a gazebo, where clients have the opportunity to spend their free time.

Figure 1: The building of the Senires residential facility in Ružomberok - Likavka.
Source: Senires, 2020

The facility has 53 rooms with one or two beds, with a total capacity of 106 beds. The rooms are situated in cells (a total of 29 cells), with each cell being equipped with sanitary facilities such as a toilet and bathroom. We note that the rooms are equipped as standard. The senior comes to this residential facility into prepared rooms with basic

equipment. The room has a bed with build-in drawer, TV, own wardrobe, bedside table, where seniors can put away or lock their personal belongings. It should be noted that seniors can arrange the rest of the room by themselves, or with their family members, according to their own ideas, so that the room reminds them as much as possible of the environment from which they come from, which we evaluate very positively. Clients have the opportunity to bring their own furniture, e.g. armchair, table, picture, various photos, etc.

Each social organization has a predetermined mission, goal, structure and purposeful relationships. The main mission of this residential facility (Facilities for the elderly) is to provide quality social services to recipients of social services on the basis of professional and ethical approach in accordance with the protection of human rights and fundamental human freedoms so as to support and develop such measures, procedures and programs social services, which, based on the support of healthy aging, would help to improve the health of the clients of this facility and at the same time support their active life and create the preconditions to maintain not only physical but also mental abilities according to their abilities, possibilities or wishes.

As part of its activities, this non-profit organization in RK is based on the Charter of Fundamental Rights and Freedoms and other ratified (approved) documents on the observance of human rights and freedoms in the Slovak Republic. It should therefore be noted that this facility informs the recipient and their family members about how to respect basic human rights and freedoms in the provision of social services, as well as the opportunities that will be provided in the facility and also addresses conflicts of interest, within which it has established rules complaints and thus their handling. We perceive as a positive that the clients are free to express their views, observations, complaints but also praise through several communication channels, either anonymously by writing in the "Book of Wishes and Complaints" or in direct communication with management or other employees of the residential facility Senires. The client has the right to participate in proposals for improvement of living conditions of seniors, which is also related to the proposals in the field of improvement of social service provision. Seniors in this facility therefore have freedom of speech but also freedom of choice in the provision of social services. The senior also has the right to leave the facility freely, while his obligation is to register in the book of turn-ins and turn-outs, resp. a "pass" form will be displayed if the client wants to leave for a longer period. However, free abandonment of the facility does not apply to seniors who suffer from orientation disorders and it may happen that the senior will not be able to find his way back to this facility. This rule is therefore a kind of prevention of danger, possible damage to health, resp. life of a senior, therefore these persons may leave this residential facility only accompanied by employees or family members. Seniors can move freely in the Senires building in RK and have access to almost all rooms, with the exception of rooms marked with a ban on entry for the unemployed. Seniors therefore do not have free entry, e.g. to the laundry room or kitchen.

As part of the study of professional literature, we also find that each organization has the form of a formal or informal social organization. Based on the above information, we conclude that in our case (in the case of the Senires facility) it is a formal social organization, as this type of organization is an organization that represents a set of predetermined standards and hierarchical relationships that are part of a whole, oriented to meet set goal. In accordance with Act no. 448/2008 Coll. on social services and on the amendment of Act no. 455/1991 Coll. on trade business Senires n.o. provides:

- *professional activities* - help with dependence on the help of another natural person, social counseling, social rehabilitation, provides nursing care;
- *service activities* – accommodation, catering, cleaning, laundry, ironing, maintenance of linen and clothing;
- *other activities* - personal equipment, to create conditions for the safekeeping of valuables, to provide hobby activities;
- *creates conditions for the implementation of other activities that increase the quality of social services*.

