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THE VALIDITY OF THE SPECIFIC BIOMARKER OF RHEUMATOID ARTHRITIS FROM THE ASPECT OF SMALL SAMPLE SIZES

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Abstract:

In our study, we processed the selected laboratory parameters of patients with rheumatoid arthritis and other rheumatic diseases. The objective of the study was to compare the differences of anti-CCP examinations between the observed groups of patients. The most specific and in practice the most used laboratory parameters to support the diagnosis of rheumatoid arthritis are anti-CCP. The importance of this parameter was confirmed by the results of our work (p = 0.01). An unexpected information bonus of our study was the use of statistical tests for small groups (n = 10 and n = 11 respectively), the low number of which was the result of a pandemic situation in connection with the Covid-19 disease and restrictive anti-epidemiological measures. It is the example of the often-required statistical analysis which must always be supplemented by a suitable interpretation of the results, even from the rational level of the benefit of the parameter for the physician's decision algorithm.

1 Background

To obtain reliable results of examinations of biomedical laboratory parameters, we need sufficiently numerous sample groups. Only in that case, we can verify the real informative value of the tested parameter from the aspect of a specific disease. Therefore, many biomedical parameters are only statistically related to the diseases. This means that examination of selected samples with a large number will show a higher relative risk of disease in an individual with specific characteristics. However, it is a selected risk that is given by statistical probability and is not deterministic. The typical examples are polymorphisms of several genes. Their carriers have a statistically increased probability of the disease, but they have no confidence that the disease will really manifest in them. The opposite example are parameters, the presence of which also means the presence of the disease in almost all cases. This group also includes antibodies against cyclic citrulline peptide (anti-CCP), which are important laboratory parameters for monitoring rheumatoid arthritis.

1.1 Rheumatoid arthritis

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Rheumatoid arthritis (RA) is a chronic inflammatory disease of an autoimmune nature that can occur in all age groups of patients. Most frequently begins between the ages of 25 – 50. The maximum incidence was observed in women before menopause. RA mainly affects the joints, their synovial lining, so it is called arthritis (from the Latin arthritis = inflammation of the joints), but the disease process often also affects non-joint components of the musculoskeletal system, for example muscles or tendons, and internal organs. It usually begins as symmetric polyarthritis, often with non-specific systemic symptoms. Its course is very variable. Acute exacerbations are often alternated with periods of remission [1, 2].

1.2 Anti - CCP

Already in the early stages of RA, antibodies to cyclic citrulline peptides appear in most patients during the inflammatory process. Compared to another laboratory parameters (such as rheumatoid factor - RF), they are much more specific for RA, up to 96 %, with the same sensitivity (approx. 80 %) [1].

These antibodies are formed by converting the amino acid arginine to citrulline. Citrulline is a non-standard amino acid that is formed by post-translational modification of arginine in proteins using the enzyme peptidyl arginine deaminase (PAD). PAD is found intracellularly inactive. It needs a much higher concentration of calcium ions than is commonly found in a living cell to activate. This increases only when the integrity of the cell is violated, when calcium ions can penetrate inside the cell and activate PAD. Protein citrullinations often occur in cell differentiation, inflammatory responses, cell apoptosis, gene regulation, and the aging process. Citrullination of the protein loses its basic charge, which can affect the entire structure of the protein and create a new epithelium that can be recognized by the immune system as an antigen. In RA, specific antibodies are formed against it, mainly in the IgG isotype [3].

2 Aim

The goal of our study was to verify the validity of parameter anti-CCP in the conditions of examination of patients from the local Caucasus population, which was significantly limited by another external factor (pandemic Covid-19). It is in accordance with good laboratory practice that the laboratory verifies the validity and informative value of the determined biomedical parameter in the catchment population.

3 Material and methods

3.1 Sample

A total of 21 individuals were evaluated, which were divided into two groups. Group A consisted of only 10 patients diagnosed with seropositive RA. From the point of view of gender representation, there were 8 women and two men in the sample. Group B consisted of patients with other diseases of the musculoskeletal system, and connective tissue (for example systemic lupus erythematosus, polymyalgia rheumatica, and others) and served as a comparative/control group. The total number of patients in this group was also only 11, of which the number of men was 3 and the number of women was the same as in the first case, i.e., 8. In individuals, we observed differences in the incidence of autoantibodies between the two groups. Specifically, these were the parameters of anti-CCP and anti-nuclear antibodies (ANA). In patients who were indicated for further typing of ANA, we tested differences in antibodies to histones and SS-A. Data were obtained in cooperation with specialist clinics in the Košice self-governing region during the period 10/2020 – 01/2021 i.e., during the second serious wave of the Covid-19 pandemic, which significantly reduced the number of individuals examined for other diseases. The processed data of all patients were deidentified and reduced in the database to numerical data of basic laboratory and physiological parameters in terms of protection of personal data of patients.

3.2 Methods

After a basic examination of ANA by the immunofluorescence method, an immune specific test was subsequently indicated, which was performed by immunoblotting (IB). The immune specification consisted of testing the serum for the presence of antibodies against DNA, histones and against so-called Extractable Nuclear Antigen (ENA), including SS-A, Jo-1 and many more. Immunoblot assays are used to detect several autoantibodies simultaneously.

3.3 Data processing

We used a Microsoft Excel platform to process the data. First, we focused on the basic properties of the monitored files and obtained data on the number, arithmetic mean, standard deviation, median, as well as the minimum and maximum value of parameters in the files. To verify the proportionality of the gender representation in the files, we applied a 2x2 contingency table using a chi-square test. A nonparametric Mann-Whitney test was used to evaluate the difference between the groups due to the low number of sets, the independence of both sets and the nature of the numerical values. The results were also compared with Student's t-test. We set $p < 0.05$ as the level of significance.

4 Results and discussion

4.1 Basic characteristics of groups

First, we verified the balance of both genders in groups A and B. The results are shown in Table 1. The data show that overall women (n = 16) predominated over men (n = 5), but their representation in both groups was equal and did not show statistically significant differences (p = 0.70).

To compare the age characteristics of both groups A and B, we used the nonparametric Mann-Whitney test as the main comparison test due to the smaller number of individuals in the sets. The differences in the medians of the age of both groups were not statistically significant (p = 0.94) and this result was also confirmed by a parametric two-tailed t-test (p = 0.99; Table 2).

By comparing the mean age between men and women, we did not find statistically significant differences (Table 3, p = 0.54, t-test). The result of the verification of the equality of variances by the F-test was on the border of statistical significance (p = 0.05), therefore we performed the Welch approximation of the t-test, which considers the situation of inequality of variances. However, even after this calculation, the results did not show significant differences (p = 0.34; t-test, Welch approximation).

Based on the above findings, we state the homogeneity of the files in terms of age and gender representation.

4.2 Comparison of differences in anti-CCP between groups

Analysis of anti-CCP showed significant differences between the two sets (Table 4). For anti-CCP, of course, the intensity class was not

Table 1 Verification of the proportionality of gender in both files

Parameter		*Gender*		*Total*	χ^2	*p*	*d.f.*
		Man	Woman				
Group	A	2	8	10	0.15	0.70	1
	B	3	8	11			
Total		5	16	21			

Legend: χ^2 – test characteristic, *p* – probability value of the test criterion of the chi-square test, *d.f.* – degrees of freedom

Table 2 Basic statistical parameters of age in files

Parameter	*n*	$\bar{x}$	*sd*	x_m	*min.*	*max.*	*p (t-test)*	*p (M-W)*
Group A	10	51.9	16.2	56.5	20	71	0.99	0.94
Group B	11	51.8	16.3	55.0	20	75		

Legend: *n* – number of individuals, $\bar{x}$ – arithmetic mean, *sd* – standard deviation, x_m – median, *min.* – minimum value, *max.* – maximum value, *p* – probability value of the test criterion of the tests used (Mann-Whitney test and t-test)

Table 3 Comparison of average age between genders

Gender	*n*	$\bar{x}$	*sd*	x_m	*min.*	*max.*	*p(t-test)*
Men	5	55.8	6.1	55.0	51	66	0.54
Women	16	50.6	17.8	56.5	20	75	

Legend: *n* – number of individuals, $\bar{x}$ – arithmetic mean, *sd* – standard deviation, x_m – median, *min.* – minimum value, *max.* – maximum value, *p* – value of the t-test test criterion

Table 4 Statistical comparison of anti-CCP (kIU/l) between patients with seropositive RA and patients with other rheumatic diseases.

