

PSYCHOSOCIAL BENEFITS OF THE INCLUSIVE CONTROLLED PHYSICAL ACTIVITIES IN CHILDREN AND YOUTH WITH INTELLECTUAL DISABILITIES

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Abstract

Background: The project was addressed to horizontal priority of the social inclusion in Programme “Erasmus +”, to actions that help address diversity and promote – in particular through innovative and integrated approaches – ownership of shared values, equality, including non-discrimination and social inclusion through education, training, youth and sport activities. Aim: The main goal of the presented paper is to present psychosocial benefits of the inclusive controlled physical activities in juvenile individuals with intellectual disabilities, applied in leisure time. Partial goal is to demonstrate types of the popular controlled activities for children and youth with intellectual disability in the participated countries of the project, i.e. Bulgaria, Czech Republic, Greece and Macedonia. The aim and all activities of the project are in accordance with EU Work Plans for Sport 2017-2020 with a focus on Priority 3: Sport and Society - Access to sport for people with disabilities. Methods: Battery of following methods was used – Content analysis of literary sources; Brustman tapping test; Bourdon proofreading – examination of the properties of attention; Emotional instability (model tremometry); Creativity Assessment Packet; Intervention “You are part of us”; for statistics the method of Qualitative Comparative Analysis was used. Results, discussion: Positive changes were observed in the measured of two measures of attention, i.e. “Attention in concentration” and the “Attention in switch ability”. Adaptation ability of the monitored samples has been improved. Conclusion: Emotional stability and ability to concentration has been improved.

Keywords

Controlled physical activities; Children; Intellectual disability; Integration; Sport activities; International project.

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INTRODUCTION

Adapted physical activity (APA) is an actual field of scientific knowledge that is related to physical activity and sports for people with various disabilities. APA can be considered as part of a comprehensive rehabilitation and in particular as a special type of kinesiotherapy, in which the individual can actively participate in something new and interesting, which further motivates him to improve motor

activity in children and young people is a matter of repetition of more complex movements with high motivation, which the art of sports itself provides them (Winick, Porretta, 2020). Recommended controlled physical activities for juvenile persons with intellectual disability are: running, walking, swimming, yoga, dancing, athletics, modified volleyball, gymnastics, bocce, martial arts, rowing, ten-

nis, riding and others (Atherton, Crickmore, 2011). This is to comply with the EU Disability Strategy (2010-2020) - Empower people with Disabilities so, that they can enjoy their full rights and benefit from fully participating in society and the European economy (WHO, 2017). The purpose of the project is to raise capacities of involved organizations to promote social inclusion by implementing sport activities and services directly including children and young people with intellectual disabilities and to use sport as drive force of social inclusion. By reaching the project goal organisations aim to break the barriers that people with intellectual disabilities. The main objectives are oriented on following significant development aspect:

- To develop and reinforce networks;
- To increase capacity to operate at transnational level;
- To exchange good practices;
- To confront ideas and methods in different areas relating to sport and physical activity.

Cognitive or behavioural factors such as social interaction and support, feelings of achievement, self-mastery and self-efficacy and distraction or diversion of attention may be the initial cause of improved mood following exercise (Cureton, Wasserman, 2020; DePauw, Gavron, 2005). The distraction hypothesis posits that exercise results in psychological benefits because it typically is performed in a setting removed from the stressful environment, resulting in a form of pleasant diversion. Also feelings of achievement may contribute to improved mood and mental health (Raglin, Wilson, and Galper, 2007).

A basic educational impact of each child has a family, school and group of peers, but also out-of-school education, respectively, leisure time of the child (Velemínský, Velemínský jr., 2017).

Only the educational influence complementing all the attributes of the family and non-family community gives the chance for a harmonious development of the personality of a disabled child. (Davis, 2011; Eileen, Glynnis, 2015; Fiedler, Simpson, Clark, 2007).

In the course of the research various problems related to the mental and physical development of children and young people with intellectual disability specific needs were registered. Adapted sports activities contribute to a certain extent to overcoming the various deficits in children and young people. Different measurements prove the effect of adapted physical activity and declare improvement of the mental and physical condition of children and adolescents with intellectual disability (Rehor, Kornatovska, 2013; Matson, 2019).

In the modern health educational focus the education of children with disabilities is understood as the education of children with different attributes, inclinations and abilities. In English it is used the term "challenging children" for children with disabilities in the sense of the principle "people first" that people have different characteristics and one of them may be a disease, disability, because these children have normal social rights, i.e. the right to participate in school education, to participate in sport activities, etc.