In the Senires facility in RK, social workers apply work with clients, which is based on an individual approach, ie the social service provider provides services based on the individual needs, goals and abilities of the recipient of the social service. This residential facility performs individual as well as group work with the senior, archives written individual records on the course of providing social services and evaluates the progress and operation of the provided social service with the participation of the client of this facility. With the help of social diagnostics or rediagnostics, the social workers of this facility find out the individual abilities, interests, possibilities of the needs of each senior and through this information they subsequently determine the individual development of the client's personality. As already mentioned, social workers in Senires in RK also use the method of social work with the group, because in their opinion, such work creates cohesion, supports the ability of mutual communication, cooperation or tolerance. It also develops the client's creative thinking and meaningfully fills the senior's free time. At work, social workers appeal to cultural, freetime but also work activities and use various methods such as art therapy - painting, handicrafts, production of decorative items, occupational therapy in the form of walks, bibliography, where they read books with clients and try to make seniors more active, for example with board games. They also use music therapy, where they sing with seniors, or sociotherapy associated with walks and trips.

The goal of social workers working with seniors is to support the mental and physical condition of each client as much as possible and to involve them in various activities and maintain their contact with the social environment. It should be noted that social workers always take into account the possibilities and abilities of the senior and also the health condition of the client, so the seniors have the right to refuse to participate in an activity if their health does not allow it.

Senires n.o. has created a system for intensive, planned and partnership cooperation of the beneficiary and its social network with the team of workers. The beneficiary is supported in this cooperation by a stable contact person - the so-called tutor. The very key to quality social services are employees who provide social services. Employees who are in direct contact with the beneficiaries need to be provided with further education, training and, in some cases, professional assistance from independent experts. Good working conditions are also needed for education and training. The primary condition for employees should be the needs and personal preconditions of the beneficiaries, which should be reflected in their increased independence. When hiring new employees, it is important to take into account the education required to perform the selected position.

Employees actively seek contacts with relatives, are interested in developing and strengthening clients' contacts, and help them maintain the contacts. The facility strives to involve the family and family members in helping the client as much as possible, e.g. accompany them to an examination, a visit to the home environment, or regular visits to the facility. The facility creates conditions for the implementation of visits - they can stay in rooms with the consent of roommates, in the common room, in the corridors, in the garden, in the area - there is no time or space reserved. The facility has dedicated visiting hours, from 08:00 until 20:00. Every contact of the client with relatives, friends, acquaintances, volunteers or other persons for the purpose of meeting with the client with his/her consent is welcome and secured.

The organization shall also regularly prepare an annual activity and management report each year, which provides the beneficiary and the beneficiary's relatives and the professional and lay public with relevant, comprehensible and reliable information on the provider's activities and management for the previous calendar year. publicly available, audited by an independent auditor. It must be prepared and published by 30 June of the given year for the previous year.

5. Conclusion

Unfortunately, working in residential conditions is an irreplaceable form of social care. It has its advantages and risks. Retirement homes are facilities in which some of the clients spend most the most time or even their entire lives. In this respect, these organizations are irreplaceable. However, they can be more or less effective. Every change of environment, even admission to residential care, causes a certain trauma in the life of an elderly person. Older people experience coming to a residential care institution very sensitively and with apprehension. A person living in a retirement home, ie in the environment of a residential institution, had to leave their home and should therefore feel famialrized there, their autonomy and personality should always be respected and they should be able to carry out activities according to their interests. It is important that they are given all the necessary care appropriate to their age and that the regime system should be open or semi-open.

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LONELINESS OF SENIORS AS A CONSEQUENCE OF THE FIGHT AGAINST COVID-19

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Abstract: *In recent months, the whole world has been struggling with the new disease COVID-19. Countries are gradually taking strict measures to protect the lives and health of their people. The closure of factories, shops and schools and the banning of any events have led people to isolation and the need to be independent. However, not everyone is able to function independently, so it is necessary to pay increased attention to selected risk groups during this period. The aim of our paper is to identify the impact of the COVID-19 pandemic on the most vulnerable group of the elderly. The results of research draw attention to the phenomenon of loneliness of seniors, which they experienced before the outbreak of the pandemic, which intensified this feeling even more.*