Parameter	*n*	$\bar{x}$	*sd*	x_m	*min.*	*max.*	*p (t-test)*	*p (M-W)*
Group A	7	276.6	246.8	271.5	6.3	600	0.02	0.01
Group B	3	0.6	0.5	0.5	0.2	1.2		

Legend: *n* – number of individuals, $\bar{x}$ – arithmetic mean, *sd* – standard deviation, x_m – median, *min.* – minimum value, *max.* – maximum value, *p* – value of the test criterion of the tests used (Mann-Whitney test and t-test)

evaluated, but its concentration is given in kIU/l directly. We tested this parameter with the aid of the t-test, and due to character of the parameter we chose a two-sample t-test with unequal variance. The t-test revealed a significant statistical significance of the differences between the two sets at the level of p = 0.02. Due to the very small number in group B, we used a more suitable Mann-Whiteny test, the value of which did not differ significantly from the student's t-test (p = 0.01). Therefore, we can conclude that there are statistically significant differences in studied groups.

The most useful markers to support the diagnosis of rheumatoid arthritis are antibodies against cyclic citrulline peptide [4]. According to the data available, we observed differences in the parameter between patients with RA and patients with other connective tissue diseases. In group A, anti-CCP antibodies were determined in 7 patients, but in group B we tested anti-CCP in only 3 patients (Table 4). However, this is only a consequence of the effectiveness of the indication of examinations in our health system, because if RA is not suspected, the doctor does not unnecessarily indicate the examination of the parameter. However, despite this disproportion, statistically significant differences with a high level of significance were verified by both applied tests (t-test, p = 0.02, Mann-Whitney test, p = 0.01). Interpretation of the findings given in table no. 4 must again consider the low numbers of individuals in the groups, especially in group B of patients with other rheumatic diseases. Therefore, we must evaluate the results on two levels: statistical and rational. In the case of low numbers of individuals, the authors (for example de Winter [5]) admit acceptance of the results, provided that a high rate of false positive results is considered in the case of different number of compared files and different variability of the observed parameter in them [5]. Even the possible use of modifications of tests that work with rank values (as we use the Mann-Whitney test) in the case of low numbers does not provide an interpretatively "safe" solution [6]. Moreover, these literature sources are not related to laboratory examination methods, and in particular the work of Zimmerman and Zumbo [6] is more than a quarter of a century old. Therefore, from the point of view of statistical data processing, we can only carefully state that our results suggest agreement with the assumption of a high association of the parameter

with rheumatoid arthritis and thus support the usefulness of anti-CCP as part of the classification criterion for RA diagnosis. At this point, we would move in the evaluation of this parameter from the statistical level to the rational level. If the range of group A was 593.7 kIU/l (minimum 6.3 kIU/l; maximum 600 kIU/l) and the range of group B was 1.0 kIU/l (minimum 0.2 kIU/l; maximum 1.2 kIU/l) thus, assuming the representativeness of the sample and the homogeneity of the target population, we can assume that in the case of patients with rheumatoid arthritis, the numerical values of anti-CCP will be in a much wider range with significantly higher concentrations. This fact makes anti-CCP a very beneficial laboratory parameter.

5 Conclusion

Our results show that sufficient file count cannot be understood as a fixed mantra, but any data processing results of small sample groups must be interpreted in the broader context of the biomedical significance of a particular laboratory parameter. Such an approach can be useful in cases of extremely low sample numbers due to the unexpected influence of an external factor.

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USE OF CANISTHERAPY IN THE REHABILITATION OF A CHILD WITH CEREBRAL PALSY

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Abstract:

Background: Cerebral palsy is a complex of various symptoms and diseases that cause disorders in the brain. It is a lifetime disease that affects not only patients but also their family members and the wider environment.

Objective: The main objective of our study is to focus on canistherapy, to determine the effect of intervention on the patient from the positional side of canistherapy, to master facilitation and inhibition techniques and to relieve the signs of the development of brain paresis.

Method, sample, and results: Our contribution consists of a theoretical background and a case study from the practice. There we introduce objectives, procedure, and techniques in our therapy with the selected methodology. Due to the age of the patient (5 years), we gave priority to rehabilitation exercises in the form of a game to motivate him and invite him to co-operate. The results are summarised in the form of a discussion, recommendations for practice and a general summary of the process.

Conclusion: We found that the selected method positively affected the patient's health condition, both physically and mentally. An individual approach and adaptation of the exercise to the patient was also proved important.

1 Introduction

Cerebral palsy is not a disease as such, but it is a collection of various symptoms and diseases that cause disorders in the brain. This disease is for life and affects not only patients, but also their family members and the wider environment. Cerebral Palsy (CP) is the most common neurological disorder in children, a permanent disorder that affects movement and posture, limiting activity and is often accompanied by disturbances of perception, cognition, communication, and behaviour. Although it is a lifelong disability, there are many interventions that can help reduce its impact on the body and the child's quality of life.

Canistherapy has been considered since ancient times a supportive form of rehabilitation for its impact on the human psyche. The direct, therapeutic effect of a dog on the patient has not been proved. There have been major changes in this field recent-

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ly, as evidenced by various studies. Interventions with animal assistance are now natural and they become the part of comprehensive therapeutic care for various clients in various types of health, social and educational facilities. The curative effect of canistherapy comprises four basic mechanisms: psychological, emotional, playing, and physical stimulation, according to Ballarini [1]. All the mechanisms together demonstrate the psychosomatic effects of the human-animal bond and the interaction during AAT and animal-assisted activities [2, 3].

The relationship between a dog and a child result in an increase in neurochemicals, which initiates a decrease in blood pressure and induces relaxation. This relationship may be beneficial for ameliorating agitated behaviour and psychological symptoms of chronic diseases that involve physical and mental disabilities. Kongable *et al.* observed that a therapy dog increased patients' social behaviours, including smiling, laughing, looking, touching, and verbalizing [4].

One of the methods used is positioning – a physiotherapeutic method based on direct physical contact of a man and a dog. One or more dogs are lying in close contact with man, during which heat is transferred, breathing is stimulated and physical relief as well as psychical relief set in. Other described methods are group interaction with clients with certain handicap type. Canistherapy has a positive impact on the psychic, social, and physical side of a patient. Important effects include stimulation or motivation, delightful emotional experience such as joy, relaxation, distraction from problems or pain, communication facilitation, mental and social support, blood pressure drop, mood improvement and others [5].

Patient contact and communication with dogs (giving them treats and walking them) help to stimulate and activate patients with various diseases and impairments. Direct contact with a dog provides relaxation and a feeling of peace. It also evokes the feeling of sharing and offers the opportunity to change from difficult to light conversation topics [6].

The process of interventions in the programme with the assistance of dogs considers the assessment of the particularities of a patient and the formulated objectives of physiotherapy. It is needed to decide what methods and forms of intervention with dogs will be used. The individual steps of planning and implementation of interventions are focused on the intervention plan and individual interventions. [7]. After the intervention, it is necessary to create space for rest and regeneration of the dog [8]. It is necessary to make a recording of each intervention which is the part of comprehensive documentation within the profession [9]. Ending the programme with the assistance of dogs reflects the fulfilment of the formulated objectives. The part of the ending is also a farewell to the patient and the dog. In the completion process, the achieved results and benefits for patients, staff, human-animal team, and organisation are summarized, analysed, and interpreted. The effectiveness of this cooperation with recommendations for the future is also assessed there [10].

When examining the effects of a dog on a patient, we shall focus on physical and chemical phenomena [11]. Chemical factors include the impact of oxytocin on a patient. How does oxytocin work in clinical practice? Since 2008, Japanese scientists have been studying the effects on humans and the connection with this hormone. It is called the hormone of trust, it plays an important role in motherhood, it creates the so-called attachment links between the child and the mother. It occurs in all mammals and is a regulator of social behaviour, regulates anxiety, reduces the level of stress (which is measured mainly through the level of cortisol). It affects the production of the other hormone vasopressin and they both work to create closeness with a new person or animal, reduce fear and anxiety, phobias, and relationship development. It has been found that the amount of oxytocin in humans increases by up to 300 % after contact with a dog for 30 minutes. Of course, the value of the dog also increased after contact with a person who showed interest in the dog by about 130 % [12]. It was found out that the dog and the patient can establish a personal, intimate, empathic relationship in a short time. Thanks to this relationship both participants in canistherapy, a patient and a dog, are happy. If especially a child patient, is exposed to stress, increased social tension, anxiety from the unknown, or, conversely, the fear of repeated manipulation, it is very important in therapy [13].

- Risks in caninstherapy are ignorance and unprofessional approach which brings damage.

- Wrong estimation of situation can bring attack and defence.
- High pressure causes stress and burnout.
- Underestimation of capacities can cause the damage [14].

The main objective of our study is to focus on the issue of canistherapy. To determine the intervention on the patient from the positional effect of canistherapy, to master facilitation and inhibition techniques and to relieve the signs of the development of brain paresis.

2 Case study

The practical part consists of a case study, objective, procedure, and techniques of therapy with the selected methodology.