The term "controlled physical activities" is the designation of system in recreational physical activities carried out to achieve health benefits through professionally guided motor learning, aimed to reach health benefits through professionally led training and learning, as for example specialized trainers, instructors, assistants, etc. (Kornatovská, 2016; Kornatovská, 2017). The "International Classification of Functioning, Disability and Health" expresses support for research projects allowing the development of persons with disabilities, including reduction of the drugs

consumption and better medical prognosis. It is desirable to focus on the development of physical learning and organization of controlled physical activities to this part of the population with specific needs, especially in the preparation of instructors, motion animators, coaches etc. Specially trained professionals help integrate people with disabilities into the community by showing them how to use leisure and recreational activities in the countryside (Kudláček, 2010; Bendíková, 2017).

AIM, HYPOTHESES

The main goal of the presented paper is to present psychosocial benefits of the inclusive controlled physical activities in juvenile individuals with intellectual disabilities, applied in leisure time. Partial goal is to demonstrate types of the popular controlled activities for children and youth with intellectual disability in the participated countries of the project, i.e. Bulgaria, Czech Republic, Greece and Macedonia. The aim and all activities of the project are in accordance with EU Work Plans for Sport 2017-2020 with a focus on Priority 3: Sport and Society - Access to sport for people with disabilities.

Hypotheses:

H1 After completing the ten-day intervention, the "Attention in concentration" score in the Bourdon test will be significantly improved.

H2 After completing the ten-day intervention, the emotional stability score tested through tremometry test will be significantly improved.

METHODS

Participants

The subject of the quasi-experiment research were adapted physical exercises influencing the mental and physical development of children and young

people with intellectual disability, realised in the regime of controlled physical activities under guiding of professional coaches of APA. The objects of the conducted quasi-experiment were 17 probands in the age 8-16 years old (11 males, 6 females), with moderate intellectual disability from Sofia, Plovdiv and Kazanlak, dealing with adapted physical activity in FAFA organisations. This group of probands was divided into two experimental samples: S1 included 10 probands with the moderate intellectual disability in the age 8-11 years old (7 males, 3 females) and S2 included 7 probands with the moderate intellectual disability in the age 12-16 years old (4 males, 3 females).

Procedure

The study was conducted in August 2019 during a ten-day summer camp in Greece (Athens / Pireo). Both experimental samples participated in the ten-day intervention program "You are part of us", which was realised in the modern equipped hotel "Korelko" with swimming pools, beach and sports grounds. Here, PRE and POST monitoring and measurements of the participants were realised at the beginning and at the end of the camp.

Methods

Content analysis of literary sources

The theoretical issues of the study were developed on the basis of content analysis of literary sources in the form of review processing. Individual sources come from professional scientific literature, studies or scientific monographs. The authors studied from these sources in order to author ethics and build on them the research part of the study. All these sources are listed in the part "References" and are referred accordingly the text citation.

Diagnosics

- *Brustman tapping test (Bartůňková, 2006)*

It is a test of impulsive motor reactivity and psychomotor coordination. When performing movements, flexors and extensors of the forearms are involved at the beginning, followed by fatigue of the muscles of the arm, shoulder and torso. Device: Computer with the given program, tapping set, monitor, interface. Realisation: We perform the test sitting. The measurement of one limb takes 60 seconds, when the time is divided into 6 ten-second intervals. We start the test with the first touch of a metal pencil, which we hold in the tested limb, on the copper interface plate. Hand movements must be the fastest throughout the measurement. Evaluation: The evaluation is carried out continuously at individual ten-second intervals. After 60 seconds, the monitor will display a graphical representation of the number of touches at given intervals, as well as the total number of touches per minute and also the frequency of touches per 1 second.

- *Bourdon proofreading – examination of the properties of attention (Kunchev, 2017).*

The test is conducted using special forms, which are rows of letters (numbers, Fig.s, symbols) arranged randomly. The subject examines the text (form) line by line, as from it is asked to cross out certain letters (numbers, symbols). The test allows to establish different indicators of attention: Sustainability and performance (productivity); Concentration; Switch ability.

- *Emotional instability (model tremometry) (Forrest, 1990)*

The name of the device comes from the Latin word tremor, i.e. trembling. Vibration is the involuntary oscillating movements of the hands and fingers, eyelids, tongue, lower jaw, head. In healthy people, tremors can occur due to muscle tension, emotional arousal and the effects of the common cold. The designed test allows to quantify finger shake using a special probe to move along slots of a certain shape without touching their edges.