Key words: *COVID-19. Loneliness. Pandemic. Social work. Seniors.*

1. Introduction

The first reports of the spread of COVID-19 appeared in China in late 2019. Since then, we have been able to observe its inevitable spread around the world. In recent months, the disease has affected the lives of individuals, groups, communities and society as a whole and has exacerbated the vulnerability of some social groups. The Ministry of Health of the Slovak Republic [7], based on the tendencies of the spread of the disease in other countries, identifies as risk groups persons aged 60 and over and persons with serious chronic diseases such as diabetes, lung diseases, heart diseases or diseases associated with reduced immunity. In Slovakia, according to statistics kept by the Public Health Office of the Slovak Republic [1], in August 2020 men in the age category of 25–34 years and women in the age category of 20–24 years were most often infected with the virus (Graph 1).

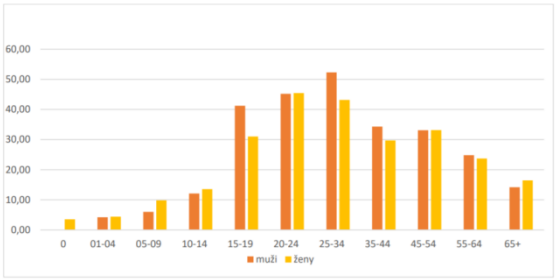

Figure 1: Number of positive persons tested by sex for the period 08/2020 [1]

Statistical data also show the fact that the most frequently hospitalized age group were citizens aged 65 and over (Graph 2).

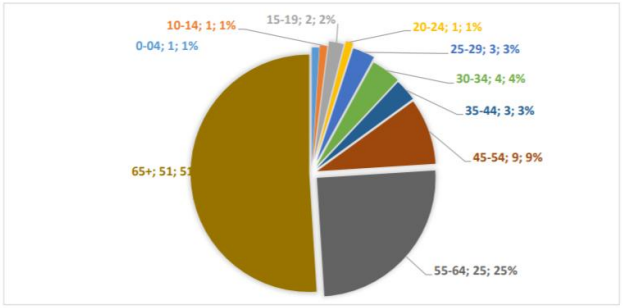

Figure 2: Number of positive persons tested by sex for the period 08/2020 2020 [6]

In addition, people in this age group, along with people in the 55-64 age group, had the most frequent deaths due to COVID-19, as shown in the following table:

Table 1 Deaths due to COVID-19 by age and sex, 08/2020 [6]

Age group	men	women	together
55 - 64	4	-	4
65+	9	24	33

2. Measures to protect life and health of the elderly and their consequences

Based on the above facts, it is clear that seniors have recently demanded increased attention and protection from society. The adopted anti-epidemiological measures to protect the health of the elderly ordered a temporary suspension of the provision of social services on an outpatient basis in social services facilities, such as day hospitals, care services, rehabilitation centers, specialized facilities, social service homes and day centers [12].

According to the Social Services Act [14], social services are primarily aimed at *"preventing the emergence of an unfavorable social situation, resolving an unfavorable social situation or alleviating the unfavorable social*

situation of a natural person, family or community", "maintaining, restoring or developing a natural person's ability to lead an independent life and to promote its integration into society "as well as to" provide the necessary conditions to satisfy the basic living needs of a natural person ", therefore, it was not possible to leave seniors without any form of assistance. Higher epidemiological measures were subsequently responded to by higher territorial units, municipalities and non-governmental organizations, based on the knowledge that the focus of social work is to increase human well-being and provide assistance in meeting basic human needs with regard to needs and empowerment of vulnerable, oppressed and living in poverty [9]. Public and non-public entities began to help in the form of internet and telephone services, through which seniors could obtain the necessary information, professional advice, request the purchase of food and medicine, order lunch or just talk. These forms of assistance were intended primarily for seniors living in their natural home environment, living there alone, cared for by their close relatives or using a care service. One of the important measures was to limit personal contact and mutual visits, which are an important part of life for seniors living and the absence of which can lead to feelings of sadness, loneliness and solitude. This fact is also evidenced by the authors' Gretskowski and Kamanová research [3], in which seniors in Poland and Slovakia defined their dreams and desires, which were focused on social relations in their natural family.