Name: K.M.
Age: 5 – year old
Weight: 13 kg
Diagnosis: DMO quadruspastic mixed, hypertonic-dystonic form, predominance of l.sin.
Spontaneous motorism disharmonically III. trimenone

Check: Neurological examination November 2019
The boy attends kindergarten with his mother for the second year, for three hours a day, knows the basic colours, likes to catch markers and to open, they have a special eye communicator to which he responds well, shakes his head with disapproval, tries to nod with his right hand, agrees more. They train NDT Bobath with a certified physiotherapist once a week + they train according to instructions from Adeli centre in the home environment and canistherapy in Žilina.

Orthopaedic examination: X-ray position of coxofemors of the joints in standard 10/2017.
Rehabilitation aids: Torso orthosis (non-prosthetically individually made torso and head orthosis - Podotech), Hylton compression orthosis for torso, chair, have borrowed verticalization stand + DAFO orthoses + shoes + stroller MEWA + Kid-Walk walker.

Neurological examination: EEG specific without current discharge activity, EEG does not detect correlate, recommended rehabilitation treatment, vitamin therapy, Tebokan. In terms of epileptic seizures, the patient is compensated.

Objective finding: Makes eye contact, strabismus, salivary gland, watches the toy intermittently, checks the head in space, opens the hands better in bed, thumb relaxed, upper limb semi-injection position, palmar bilateral grips, upper limb mobility symmetrical. Tone higher more to the left, mobility lower limb symmetrically. In the extension posture hypertonus of the limbs highlighted acrally more to the left, mobility symmetrical, easy shortening of adductors, shortening of left lower-limb to 1.5 cm, shortened flexors of knees more to the left, in supine position pulls upper limb from below with help and after facilitation for a short time, after adjustment to the support on the elbow, it keeps the th-L kyphotization partially correct when the passive sitting is in the fist. The foot goes into equnovarosity, the axial organ without obvious asymmetry in the frontal plane, a stepped mechanism with assistance is present. The patient does not sit or walk alone.

Conclusion: Cerebral palsy mixed form quadruhypertonic sy with prevalence on the left, axial hypotension, psychomotor retardation.

2.1 Objective of therapy

- Affect the position and posture of the whole body.
- Improve stability.
- The release of spasticity upper and lower limbs.
- Increase in muscle strength of individual muscle groups.
- A separate seat with support on the upper limb.
- Strengthen the torso.
- Long-term rehabilitation plan.
- Game with a dog aimed at crawling – subsequent crawling, the possibility of your own movement in the home environment.

2.2 Examples of exercises

We usually start the exercise with neurogenesis – a stimulating massage of the patient's lower and upper limbs. The dog is face to face to produce oxytocin, it should be at a safe distance, so as a child can have intense eye contact with a dog and touch it.

Then we continue with a sitting position with spinal support, where a patient feeds the dog with a spoon. The objective is to train endurance while sitting and at the same time to train independence in eating. Connecting the eye, picking the granules from the bowl with a spoon and offering food to the dog, that eats the food carefully from the spoon. The exercise has a very positive effect on the child's independence in activities of daily life, it also works with the management of salivation in the child and constant caution about pulling the lower jawbone and inserting the tongue into the mouth, training of fine motor skills and sensorics.

Another exercise was aimed at imposed load on the patient body's boundaries. The dog is placed in a correct lie down positioned above the sacral spine and about 1/3 of the dynamic weight which acts vibrations on patient's body (deep stimulus). The child feels the vibration of the dog's body, the warmth of the dog (approximately 39 degrees), it also indirectly acts on the abdominal press and peristalsis. The length of the exercise is about 5 minutes and the dog weight approximately 31kg.

Further we continued by stimulating the respiratory muscles and deep postural muscles using the DNS method. The resistance of the first dog lying on the abdomen served as the stimulation of breathing and the positioning of the second dog under the patient's knees served as a vibrating pad to elevate the lower limb. By pulling the dog on the abdomen, we improve peristalsis and engagement of the abdominal press.

Basic positioning of the dog during exercise: Lying position (next to the patient laterally, below the knees), sitting position (opposite the patient, on the cylinder, fit ball), lying down (on the patient's back, on the patient's legs and abdomen).

Basic intervention of the dog for the needs of a patient: Basal stimulation (positioning rollers and pillows), somatic stimulation (body perception), occupational therapy (training of service activities, eating, swallowing, salivation), handling (influencing muscle tension, supporting the right patterns).

2.3 Intervention evaluation and documentation processing

Date: February 28, 2020
Location: PHYSIO CANIS, Žilina, Dolné Rudiny
Duration: 3 hours.
Exercises: 6.
Patient identification: R.K., 5 years, diagnosis: DMO quadruspastic form.

Dog identification: Swiss White Shepherds (2 females, 1 male), black French Bulldog (female)

Brief description of the intervention:

- The therapy took place in a pre-prepared, clean gym equipped with all the necessary aids for the patient and the dogs (mats, exercise balls, rollers, balance platforms, pulley cage, bowls for the dogs).
- At the start of therapy, the patient was restless with neurogenesis, was crying, did not cooperate.
- The presence of dogs per patient was reassuring, motivating and educational, thus improving cooperation with the patient (according to the patient's age, therapy adapted to his interests).
- Rapid adaptation to the dog-patient-therapist-other relationship.
- Total of three dogs alternated during the dynamic exercise, dog breed: White Swiss Shepherd.
- Alternation of Swiss dogs during the therapy according to necessary stimulus during exercise, play, positioning, education, gross and fine motor skills, targeted active involvement of muscle groups.
- During positioning we used the presence of another breed: French Bulldog.
- The rotation of the dogs during one exercise was approximately 15 minutes.
- The behaviour of the animals was adequate to the patient's condition, tolerated and met all the requirements necessary for therapy.
- The dogs showed no signs of stress.

Ending of intervention – Fulfilment of objectives:

- Improving the functioning of the nervous system.
- Effect on the improvement of sensorimotor skills (by perceiving the hair's perception of a higher temperature of the dog compared to humans).

- Stimulation and induction of proper breathing.
- Increase the patient's motivation for the exercise itself.
- The licking method affected the spastic holding of the limbs.

Goodbye to the patient.

3 Results and discussion

Children are not born with a diagnosis of Cerebral palsy (CP), but the clinical manifestations are gradually developing, and early diagnostics and treatment is important. Early treatment significantly changes the extent of movement disorders. In older age, the treatment with facilitation and inhibition techniques is only secondary one. The patient's condition does not improve overall, but regular exercise can prevent the condition from getting worse. The patient R.K. diagnosed with quadruspastic form of Cerebral Palsy was co-operating appropriately for his age (5 years). The patient attends a school facility, mentally understands everything. His behaviour was adequately adapted to rehabilitation process, and he was active in all parts of the rehabilitation programme. Due to short time donation, we completed one therapy, and the patient will continue attend the centre in addition to other rehabilitation facilities.

The main objective was to relax the flexion position of upper limb and spastic muscle groups. Adjustment of primitive reflexes and improvement of body coordination led to an overall improvement. The influence of dogs on the patient was positively transferred to his health condition. Three dogs were present with the patient based on the rehabilitation objective and the fatigue of dogs. The dogs were specifically trained for positioning, education, and motivation, that is why we could adapt the abilities of the dogs to the rehabilitation process. During the therapy, the breed of a white Swiss Shepherd dog was used. Toward the end of therapy, we another dog of a different breed was present, a French Bulldog that was used to position the DNS (dynamic neuromuscular stabilization). The presence of another dog aroused even greater interest and motivation in the patient. The therapy took place without significant problems and in the form of a game. We used all available tools, pulley system, light therapy, and music therapy. The therapy was led by a chief physiotherapist and a lead canistherapist. The exercise took place without the presence of a parent. The type and structure of the exercises were chosen according to the patient's needs, in a motivating, fun and playful way.

The reason for choosing the methodology was the general interest in the method and finding out how the assistance of a dog affected the patient with a serious diagnosis. As the method is complementary, the overall impact on improving the patient's health can be assessed overall after completing additional procedures and rehabilitation techniques. We do not anticipate further deterioration of the condition, with regular exercise. With a diagnosed disease, rehabilitation is not enough. It is necessary to work with other professionals, such as neurologists, surgeons, psychiatrists, special educators, occupational therapists, special educators.

3.1 Recommendations

Based on the analysis and findings, we recommend the following suggestions for rehabilitation with a focus on the following:

- Pay attention to children diagnosed with DMO, take care of their needs.
- Provide relatives with sufficient knowledge of the child's diagnosis and current state of health.
- Inform parents about canistherapy as a support therapy.
- Make available professional journals and books on canistherapy and its positive impact on a patient with severe disabilities.
- Educate and inform more about CANIS centres and the care they provide.