- *Creativity Assessment Packet (Williams, 1980)*

1. Ease – productivity, is determined by listing the amount of drawings that the child has been able to draw, regardless of their content; 2. Flexibility – the number of changes to the drawing category starting from the first drawing. 3. Originality – location (inside – outside of the stimulus Fig.) on which the drawing is executed. Most original are those drawings, which include drawing both inside and outside of the stimulus Fig. 4. Development – symmetry-asymmetry, where are the details that make the drawing asymmetrical. 5. Name - richness of vocabulary, i.e. number of words used in the name and the ability to convey the image of the image depicted in the drawing (direct description or hidden meaning, subtext).

Intervention

The preparatory phase for the intentional ten-day intervention “You are part of us” and research survey was the holding of three workshops, when the researchers from each project partner

country provided a three-day professional workshop with the participation of persons with intellectual disability, their parents, coaches and volunteers. The FAFA workshop (Bulgaria, Sofia) focused on the presentation of activities in clubs in the community in Sofia, the main principle of which is joint exercises of parents with children. Workshops ČHSO (Czech Republic, Prague) focused on the presentation of adapted sports, bowling and modified volleyball, as well as on the presentation of the Healthy Athlete project and methodology for measuring of fitness indicators. The workshop of the IdEAL CIC organization (UK, Boston) focused on the presentation of activities on the farm for the training of child-friendly horses, i.e. to work with horses, leading them, not riding. The farm plays the role as an important inclusive meeting place for everyone, who is interesting.

The intervention program "You are part of us" was realised in Greece (Athens / Pireo) in the modern equipped hotel "Korelko" with swimming pools, beach and sports grounds. All researches participated in the intervention program monitoring and realisation. The intervention program "You are part of us" included daily yoga exercises, bocce sport, modified volleyball, athletic elements (including the popular javelin and relays), water games, swimming lessons including diving in the pool and in the sea. Intervention procedure consisted of the ten-day camp of adapted physical activities in the regime of controlled physical activities under coaches guiding. Here, PRE and POST research screening of diagnostic indicators was performed in 17 participants with moderate intellectual disability in the beginning and in the end of the ten-day intervention. Intervention program was supplemented with voluntary culture evening program of art, handicraft activities,

shadow theatre and 2 well-chosen tourist trips. During the trips, the integration among the public and the public acceptance of the camp participants was evident. As an important moment of the intervention, we state that the parents of the children worked as assistants in the intervention program, so that in the intervention program the parent always assisted a child other than his own. Outside the program, the parents were with their child. In this way, the child's social integration and independence and detachment from parental assistance were deliberately developed.

Statistics

For obtained data evaluation the method of Qualitative Comparative Analysis (QCA) was used, because the analysed samples were relatively small (compare Thomann, & Maggetti, 2020). QCA is a means of analysing the causal contribution of different conditions, e.g. aspects of the intervention to the outcome of interest. Configurations were evaluated in terms of coverage (the percentage of cases they explain) and consistency (the extent to which a configuration is always associated with a given outcome). Data for the QCA analysis was collated in a simple matrix form, where rows = cases and columns = conditions, with the rightmost column listing the associated outcome for each case, also described in binary form. Dichotomisation of quantitative measures about the incidence of a condition also were carried out with an explicit rationale.

RESULTS AND DISCUSSION

Mental resilience as a factor of the psyche has been studied. There was a positive change in the Sample 1, see Fig. 1. The number of movements produced after 10 seconds, their slight decrease after 20 seconds and their relative preservation after 30 seconds are statistically significant. The total value is

also statistically significant. There is a slower onset of fatigue and area, between the PRE and POST testing. The mental stability and adaptation of the

group has been improved.

The results in the second group Sample 2 have similar changes, with the tendency to improvement, see the Fig. 2.

