
EUROPEAN of Physical Education and Sport

Has been issued since 2013.
E-ISSN 2409-1952
2020. 8(1). Issued 2 times a year

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Postal Address: 1367/4, Stara Vajnorska str., Bratislava – Nove Mesto, Slovakia, 831 04 Release date 05.06.20.

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Founder and Editor: Academic Publishing House Researcher s.r.o. Order № 21.

European Journal of Physical Education and Sport

2020

Is. **1**

C O N T E N T S

Articles

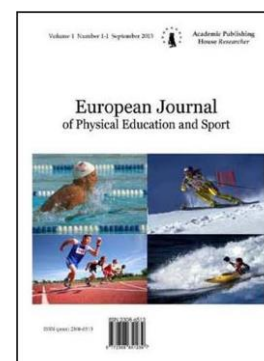
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Published in the Slovak Republic
European Journal of Physical Education and Sport
Has been issued since 2013.
E-ISSN: 2409-1952
2020, 8(1): 3-10

DOI: 10.13187/ejpe.2020.1.3
www.ejournal7.com



Articles

Suggested Educational Units Using the Game-Oriented to Improve the Coordination Skills of Primary Students

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Abstract

The aim of the study was to determine the effect of proposed educational units, by directed game, on the balance, compatibility, and speed of reaction of primary school pupils (aged 09 ± 12 years). We assumed that the units positively affect the development of balance, compatibility, and speed of reaction. We applied them on a sample of $n = 26$ students, divided into two groups of 13, experimental and control. We relied on an eight race test, a foot-to-foot balance test, and Nelson Kinetic Response. They used the SPSS program in the statistical analysis of the data got. We considered the results of statistical tests significant with $p < 0.05$. The test physical that participants used were a test run in the form of the number eight and The walking test is a foot behind a foot and Nelson test for the motor response, and eight educational units were placed at one educational unit per week within two months, to contain physical exercises and kinetic activities focused on the use of guided play, and program content included walking and balance exercises and games, running exercises and games, jumping exercises and games, exercises and compatibility of games with movement games. The results of the pre-test of the experimental sample showed that the arithmetic mean was (15.41 ± 2.12) , but in the post-test, the experimental sample got a mathematical mean of $(15, 39 \pm 2.08)$ and the calculated value of (T) was (11.61 ± 0.55) . It is smaller than the table ($T = 1.78$, $df = 12$, $p < 0.05$) and it is situated at the level of significance. This means that the difference between the pre-test and the post-test is a significant difference which is not statistically significant. Finally, we concluded that there was an improvement in the quality of compatibility in the experimental sample.

Keywords: educational units, guided game, compatibility skills, primary school.

1. Introduction

Good compatibility is one of the basic requirements for practicing motor skills, which is formed by muscle contractions, so that each joint muscle serving motor skills should contract and relax at the appropriate time, where harmonic exercises should be used to acquire and master the different movements and sport skills in a meaningful way, as difficult, complex and overlapping movements often need simplification and progression, and sometimes even fragmentation, for the learner to be able to perform it in its complex form as a complete skill later on (Othman, 2013; Ahmed et al., 2010; Abdel hadi, 2004; Doraj, 2012).

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Playing is an important educational medium, working to create children at this critical stage of human development, and one of the most vital and important activities for children's lives. It is a necessary learning experience through play that enables children to master skills and gain insights into cognitive, social, physical and psychological aspects, and therefore there is a close relationship between child intelligence and play (Harbach et al., 2020; Suhail, Mahdi, 2007; Harrow, 1990).

Playing is often described as an automatic activity that is not tied to external factors, and examples of play are from invertebrates to monkeys, so we need to classify playing activities into at least four categories, which need to be analyzed in at least four different sets of conditions. This is the random play that begins in early childhood, the regular semi-play that begins in the middle childhood, the regular play that appears with the late childhood, and the abstract play that accompanies adolescence (Ammar et al., 2007; Suhail, Mahdi, 2007; Victor, 2017).

Learning by playing is a modern teaching technique, and children are the focus of learning, and play is a guided activity by children to develop their mental, physical, and emotional behaviors and abilities, while also making fun and fun, and the learning style by playing is to use play activities to gain knowledge, bring science principles closer to children, and extend their cognitive skills (Harbach et al., 2013; Abdelhadi, 2004; Suhail, Mahdi, 2007; Memmet, 2008).

Educational studies have demonstrated the importance of playing games in gaining knowledge and communication and interaction skills if they are best exploited and organized, and play is a pedagogical medium that works to a great extent to shape the personality of the child in its different dimensions, social outreach for more interaction with others, compulsory engagement in school education and integration with the school environment. It is also the key to building a child's productive personality by investing games in his or her economic and financial concepts. (Harbach et al., 2018; Marwa, 2010; Dos Santos, Vieira, 2013).

Despite efforts in this regard, physical education has not been as high as it is intended at the primary level for many reasons, and the goals set for physical education at this stage (9-12) are aimed at developing physical fitness and giving children the opportunity to express themselves and their potential, as far as possible. The situation and situation require that appropriate solutions be chosen, in line with their mental and physical abilities in terms of their development and improvement (Harbach et al., 2016; Muhammad, 2004; Cairney et al., 2010).

Based on some previous studies, B. Harbach, and others 2018, the effectiveness of the teaching strategy of playing with the development of some physical and motor capabilities in secondary school students, and the study of Marwa Mohammed Ali Sulaiman, entitled the effectiveness of a guided play program in addressing the inadequacy of some cognitive abilities of kindergarten children (Benzidan, 2011; Harbach et al., 2019; Cherng, 2007).

As mentioned above, the use of guided games is an important issue that has not received the attention of researchers in the sports field in its general capacity and in physical and sports activities in educational institutions in particular. Through the survey conducted by researchers within educational institutions and some field visits, it was noted that the physical and sports classes lacked the types of training that contributed to the development of the physical, professional and mental capacities of this group, which needed care and attention in the exercise of physical and sports activities. Researchers have been interested in using a training program using directed play and in learning its impact on some of the compatibility abilities of primary school students.

2. Methods

Research methodology: Researchers used the experimental method using two groups, one experimental and one control, to match the nature of the research.

Research and Sample: The research Society is 90 children between 9-12 years of school season 2018/2019 in a deliberate manner, and the research sample included 26 male pupils. A sample officer of 13 primary-year pupils was divided B and a teacher-led program was applied to them.

The two groups were chosen in the deliberate way, as the proposed units were applied to the experimental sample after being presented to a group of professors in the field of physical and sports education, sports training and movement sciences, and researchers performed the equivalence between the experimental and control eyes. This is by examining some variables that will affect the experimental variable of compatibility capabilities.

Research Tools: After getting acquainted with the methods of selecting samples, we now turn to some means of collecting information through questionnaire, interview and observation, and these three types can be relied upon by every specialist in his profession, whether that specialization is research science or social science, but it depends on the nature of the subject and the type of information to be collected.

Physical tests: One of the most important methods used in experimental research as the basis for objective evaluation is the most effective way to achieve accurate results, so researchers have relied on standardized tests that measure the compatibility of children on the research sample associated with the subject matter of study, and these tests have been presented to experts for arbitration, as follows:

Test run in the form of the number eight:

Test objective: Measure student compatibility.

-Tools used: A person to determine the distance, my time to determine the time of each pupil, a dicameter bar (Muhammad, 2004).

- Working method: two persons are placed so that the distance between them is six metres, the child starts to run in the form of the number eight so that the child can lean on the two persons to determine the place where he or she changes direction, the child runs four sessions to determine the time of his or her choice.

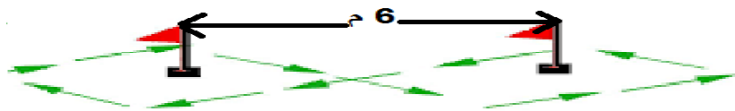


Fig. 1. Shows the stages of running a run as 8

The walking test is foot behind a foot:

The purpose of the test: To measure the balance of the student.

- Instruments used: timer, decameter tape, plotter, etc.

- Method of work: The distance of 6 meters is determined by plos, where the student stands at the first pad and hearing the whistle, the student starts to walk behind to stick to reach the second pad for the attempt to be correct, then we record the time for each student (Abu Shun, 2002).



Fig. 2. Shows how the foot-behind-the-foot walking is performed

Nelson test for motor response:

The objective of the test: to measure the student's reaction speed.

- Instruments used: chronometer, decameter, markers.

- The method of work: the student stands in front of the teacher who holds the chronometer with one of his hands, lifting it upwards, then quickly moves his arm, either to the left or to the right and at the same time executes the stopwatch, so that the student executes at full speed in the direction indicated by the teacher, and when he reaches the student at the end of the previously determined distance, which is a distance of (6.4 m) The teacher stops the stopwatch to record the time achieved by the student (Harbach et al., 2016).

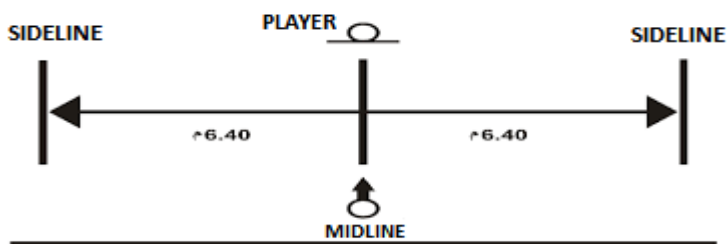


Fig. 3. Shows how Nelson's kinetic response test is performed

Suggested educational units:

To achieve the objectives of this research and solve its problem, the researchers selected two samples, the first experimental and the second control, so that a set of tribal tests and proposed units would be applied to them, and these units were applied to the experimental sample, and these units contained a set of simplified games that would develop consensual skills. The total number of proposed units was 08 units at the rate of one teaching unit per week in two months.

A. foundations of the course development:

The researchers constructed the proposed units on a scientific basis, selecting program content, movement activities and physical exercises, focusing on a group of games to improve certain harmonic abilities of the research sample. 08 units were placed at the rate of one educational unit per week within two months, to contain physical exercises and kinetic activities focused on the use of guided play, and program content included walking and balance exercises and games, running exercises and games, jumping exercises and games, exercises and compatibility of games with movement games.

The proposed modules are based on a well-established scientific basis that takes into account all aspects of pupils' development, especially with regard to the characteristics of late childhood, which are characterized by physical, psychological or social development and in which physical activity plays a significant role in this development.