4 Conclusions

We found that the selected method positively affects the patient's health condition, both physically and mentally. Exercises improved the condition for a short time. Regular exercise is therefore very important to activate, also the parts of the body that would not be engaged spontaneously. Regular exercise and rehabilitation stay at CANIS centre, is also important in maintaining self-service and activities of daily life (ADL).

An individual approach and adaptation of the exercise to the patient has also been proved important.

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MODEL OF THE PROFESSIONAL AND APPLIED PHYSICAL TRAINING OF NURSES

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Abstract:

Objective. *The article examines requirements for the professional training of nurses. The analysis of features and modern aspects of professional and applied physical training (hereinafter – the PAPT) of nurses is carried out. A model of the PAPT process of nurses has been developed, its components (goals, objectives, principles, approaches, forms, methods, training tools) have been identified.* ***Methods****. The research was conducted on the basis of theoretical analysis and generalization of data from special scientific and methodological literature.* ***Results.*** *A model of the PAPT process of nurses has been developed, its components have been determined: target, theoretical and methodological, content-procedural and criterion-effective. The applied physical qualities of nurses that they need in their professional activities are determined: general and special endurance, strength, speed, agility. To develop the applied physical qualities of nurses, it was proposed to use during practical training sessions in the process of professional and applied physical training in an educational institution such sports as: athletics, skiing, swimming, cycling, sports games, gymnastics, Nordic walking, simulation exercise, fitness, Pilates, stretching. Tests to determine the level of development of applied physical qualities of nurses are proposed.* ***Conclusions****. Modern requirements for the quality of training of future medical workers, in particular nurses, presuppose their corresponding professional and applied physical training. Professional and applied physical training of nurses should be aimed at developing and maintaining at the optimal level their professionally important physical and mental qualities. It is necessary at the state level to pay attention to the creation of appropriate conditions for people to en-*

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gage physical exercises throughout their lives: training of highly qualified personnel in physical education and sports, sufficient funding, involvement, promotion of a healthy lifestyle, a ban on advertising of alcohol and tobacco products.

1 Introduction

Modern work requires a significant amount of mental, psychic and physical strength, increased coordination of workers' movements in any field. Each profession dictates its own level of development of psychophysical qualities, its own list of professionally applied skills and abilities [1]. The work of medical workers is one of the most difficult, stressful and responsible types of human activity. It is characterized by great mental stress, requires attention, high efficiency and always significant physical effort and endurance [2].

Studies of modern scientists has shown that non-verbal communication in intercourse is very important for the professional activity of nurses (according to some estimates up to 93% [3], according to others – from 60 to 90% [4]). Moreover, scientists have described various ways of non-verbal communication, including artifacts (presence of physical and environmental objects), chronicle (use and time perception), haptic (use of touch), kinesics (interpretation of body motion), physical appearance (body type and clothing), proxemics (use of space and distance), vocals (aspects of voice) [3, 5-8]. The development of moral competencies and the formation of professional identity (a set of values and beliefs that a person has in his work) in nursing students occurs mainly during the years of college. According to scientists, they are important qualities of modern nurses and have a close relationship [9]. The results of modern research show that nurses' moral courage can be increased by strengthening their psychological capabilities, which will increase patients' satisfaction and quality care [10]. The results of research by scientists convince us that modern medical workers must constantly improve their professional knowledge, skills and abilities in the process of continuous professional development [11], [12, 13]. Motivation for mastering new professional knowledge will provide an opportunity for their career growth [14].

The clinical competence of nurses, according to scientists, consists of: direct clinical practice, professional development, moral decision-making, clinical leadership, collaboration and consultation, critical thinking. Clinical competence is vital to providing safe and quality care, and continuous assessment of nurses' clinical competence is an important component of their training [15, 16]. Studies have shown that the multiculturalism of modern society requires nursing schools to ensure their cultural competence in the process of training nurses [17]. Nursing is an emotionally demanding profession, and the quality of patient's care depends on her mental well-being [18]. Scientists have established a link between endurance and professional burnout of nurses, which is manifested by a high level of emotional exhaustion, cynicism, and a low level of professional efficiency [19]. The stressful work environment of nurses, according to scientists, increases the risk of non-communicable diseases, together with a high prevalence of obesity, poor eating habits and lack physical activity [20, 21]. Studies have shown that the acquisition of psychomotor clinical skills improves the quality of service provided to clients in the provision of health care [22].

Most health education institutions teach nurses the basics of health, as they serve as model for healthy lifestyles and behavior. According to research, the most common risk factors for chronic diseases of nurses were insufficient amount of vegetables (92.6%) and fruits (80.1%) in the daily diet, overweight, obesity (44.0%) and excessive alcohol intake (34.7%) [23]. Adopting a healthy lifestyle is considered to be the most important component of nursing education [24]. Physical culture and sports are one of the means to increase professional efficiency, labor productivity, and the success of professional activity [25]. Physical education has always been one of the means of preparing a person for work and adaptation to the social environment. The mechanism of the influence of physical exercises on the success of professional activity is based on the phenomenon of the transfer of skills and abilities formed in one area of human activity to the results of mastering skills and abilities in new areas

[26]. In our opinion, at the moment, the process of professional and applied physical training of nurses has not yet been sufficiently studied, the model and its components have not been developed.

The purpose. Analysis of literature on modern aspects of professional and applied physical training of nurses, development of a process model, determination of its components, forms, methods and means of training.

2 Experimental details

2.1 Methodology and methods

Theoretical analysis and generalization of data of special scientific and methodical literature.

3 Results and discussion

In the theory and practice of physical education, the special training of a student for future professional activity is called "Professional and applied physical training" (hereinafter – the PAPT). In the works of V. Ilyinich, the PAPT is considered as a specially directed and selective use of physical culture and sports means to prepare a person for a certain professional activity. Its main purpose is the directed development and maintenance at the optimal level of those mental and physical qualities of a person, to which the specific professional activity makes increased requirements, the development of the body's functional resistance to conditions of this activity and formation of applied skills and abilities, mainly necessary in connection with special external labor conditions [27]. The term "applied" emphasizes the purely utilitarian profiling of a part of physical culture in relation to the main activity in the life of an individual and society – to professional work. Developing the proposed model of professional and applied physical training of nurses, we proceeded from the fact that a model (in French "modèle", in Latin "modulus – measure") is a sample, a copy of something; reduced reproduction of some structure, mechanism; scheme for explaining any phenomenon or process [28]. Thus, a model is understood as a material or mental (symbolic, conceptual) system that indirectly reflects a set of factors that imitate the reproducing object at different levels of its organization, self-organization and development.

The model of the process of professional-applied physical training of nurses developed by us has the following components: target, theoretical and methodological, content-procedural and criterion-effective (Fig. 1).

The purpose of the process of professional and applied physical training of nurses is to achieve their psychophysical readiness for successful professional activity and reduce the time of professional adaptation.

The theoretical and methodological component of the model of the professional-applied physical training process of nurses includes the principles of training, methodological approaches and tasks of the process of physical education.

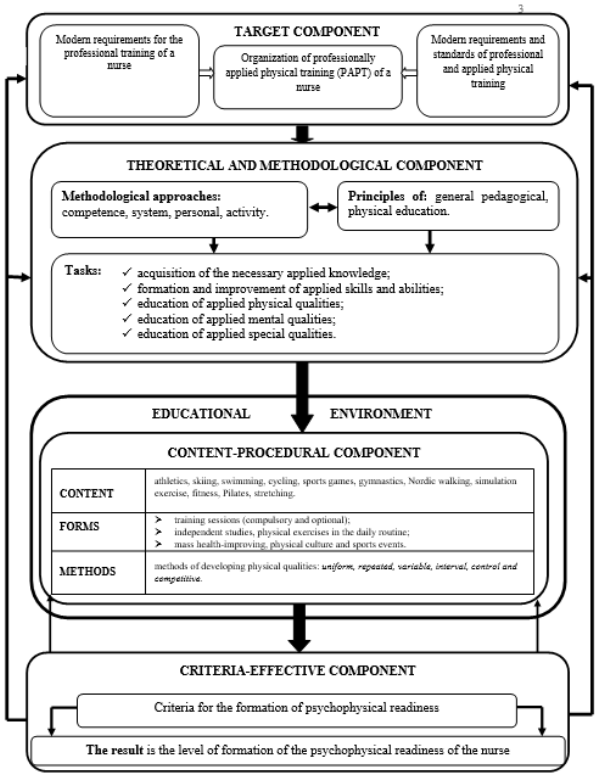

Fig. 1. Process model of professional and applied physical training of a nurse

Under "principles" (in Latin "principium – the basis") in the theory of physical education is understood, as noted T. Krucevich, the most general theoretical provisions, objectively reflect the essence and fundamental laws of training, education and all-round development of personality [26]. Professional and applied physical training of nurses is based on

the system of general pedagogical principles and principles of physical education.