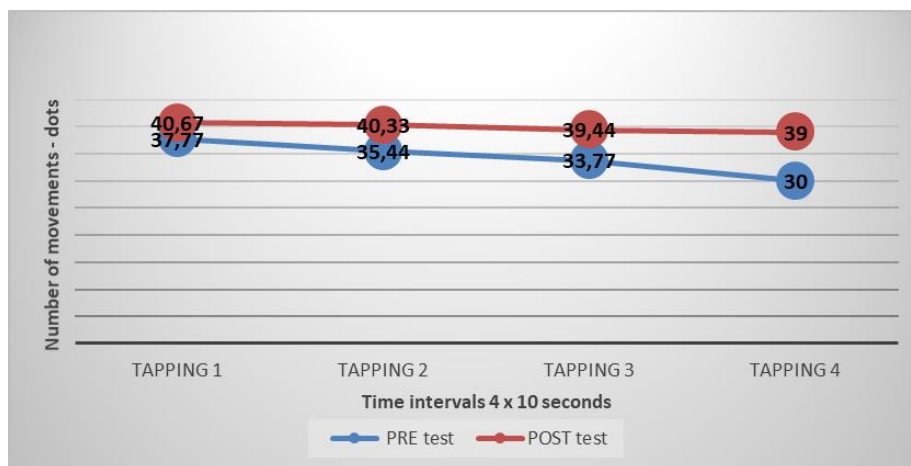


Fig. 1 Results of the tapping test in Sample 1 in comparison of the PRE/POST test (n=10)

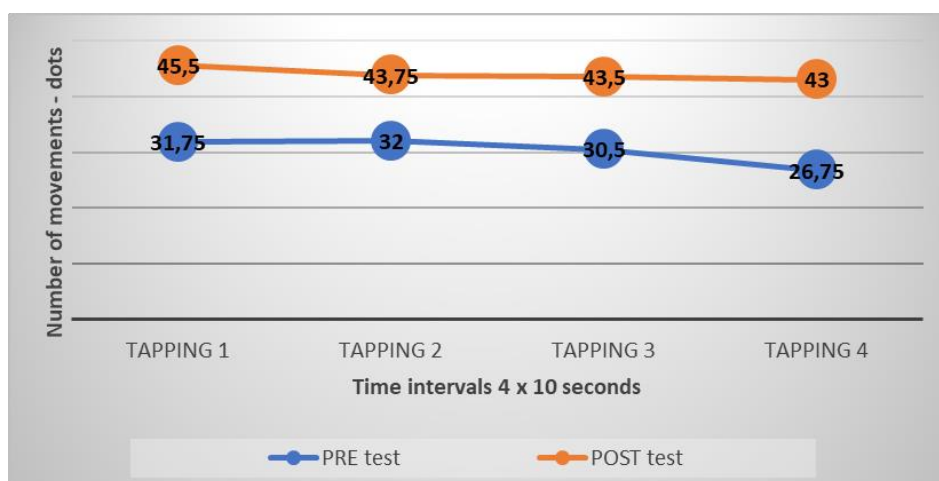


Fig. 2 Results of the tapping test in Sample 2 in comparison of the PRE/POST test (n=7)

Positive changes were observed in the “Attention in concentration”, i.e. the attention in the sense of concentration keeping (vigilance) was expressed. This fact we can discuss as a state of alertness in which an appropriate response is made to a stimulus in persons with intellectual disability (Atherton, Crickmore, 2011; Davis, 2011). The

higher the result, the higher the concentration. This indicator has no established numerical value (norm), as it depends on the specific stimulus material used. The first measurement, PRE test, gives an average of 14.83 and the second one, POST test, has 18.33 which shows a significant tendency to improve the “Attention in concentration”.

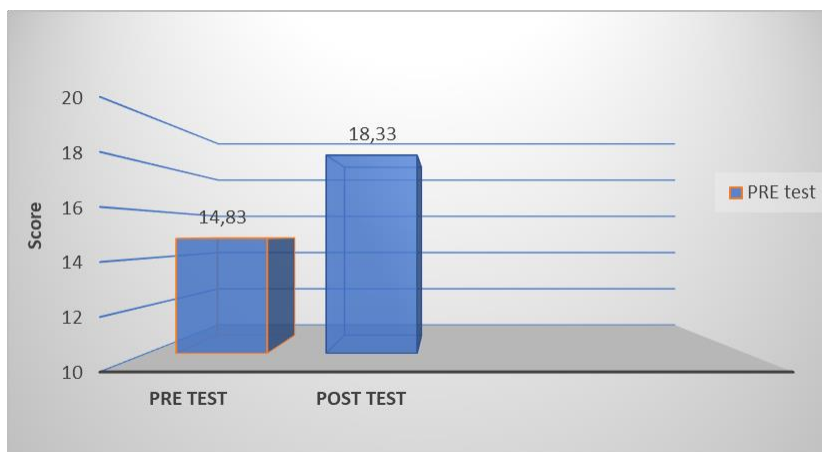


Fig. 3 Positive changes of Bourdon test item “Attention in concentration” in the comparison of PRE/POST test (n=17)

The results “Attention in switch ability”, where the attention in the sense switch ability keeping, are expressed in the Fig. 4. Attention switching is related to levels of sustainability and is one of the

indicators of attention. The first measurement gives 56.27% and the second one decreases to 45.59%, which shows a tendency to improve (see Tab. 1) for the switch ability, which for the group is within the average levels.