3. Results and discussion

Pre-testing for two sample searches

Table 1. T-test results for the significance of differences between the means of the tribal tests for the two research samples: degree of freedom 42 at the .05 significance level

Variables	Experimental sample		Control sample		Calculated T	Tabular T	sig
	Mean	SD (\pm)	Mean	SD (\pm)			
Length (m)	1.4	0.03	1.41	0.02	1.16	1.71	No sig
Weight (kg)	30.69	1.48	31.05	1.24	0.68		No sig
Running Test (Compatibility) (s)	18.29	1.01	18.03	0.96	0.65		No sig
Walking test (balance) (s)	15.41	2.12	15.56	1.97	0.18		No sig
Nelson kinetic response test (reaction speed) (s)	2.43	0.26	2.39	1.18	0.5		No sig

Discussion and analysis of pre and post test results for the two research samples:

From the table, some consensual capabilities do not have significant differences between the two groups, where the calculated value of T ranged between (18.18 ± 1.16) , and all of them are less than the tabular levels at the significance ($T = 1.706, df = 24, p < 0.05$), which confirms the parity and homogeneity of the two groups before conducting the experiment.

First: Running test in the form of 8 (compatibility)

Table 2. Results of the two tests for a running test in the form of 8

Sample	N	Pre-test		post-test		Calculated T	Tabular T	sig
		Mean	SD (±)	Mean	SD (±)			
Experimental sample	13	18.29	1.01	16.84	0.87	11.61	1.78	sig
Control sample	13	18.03	0.96	17.91	0.77	1.61		No sig

The results of [Table 3](#) of the pre-test show that the experimental sample got an average of (18.29 ± 1.01). In the post-test, the experimental sample got an average of (16.84 ± 0.87) and the calculated value of (T) was 11.61, which is greater than (C) The table, (T = 1.78, df = 12, p < 0.05). This means that the difference between the pre-test and the post-test is a statistically significant difference in favor of the post-test.

In the pre-test, the control sample got an average of (18.03 ± 0.96). In the post-test, the control sample got an average of (17.91 ± 0.77), and the calculated value of (T) was 1.61, which is smaller than the table (T = 1.78, df = 12, p < 0.05), this means that the difference between the pre-test and the post-test is a significant difference which is statistically significant.

Second: the test of walking feet behind the feet (balance)

Table 3. The results of the pre and post tests the walking test presented behind the feet (balance)

Sample	N	Pre-test		post-test		Calculated T	Tabular T	sig
		Mean	SD (±)	Mean	SD (±)			
Experimental sample	13	15.41	2.12	15.39	2.08	2.56	1.78	sig
Control sample	13	15.56	1.97	15.46	1.79	1.38		No sig

Observing the results of [Table 4](#) in the pretest, the experimental sample got (15.41 ± 2.12). In the post-test, the experimental sample got an average of (15.39 ± 2.08) and the calculated value of (T) was 0.53, which is less than (C) Tables, (T= 1.78, df = 12, p < 0.05). This means that the difference between the pre-test and the post-test is a significant difference which is not statistically significant.

In the pretest, the control sample got an average of (15.56 ± 1.97). In the post-test, the control sample got an average of (15.46 ± 1.39), and the calculated value of (T) was 1.38, which is lower than the table (T= 1.78, df = 12, p < 0.05), this means that the difference between the pre-test and the post-test is a significant difference which is not statistically significant.

Third: Nelson Motor response (reaction speed)

Table 4. Results of the two tests for the Nelson Kinetic Response Test

	N	Pre-test		post-test		Calculated T	Tabular T	sig
		Mean	SD (±)	Mean	SD (±)			
Experimental sample	13	2.43	0.26	2.4	0.25	0.55	1.78	No sig
Control sample	13	2.39	0.18	2.34	0.17	0.92		No sig

Observing the results of [Table 4](#) in the pretest, the experimental sample got (2.43 ± 0.26) . In the post-test, the experimental sample got average arithmetic of (2.4 ± 0.25) and the calculated value of (T) was 0.55, which is less than the tabular ($T = 1.78$, $df = 12$, $p < 0.05$). This means that the difference between the pre-test and the post-test is a significant difference which is not statistically significant.

In the pre-test, the control sample got an average of (2.39 ± 0.18) , while in the post-test, the control sample got an average of (2.34 ± 0.17) and the calculated value of (T) was 0.92, which is smaller than the table ($T = 1.78$, $df = 12$, $p < 0.05$), this means that the difference between the pre-test and the post-test is a significant difference which is not statistically significant.

The use of directed toys has a positive result in the improvement of some compatibility capabilities of Primary school students, and this is what we have noticed through [Table 2](#) in that there are statistically significant differences between the pre- and post-test of the experimental sample compared for all tests except Nilson's motor response test, as the This sample was applied to the proposed program using directed games, and the researchers attribute this to the positive effect of the proposed program based on the use of directed games, by focusing on the use of physical and sport activities represented by games in addition to compatibility development exercises, and the effect of indirect sensory experience in moving from the execution of motor skills during practice to the accompanying development of neuromuscular consensus, using motor activities selected in an organized manner to use directed play which helped to improve some of the students' consensual abilities, and harmony in line with what Abdel hadi (2004) has indicated that the higher the degree of muscle nerve-muscle compatibility in an individual, the more likely it is to be achieved, the more there is harmony and harmony between the different parts of the body and its muscles in action, the better it will be to achieve specific performance, as Ammar et al. (2007) point out, that school activities as part of the curriculum are affected by the nature of the content and are linked to it and with it in some way. Therefore, attention needs to be paid to the content of curricula and syllabuses in schools, especially for this category.

The researchers attribute the superiority of the experimental sample over the control sample to what was taken into account when developing the program. The researchers attribute the superiority of the experimental sample over the control sample to the scientific basis of unit construction in terms of taking into account repetition, intensity and volume during training, in addition to choosing exercises that depend on changing play and directions and balance and compatibility exercises, and that these exercises were It is performed in the form of games with the use of small tools of different sizes, colours and weights, and this result is consistent with the findings of the study by Harbach et al. (2016) and Benzidane et al. (2011) and the study by Marwa Mohamed et al. (2010) on the effectiveness of the use of directed toys in improving certain abilities of compatibility of the primary school pupils under study.

The researchers also refer to the statistical differences in [Tables 4](#) and [5](#) in the Running Test as 8 and the Walking Test to use a variety of activities using guided play as chain exercises by performing simple basic skills for guided games with accurate visualization of movement with increased suspense. This is consistent with the physical and skill requirements of the students. In addition to improving my father's kinetic awareness factors, it helps with general compatibility, and thus the improvement of harmonic abilities helps to use these abilities in everyday life. It is consistent with what Harbach et al. (2016) pointed out in his study The effectiveness of teaching

strategy with games in the development of some physical capacities among primary school students (15-16 years).

Referring to [Table 4](#), we find non-significant differences in Nelson's response to kinetic response (reaction speed), which the researchers explain that improving reaction speed requires more time, which is consistent with P. Victor (2017), N. Ahmed (2010). And Marwa et al., (2010) according to which always correct codified training depends on complex movements and shortens reaction time and that response time cannot be minimized, which is the time required for physiological processes and that reaction speed is one of the important and complex characteristics that require more training until it can be improved.

4. Conclusion

As a result, we think that the use of guided play is an important issue that has not received the attention of researchers in the sports field in its general capacity and in physical and sports activities in educational institutions in particular. Through the survey conducted by researchers within educational institutions and some field visits, it was noted that the physical and sports classes lacked the types of training that contributed to the development of the physical, professional and mental capacities of this group, which needed care and attention in the exercise of physical and sports activities. Researchers have been interested in using a training program using directed play and in learning its impact on some of the compatibility abilities of primary school students.

5. Acknowledgements

I would like to sincerely thank all those who participated in this study, especially the Directorate General of Scientific Research and Technological Development DGRDST for all the assistance provided to us in carrying out this research, as well as all the researchers, professors, students, their parents, teachers, administrators and all the administrative and pedagogical staff of the schools involved in the study.

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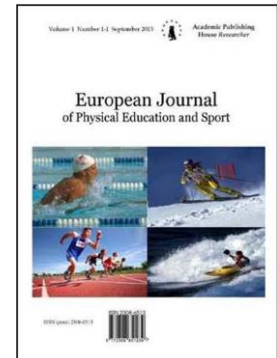
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Published in the Slovak Republic
European Journal of Physical Education and Sport
Has been issued since 2013.
E-ISSN: 2409-1952
2020, 8(1): 11-17

DOI: 10.13187/ejpe.2020.1.11
www.ejournal7.com



Experimental Integrated Characteristics of Physical Performance of Students with Chronic Health Conditions in Physical Education

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Abstract

The control of physical performance in physical training in physical education of students with chronic health conditions, which provides maximum mobilization of the body during the absence of physiological limits, is considered. The task of the work – implement analysis the dynamics of the physical performance during the training under the influence of experimental control technology in physical education students with chronic health conditions. Experimental integral characteristic of the dynamics of integrated students of different chronic health conditions under the influence of experimental control technology in their physical education is presented. Results of the study show that the application in practice of experimental control technology in physical education of students with chronic health conditions allows activating compensatory mechanisms and consequently significantly increasing of physical performance. Info empirical research confirms the practical effectiveness of the developed technology and its impact on the effectiveness of the functional state of an organism of students with disabilities in health. The experimental results are necessary for a comprehensive monitoring psychophysiological condition of students to assess their health and improve management in physical education of students with chronic health conditions. The information obtained empirical research for effective interaction between the subjects of teaching and healing process of physical education of students with chronic health conditions in the form of person-centered anthropic technology can be used to create a basis.

Keywords: physical education, student, chronic health conditions, control, physical performance.

1. Introduction

The high level of psychophysiological condition of students with chronic health conditions provides an opportunity for effective realization of their psychomotor and intellectual potential. This implies the existence of an appropriate level of efficiency to ensure the effective performance of professional duties in the production environment (Dalen et al., 2017).

A high level of efficiency, which provides the potential ability to perform the maximum amount of work satisfactorily, is formed against the background of a specific psychophysiological state of the organism (Santana et al., 2020). The latter requires a proper synthesis of its components, the interaction of which is aimed at achieving a positive result. The compromise balance of these components determines the level of physical performance, which, in turn, provides

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maximum mobilization of the organism in the process of activity in the absence of physiological limitations (Zhai et al., 2020).

Given the above and the presence of functional abnormalities in the health of students with chronic health conditions, the issue of forming a high level of efficiency of such students and its proper control during their stay in the university, becomes especially relevant.

The problem of ensuring a high level of professional readiness of student youth is the subject of scientific research of many scientists in the field (Adyrkhaiev, 2014; Iedynak et al., 2017; Viktorov et al., 2018). However, today the experimental research of domestic scientists is focused on the contingent of student without chronic health conditions, to which a significant amount of work is devoted. So far, the problems of institutional transformations of physical performance have been studied in a rather discreet scientific substantiation.