Kozielecki [6] defines loneliness as a complete lack of close people willing to live, communicate, help and care for the elderly or the sick. According to Morley and Vellas [8], loneliness in the elderly can cause decreased or complete cognitive failure, depression, cardiovascular disease, and increased mortality. Authors Žilová, Gretkowski and Novotná [15] distinguish between loneliness and solitude. They consider solitude as *„lack of interactions with other people as well as with yourself, loneliness on the other hand is only dealing with yourself, is concentrating solely on matters of your own world“*. Berg-Weger and Morley [2] consider loneliness and solitude to be a significant problem in the elderly, but this was before the pandemic itself. They point out that social workers do not determine the degree of socialization or social isolation of the client within the diagnostics, in connection with which they created the so-called ALONE scale, which can be used to determine the degree of social isolation of clients (Tab 2).

Table 2 ALONE scale [2]

A	Are you Attractive (as a friend) to others?	Yes	Sometimes	No
L	Are you Lonely?	Yes	Sometimes	No
O	Are you Outgoing/friendly?	Yes	Sometimes	No
N	Do you feel you have No friends?	Yes	Sometimes	No
E	Are you Emotionally upset (sad)?	Yes	Sometimes	No

An interesting example is Finnish social workers in residential social services facilities, who have had to adapt to this unexpected pandemic situation and apply an innovative approach to clients and their families, to which they have not been accustomed so far. They included it in their work routine:

- sending regular information on the status of clients to their family members by electronic communication,
- ensuring clients' contact with their families via social networks or applications such as Face Time, WhatsApp, Skype or Zoom,
- arranging visits of clients with their families through the window,
- organization of activities for clients on the premises of the facility,
- enabling personal visits to the client's families in the last days of life [2].

Measures concerning the restriction of personal contact affect not only the clients of social services facilities themselves, but also their families. Wallace et. al [13] points out that the possible death of a senior, whether as a result of COVID-19 or other illnesses, can cause great sorrow for his loved ones because they could not say goodbye to him in person before death or could not attend his funeral. . Manifestations of grief can be varied, it can be constant thoughts of the person they have lost, a constant experience of grief, a lack of interest in previous social relationships or activities, or even a loss of meaning in one's own life. According to several authors, the ability to manage the grief of the loss of a loved one can [4; 10; 11] be facilitated by a network of social support, which can be formed not only by family members, friends or the wider social environment, but also by health professionals or social workers who provided care and assistance to the dying. Social support thus creates a space for the individual in which he can *"draw support from relationships through which positive emotions and reassurances are distributed about who we are and where we belong, that we are accepted and loved"* [5]. We therefore consider it necessary for social workers in this difficult situation to be even more aware of the importance of their work and their approach to clients and their families, to whom they can significantly help in overcoming a difficult period.

3. Conclusion

The past months have been a burden on society as a whole. It has not been easy for political leaders or ordinary citizens to take strict anti-epidemiological measures. The measures had not only a positive effect on reducing the number of infected people, but also a number of negative social consequences, such as an increase in the number of unemployed, an increase in domestic violence, an increase in the number of young people turning to helplines and others. We share the views of Berg-Weger and Morley [2], who claim that the pandemic has helped people better understand the feeling of loneliness, as they have been able to experience it for themselves in recent months. We believe that this experience will change the views of the younger generation of seniors who spend most of their days alone and will lead them to spend enough time with them to the best of their ability. They do not have to focus only on their family members, but they can look for a lonely senior in their immediate area and offer him their help. The pandemic, in our opinion, has created a space for the implementation of formal and informal community work, in which community members can help each other, for example, by visiting each other or providing shopping or food. As well as social workers and other workers in the helping professions currently have space for creative and innovative methods of working with their clients and their families. They can be motivated, for example, by Finnish social workers, who did not hesitate to include more intensive use of available technologies in the intervention provided to their clients.

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Index of Author(s)

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