The general pedagogical principles include: scientific character; sequences; accessibility; systematic; purposefulness; humanization of education; creative orientation of the educational process; individual approach; connection of training with practical activity; national education; independence in learning; motivational support of the educational process [29]. The principles of physical education include the principle of comprehensive, harmonious development of the individual; connection with vital activity; health-improving, therapeutic and adaptive orientation; accessibility and customization; systematic; age-appropriate physical activity; gradual increase in physical activity; alternation of load and rest [30]. In our opinion, it is possible to implement the process of professional and applied physical training of nurses using such basic methodological approaches as [31]: competence, systemic, personal, and activity-based. The competence-based approach focuses on the results of education, and the result of education is not considered as the sum of acquired information, but a person's ability to act in various problem situations. The systemic approach considers a person and society, as well as individual processes and qualities that ensure their progressive development as interacting systems and move towards an optimal state. The personal approach allows to take into account the social, cultural, personal determinants of a person's real state for the purpose to organize the educational process, achieve personal, professional development, self-development, and self-improvement of the individual. The activity approach allows analyzing the process of professional and applied physical training of nurses from the point of view of active human activity as a self-organizing, self-regulating system. Thus, to achieve the goal of professional-applied physical training of nurses, it is necessary to solve the following tasks: acquisition of the necessary applied knowledge; formation and improvement of applied skills and abilities; education of applied physical qualities; education of applied mental qualities; education of applied special qualities.

One of the most important conditions for the formation of a future specialist in the process of professional-applied physical training, in our opinion, is the educational environment of a higher educational institution as a set of conditions affecting the purposeful interaction of educational subjects and ensuring the effective functioning of forms, methods and tools of the educational process to achieve their goals.

According to A. Chuvakin [32], the environment of physical education of a professionally applied orientation created in the conditions of an educational institution of secondary medical professional education makes it possible to effectively form the objective and subjective qualities of the personality of nurses, which form the basis of general and professional-applied physical culture of the individual.

The content-procedural component of the developed model of the process of professional-applied physical training of nurses is the content of the educational process, forms and methods of education of applied physical qualities.

The main factors that determine the specific content of professional-applied physical training for future work are [33]: forms (types) of specialists's work in this field; conditions and nature of work; work and rest regime; features of the dynamics of the working capacity of specialists in the labor process and the specifics of their professional fatigue and morbidity.

Practical educational and training sessions in the process of professional and applied physical training of nurses in an educational institution, in our opinion, should include: athletics, skiing, swimming, cycling, sports games, gymnastics, Nordic walking, simulation exercise, fitness, Pilates, stretching. Self-study should be conducted in extracurricular time according to the tasks of the teacher or an individually developed plan with the methodological guidance of teachers of the Department of Physical Education. For extracurricular activities, we recommend using the following forms of physical education of nurses: physical jerks, physical exercises during the day, special independent training sessions according to the program of professional and applied physical training, independent and amateur classes in specialized sports, independent training sessions that have a sports orientation with elements of PAPT, mass health-improving, physical culture and sports events.

According to Kochetkov, a specific of the PAPT of future nurses' students is the orientation of the set of physical exercises, which should ensure a high level of functioning of the CVS, mechanisms of external and internal respiration, and the vestibular apparatus; development of general endurance,

speed and accuracy of movements, dexterity of hands, fingers; development of volume, distribution, switching, concentration and stability of attention, operational thinking, emotional stability [34].

In the profession "Nurse", according to Romanova, the dominant way of thinking is the "application-procedure" method, in which a person quickly, accurately and punctually performs well-known procedures to solve the task, and the qualities that ensure the success of professional activities are the following abilities: developed switching, concentration and distribution of attention (the ability to quickly switch attention from one type of activity, subject to another, the ability to focus on one object or type of activity, distracting from others, and the ability to keep in focus several subjects at the same time or perform several types of activity in parallel); a high level of analytical thinking development: fine visual, auditory and tactile sensitivity; ability to react quickly to a situation; ability to work in stressful conditions (night work, military field work conditions, etc.); ability to self-control; ability to endure heavy physical activity; manual dexterity during various medical procedures; as well as personal qualities, interests and inclinations: patience and mellowness; benevolence and friendliness; responsibility; accuracy; tact; sensitivity; attentiveness; honesty [35]. Modern researchers identify the following professionally important qualities of the nurse's personality: 1) moral: mercy; goodwill; hard work; optimism; determination; 2) aesthetic: accuracy; cleanliness; attraction to festivity; 3) intellectual: erudition, observation, consistency [4].

Thus, as the results of our research have shown, the applied physical qualities of nurses that they need in their professional activities are general and special endurance, strength, speed, agility.

I. Grebenkina, V. Aksenov in their research showed that if the proportion of PAPT is increased to 35-50% of the total number of hours devoted to the discipline "Physical culture", the level of professionally important motor skills of medical college students will increase , and the degree of formation of other motor qualities will not deteriorate [36]. In the process of professional and applied physical training of nurses in an educational institution, in the upbringing of applied physical qualities, such methods should be used: uniform, repeated, variable, interval, control and competitive.

The early accentuated formation of applied qualities in the process of physical education up to the required professional level allows to indirectly influencing the education of applied mental and psychophysical qualities of nurses (Table 1).

Table 1 Professionally important qualities of a nurse

Physical	Psychophysical	Mental
Endurance (general, special), strength, speed, agility, coordination.	Attention, vestibular stability, spatial and temporal orientation.	Memory, attention, operational thinking, communication, determination, emotional stability.

The criterion-effective component of model of the process of professional and applied physical training of nurses includes a battery of tests [37] to determine and assess the level of development of physical qualities in order to control and, if necessary, correct the process of physical education in an educational institution (Table 2).

Table 2 Tests to determine the level of development of physical qualities in the process of professional and applied physical training of nurses

Physical Quality	Tests
Overall endurance	Running the 500 m (min., Sec), running the 1000 m (min., Sec), jumping rope for 1 min. (number of times).
Special endurance	Bending of the trunk back (number of times), one-legged squats (number of times on each).
Power	Flexion and extension of the arms in the lying position (number of times), flexion and extension of the arms in the hanging position (number of times), squats (number of times).
Speed (speed-strength readiness)	Running the 30 m (sec), running the 60 m (sec), and standing long jump (cm).
Coordination, precision of movements and muscular efforts	Throwing a tennis ball into the goal (10 throws), basketball complex exercise (sec), shuttle run the 3x10 m (sec), shuttle run the 10x5 m (sec).
Vital skills and abilities	Cross-country skiing the 3 km (min, sec), cross-country skiing the 5 km (min, sec), swimming the 50 m freestyle (min, sec), and swimming the 100 m freestyle (min, sec).

The level of development of applied mental qualities in the process of professional and applied physical training of nurses can be determined using standard psychological tests, which are used depending on the purpose, stage of the development process, the contingent of those involved [38].

In today's market economy, taking into account the influence of environmental factors and the negative consequences of certain industries on human health, the requirements for the quality of training of future medical workers, in particular nurses, are growing, whose professionalism directly affects the future of a healthy nation, which is the key to a strong society and successful development of the state. According to research by modern scientists, the professional activity of a nurse requires the exertion of mental, psychic and physical strength [2, 10, 18]. The professional activity of a nurse requires graduates of medical educational institutions of clinical [15, 16], moral [9], communicative [3-8], cultural competence [17], motivation for continuous professional development [11-14], knowledge of healthy lifestyle [23, 24], prevention of stress, emotional burnout, occupational diseases, improving performance [19-21].

The results of our research have shown that the PAPT of nurses is aimed at developing and maintaining the physical and mental qualities of a person at an optimal level, the formation of applied skills and abilities, to which their professional activity makes increased demands.

We share the opinion of scientists [36, 39], who argue that insufficient attention is paid to the problems of the formation of physical culture of students of medical colleges, which is confirmed by the minimum requirements for the amount of knowledge, skills and competencies needed for mastering the discipline “Physical culture” in comparison with requirements for disciplines in other subjects. This is one of the reasons that do not allow to achieve a sufficient level of development of students' physical potential. In our opinion, the current standards and curricula do not contribute to the development of professionally important applied physical and mental qualities of nurses. The reason for this, in our opinion, is the lack in these documents of a list of professional and applied components that contribute to the effective and efficient performance of professional duties; lack of differentiation of control and accounting standards for general and professional-applied training; lack of proper material and technical base and appropriate sports equipment.