Analysis of the theoretical achievements in relation to the above, revealed the lack of research in this area for students with disabilities. A comprehensive study of the assessment of physical performance indicators in physical education of students with chronic health conditions is quite limited, which significantly complicates the identification of regular trends in this perspective.

At the same time, a constructive analysis of the scientific and methodological literature gives grounds to state that determining the effectiveness of physical education for students with chronic health conditions involves studying the dynamics of their ability to work as an indicator of professional suitability and informative integrated indicator of health (Adyrkhaiev, 2014; Iedynak, et al., 2017; Di Tore et al., 2016). In addition, it is believed that the quantitative assessment of physical performance is one of the main factors that determine the organization of physical education of students with chronic health conditions to avoid desynchrony in students, on the basis of which it is possible to deepen existing diseases (Anikieiev, 2015; Douglas et al., 2013).

The purpose of the study is to analyze the dynamics of physical performance in during training under the influence of experimental control technology in physical education of students with chronic health conditions.

2. Methods

Research methods. The following research methods were used to solve the tasks, namely: general scientific methods of theoretical level: analysis and synthesis, and methods of obtaining empirical data: pedagogical experiment, pedagogical testing, mathematical methods of digital processing arrays.

Calculation method for evaluating of physical performance (Metzler, 2017):

Physical performance = $700 - 3 \times \text{heart rate} - 2,5 \times \text{ADmedium} - 2,7 \times \text{age} + 0,28 \times \text{body weight}/350 - 2,6 \times \text{age} + 0,21 \times \text{growth}$

Where:

1. Heart rate – heart rate for 1 minute at rest
2. Average blood pressure (ADcr.). It is determined by the formula:
ADmedium = $\text{ADd} + (\text{ADcr.} - \text{ADd})/3$
3. Age/
4. Body weight (in kilograms)/
5. Growth (in centimeters).

The level of physical fitness is:

- low if the physical performance is below 0.375;
- below average – at physical performance is 0.376-0.525;
- average – at physical performance is 0.526-0.675;
- above average – at physical performance is 0.676-0.825;
- high – at physical performance is above 0.825.

Organization of the study. In accordance with the defined goal, the study was conducted on the basis of the Department of Physical Education of Lviv Polytechnic National University during a three-year course in a particular discipline. The number of experimental groups formed of students with chronic health conditions was equal – 120 boys and 120 girls, including 40 people of the same nosology: cardiovascular and respiratory diseases, diseases of the musculoskeletal system, pathologies of the nervous system, digestive disorders and metabolism and ophthalmic diseases. The research was conducted annually within the timeframe set by the university curriculum.

3. Results and discussion

Providing operational, informative and meaningful information to obtain accurate data on the state of physical performance students with chronic health conditions implemented through the use of mobile and easy to use and interpret data diagnostic calculation methods. Urgent research of a significant number of students is secured by the efficiency of its application (Metzler, 2017). It is also fundamentally important that the diagnosis covers the full period of training, and its results are easy to compare. Taking into account all the above, a method was chosen that indirectly evaluates the integrated of physical performance based on the study of informative parameters of functional reserves of the body, which is considered the best method for assessing the physical condition of students to manage the educational process of physical education.

The integrated monitoring of physical performance was carried out according to the operational-procedural criterion: control measurements were carried out, the results were generalized on the basis of quantitative evaluation of information. The null hypothesis assumed that the results taken from the general population of the sample are subject to the same distribution law, and the differences are random. The effectiveness of the test tasks by the students of the sample during the course of physical education in the university were calculated and presented their averages (Table 1).

Analysis of the results at the beginning of the experiment of physical performance indicators of EG and CG students showed no significant difference between them, which is statistically confirmed ($p > 0.05$). The study showed that significant differences in the level of physical performance between groups of different nosologies in boys and girls of the first year were also not found ($p > 0.05$). A low level of the research parameter (< 0.375) was found in 100 % of the studied sample of students at the beginning of the experimental study. In this aspect, we note that physical performance is limited by the state of the cardiorespiratory system and is its indirect criterion, which in all students of the study sample to some extent before the experiment has certain deviations from the appropriate values.

According to the variability of individual indicators, the groups were homogeneous, as evidenced by the value of the coefficient of variation V : in EG they amounted to 2.3-9.1 %, in CG – 2.2-11.7 %, which increased the objectivity of conclusions about the effectiveness of the developed technologies in physical education of students with chronic health conditions.

The use during three school years of experimental and current versions of the content of the control system in the physical education of students with chronic health conditions led to the following results. The introduction of the developed technology in the educational process of students with chronic health conditions contributed to the development of positive processes in the body of students, which is reflected in the dynamics of physical performance. Accordingly, these changes lead to the neutralization of negative mental symptoms of fatigue, increase the tone of the central nervous system and, above all, the brain, which leads to an increase in the level of efficiency and normalization of neurodynamics in general. As a result, the parameters of the psychophysical state improve: perception, thinking, processing, judgment, increases the ability to abstraction, improves memory, and so on.

The results of statistical-probabilistic analysis of the obtained results of test control show that at the end of the study the average indicators of physical performance in EG students in general on average reach the upper limit below the average level.

However, it was found that the relative values of physical performance in students of different nosologies significantly level. The analysis of the obtained statistical data shows that the lowest indicators of physical performance for the period of experimental research are observed in students with neurological diseases. Specific lesions of the emergency, cause a significant disability, as we see in our case: the level of physical performance in students of this nosological group, compared with others is much lower. In the first year of study, its quantitative indicators undergo virtually no qualitative changes in students with neurological diseases. However, by the end of the study we observe their increase to 34.36 % ($p > 0.05$). Note that in this nosology, the rate of physical performance is characterized by the most pronounced sexual demorphism. At the same time, the insignificant growth rates of physical performance in students of this nosology are explained by the low level of motor activity and a much higher incidence rate, compared with other nosological groups.

We assume that a significant increase in hemodynamic parameters in EG students and with cardiovascular systems diseases during the experimental study ensured the establishment of compensatory mechanisms in their body to maintain optimal performance. As a result, the growth of physical performance in this nosological group before the end of the experiment is up to 25.62 % ($p > 0.05$).

Table 1. Dynamics of physical performance of students of research groups

NOSOLOGY (disease)	Course	Sex	EG			CG			p
			X	S	%	X	S	%	
Cardiovascular systems	I	m	0,3465	0,0116		0,3429	0,0121		>0,05
		f	0,3297	0,0095		0,3291	0,0077		>0,05
	II	m	0,4041	0,0180	16,62	0,3437	0,0155	1,39	<0,05
		f	0,4024	0,0154	22,05	0,3299	0,0109	2,43	<0,01
	III	m	0,4353	0,2417	25,62	0,3443	0,0127	4,08	<0,001
		f	0,4105	0,233	24,51	0,3302	0,0133	3,34	<0,01
Respiratory systems	I	m	0,3501	0,0122		0,3541	0,0155		>0,05
		f	0,3343	0,0128		0,3321	0,0109		>0,05
	II	m	0,4101	0,0184	17,13	0,3547	0,0123	1,69	<0,05
		f	0,4088	0,0135	22,28	0,3326	0,0117	1,50	<0,05
	III	m	0,4412	0,0151	26,04	0,3550	0,0107	2,54	<0,01
		f	0,4208	0,0163	25,87	0,3328	0,0128	2,10	<0,01
Nervous systems	I	m	0,3201	0,0149		0,3209	0,0137		>0,05
		f	0,3051	0,0188		0,3001	0,0169		>0,05
	II	m	0,3318	0,0151	3,65	0,3212	0,0155	0,93	>0,05
		f	0,3177	0,0167	4,12	0,3005	0,0134	1,33	>0,05
	III	m	0,4301	0,0212	34,36	0,3215	0,0183	1,86	<0,01
		f	0,4082	0,0207	33,71	0,3007	0,0177	1,99	<0,001
Musculoskeletal system	I	m	0,3698	0,0079		0,3677	0,0118		>0,05
		f	0,3512	0,0101		0,3509	0,0125		>0,05
	II	m	0,4218	0,0124	15,76	0,3684	0,0125	1,91	<0,05
		f	0,4118	0,0177	17,25	0,3515	0,0172	1,70	<0,05
	III	m	0,4688	0,0214	26,77	0,3689	0,0185	3,26	<0,01
		f	0,4414	0,0211	25,68	0,3519	0,0167	2,84	<0,01
Digestive organs and metabolism	I	m	0,3386	0,0133		0,3392	0,0115		>0,05
		f	0,3253	0,0107		0,3241	0,0128		>0,05
	II	m	0,3891	0,0207	14,91	0,3397	0,0166	1,47	<0,05
		f	0,3986	0,0215	22,53	0,3244	0,0114	0,92	<0,05
	III	m	0,4319	0,0261	27,55	0,3402	0,0115	2,94	<0,001
		f	0,4112	0,233	26,40	0,3247	0,0128	1,85	<0,01
Ophthalmic	I	m	0,3201	0,0132		0,3209	0,0121		>0,05
		f	0,3124	0,0117		0,3119	0,0133		>0,05
	II	m	0,3526	0,0182	10,15	0,3214	0,0125	1,60	<0,05
		f	0,3603	0,0201	15,33	0,3122	0,0166	0,96	<0,05
	III	m	0,4067	0,0233	27,05	0,3218	0,0172	2,80	<0,05
		f	0,3913	0,0201	25,25	0,3125	0,0145	1,92	<0,05

Legend: EG – experimental groups, CG – control groups, m – male students; f – female students

In EG students with respiratory diseases, an increase in the quantitative indicators of physical performance (up to 25.87 %, $p > 0.05$) was accompanied by economization of ventilatory function and a decrease in energy expenditure for the implementation of the respiratory act. Given the fact that the functional reserves of the respiratory system are a limiting factor of physical performance, such changes are obviously due to the growth of functional reserves and increase the

adaptive capacity of the body of these students. Accordingly, this is accompanied by the optimization of gas homeostasis and respiratory function of the body as a whole, which was manifested to a greater extent as the level of physical performance.

Students with metabolic and digestive diseases also, compared with other nosological groups, reduced physical performance, due in some way to the presence in this group of people with hormonal disorders. And since hormones provide the intensity of metabolic processes, it largely determined the level of physical performance in students of this nosological group. However, at the end of the course of physical education, the positive dynamics of the studied indicator in this group reached 27.55 % ($p > 0.05$).

Slightly lower in qualitative characteristics indicators of the studied parameter in the group of students with ophthalmic diseases and slightly better expressed positive dynamics during the years of study at the university (up to 27.05 %).