Tab. 1 Bourdon test - evaluation of the “Attention in switch ability” measurement

MISTAKES [%]	SWITCH ABILITY
0 – 20	Very high
21 – 40	High
41 – 60	Average
61 – 80	Low
81 – 100	Very low



Fig. 4 Positive changes of Bourdon test item “Attention in switch ability” in the comparison of PRE/POST test (n=17)

In these measurements, emotional instability was examined as a factor of the psyche. From the results obtained in the Fig. 4, it can be seen that the mean values of the execution time in the item of "Attention-switch ability" decreased by 28 seconds, which tends to improve. We can discuss the influence of yoga exercises and yoga set "Greetings to sun" with proper breathing and slow provided movements, what may harmonise the psychic state of participants, improve the mobility of their body and mind, and positively affect the functioning of attention ability. Muscle sensation and spatial orientation were improved. Yoga formations harmonize and strengthen the entire nervous system. Regular day-to-day exercise of several assembly kits removes defective posture, relieves back pain, stress and digestive problems (Ma-

heshwarananda, 2005, Maheshwarananda 2014, Krejčí, Kornaťovská, 2017). It has been an effort to train the sets smoothly in accordance with breathing, preferably with closed lids. The aid was the imagination of the rising sun, where the individual positions are applied the idea of what part of the body is the most warmed by the sun.

From the results demonstrated in the Fig. 5, it can be seen that the mean values of the execution time decreased by 28 seconds, which tends to improvement. The decreasing of errors also show an improvement. From the results obtained in Fig. 6 we can see that the first measurement is 46.56, while the second measurement is 26.33. Decrease by 20.23 counts for the whole group. All this shows a tendency to improve the emotional structure.

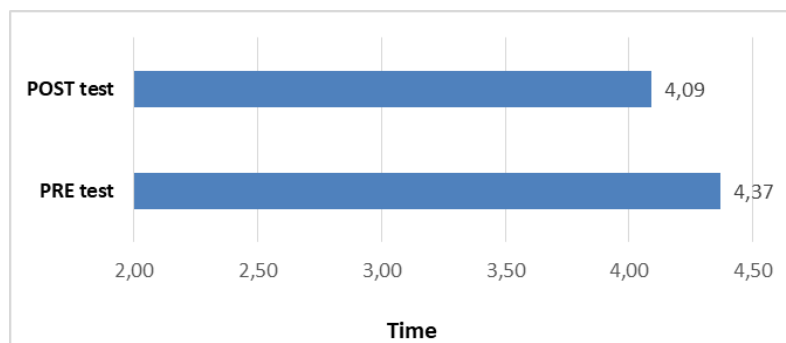


Fig. 5 Results of time averages of the model tremometry test (n=17)

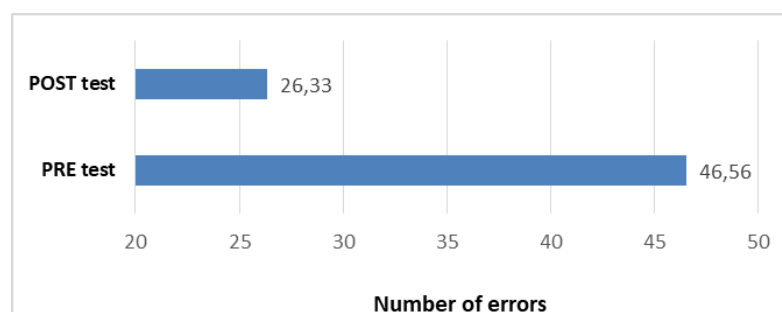


Fig. 6 Results of errors number averages of the model tremometry test (n=17)

PRE and POST results of the Williams Creativity test indicators of the investigated sample S1 are demonstrated in the Fig. 7. Positive changes are observed in the measured indicators of creativity, as the biggest increase is 27 points, development 26 points, flexibility 26 points, originality 21 points, lightness 4 points. The results of the experimental sample S1 show improvements in developing and stimulating children's ability to express what they feel and think through drawing. Imagination and fantasy are observed in children's drawings designed on the stimulus material. This develops and stimulates the ability of children to convey figuratively the essence of the depicted, through name, subtext or hidden meaning, to express their inner world. We declare meaning of the five measured indicators (see Fig. 7):

- Easy – productivity is determined by listing the amount of drawings that the child has managed to draw, regardless of their content;
- Flexibility – number of changes in the category of the drawing, starting from the first drawing.
- Originality – location / inside – outside the stimulus Fig. /, on which the drawing is performed.
- Development – symmetry-asymmetry, where the details are located, making the drawing asymmetrical.
- Name – richness of vocabulary / number of words used in the name / and ability to figuratively convey the essence of what is depicted in the drawings / direct description or hidden meaning, subtext.