Thus, in our opinion, the problem of high-quality professional and applied physical training of specialists, including nurses, should be solved at the state level with the involvement of leading specialists in physical education and sports. Appropriate conditions should be created for physical exercises during a person's life (kindergarten, school, secondary and higher educational institutions, sports clubs, sports sections, etc.): training of highly qualified personnel in physical education and sports, sufficient funding (material and technical base, salary fee), promotion, involvement, encouragement of children and youth to lead a healthy lifestyle, a ban on advertising of alcohol and tobacco products. As a result of the above, students, including those of medical schools, will have sufficient motor experience, knowledge and motivation to regularly engage in physical exercises, both during school time and independently throughout their lives.

4 Conclusions

Summing up, we can say that the process of professional and applied physical training of nurses forms professionally important physical and mental qualities, applied skills and abilities that: allow to achieve highly productive work in the chosen profession; prevent occupational diseases and injuries, ensure occupational longevity; allow to use the means of physical education and sports for active rest and restoration of general and professional working capacity in working and free time.

The professionally important applied physical qualities of nurses are general and special endurance, strength, quickness and agility. For their development in the process of practical educational and training sessions, professionally applied physical training of nurses should include such sports as athletics, skiing, swimming, cycling, sports games, gymnastics, Nordic walking, simulation exercise, fitness, Pilates, stretching. The problem of organizing the process of PAPT in educational institutions, in our opinion, should be solved at the state level.

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UNIVERSITY REVIEW

EXPERIMENT IN COACHING AS AN INSPIRATION FOR PROFESSIONAL DEVELOPMENT OF COACHES

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Abstract:

The contribution focuses on the method of experiment as an inspiration for the professional and personal growth of ICF approved coaches. It clarifies the key terms for coaches who want to adopt change in their coaching dialogues. If coaches implement something new in their coaching practice or life, experiment helps them to learn, discover, explore, and verify whether this change works and how it works. Experiment helps determine the effectiveness of an intervention. It should be planned, repeatable and verifiable with the outcome that has measurable results.

We focus on the 4th ICF Core Competency: B. Co-Creating the Relationship: 4. Cultivates Trust and Safety. The coach is present in the coaching dialogue as a professional and a person.

Coaches can use experiment as a source of inspiration when they want to:

1. Introduce something purposefully into their profession or life and to find out how it works.

2. Change something purposefully and systematically.

3. Exclude something from their personal life or coaching practice.

This process is the series of steps and observations, the purpose of which is to capture specific changes over time and decide, based on the outcome, whether to take or not to take a few steps into coaching practice or personal life. Experiment is successful when it has been truly implemented and has brought insight into the problem or has brought a new vision. Finally, we introduce professional and personal benefits that a clearly specified hypothesis can bring to coaches.

1 Introduction

The method of experiment can be a source of inspiration for the professional and personal growth of coaches approved by International Coaching Federation (ICF). When coaches want to examine something new, implement transformation or innovation in their coaching practice, experiment is a good op-

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portunity to learn, discover, explore, and verify whether this innovation works and how it works.
Scientific experiment is the method that helps determine the effectiveness of an intervention or the best possible option. Effective experiment is planned, repeatable and verifiable with the outcome that has measurable results [1]. Scientists apply the scientific method when conducting an experiment. The scientific method is the set of procedures and principles that guide how scientists develop research questions, collect the data, and come to conclusions. The four basic steps of the process are [2]:

- Forming a Hypothesis
- Designing a Study and Collecting Data
- Analysing the Data and Reaching Conclusions
- Sharing the Findings.

Scientific experiment can be quantitative (with a clear hypothesis and a larger sample) or qualitative (with a hypothesis that becomes clear to me at the end of the experiment and a small sample). A successful experiment is the one that has been truly implemented and has brought insight into the core of new issue or a new vision. In coaching practice, an experiment can be used to examine something, to discover what it is like, and to find out more about it [3]. For coaches it can be a powerful method to obtain authentic insights and value from coaching dialogues, to experiment how to be more active, reflective focused on the present and more aware of the potential of a change [4]. When coaches want to grow systematically through the method of experiment, it helps them to be more and more present during coaching sessions in agreement with ICF Core Competencies. It also helps them to examine their new behaviour – how it helps a client and me, a coach. When it does not help, a coach can select a new, better option.

The objective of our contribution is to focus on the method of experiment to implement something new into our coaching practice, so that we could learn and discover, explore, and verify how it works and to adopt the best possible solution. The focus is on 4th ICF Core Competency: B. Co-Creating the Relationship: 4. Cultivates Trust and Safety.

2 Experiment in Coaching

Taking an inspiration from scientific experiment helps coaches to be attentively present, and to understand how exactly they serve clients according to 8 new core competencies (key coaching skills) in four domains. Experiment is the process that can help coaches practise and improve behaviour in a particular ICF core competency or skill (fig. 1).

The experiment gives coaches an opportunity to change purposefully and systematically "reality", measure outcomes or observe specific changes during coaching sessions. It is a series of steps and observations based on our outcomes, that enables coaches to decide whether to or not to start doing something in our professional or personal life (based on new knowledge or awareness).

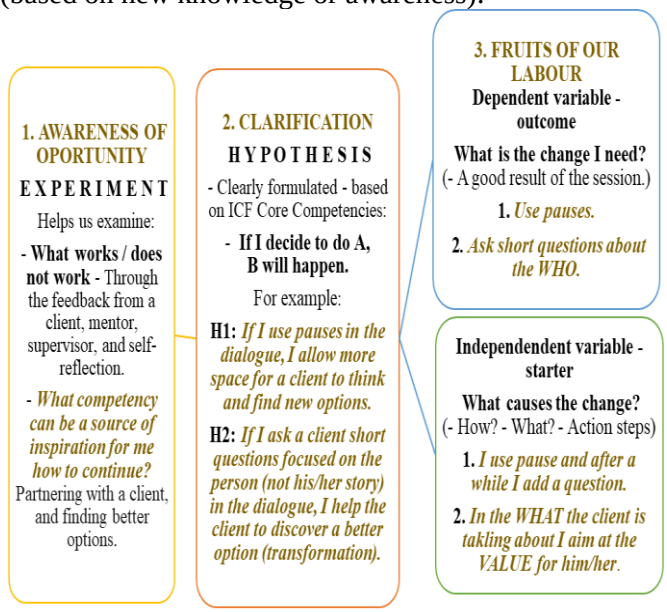

Fig. 1 *Experiment in Coaching* [1, 5]:

In the beginning of experiment coaches formulate a clear hypothesis, which is an assumption built on a stable basis: "If I decide to do A, it will become B." For example: "If I stop eating sweets and fats in the evening, I will lose a few kilos and my pressure improves."

After the formulation of a clear hypothesis coaches work with two variables. These are phenomena that coaches want to examine deeper. The first one is a dependent variable – it is focused on client's outcome:

- "What will be the good result of this session?"
- "What is meaningful to you?"

The second variable is an independent variable. It is focused on action steps:

- "How would you like to accomplish outcome in your life?"
- "What impact would it make on you?"

Experiment is the process in which we use various instruments that help us to be aware of necessity to change our behaviour:

a) ICF Core Competency Model [6, 7] with 8 competencies in 4 areas.
b) Feedback from a client, triad, self-reflexion after a coaching dialogue (after listening to a recording), from a mentor or a supervisor.
c) Formulation of hypothesis: Based on feedback, and opportunity awareness, a coach formulates a clear hypothesis based on ICF Core Competency Model.
d) Specify the outcome: What do I need to change for the benefit of a client?
e) Action steps: How will I accomplish the outcome?
f) Results: After a recorded coaching session, a coach sends the recording to his/her mentor coach, supervisor, or gets feedback from a client. Here the whole cycle ends, and a coach can repeat the experiment again and improve his or her ICF core competencies.

With the feedback from their clients, mentors, supervisors, or self-reflection coaches can examine how their new behaviour, that they want to implement in their coaching practice, works during the coaching session. The way how coaches analyse what they have found out (the outcomes) is very important feedback. They gain their outcomes from the coaching sessions from their recordings that they send to mentor coaches or supervisors; and by self-reflection after the session via their senses sight, smell, touch, hearing and taste and via perception and observation of phenomena [8].

3 Experiment Focused on Maintaining Trust and Safety

When we want to apply experiment in coaching, we need to formulate a hypothesis that stands on the solid foundations and examine it precisely (If I implement A – the B will happen). ICF Core Competencies and the ICF Code of Ethics represent solid foundations for us coaches.

In this contribution we explain how to make experiment in our coaching using the 4th competence of the 2nd domain: B. Co-creating the relationship: 4. Cultivates Trust and Safety [6, 7]:
Definition: Partners with the client to create a safe, supportive environment that allows the client to share freely. Maintains a relationship of mutual respect and trust.