The annual change in indicators in the experimental groups differed significantly. We follow a clear trend of the dynamics of the studied parameter during the courses according to sexual demorphism, namely: in girls a significant improvement in the quality of physical performance occurs in the second year, with further stabilization, and in boys – at the end of the third year. When evaluating the indicators, it is noteworthy that the largest values in absolute terms in girls at the end of the fourth semester. At the same time, the second-year students have the lowest CG: physical performance in these students has no significantly significant changes before its completion ($p < 0.05$), which accordingly indicates a decrease in the aerobic potential of the body and, consequently, its resistance to stress. In general, at the end of the study, the average rates of physical performance in 70.8 % of CG students were virtually unchanged and correspond to a low level, according to assessment scales ($p > 0.05$).

Differences in the values of physical performance students EG and CG ($p > 0.05$) at the end of the class indicate the positive impact of the developed technology and increase the efficiency of the body during physical activity.

Our study is based on the fact that certain levels of physical activity in the process of physical education of students with chronic diseases should focus not only on the level of physical fitness of students but also on the real capabilities of their body due to health, that is physical performance (Bertills et al., 2018; Koryahin et al., 2019). Therefore, we have expanded our information on the use of physical performance indicators as one of the most objective criteria for health (Di Tore et al., 2016; Zhai et al., 2020). The lower the performance, the more carefully you need to adjust the load during training (Ayers, 2004).

The results of the study confirmed the available scientific data that the increase in the process of physical education physical performance in students is accompanied by a set of morphological and functional adaptive changes in various body systems (Overton et al., 2016; Zhai et al., 2020). Appropriate use of physical education classes helps to increase the level of physical performance, and thus increase the level of physical health (Bertills et al., 2018; Iedynak et al., 2017; Koryahin et al., 2019).

Scientific data on the control of the process of physical education of students with disabilities have been expanded and the feasibility of using in the control of physical performance (Anikieiev, 2015; Koryahin et al., 2019; Viktorov et al., 2018).

The difference in the quantitative indicators of physical performance can be traced in the aspect of sexual demorphism, namely, boys have an initial level of its quantitative indicator higher than girls ($p < 0.001$). The reduction of physical performance in the latter to critical values is obviously combined with those health disorders, which are based on failures in autonomic and endocrine regulation, given that the state of adaptation is determined by the functional maturity of hormonal and autonomic regulation of homeostasis (Douglas et al., 2013; Iedynak et al., 2017).

Our research confirms the available data on the specifics of psychophysical development of students with ophthalmic disease (Aiman et al., 2016).

4. Conclusion

Given that the level of physical performance is closely correlated with the level of functional state, physical fitness, motor activity and depends on the level of fitness, statistical analysis of the final data obtained at the end of the experimental study confirmed the practical effectiveness of the

developed technology and its impact on functional status, the body of physical performance students.

Thus, the results of the study show that the application in practice of experimental control technology in the physical education of students with chronic health conditions allows to activate the compensatory mechanisms and, as a consequence, significantly increase the level of physical performance (up to 34.36 % ($p > 0.05$), which indicates In general, the results of three-year (from the first to the third year) use of experimental technology in physical education of students with chronic health conditions, showed higher ($p < 0,05$) efficiency of the content of the control system in improving the condition of students with chronic health conditions,, compared to the current.

The obtained data of experimental-experimental integral characteristics of physical performance of students of different nosologies of students with chronic health conditions and taking into account that indirect indicators of working capacity in the course of performance of work worsen much earlier than its direct criteria, can serve as the basis for elucidation of adaptation mechanisms. Functional states of the body in the physical education of students with chronic health conditions

Prospects for further research are to study the dynamics of neurodynamic functions of students with chronic health conditions in the process of physical education in higher education.

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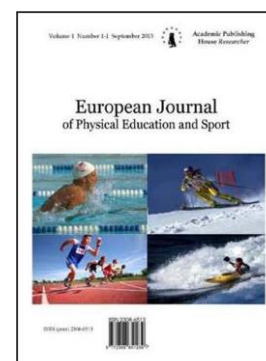
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Published in the Slovak Republic
European Journal of Physical Education and Sport
Has been issued since 2013.
E-ISSN: 2409-1952
2020, 8(1): 18-25

DOI: 10.13187/ejpe.2020.1.18
www.ejournal7.com



Static Strength Tests for Physical Education of Students with Chronic Health Conditions: Metrology Assessment

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Abstract

The paper deals with the question of metrological conformity of the methods of test control of the level of development of static force endurance of students of with chronic health conditions of universities. The purpose of the work is to perform a metrological analysis of the current methodology of test control of static force endurance of students with chronic health conditions of universities. Research methods: theoretical analysis, systematization, comparison of different views on the problem under study, generalization of scientific and methodological and specialized literature data and methods of obtaining empirical data: pedagogical experiment, pedagogical testing, mathematical methods of processing digital arrays, system-functional analysis. On the basis of the results of the conducted experimental study, the degree of authenticity of the test methods of control of static force endurance of students of with chronic health conditions was established. The possibility of using the results of the study as the initial empirical and theoretical basis of the reorganization of the test control of static strength endurance of students with deviations in the state of health to ensure the realization of the health problems of physical education of students with chronic health conditions is shown.

Keywords: student, chronic health conditions, control, testing, static strength endurance, authenticity, validity, reliability.

1. Introduction

It is determined that the student's state of health is determined by the level of physical and mental capacity (Ayers, 2004). Accordingly, the overall level of performance is determined by the level of endurance development (Baghurst et al., 2014). Endurance is a basic physical quality that is manifested in professional practice and daily life and ensures the proper development of professionally important physical and psychophysical qualities. One of the important components of physical performance is the level of static endurance (De Corby et al., 2005; Koryahin et al., 2013).

In scientific works (Ayers, 2004; Metzler, 2017; Golovchenko et al., 2001), static force endurance is considered as an important component of performance, which positively influences the vital activity of a muscle cell, its functional state, the metabolic, structural and energy processes in muscle tissue, maintaining the tone muscles and their implementation of the massage-corset function necessary for the normal functioning of the whole body. In addition, static endurance plays a key and equally important role in shaping the posture and maintaining the position of the

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torso: the formation of the correct spine and posture is provided primarily by the ability of the muscles to support static efforts (Overton et al., 2016).

Researchers emphasize (Adyrkhaiev, 2014; Di Tore et al., 2016) that the nature of the manifestation of this type of endurance depends largely on the stability of functional states and general muscular activity, on the combined activity of the cardiovascular and external respiratory system and of the central nervous system activity. In general, the level of development of static endurance depends on the functionality of all organs and systems of the body. This confirms the need for purposeful development of this physical quality in students with chronic health conditions in the process of their physical education: along with the fact that static endurance is important in the development of general physical fitness, it is also one of its most informative indicators (Keating et al., 2009).

2. Methods

Purpose: is to perform a metrological analysis of the current methodology of test control of static force endurance of students with chronic health conditions of universities.

The authors highlight the literature review and methods used in the study theoretical: quantitative and qualitative analysis and synthesis, induction and deduction, correlation, comparison and critical reflection, logical method, structural and systemic method, method of systematization and generalization; conduct the analysis of the system and methods of obtaining empirical data: pedagogical experiment, pedagogical testing, mathematical methods of processing digital arrays, system-functional analysis, empirically establish the level of authenticity of tests using correlation analysis (Vincent, 2005).

Participants: students of the Lviv Polytechnic National University of the first year of study were selected for research. 120 boys and 120 girls who entered the first year of study, 40 of them in groups with chronic health conditions with diseases: cardiovascular system, respiratory system, musculoskeletal system, nervous system, digestive organs and metabolism, ophthalmic. The study sample was formed according to students' illnesses. The requirements for the adequacy of its volume at the level $p < 0.05$ were met.

2. Discussion

The analysis of literature in the field of theory and methods of physical education (MacDonald et al., 2019; Koryahin et al., 2013) shows the search for the ways of the most effective differentiated management of the physical condition of students with health disorders. It is widely (Metzler, 2017; Golovchenko et al., 2001) recognized that its basis should be a comprehensive physical training in the wellness and training process and ensuring the functioning of the control system, which includes the diagnosis of the level of development of its components. According to scientific literature development (Baghurst et al., 2014; Dinucci et al., 1990; Di Tore et al., 2016; Plowman et al., 2014), considerable attention should be paid to methods of controlling and improving static endurance. However, there are some inconsistencies in the issue of the specificities of students with chronic health conditions.

Analysis of the latest scientific data on the system of control of static force endurance of students with chronic health conditions (Adyrkhaiev, 2014; Blavt, 2016; De Corby et al., 2005; Macleod et al., 2009) reveals certain, and in some cases, considerable differences in the obtained results. This fact is explained by a number of objectively existing factors: rather heterogeneous contingent of the studied students, differences in the used test methods, the need to take into account the individual physiological features of each student (Adyrkhaiev, 2014; Aiman et al., 2016); the presence of conservative (rhythm of development, linear dimensional features, histological features) and histological features and histological features basic and related diseases in the body) signs that characterize the influence of exercise on the body, etc (Aiman et al., 2016; Blavt, 2016; Overton et al., 2016).

However, the researchers are unanimous in the opinion that the use of test control of students with chronic health conditions plays a proper role in solving the health problems of physical education of universities (Adyrkhaiev, 2014; Blavt, 2016; MacDonald et al., 2019; Koryahin et al., 2013). According to the research, the need to create the necessary basis for the selection and practical use of simple and authentic tests, reflecting the level of development of

static endurance at different stages of physical education of students with health disorders, is quite relevant and significant (Ayers, 2004; Macleod et al., 2009; Blavt, 2016; Overton, et al., 2016).

At the same time, there are many questions today regarding the effectiveness and validity of current test methods for controlling the level of static endurance in students from of students with chronic health conditions and interpreting the results of the tests. The analysis of the scientific literature (Baghurst et al., 2004; Dinucci et al., 1990; Geoffrey et al., 2012; Koryahin et al., 2019) conducted from these positions testifies to the fact that there is insufficient research on the problem and the isolation of the discussion points. The vast majority of existing research on static strength endurance testing has focused mainly on the testing of students with a high level of health, but these issues remain relevant concerning the students with chronic health conditions. With the obvious theoretical and practical significance of the above problem, it is now one of the virtually unexplored.