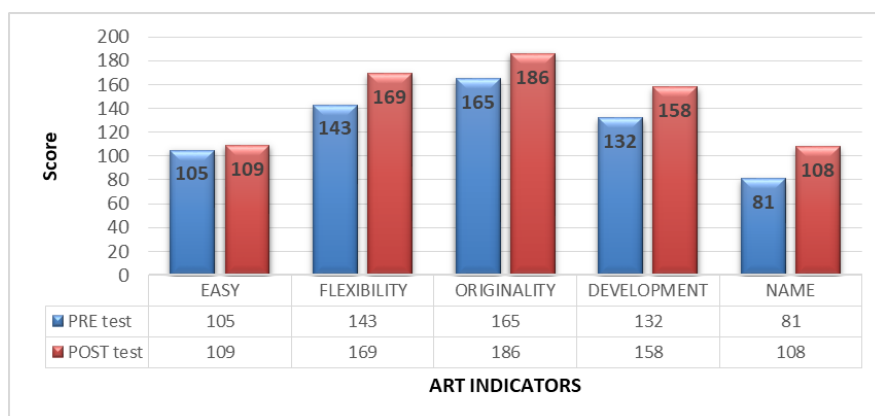


Fig. 7 PRE and POST results of the Williams Creativity test indicators of the investigated sample S1 (n=10)

All indicators show positive changes (see Fig. 7), being the largest in the name increase by 27 points, elaboration increase by 26 points, flexibility increases by 26 points, originality increases by 21 points, lightness increases by 4 points. The results show improvements in the development and stimulation of children's ability to express what they feel and think through draw-

ing. Imagination and fantasy are observed in children's drawings designed on stimulating material. This develops and stimulates the ability of children to convey figuratively the essence of what is depicted, by name, subtext or hidden meaning, to express their inner world.

As a limit of the presented study, it can be stated that the monitored groups were very small with a diverse diagnosis of moderate mental disability (Down's

syndrome, autism, cerebral palsy, etc.). A certain additional limit can be considered to be proof of the effect time of the performed intervention of 10 days. It would be desirable to take measurements after 3 months to demonstrate the long-term effect of the intervention.

Possibility to actively participate in controlled physical activities at any level is probably an important integration element for people with intellectual disability, as it is very closely related to the development of their social competences (Lepore, Gayle, Shawn, 2007; Mansell, & Beadle-Brown, 2010).

Movement programs in water for children with disability are aimed primarily at appropriate stimulation of their movement learning and are an important means for adequate health-oriented functional loading of the organism. Mastering independent movement in the aquatic environment is an important experiential activity that leads to an individual's awareness of their own body as an essential powerful means of movement. Floatation allows a wide range of applications in various fields of water therapy (leisure activities, rehabilitation, swimming lessons). It allows each child with disability to learn the aquatic environment in an entertaining and safe way, to remove the concerns of the aquatic environment. It is also possible to achieve self-confident and independent movement in the water, to develop and strengthen swimming skills, to experience relaxation in the aquatic environment, to develop group movement activities (Winnick, Porretta, 2020).

CONCLUSION

The presented changes study show positive tendencies towards, improved psychomotor, concentration and switching of attention. The Hypotheses H1: "After completing the ten-day intervention, the "Attention in concentration" score in

the Bourdon test will be significantly improved" was verified. The Hypotheses H2: "After completing the ten-day intervention, the emotional stability score tested through tremometry test will be significantly improved" was verified.

Emotional instability, as a factor of the psyche, has been improved, which is of paramount importance to the groups measured. The results show improvements in developing and stimulating the ability of children to express what they feel and think through drawing, developing imagination and fantasy. The social improvement is evident after the intervention from the communication development according the realised vocabulary development in monitoring children and youth with intellectual disability. The communication with others has increased as well, and others were willing to support the group members. Adaptation and ability to adapt to a new environment (hotel, sea, beach, sport grounds, etc.) are improved, as well as a positive changes in concentration and attention.

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