1. Seeks to understand the client within their context which may include their identity, environment, experiences, values, and beliefs
2. Demonstrates respect for the client's identity, perceptions, style, and language and adapts one's coaching to the client
3. Acknowledges and respects the client's unique talents, insights, and work in the coaching process
4. Shows support, empathy, and concern for the client
5. Acknowledges and supports the client's expression of feelings, perceptions, concerns, beliefs, and suggestions
6. Demonstrates openness and transparency to display vulnerability and build trust with the client.

How do coaches know that they maintain trust and safety? To all of coaches the words trust, and safety mean something else. We will use the experiment to become an experimentalist. Let us say that the starter will be partnership to a client and its outcome will be trust and safety (table 1):

Table 1 *Depended and Independent Variables of our Experiment*

Starter (How?)	→	**Outcome (What?)**
Partnership	→	Trust and safety

The research question that coaches can ask is:
– When I seek to achieve partnership to my clients, how much do I contribute to trust and a safety?
ICF hypothesis:
– I assume that through partnership with clients, I contribute to increased trust and a safety.

Why a research question is not enough, and a hypothesis is needed? Because a good research question should be SMART: Specific – Measurable – Achievable – Relevant and Time bound. The hy-

pothesis asks experimentalists to answer "Yes or No" directly – to be clear and explicit. According to that, experimentalists accept or reject the hypothesis; do not accept it or accept something else in their life. It is important to decide what I want to include in my experiment from my way of maintaining trust and a safety.

4 Helpful Questions for the Experiment Before, During and After Coaching

The method of experiment can be used by coaches who want to change something or improve their coaching skills and use it in their coaching sessions. In this contribution we focus on the 4th core competency of the 2nd domain B. Co-creating the relationship: 4. Cultivates Trust and Safety [6, 7].

As our experiences are unique ones, there will be various answers to the following questions:

1. What would you like to implement in your coaching that would contribute to increased trust and safety in a coaching session?
a) Express empathy and care.
b) Support a client.
c) Partner with a client.
Example:
"I have tendency to use long sentences:
- What do I want to change?
I want to use short sentences.
- How will I realise it?
I will consciously shorten my sentences."

2. How do you know that your sentences are short enough?
Example:
"Clients will do 70-80 % talking and I (a coach) only 30-20 %."

3. What values do you want to create*?*
Example:
"I believe that I will express authentic interest in the client and his/her situation and my desire to help him or her."

It is important to verify the results of what a coach wants to implement in a coaching session. It is also important to receive the feedback from our clients by asking them the following questions:
– "In this coaching session I tried to … Have you seen / perceived / heard that during the dialogue?"
– "How do you know that I performed it?"
– "How did you feel when I performed it?"

5 The Benefits and Blind Spots of Formulating Clear Hypothesis in Experiment

When coaches decide what they want to experiment with in their coaching dialogue, it is of great importance to formulate their hypothesis in a clear and understandable language based on ICF Core Competencies:
a) What good result of your experiment do you expect (the change you wish – dependable variable)?
b) What action steps you need to implement it?

Finally, coaches verify their outcomes and receive the important indicators of the quality of experiment which contribute to the development of their professionality or personality:

Professional benefits relate to:
- Development of honesty, patience, and courage.
- Development of coaching skills.
- Learning and new awareness.

Personal benefits relate to:
- Becoming a better person.
- Work on assumptions and prejudices.
- Implement a particular change in one's life.

If the hypothesis is not clearly formulated, is vague or metaphoric, the results are the following failures of a professional or a person:

Professional blind spots relate to the following:
- Violation of ethics.
- The results of my work are superficial.

Personal blind spots relate to the following:
- I cannot improve as a human if the hypothesis is based on prejudice.
- I confirm my human value.
- It serves as a proof that I am right.

6 Conclusion

Every coach should maintain presence in his or her coaching session as a professional and a person. Experiment can serve coaches as a tool to learn and verify the outcomes when they:

a) Are determined to implement something into their professional life and see how it works.
b) Want to change something purposefully and systematically.
c) Want to exclude something from their professional life and see how it works.

Experiment in coaching is a process, a series of steps and observations, the purpose of which is to verify whether something (knowledge or reality) can or cannot be implemented in good coaching practice or personal life of coaches.

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OPEN ADOPTION AND CHILD'S FURTHER SOCIALIZATION

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Abstract:

Background: Contribution discusses possible positive and negative effects to those who are adopted or taken under the foster care. On the other hand, openness within adoption in most cases is presented in a positive way, by becoming increasingly common, especially due to a growing recognition of the benefits of allowing an adopted child to establish or maintain connections with the birth family. Although many studies have shown a relation between adoption and later difficulties, there is no clear evidence that adoption could cause behavioral problems in child's later development periods. Many authors would argue that this process has also negative influence, especially dealing with adoptees' self-identity formation, social attachment, and communication with others. Attention is devoted to these children' abilities to develop their own relationships with other friends and mainly with step-parents. Teenage period is stressed when identification challenges take over other developmental necessities and social attachment is developed. That is why the phenomenon of open adoption in the childhood is mainly presented in the context of its influence to a child's further psychosocial development and growth.

Objective: The main objective of the contribution is to analyze theoretically adoptees psychosocial variables that influence their further development in the context of open adoption's process.

Method: Main method of this explorative work is a meta-analysis and more theoretical observation of previous research in the selected area.

Conclusion: Openness relates to the degree to which information passes between birth and adoptive families and to the level of contact and relationship between these families.

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1 Introduction

Open adoption, as it is stated in much of the literature, is a type of adoption in which birth and adoptive families have some form of initial and usually ongoing contact; the open adoption also allows adoptive parents (often the adopted child as well), to interact with the child's birth parents. Besides, the type and the way of openness can vary from family to family and may change over the time. Open adoption is becoming increasingly common, in part due to a growing recognition of the potential benefits of allowing an adopted child or youth to establish or maintain connections with his or her birth family [1]. Within past few decades a greater sophistication has emerged in the understanding of the concept of openness and the professional practices related to the concept. Openness no longer refers simply to open communication between adoptive family members but also relates to the degree to which information passes between birth and adoptive families and to the level of contact and ongoing relationship between these enmeshed families [2]. Yet, on the other hand, the formation of an adoptive identity is one of the more critical and complicated tasks that adoptees would face [3].

Having those aspects in mind, all European Union Member States have ratified the UNCRC (Convention on the Rights of the Child), which provides a key framework to guide program and policy interventions with and for children deprived of parental care. The preamble of the UNCRC emphasizes the role of the family as "the fundamental group of society and the natural environment for the growth and well-being of all its members and particularly children" [4]. Articles within the convention seek to prevent separation of children (Article 9), support family re-unification (Article 10), provide alternative care for children when required (Article 20), provide regular reviews of care plans, ensure attention to individual needs and development of each child (Article 25), and assure the child the right to express his/her own views (Article 12). Taking in account of the key principles of the Eurochild Policy Position on Quality of Alternative Care for Children Deprived of Parental Care [4], care responses must always be made in the child's best interests (Article 3).

Almost all countries in the world admit that every child needs a family, security, and constant feelings [5]. On the first hand, all necessary instruments should be taken in action while saving child's biological and unified family after some serious problems occur. Only if the best solution is suspending from parents' rights or biological parents cannot take care of their own child any longer, the adoption could take a serious part within child's wellbeing construction. On the other hand, adoption is rather a complicated psychosocial process even though a frequent phenomenon in society today. Rutter et al. [6] have been stated that adopted children's behavior, cognitive abilities as well as physical development in many cases are laden in comparison with non-adopted peers. After the adoption, a child needs to adapt to the new environment – get used to some strange smells, cultural differences, and all of that undoubtedly differ from his/her previous experiences.

In Western cultures adopted children's behavior and the variety of their experienced emotions are the focuses of many surveys. Besides, much of attention is paid to such children abilities to develop their own relations with other friends and mainly with stepparents. Especially teenage period is stressed when identification challenges take over other developmental necessities and social attachment is developed [7]. It is stated that early adoption factor plays much of the role within formation of self-identity, social attachment, and child's psychosocial characteristics – better results are expected when child was adopted before 6 months of age [8]. Open adoption, according to Singer and Krebs [8], is revealed as child's and his or her birthparents participation meaning at the adoption process as a progressive tactic [9]. Open adoption is recommended as the best option for the child by Committee on the Rights of the Child. It has been stated as the standard in the Quality4Children Standards for Out-of-Home Child Care in Europe [10]. It is almost taken for granted by adoption services and adoption participants in the USA.