The significance of our study is determined by the decisive importance for the effective physical education of students with chronic health conditions, the existence of an adequate system of control of static endurance on the one hand and the lack of its metrological justification – on the other. An effective tool for implementing this approach is the detailed analysis of the metrological support of the current methodology of test control of static endurance (Bassett, 2000; Vincent, 2005). The result of this analysis is to substantiate the objective criteria for effective management of students' physical fitness development. Developing a problem of this nature is of practical and scientific interest (Ayers, 2004; Plowman et al., 2014; Silverman et al., 2006; Zhu, 1998). Considering the aforementioned and at the same time insufficiency of elaboration of this problem, we were prompted to consider an important scientific and applied issue that needs to be solved, which actualizes the choice of the research topic.

4. Results

Testing in the form of exercises from static postures to a certain group of muscles is used to assess the status of static endurance of students with chronic health conditions of universities. A common method of assessing static endurance, according to which the test process is monitored, is to perform a series of exercises to hold the appropriate posture in accordance with control standards. The main indicator of static endurance of different muscle groups in tests is time (in seconds) and comparison of the obtained results with the test rating scales (Blavt, 2016; MacDonald et al., 2019).

The choice of test methods for the control of motor performance is based on the fact that the choice of the method by which the study is conducted, largely determines the success of the study. Considering the specificities of the contingent of students with chronic health conditions, the following factors should be taken into account in the selection of test control methods:

- the method should be an adequate test task;
- the method used should not further affect the functional state of the student's body, taking into account the presence of diseases;
- tests must not contain complex motor skills that require long mastering;
- the results obtained by the application of one or the other method must be presented in a readable form (Bassett, 2000; Baghurst et al., 2015; Zhu, 1998).

Based on the above, we use a set of tests of equivalent nature to evaluate the level of development of static endurance of students with chronic health conditions. A good set of tests can be characterized as homogeneous, which is confirmed by the obtained correlation values ($r = 0,400-0,551$) (Vincent, 2005). This made it possible to use the indicators of the selected test exercises for a comprehensive assessment of the student's static endurance of students with chronic health conditions.

Using scientific intelligence (Di Tore et al., 2016; Geoffrey et al., 2012; Koryahin et al., 2019) find also the most important functional function that is used in the process of physical search, diagnosed, and now need to get active information about the state of the study being investigated as a result of the results, and, accordingly, the necessary mathematical information, as well as the correct system of documents – the most important system-forming factor of active management of the process of physical cultivation. As a diagnostic method, testing requires a trusted activity review service (Baghurst et al., 2004). The answer to the provisions of test theories,

the effectiveness of the test search, was used only in the effectiveness of test trials by the basic metrological level of theoretical tests (Zhu, 1998).

Theoretical data that contains a theoretical theory leave a thorough general theoretical theory. We work with them, but this was the most important thing that was shown at an authentic studio. Authentication metrics may be available to see some test that can be changed, or to lose sense of what it is trying to put into practice. The paper confirmed that a number of individuals have been authentically identified as trusts: trust and validity (Blavt, 2016; Vincent, 2005). To determine the reliability of the tests used to monitor the level of development of static endurance, an experimental study of the evaluation of this quality of students with chronic health conditions was conducted. Quantitatively, the degree of authenticity of the test trials is expressed by the coefficients of reliability and validity (Vincent, 2005). The results are shown in Table 1.

Table 1. Authenticity of tests of level of development of static endurance

Statistical parameters	Test tasks (s)									
	Holding a corner in a sitting position		Lifting the trunk into the saddle from the supine position		Lifting the legs to the corner 45° from the lying position		Hold the torso parallel to the floor in a supine position		Holding the feet at an angle of 45° with load	
	f	m	f	m	f	m	f	m	f	m
M	18,1	28,8	23,7	39,2	33,3	48,8	5,6	18,6	23,9	33,4
S	3,5	4,7	5,8	6,1	7,6	12,2	1,3	4,2	4,1	5,8
V (%)	30,1	32,4	33,1	38,4	45,2	46,1	43,8	42,5	30,5	30,2
Authenticity of the test										
Reliability	0,676	0,700	0,711	0,702	0,671	0,785	0,654	0,623	0,758	0,756
Validity	0,251	0,267	0,354	0,435	0,300	0,451	0,291	0,298	0,346	0,319

*m – male students; f – female students

According to the results of the monitoring, the relatively low reliability of each of the test trials (0.75-0.67 – limits acceptable only for the characteristics of a particular group and low) and the validity (0.28-0.35 – limits of low and medium) determines their feasibility complex use: it is proved that the reliability of estimation of controlled indicators increases with the use of more equivalent tests (Plowman et al., 2014).

Test theory emphasizes (Zhu, 1998) that there is no fixed value of authenticity that would allow the test to be considered acceptable. It all depends on the importance of the conclusions drawn from the application of the test. Considering the peculiarities of the contingent of students with chronic health conditions, it is not possible to make general conclusions about this. Empirical characteristics that are determined empirically are significantly influenced by the nature of the sample used to validate the test (Vincent, 2005). To characterize the sample, a variation coefficient was determined in each test trial. The results of this indicator (V) within the range of 28.6-47.4 % (significant variation) indicate that the stability of the results is below the required metrological reliability standards. Such values of the coefficient of variation make it possible to conclude that the statistical population of the studied contingent of students is heterogeneous, and the average value is atypical, so it cannot be used as a generic indicator of this population, and accordingly, to draw certain conclusions on this basis.

This, to a large extent, influences the interpretation of the test results obtained. An objective interpretation is obvious if the position of the test results is uniquely defined on the test scale – it is problem-free (Bassett, 2000). However, if there are no anchor points for the classification of the studied contingent, then the degree of freedom in interpreting the test results becomes too high. According to the theory, test scores are accurate estimates of the subjects (Koryahin et al., 2019). But for the contingent of students with chronic health conditions, they only represent these values with some precision. In our case, test scores of the subjects are given without taking into account the objective limitations due to the presence of a specific disease in the body. Disruption of certain

functional systems of the body of students due to the presence of disease in the body causes some lag in physical development and decrease in the level of physical fitness (Adyrkhaiev, 2014; Blavt, 2016) That is, the presence of physiological features is not considered at all in testing in groups of students who are not formed by nosology.

In practice, there is a situation where students with completely different physiological condition of the body are put in the same conditions, which makes it impossible to ensure standardization and objectification of the testing procedure. Apriori, the degree of authenticity of the techniques used depends on these factors. Given the above, the obtained values can not be generalized: in students of different nosological groups, the criterion for the diagnosis of static endurance can not be average. The use of such criteria leads to the fact that the empirical validity of the test is not ensured, since the assessment criteria do not agree with the nature of the student's illness. All authenticity studies should be performed on representative samples (Vincent, 2005). That is, there is an objective need to overestimate the reliability of test trials in relation to the nosology of students: in this way we try to ensure that the sample is representative (Table 2).

The results show that one and the same test has a "high" degree of authenticity in a certain nosological group of students, while having a "low" one for others. Accordingly, the results of the metrological analysis of current test methods for controlling the level of development of static endurance are not reliable for the whole contingent of students, with chronic health conditions. The least degree of authenticity of the test methods used is observed in groups of students with diseases of the cardiovascular, respiratory and nervous systems. This is due to the fact that the performance of a series of test trials is associated with exertion, accompanied by respiratory retardation and blood redistribution phases. Students with neurological diseases, accordingly, have difficulty adjusting their breathing when coordinating it with movements in such exercises.

Table 2 Assessment of the authenticity of test tests of the level of development of static student endurance in accordance with nosology

Test tasks	NOSOLOGY (disease)											
	Cardiovascular system		Respiratory system		Neurologica diseases		Musculoskeletal system		Digestive organs and metabolism		Ophthalmic	
	R	V	R	V	R	V	R	V	R	V	R	V
Holding a corner in a sitting position	0,641	0,258	0,666	0,264	0,612	0,207	0,798	0,411	0,788	0,514	0,781	0,378
Lifting the trunk into the saddle from the supine position	0,674	0,288	0,723	0,241	0,623	0,212	0,77	0,475	0,813	0,411	0,748	0,407
Lifting the legs to the corner 45° from the lying position	0,677	0,267	0,756	0,351	0,603	0,215	0,789	0,315	0,878	0,499	0,778	0,350
Hold the torso parallel to the floor in a supine position	0,709	0,385	0,722	0,287	0,634	0,482	0,654	0,201	0,781	0,465	0,765	0,306
Holding the feet at an angle of 45° with load	0,718	0,340	0,789	0,319	0,654	0,448	0,674	0,353	0,815	0,391	0,803	0,386

*R – reliability f – validity

3. Discussion

It should be noted that strength endurance, as well as other qualitative characteristics of muscular activity, is quite specific and is determined by the morpho-functional state of the student

body, which, in turn, is caused by the presence of basic and comorbid diseases in the body (Ayers, 2004; MacDonald et al., 2019). That is, a rather topical issue related to the need for individual testing of students, taking into account all the nosological characteristics of the student body, remains unresolved in the above test requirements. It is impossible to eliminate, due to these factors, the error of metrology testing is impossible, but it is imperative to know them and take them into account in the test control process. As a prerequisite for determining the degree of authenticity by the criterion is that the sample, for which the final conclusions of the test are made, is fully representative (Vincent, 2005; Zhu, 1998). In practice, this requirement is extremely difficult to meet.

The greatest difficulty in interpreting the coefficients of authenticity is that the overriding goal of assessing the level of authenticity of test methods is to determine the practical value of the methodology being developed (Baghurst et al., 2004). The criteria in this case, in our case, act as indicators of direct value to the individual nosology of students. At present, a methodological approach has been developed in the system of controlling the static endurance of students with chronic health conditions developed on the basis of the average criterion (Blavt, 2016; Koryahin et al., 2019). However, the criterion of motor readiness may not be average for students of different nosology.

Considering all the obtained results of the conducted research, it is indisputable that there is a need to improve the test methods of the level of development of static endurance, which is based on the analysis of the data, which testify to the shortcomings of the metrological support of the current system of testing of students with chronic health conditions. Accordingly, this, in turn, causes a decrease in its efficiency. Thus, performing primarily the control function, it practically does not provide it, since the methods used require improvement of the metrological basis. This is largely due to the incompleteness of the development of conceptual ideas and provisions for the content, organization, regulatory support of such activities; lack of comprehensive studies of general trends, features of detection and change of morphofunctional indicators of students with various forms of the disease.

This complicates the development of test technologies aimed at implementing the functions of control of static endurance. Requirements for its evaluation criteria, adapted to the contingent of students with chronic health conditions, have not been formulated to date. There are no common approaches to the assessment of its normative parameters of different nosological groups of students with chronic health conditions. The foregoing demonstrates the objective need for research using complex criteria for dividing students into homogeneous samples, that is, those that are relatively stable over the study period, namely, stay in a university. Modern approaches to the organization of the control process and the principles of the organization of the special testing and its content allow for its modification of students with chronic health conditions and involve the integration of a wide range of factors that determine the effective development of the components of the control system as a whole.

5. Conclusion

1. As a result of the conducted research it is established that the current test methods of control of the level of development of static force endurance of students with chronic health conditions do not fully meet the requirements of the theory of tests. The relatively low authenticity of the techniques used ensures the proper level of control and diagnostics of the level of development of the investigated quality, and, therefore, cannot be the basis for the creation of further training programs in physical education of students with chronic health conditions. The existence of scientific-theoretical problems of using the existing test methods of control of static force endurance in the physical education of students with chronic health conditions of universities is clarified. The expediency of further search and development of scientifically substantiated test methods of control of the investigated quality and introduction of the necessary reorganizations in the testing process for realization of scientific and methodological provisions of metrological requirements in the test control of physical education of students with chronic health conditions of universities was proved.

2. Taking into account the shortcomings of the current organization and content of testing of static force endurance in physical education of students with health conditions, the directions of their improvement are determined, on the basis of general and methodological principles of the

control system, and in the formation of its content takes into account the peculiarities of the morphofunctional dynamics development students body. This provides for the consideration and pedagogical conditions for the effective implementation of the content of the test control of static force endurance in the process of physical education of universities, which determines the experimentally substantiated forms, means and methods of its development.

3. The possibility of using the research results as the initial empirical and initial theoretical foundations of the test control reorganization based on the model of knowledge of fundamental provisions of the theory of tests is offered and shown, which will increase the efficiency of diagnostics and allow to obtain a complex assessment of the level of development of static force endurance of students with chronic health conditions.

Further studies provide an analysis of the metrological support of other test trials that are currently used in the control system of students with chronic health conditions of universities.

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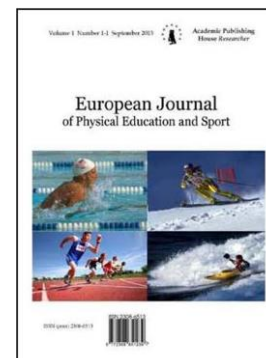
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Published in the Slovak Republic
European Journal of Physical Education and Sport
Has been issued since 2013.
E-ISSN: 2409-1952
2020, 8(1): 26-31

DOI: 10.13187/ejpe.2020.1.26
www.ejournal7.com



Integrated Approach Towards Diabetes Management

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Abstract

The World Health Organization (WHO, 1995) estimated that there were 135 million diabetics in 1995 and this number would increase to 350 million by the year 2030 with India emerging as the diabetic capital in the world with around 40.9 million diabetics currently and expected to rise to 69.9 million by 2025. This research paper assessed the effects of combination of Yoga therapy along with Naturopathy to deliver cost effective mass health care means and methods to prevent & cure diabetes at both urban and rural primary health care level. The study was conducted on a purposive random sample of 90 Diabetic (Type 2) patients out of 270, aged 45-50 from Ananda Kendra Gwalior, who fully participated in all training sessions during eight weeks of the experimental training schedule. All participants were again randomly divided into 3 groups (i) Group-I – Yoga Therapy (N = 30) (ii) Group-II – Naturopathy (N = 30) and (iii) Group-III – Combination of Yoga and Naturopathy (N = 30). Further the data of three different treatment groups were analyzed by ANCOVA statistics and it was concluded that the group practicing the experimental training of Combination of Yoga and Naturopathy showed the most significant effect ($p < 0.05$) in reducing the blood sugar level in comparison to other two groups.

Keywords: diabetes, naturopathy, yoga.

1. Introduction

Diabetes is one of the leading causes of death in any developed and developing countries and afflicts about 18 million people. The lack of secretion of insulin and insulin resistance leads to inadequate control of sugar level in blood. Lack of physical work and excess of mental stress are the basic causes of this disease. The worst drawback of this disease is that it draws numerous other diseases like diabetic nephropathy, diabetic neuropathy, diabetic retinopathy etc. It cannot be cured completely but very well managed. Diabetes, being a nutritional disorder, characterize by an uncharacteristically elevated level of blood sugar and excretion of excess glucose through urine. It results from lack of insulin which leads to abnormalities in carbohydrate metabolism as well as metabolism of protein and fat that leads to Type 1 diabetes and Type 2 diabetes. Nature cure has the supremacy to control diabetes at the earliest. According to Yoga and Naturopathy, it is a usual syndrome of digestive system and may be brought under control within 6 weeks with the help of regular yogic practices, nature cure treatments and combined practices of yoga and naturopathy (Central Council for Research in Yoga and Naturopathy, 1999). The yoga practices are thought to act in two distinct ways to overcome diabetes. Firstly seems that the cells of the islets of Langerhans, the secretory portions of the pancreas which have been prematurely exhausted due to over secretion of insulin, are rejuvenated. This would mean that insulin production is stimulated

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and that its release is better timed so as to be appropriate to the level of sugar in the blood. This occurs gradually as depleted levels of pranic energy in the mid-digestive tract are restored (Karmananda, 2003).

The practice of Kunjal, Vastra Dhauti, and Shankha Prakshalan (once in a month) has proved to be highly beneficial. Along with the practice of Udara and Kati Shakti Vikasaka Exercises described in Yogic Sukshma Vyama the practice of Kati Chakrasana, Urdhva Hastottasana, Pada Hastasana, Konasana, Supta Bajarasana, Supta Pavamuktasana, Chakrasana, Sarvangasana, Bhujangasana, Dhanurasana, Vajrasana, Ardh-Matsyendrasana, Ushtrasana, Paschimottanasana, Mandukasana, Mayurasana, Matsyasana etc. are beneficial. Regular practice of Surya Namaskara end engine race work like a panacea in this disease. In Naturopathy, Mud pack over the abdomen, Enema, Cold Hip Bath, Hot and Cold hip bath and Abdomen and Gastro-hepatic packs also helps a diabetic in an effective manner (Central Council for Research in Yoga and Naturopathy, 1999). As it is already established after going through various research articles and reviews that Yoga and Naturopathy have significant effect in controlling Type 1 and Type 2 diabetes (Chimkode, 2015), the researcher developed an interest in finding a quicker solution and a more cost effective program in controlling blood sugar level and hence implemented the combination of Yoga and Naturopathy to see how much effective it is in comparison to the other two treatment program.

2. Methods

The study was conducted on a purposive random sample of 90 Diabetic (Type 2) patients out of 270, aged 45-50 from Ananda Kendra Gwalior who fully participated in all training sessions during eight weeks (each session in the early morning not lasting more than 60 to 80 mins) of the experimental training schedule of Yoga, Naturopathy and combination of Yoga and Naturopathy respectively. During this practice they did not take any other treatment. All participants were further randomly divided into 3 groups (i) Group-I – Yoga therapy (N=30) (ii) Group-II – Naturopathy (N=30) and (iii) Group-III – Combination of Yoga and Naturopathy (N=30). They were trained under expert's guidance. The Blood Sugar levels of all these patients were assessed before starting the program and after the completion of 8 weeks of training program.

2.1. Training Schedule

Table 1. Training Schedule

Weeks	Yoga	Naturopathy	Yoga And Naturopathy
1	Suryanamaskar (11 rounds), Asanas (beginners) and Pranayama	Mud pack	Mud pack, Sukshma Vyama and Surya Namaskara (6 rounds)
2	Suryanamaskar (11 rounds) and Asanas (intermediate)	Mud pack and Hydrotherapy	Mud pack and Surya Namaskara (11 rounds)
3	Chakrasana Sarvangasana Bhujangasana Dhanurasana Vajrasana Ardh-Matsyendrasana Ushtrasana Paschimottanasana Mandukasana Mayurasana Matsyasana and Kunjal	Gastro-hepatic and Hydro therapy	Hydro therapy, Kati Chakrasana, Urdhva Hastottasana, Pada Hastasana, Konasana, Supta Bajarasana, Supta Pavamuktasana, Chakrasana, Sarvangasana, Halasana and Kriya
4	Ardh Kati Chakrasana Urdhva Hastottasana Pada Hastasana Konasana Supta Bajarasana Supta Pavamuktasana Chakrasana Sarvangasana Halasana and Kriya	Fasting and Mud Pack	Fasting and Suryanamaskar (6 rounds)

5	Suryanamaskar, Chakrasana, Halasana, Janusirasana, Supta Bajrasana, Bandhapadmasana, Pawanmuktasana and Dhanurasana	Cold Hip Bath	Cold Hip Bath and Pranayama and Series of cultural Asanas
6	Suryanamaskar (11 Rounds) and Pranayama	Cold and Hot Bath and Mud pack	Cold and Hot Bath, Chakrasana, Halasana, Janusirasana, Supta Bajrasana, Bandhapadmasana, Pawanmuktasana, Dhanurasana and Kunjal
7	Chakrasana, Sarvangasana, Bhujangasana, Dhanurasana, Vajrasana, Ushtrasana Ardh-Matsyendrasana Paschimottanasana, Mandukasana, Mayurasana, Matsyasana and Kunjal	Enema and Fasting	Enema, Sukshma vyama And Meditation
8	Ardh Kati Chakrasana, Urdhva Hastottasana, Pada Hastasana, Konasana, Supta Bajarasana, Supta Pavanmuktasana, Chakrasana, Sarvangasana, Halasana and Kriya	Mud Pack, Hot Bath and Wet Packs	Mud Pack, Suryanamaskar (11 rounds) and Series of intermediate cultural Asanas

The eight week program of different intervention of yoga, Naturopathy and combination of both for diabetes management has been planned and implemented with the guidance of yogic and naturopathy experts and as per the availability and feasibility of the resources and time.

2.2. Data Analysis

The data gathered from the subjects by the blood sugar test done (fasting) before and after the training program (treatment), were analyzed by Descriptive statistics. Further the three different treatment groups were analyzed by ANCOVA Statistics and it was concluded that the group practicing combination of Yoga and Naturopathy showed the most significant effect ($p < 0.05$) in reducing the blood sugar level in comparison to other two groups.