That is why the problematic situation in almost all research works is mainly defined with the following issues that are much of interest to many academics and practitioners and educators:

a) Experiences of adolescents adopted from the care system in relation to the themes of grief and loss status.
b) Reasons behind individual differences-why do some adoptive people feel different to others (cultural differences, dependence of adoption type).
c) Birth parents and adoptive parents' attitudes and values in relation to adoption and openness in adoption.
d) How does self-esteem, emotional and behavioral development of adopted adolescents relate to pre-placement risk factors such as length of time in institutions and care system?

The theme of this contribution is the phenomenon of openness within adoption and its impact to the child's further psychosocial development, especially having in mind self-identity processes.

The main objective of this contribution is to analyze theoretically adoptees psychosocial variables that influence their further development in the context of open adoption's process.

Method is a meta-analysis and theoretical review of previous research in the selected area.

2 Approaches to an Open Adoption and its Challenges: Insights and Discussion

The practical part consists of a case study and an objective. Neil [9] in her studies on post-adoption contact and openness reveals the fact that adoptive parents and their children report face-to-face contact to be a positive experience and such contact appeared to have a positive effect on the ability of birth relatives to adjust and accept the fact of the child's adoption. For instance, in England and Wales, the 2002 Adoption and Children Act obliges agencies to make post-adoption support plans for every child, and gives adoptive parents, adopted children and birth relatives the right to ask for an assessment of their support needs. Neil states that providing support for post-adoption contact is an important opportunity for social workers to facilitate communication between children, adoptive parents, and birth relatives, as well as helping all three parties understand and manage their own feelings regarding the adoption [9].

Although many studies have showed a relationship between adoption and later difficulties, there is no clear evidence that adoption could cause behavior problems in child's later development periods [11]. Indeed, many mechanisms are likely involved in the adoption process, which may interfere with the parent-child relationship and the child's development and well-being. As the matter of fact, fostering and adopting are both means by which children are given new, safe, and supportive homes, because early stress, poor life conditions and separation may constitute potential risk factors regarding the social-emotional development; the period of adolescence, which involves separations and new relationships may be especially sensitive in this regard [12]. However, both fostering and adopting, are important to remove adoptees from usually unhealthy environments and allow them to move towards a brighter future.

On the other hand, along with the positive intentions of adults to foster or adopt a child some psychological negative outcomes of child's adoption/foster process may be seen as well, especially having in mind the international adoption, that has some effect on emotional and social development in adolescence, specifically attachment, and separation processes [11]. Having been adopted may constitute a risk factor regarding psychological development, particularly at adolescence [12]. A question raised in the literature is, whether adopted children exhibit more behavior problems than non-adopted peers in later development stages.

As Pierrehumbert et al. [12] emphasizes, there are other important issues related to pre and post adoption processes that could be taken in account within proposed research, such as the effect of early deprivation on the adopted child, for example a late adoption frequently means a long time spent in institutions in poor living conditions, without any attachment figure. Therefore, these factors increase the risk that the child encounters adverse life events with probabilities of long-term consequences on his/her psychosocial development [11]. The data suggest that the impact of early deprivation may last long after adoption and that a long stay in institution can hinder the capacities of recovery.

The effect of early deprivation on parent-child attachment. That means that poor relationships at pre-

adoption phase may negatively influence the development of emotional regulation and of later social adaptation. Putting in other words, in case of adoption, child caregivers' bonds may have been disrupted or remained unconstructed, increasing psychological vulnerability [11]. That is why a late adoption increases the risks of having been exposed to harmful and disruptive life experiences, and to negative models of relationships.

Finally, the reactive attachment disorder (hereinafter RAD) may be observed when difficulties or impossibilities to create a significant relationship with anyone occur. Among the long-term consequences of RAD are the difficulties to engage emotionally with other people, loneliness, social withdrawal, identity problems, or loss of positive self-esteem. Adopted children with a RAD are then likely to endure difficulties regarding emotion regulation as they cannot trust the attachment figures in stressful situations [11].

Adoptive parents and their representations concerning their children is a significant factor that may influence child's wellbeing while in the new environment. Pierrehumbert et al. [12] have pointed out that parents' representations towards their children mainly could be described as the consequence of the capacity to understand their own behaviors and those of their children in terms of mental states, intentions and needs, and to reflect their children's psychological experiences. Parents of children who had been placed relatively late, experience a greater need for support, and report higher levels of children's aggression, rejection, control behaviors, and overfriendliness; this contrasts with children placed earlier in infancy, whose adoptive mothers report higher levels of joy, competence, confidence, warmth, happiness, and affection. Lastly, adoptive parents who were themselves insecure or unresolved in relation to attachment seem to be more likely to represent their adoptive children, and the relationship with them, in negative ways [11].

That is why it is of great importance to understand what and how underlying factors may intervene in the pre and post adoption processes, to prevent difficulties and vulnerabilities, and to optimize chances for an optimal child's psychosocial development [9]. Secure attachment has been pointed out as a protective factor regarding behavior problems in childhood. Attachment is also influenced by several individual and environmental factors such as parental competencies regarding interactions, sensitivity to the child's demands, and parental representations (mentioned above), as well as characteristics of pre-adoption context (age at adoption, origin, adoption from care, early institutional/environmental experiences, and others).

To be more specific, the experience of adoption makes the adopted child deal with more rather complex emotional issues, such as rejection and grief at an early age. Even though adopted children can grow up joyfully, as stated above, but they grow up differently as well, and both internal and external factors could have an impact for adoptees further development [13]. Many believe the increased incidence of referral for adjustment problems is the result of the psychological impact of adoption on children [13].

Therefore, the psychological impact of adoption means that adopted children and their both biological and adoptive families face unique challenges: loss, grief, rejection with accompanying feelings of guilt/shame, identity, and intimacy/relationships issues and others [9]:

- Loss is the primary adoption-related matter from which the other issues flow. Adoption involves many losses for the child [13]. Adopted children have lost the chance to be "normal" like their friends who are growing up in their biological families. Child also may have lost siblings, birth order, and other connections with the biological family. Another unique feature of adoption is that the adopted child must cope with losses that are less obvious, for example in the case of death, society provides the rituals of funerals and the gathering of people to support the person who is mourning [14]. However, losses of adoption frequently are not recognized, nor are there established rituals or ceremonies to mourn such losses. For the adopted person, loss in adoption is not a single event but a series of ongoing losses: birthdays, Father's Day, and Mother's Day can be viewed as a reminder of the original loss and the ongoing nature of that loss [13].
- Adopted children have experienced significant losses, and grieving these losses is rather important for healthy adaptive development.

Grieving is a natural and necessary response to the adoptive experience as well as to the death of a loving one, parents' divorce, migration, and others [7]. The losses of adoption may be less obvious and less likely to be acknowledged, thus the adopted child and others may deny the grief being experienced. Behavioral changes seen in elementary school-age adoptees that reflect grieving include anger, aggression, oppositional behavior, and uncommunicativeness, depression, and self-image problems. Feelings of anger, resentment, and sadness may be projected onto the people available to the child, especially the adoptive parents. Besides grief in adolescence may be expressed with anger and defiance.

- Child's feelings of loss are heightened by feelings of rejection [13]. As the child matures, he/she begins to wonder why his/her birthparents or someone from the extended family did not choose to care for him or her. Adopted children may view themselves as responsible for the birth family decision not to parent them. Because of egocentric thinking, they feel they were bad, defective, unlovable, and unworthy. A sense of deserving the loss and rejection may lead them to feel guilty and ashamed [13].
- Consider the challenges and the models of coping with them, the possible consequences in later child's development stages could become obvious, for example when expanding social network in adolescence, many adoptees, as for their specific "internal working model of attachment" may present a difficulty in establishing selective bonds with others, leading to social withdrawal and feelings of helplessness [11].

3 Conclusions

Open adoption is mainly seen as the phenomenon that allows the adopted child freely to communicate with both birth and adoptive parents and this process leaves no space to any hidden psychological or even identity obstacles within child's interaction with his/her closest environment. Openness no longer refers simply to open communication between adoptive family members but also relates to the degree to which information passes between birth and adoptive families and to the level of contact and ongoing relationship between these enmeshed families.

Along with the positive intentions of adults to foster or adopt a child some psychological negative outcomes of child's adoption/foster process may be seen as well, especially having in mind the international adoption, that has some effect on emotional and social development in adolescence, specifically attachment and separation processes.

It becomes also much clear that the psychological impact of adoption in many cases means that adopted children and their both biological and adoptive families face unique challenges: loss, grief, and rejection with accompanying feelings of guilt/shame, identity, and intimacy/relationships issues.

Therefore, it is of great importance to understand which and how the underlying factors may intervene in the pre and post adoption processes, to prevent difficulties and vulnerabilities, and to optimize chances for an optimal child's psychosocial development. Secure attachment could be as a protective factor regarding behavior problems in childhood and social support along with networking may assure this secure attachment to be fulfilled.

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