3. Results

Table 2. Mean and standard deviation of different groups measured in post testing

Treatment Groups	Mean	Std. Deviation	N
Yoga	240.7333	68.50871	30
Naturopathy	222.0000	58.70147	30
Yoga & Naturopathy	168.5333	47.40779	30
Total	210.4222	65.80888	90

Table 3. Adjusted mean and standard error of different groups in post testing

Treatment Groups	Mean	Std. Error	95 % Confidence Interval	
			Lower Bound	Upper Bound
Yoga	245.242 ^a	4.890	235.522	254.962
Naturopathy	213.320 ^a	4.906	203.567	223.074
Yoga & Naturopathy	172.704 ^a	4.889	162.986	182.423

Covariates appearing in the model are evaluated at the following values: pre = 278.4111

Table 4. ANCOVA table for the post-test data on blood sugar

Source	Type I Sum Of Squares	df	Mean Square	F	Sig.
Pre_blood sugar	244615.019	1	244615.019	341.918	.000
Treatment_grp	79300.744	2	39650.372	55.422	.000
Error	61526.192	86	715.421	Error	61526.192
Corrected Total	385441.956	89			

Table 5. Post-hoc comparison of means of data on blood sugar obtained in Post-measurement

(A) Treatment Groups	(B) Treatment Groups	Mean Difference (A-B)	Sig. ^b
Yoga	Naturopathy	31.922 [*]	.000
	Yoga and Naturopathy	72.537 [*]	.000
Naturopathy	Yoga	-31.922 [*]	.000
	Yoga and Naturopathy	40.616 [*]	.000
Yoga & Naturopathy	Yoga	-72.537 [*]	.000
	Naturopathy	-40.616 [*]	.000

Based on estimated marginal means

*. The mean difference is significant at the 0.05 level

4. Discussion

The [Table 4](#) shows the F value for comparing the adjusted means of the three treatment groups (Yoga, Naturopathy and combination of Yoga and Naturopathy) during post-testing. Since p-value for the F-statistics is 0.00 which is less than 0.05, it is significant. Since F-statistics is significant, post hoc comparison has been made for the adjusted means of the three treatment groups which is shown in [Table 5](#). All the three p-values are less than 0.05 and hence they are significant at 5 % level. Similar study was conducted by ([Nair, 2016](#)), where it was proved that combined therapy of Naturopathy and Allopathy with diet control has a tremendous effect on improving body mass index. A significant reduction in the Body Weight and BMI was recorded in the interventional group. Body Mass Index provides a simple numeric measure of a person's "fatness" or "thinness", allowing health professionals to discuss over- and underweight problems more objectively with their patients. Excessive body weight is associated with various diseases, particularly cardiovascular diseases, Type 2 Diabetes mellitus, Obstructive sleep apnea, certain

types of cancer, and osteoarthritis (Baltag, 2009). Naturopathy is a healing system using the power of nature and it is considered an art, science and philosophy. The foundation of naturopathic medicine is based on the philosophy of “vis medicatrix naturae, the healing power of nature”. The concept of holistic health or treating the body as a whole (using tools like water, earth, fire, air and weather) is given prime importance various drugless complementary medical sciences such as hydrotherapy, massage therapy, mud therapy, fasting therapy, nutrition and dietetics, chromo therapy, magneto therapy, yoga therapy, acupressure, acupuncture, chiropractics, osteopathy, aromatherapy, psychotherapy, physiotherapy, exercise therapy, Reiki and pranic healing are used (Smith, Logan, 2002; Shankar, Liao, 2004; Standish et al., 2006; Barnes et al, 2008; Herman et al., 2008; Myers, 2009). Apart from decreasing the dosage of oral hypoglycemic drugs/insulin, yoga can also delay the progression of disease process (Singh et al., 2008).

Hence it can be inferred that the combination of Yoga and Naturopathy proved to be the best remedy for reducing the blood sugar level and thus contributing to a better health and wellness. Yoga therapy when combined with Naturopathy proved to be faster and cheaper than solely relying on Naturopathic treatment alone in management of non-communicable diseases like Diabetes. Treatment of diabetes mellitus through Naturopathy modalities (Bradley, 2012) like hydrotherapy, mud therapy, massage therapy, diet therapy is aimed to improve circulation to the cells with increased activation of venous and lymphatic system. These modalities work by increasing contraction and then relaxation of muscles and blood vessels to provide sufficient blood supply along with nutrients and oxygen, required for normal vital activity of the cells. The venous circulation and lymphatic system are very important in the process of elimination of waste products from the body. Increased activation of these eliminatory channels through nature cure modalities enhances the transport of waste materials to the heart and then eliminative sites of the body like kidney and skin. This process of increased recycling may therefore promote re-establishing homeostasis resulting in the normal integrity and functioning of the cells and organs with increased synthesis of insulin receptors and reduced insulin receptor blunting. This enhanced homeostatic condition may further lead to increase sensitivity of the cells to respond to normal insulin action (increased insulin sensitivity) with glycemic control (increased glucose tolerance). Besides reestablishing homeostasis, this system of nature cure medicine, at the same time, may strengthen even other body organs to perform their normal functioning in a better manner (Central Council of Naturopathy and Yoga, 2005).

5. Conclusion

From the present research derived the following conclusions:

The combination of Yoga and Naturopathy proved to be the best remedy for reducing the blood sugar level and thus contributing to a better health and wellness than the intervention of Yoga and Naturopathy separately.

6. Acknowledgements

The authors are highly grateful to Diabetic (Type II) patients of Ananda Kendra Gwalior, Madhya Pradesh, India for participating in all training sessions during eight weeks of the experimental training schedule and also the experts involved in this research work for successful completion of this study.

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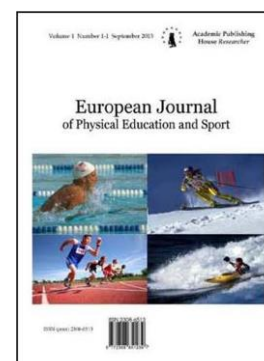
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Published in the Slovak Republic
European Journal of Physical Education and Sport
Has been issued since 2013.
E-ISSN: 2409-1952
2020, 8(1): 32-39

DOI: 10.13187/ejpe.2020.1.32
www.ejournal7.com



Examination of Empathetic Tendency Levels of Physical Education and Other Teacher Candidates in Turkey

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Abstract

The purpose of research was to examine the empathetic tendency levels of physical education teacher candidates and other teacher candidates related to age, gender and department and doing/undoing sports variances. Research group in the 2016–2017 academic year at Mustafa Kemal University; Physical Education and Sports Teaching, Classroom Teaching, Turkish Language Teaching, English Language Teaching, Visual Arts Teaching departments studying in the final year totally consisted of 232 (133 female, 99 male) teacher candidates in Turkey. In research, personal information form developed by researchers, Empathetic Tendency Scale developed by Dökmen (1988) was used as data collection tools. In the analysis of the data were used Mann Whitney U test for single comparisons and Kruskal Wallis H test for multiple comparisons from non-parametric tests. In the research, the level of significance was taken as $p < 0.05$. According to the results gained from the research; it was specified that it wasn't significant difference among teacher candidates' age, gender, department, whether they do sports or not, and empathetic tendencies. And also, it was identified that empathetic tendency levels of English language teacher and physical education and sports teacher candidates have higher empathetic tendency levels than classroom, Turkish language and visual arts teachers' candidates.

Keywords: empathy, empathetic tendency, teacher candidates.

1. Introduction

Empathy is a multidimensional fact that involves a set of functional processes that include understanding, sharing, recognizing emotions, emotional transmission, and arousing emotions of others (Walter, 2012). Empathy is simply defined as competence of understanding another person's emotions (Barut, 2004). Hoffman (2000) considers empathy as the primary mediator of positive social behavior and states that empathy plays a broad mediating role in moral behavior. Besides, he defines empathy as the ability to feel the same emotion that someone else experiences. According to him, empathy is an emotional response in accordance with the condition of the other person rather than the condition of the person. Dökmen (1997) states that when an individual empathizes with the role of the other person, he/she should remain in that person's role for a short period of time and then be able to move from that role to his/her own place. Otherwise, the individual cannot be considered as having empathy. It is different from empathy for an individual to identify with the person in front of him, that is to say, to sympathize or sympathize

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with him. Empathy, for a brief period; is the role of the person to be empathized, to try to think and feel in his name. In other words like in this idiom “thinking oneself in other’s shoes”.

Emotional perception of the mentalization system with the emotions that others feel in pain through quick social interactions in an individual’s mind is called as empathic perception. Generally, it is easier for individuals to predict the beliefs and intentions of others or to use such methods in social decisions rather than using this system (Bohl, Van den Bos, 2012).

Empathy plays an important role in both social perception and psychological processes. Empathy-related responses, including social and sympathetic anxiety, are thought to motivate social behavior, prevent aggression, and lead up the way for ethical reasoning (Eisenberg, Eggum, 2009).

It is also observed that empathy gives direction to the present day with neurological studies. There are two crucial principles of empathy. While one of these principles is to reveal the preconscious mechanisms that facilitate the emotional imitation of inner emotions and the behavior of others underlying the emotions, the other is to provide conscious and mature situations by making inferences about the physical and emotional conditions, beliefs and intentions of others (Zaki, Ochsner, 2012; Keysers, Fadiga, 2008).

It may be argued that examining subcomponents of more complex socio-psychological structures, such as empathy, may be useful from a neurodevelopmental point of view, where the only a part of its components or precursors can be observed. When all components of developmental studies (emotion, understanding, feeling, belief and bodily activities, etc.) are fully mature and coordinated, they see that system components interact very seriously in adults and create a nice contribution to the developmental processes of empathy (De Haan, Gunnar, 2009).

Cognitive empathy and emotional empathy are two important structures for empathy. Emotional empathy includes non-reflective processes. Individuals often use this module consciously and unconsciously. In addition, individuals may feel the feelings, behaviors and emotional sincerity of others over time, sometimes not even themselves. In this sense, there are important studies in the literature regarding these factors which are fed by the emotions of individuals such as social status, status, reliability and belongingness which are in emotional empathy (Guo et al., 2012; Bernhardt, Singer, 2012; Liew et al., 2011; Gu, Han, 2007).

While emotional empathy is a reaction based on emotional experience, which involves showing interest in the other, cognitive empathy is understanding of distress of the other without emotional experience (Obhi, 2012; Spengler et al., 2010; Davis, 1996).

Just after the discussions about which cognitive or affective processes were effective in empathy, it was agreed that both processes were effective in the formation of empathy. Today, empathy is conceptualized as a coherent affective response resulting from the mutual interaction of various affective and cognitive processes (Eisenberg, Strayer, 1990; Feshbach, 1997; Hoffman, 2000). The degree and quality of these affective and cognitive processes may vary from person to person. However, there is a consensus that empathy depends on the achievement of the “me-you” distinction and the ability to react emotionally. Empathy that can increase with age is also a teachable skill (Yüksel, 2004).

It is an undeniable fact that the role of teachers is very important in the future goals of countries. For this reason, it is crucial to identify empathetic tendency level of teacher candidates who will undertake education of children who will form the future of the country and to what level they can set an example for the children. The purpose of research was to examine empathetic tendency levels of physical education teacher candidates and other teacher candidates regarding age, gender, department and doing/undoing sports variables.

2. Methods

2.1. Research Model

Survey model has been used in research. This model is research pattern that is in purpose to define a preexisting condition as it is, trying to observe the situations that are subject to research in an appropriate way and not attempting to impress it (Karasar, 2002).

2.2. Study Group

Study group composed of 232 teacher candidates in the 2016-2017 School Year in Mustafa Kemal University, School of Physical Education and Sports, Physical Education and Sports Teaching Department (n = 55) and the Faculty of Education, Classroom Teaching Department

(n = 57), Turkish Language Teaching Department (n = 60), English Language Teaching Department (n = 40), Visual Arts Teaching Department (n = 20) in Hatay in Turkey.

2.3. Instruments

Personal information form developed by researchers, “Empathetic Tendency Scale” developed by Dökmen (1988) were used as data collection tools. Likert type ‘Empathetic Tendency Scale’ comprise of 20 items included 5 answer options such as “Not suitable for me at all”, “Not suitable for me”, “I am undecided”, “Very suitable for me” and “Totally suitable for me”. These options range from 1 to 5. In the scale, 3, 6, 7, 8, 11, 12, 13, 15 questions were gathered in reverse order. While minimum score that can be obtained from the scale is 20, maximum score is 100. If the score obtained from the scale is high, the empathetic tendency is high and if low, the empathetic tendency is low. The scale was implemented to 70 students twice at three-week intervals, and the test-retest reliability coefficient was reached as ,82. The correlation coefficient between the scores of the students from the single and double items of the scale was determined as ,81 with the split half-test. The criterion-related validity coefficient was found as ,68 between the ‘Empathetic Tendency Scale’ and the Intraception subscale of the ‘Edwards Personal Preference Schedule’.

2.4. Data Analysis

In the analysis of the data were used frequency and percentage distributions of descriptive statistical techniques and Mann Whitney U test for single comparisons and Kruskal Wallis H test for multiple comparisons from non-parametric tests because the data are not normally distributed. In the research, the level of significance was taken as $p < 0.05$.

3. Results

In this part, the findings of the analysis are described. In the [Table 1](#) descriptive statistics of demographical data of study group were presented.

Table 1. Descriptive Statistics of Demographical Data of Study Group

Variables		f	%
Gender	Female	133	57,3
	Male	99	42,7
Age	20-22	78	33,6
	23-25	128	55,2
	26 and over	26	11,2
Department	Physical Education and Sports Teaching	55	23,7
	Classroom Teaching	57	24,6
	Turkish Language Teaching	60	25,9
	English Language Teaching	40	17,2
	Visual Arts Teaching	20	8,6
Doing Regular Sports Status	Yes	68	29,3
	No	164	70,7

In [Table 1](#), according to the results regarding the personal features of the participants, there were 133 (57,3 %) female and 99 (42,7 %) male participants, in terms of age there were 78 (33,6 %) in the age range of 20-22, 128 (55,2 %) in the age range of 23-25, 26 (11,2 %) in the age range of 26 and over participants, in terms of departments of physical education and sports teaching 55 (23,7 %), 57 (24,6%) from the classroom teaching department, 60 (25,9 %) from the Turkish language teaching department, 40 (17,2 %) from the English language teaching department, 20 (8,6 %) from the visual arts teaching department, 68 (29,3 %) participants did not do sports and 164 (70,7 %) participants doing regular sports.

In the [Table 2](#) averages of Empathetic Tendency Scale depending on departments were presented.

Table 2. Raw Scores of Empathetic Tendency Scale Depending on Departments

Departments	N	Min.	Max.	x±sd
Physical Education and Sports Teaching	55	57,00	86,00	68,69±7,16
Classroom Teaching	57	48,00	84,00	66,61±6,92
Turkish Language Teaching	60	50,00	79,00	66,43±6,46
English Language Teaching	40	53,00	82,00	68,72±6,99
Visual Arts Teaching	20	48,00	75,00	63,25±8,21
Departments total	232	48,00	86,00	67,13±7,11

In [Table 2](#), when the averages of ‘Empathetic Tendency Scale’ were examined by departments, it was determined that empathetic tendency levels of English language teacher and physical education and sports teacher candidates have higher empathetic tendency levels than classroom, Turkish language and visual arts teachers candidates. The average of empathetic tendency of all departments was found as moderate.

[Table 3](#) points out the Mann Whitney U test analysis of Empathetic Tendency Scale as regards to gender.

Table 3. Depending on Gender Mann Whitney U Test Results of Empathetic Tendency Scale

	Gender	N	Order Average	U	p
Empathetic Tendency	Female	133	116,27	-,060	,952
	Male	99	116,81		

P < 0,05

In [Table 3](#), as regards to Mann Whitney U test results, in terms of gender variance it wasn't found a significant difference among empathetic tendency levels of teacher candidates female and male teacher candidates ($p > 0,05$).

[Table 4](#) points out Kruskal Wallis H test analysis of Empathetic Tendency Scale as regards to the age.

Table 4. Depending on Age Kruskal Wallis H Test Results of Empathetic Tendency Scale

	Age	N	Order Average	X ²	p
Empathetic Tendency	20-22	78	115,99	,094	,954
	23-25	128	116,04		
	26 and over	26	120,29		

P < 0,05

In [Table 4](#), as regards to Kruskal Wallis H Test results, in terms of age variance it wasn't found a significant difference among empathetic tendency levels of teacher candidates ($p > 0,05$).

[Table 5](#) presents the results of Kruskal Wallis H test analysis as regards to departments of Empathetic Tendency Scale.

Table 5. Depending on Department Kruskal Wallis H Test Results of Empathetic Tendency Scale

	Departments	N	Order Average	X ²	p
Empathetic Tendency	Physical Education and Sports Teaching	55	126,28	6,904	,141
	Classroom Teaching	57	112,84		
	Turkish Language Teaching	60	111,03		
	English Language Teaching	40	130,39		
	Visual Arts Teaching	20	88,68		

P < 0,05

In [Table 5](#), as regards to Kruskal Wallis H test results, in terms of department variance it wasn't found a significant difference among empathetic tendency levels of teacher candidates ($p > 0,05$).

Table 6 indicates Mann Whitney U test analysis as regards to doing regular sports status of Empathetic Tendency Scale.

Table 6. Depending on Doing Regular Sports Mann Whitney U Test Results of Empathetic Tendency Scale

Doing Regular Sports Status		N	Order Average	U	p
Empathetical Tendency	Yes	68	119,15	-,388	,698
	No	164	115,40		

$P < 0,05$

In Table 6, as regards to Mann Whitney U test results, in terms of doing regular sports variance it wasn't found a significant difference among empathetic tendency levels of teacher candidates ($p > 0,05$).

4. Discussion

As regards to results of Table 2, it was stated that empathetic tendency levels of English language teacher and physical education and sports teacher candidates have higher empathetic tendency levels than classroom, Turkish language and visual arts teachers candidates. This result can be explained by the fact that the sports backgrounds of the students of physical education and sports teaching department positively affect the development of empathy. It is because sports have the potential to develop empathy in individuals as well as many social skills. Gano-Overway et al. (2009) observed that students' empathy skills increased through sportive activities in their studies aimed at improving empathy skills of the students they included in a special sports program.

As regards to results of Table 3, it wasn't found a significant difference among empathetic tendency levels of male and female teacher candidates. As regards to this result, gender is not thought to affect the empathic tendency levels of teacher candidates. Parallel with research result, Alver (1998) found that there is no relationship between gender adaptation and empathetic skills. Similarly, there are studies that do not differ between gender and empathetic tendency (García-López, Gutiérrez, 2014; Bryant, 1982; Eisenberg, McWolly, 1993; Yılmaz, Akyel, 2008). Besides this, in different studies, it was found that there were studies that found that women had more empathetic tendency than men (Olweus, Endresen, 1998; Eisenberg et al., 2001; Öztürk et al., 2004; Toussaint, Webb, 2005; Alver, 2005; Çelik, 2008; Gülle, 2015).

As regards to results of Table 4, it wasn't found a significant difference among empathetic tendency levels of teacher candidates from the point of age. With the recognition that empathy is a feature that can be improved, empathy education has gained importance. However, it is not possible to educate each individual at the same level. It has been suggested by the researchers that the experience of learning to establish empathy by chance or accidental at an early age is important and even empathy education can be built on these experiences only in advanced lives and it is concluded that the empathy tendency increases with age (Olweus, Endresen, 1998). It has been observed that the same results have been reached with the results obtained from the age variables of the students and many studies conducted in the field (Uygun, 2006; Kolayış, Yiğiter 2010; Taner Derman, 2011; Certel et al., 2013). Considering that the age ranges of the teacher candidates are close to each other and leave behind adolescence, it can be said that it isn't significant difference from the point of age.

As regards to results of Table 5, it wasn't found a significant difference among empathetic tendency levels of teacher candidates in the aspects of departments. Considering this result, considering that the group participating in the research was trained for the teaching profession, it is thought that each teacher candidate assimilated, regardless of the branch of empathy, which is one of the important values of the teaching profession. Similar results have been reached in studies conducted among university students doing exercises and department of sports sciences students. Mutlu et al. (2014) in their research for tennis students, they could not find a significant difference among empathetic tendency levels of sports science students and other faculty students. Yiğiter et al. (2011) found that it wasn't difference among empathetic tendencies of students studying in different departments in the school of physical education and sports. Myyry and Helkama (2001); Arslanoğlu (2012); Gülle (2015) in their studies were specified the opposite outcomes of the research results. Besides, Genç and Kalafat (2008) designated that the opinions of teacher

candidates studying in different departments at the faculty of education about the empathetic tendency were separated from each other.

As regards to results of Table 6, it wasn't found a significant difference among empathetic tendency levels of teacher candidates who do regular sports and those who did not. Yılmaz (2013), Solak (2011) and Kolayış and Yiğiter (2010) found that doing exercises did not make a significant difference on the level of empathetic tendency in their researches for university students. These results support the findings of the research.

5. Conclusion

Yet, although sports have an important place in gaining important emotions in individuals' lives, it is not expected that this study could not make a difference. Because, Kırımoglu et al. (2016) designated that empathetic tendency levels of university students who do sports are higher than university students who don't do sports. Kalliopuska (1987) found that empathy is an important variable in sport activity.

Performing experimental studies in the field may be one of the most vital suggestions in terms of revealing important results. It is thought that very important data can be acquired through beta results of empathic studies that can be performed with bio-feedback instruments. Furthermore, it can be said that conducting empathic tendency researches for different sports branches can produce important results about how individuals should be approached in sports branches.

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