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In general, the editors express hope that the journal “Physical Education of Students” contributes to information exchange to combine efforts of the researchers from the East-European region to solve common problems in health promotion of students, development of physical culture and sports in higher educational institutions.
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CONTENTS

Aschenbrenner P.H., Giovanis V.F. The characteristics of Poland’s alpine skier’s (students) related to the frequency of accidents ................................................................. 167

Ghanati P., MohammadZadeh H. Comparison of the effect of game based on educational method and traditional approach on the performance of selected basketball skills ................................................................. 175

Imas Y.V., Dutchak M. V., Andrieieva O. V., Kashuba V. O., Kنسيةسka I. L., Sادovsky O. O. Modern approaches to the problem of values’ formation of students’ healthy lifestyle in the course of physical training ................................................................. 182

Kudryavtsev M. D., Kramida I. E., Kopylov Yu.A., Osipov A.Yu., Markov K.K., Savchuk A. N., Kuzmin V.A. Qigong training as a successful factor of fighter’s personal qualities development in students ................................................................. 190

Turkmen M. Religiosity and female participation in sport: exploring the perceptions of the Turkish university students ................................................................................................. 196

Yaman Ç., Uluışık V., Hergüner G., Önal A. Examining the attitudes of physical education teachers towards special education (the handicapped) ................................................................................................. 207

Yıldız M. The acute effects of repeated static apnea on aerobic power ................................................................................................. 217

Zhang X., Tambovskij A.N., Cherkashin I.A., Krivoruchenko E.V., Ohlopkov P.P. Pedagogical tests for assessing the physical preparedness of the students practicing Muay Thai ................................................................................................. 221

Information: ................................................................................................. 232
The characteristics of Poland’s alpine skier’s (students) related to the frequency of accidents

Aschenbrenner P.H.1ABCDE, Giovanis V.F.2ABCDE

1 J. Sniadecki University of Gdansk, School of Physical Education and Sport, Poland
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Authors’ Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection.

Abstract

Introduction

The risk of a skiing accident grows as a skier has lower level of skill, which is dependent on inhibitory factors such as soil conditions, snow, as well as his equipment. Erdmann and Giovanis [1] classify the causes of accidents in alpine skiing and grouping the causes and factors causing the accident as follows: personal, coaching, equipment and clothing, weather, ground land and racing. In Polish, alpine skiing is the most popular sport. This is due to its natural terrain with mountains of medium and high altitude (South Poland), low temperature, long tradition of skiing with approximately 77 ski resorts [2], many clubs, with a good national skiing team and the greatly expanded winter tourism. This present study is based on registration of ski injuries in alpine skiing in some ski resorts in Poland. The above methodology was used as an epidemiological survey in the following countries: in Poland Chojnacki [3, 4] was concerned with the accident prevention system in Alpine skiing and injuries of the racing Polish skiers [5-7], while Horczyński [8] he studied the multiple epidemiological analysis of skiing accidents in the Beskydy region of Poland. In the Holland, Bouter [9] was concerned with the risk and causes of injury to the Dutch skiers of Alpine skiing. In Austria, Neumayr et al. [10] they studied the natural and physiological factors associated with the success of professional Alpine skiing. Chojnacki & Giovanis [11] have compared the incidence of injuries in Greece, Poland and the Holland. In Greece Amoutzas & Giovanis [12] concerned with factors contributing to the reduction of accidents of skiers of alpine ski. In Greece Giovanis was concerned with the kinematic analysis of racing alpine skiing in relation to injuries [13], assessing the safety of Alpine skiing races [14] and the characteristics of 1165 skiers related to the frequency of accidents [15], while Giovanis and Erdmann [16] concerned with the problem of slalom’s outer poles. Zacharopoulos et al. they studied the types of ski injuries and snowboarding and the incidence of injuries in Greece [17, 18], In the USA Hunter [19] and Jaffin [20] concerned with the epidemiological study of ski injuries. In Switzerland, Franz et al. [21] they studied the serious spine injuries of skiers in alpine skiing and snowboarding in the ski resorts of Bern, while Giovanis & Gompakis [22] concerned with the characteristics of skiers related to the frequency of accidents in the ski resorts of Adelboden, Lenk and San Bernardino. In Australia, Korbel & Zelcer [23] have made a controlled study of ski injuries.

The recording of the factors and characteristics that increase accidents in skiers, can determine a future preventive model of organization of the System Safety in Skiing (“SSS”) [3, 4].

Hypothesis

The formulation of the hypothesis was based on the following questions: skiers’ physical preparation before the season and the warm-ups done before skiing have the chances of an accident or injuries? The result of this research is to create a future model of prevention which can protect skiers from this adverse phenomenon?

Purpose

The purpose of this research was to record the characteristics of Poland’s alpine skier’s (students) in relation to the frequency of accidents.

Material and methods

Participants

In the research the participants were N = 66 skiers (50 men and 16 women) who were selected by random. The sample came from recreational skiers (beginners - advanced) in the ski resort in Passo Tonale (Italy).

Means of data collection

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The research material came from analyzing the completed questionnaires of 66 Polish skiers (students). They have recorded four categories of factors: a) individual factors (age and sex, height and body mass of skiers), b) factors of preparation in the snow in relation to injuries (the existence of accident and injury in skiing in the past, involvement of skiers: ski equipment, wear a helmet?, level of technical training, period of ski training in years and days, preferred method of learning of skiing: individual, group or racing, with or without instructor, participation in the warm up), c) factors regarding preparation in dry ground in relation to the injury (physical fitness preparation), d) factors of injury (presence of the type of injury, the site of injury, causes and the number of days to recover from injury).

Procedure

The collection of the data was done in the winter season of 2013 - 2014, in the month of December during the scheduled winter vacation of the ski resort in Italy (Passo Tonale). The questionnaire was given to each individual skier, after briefing on the purpose of research and how to complete the questionnaire. Eighty questionnaires were handed out and 66 were returned completed (82.5% return rate).

Statistical analysis

In every characteristic group of skiers corresponds three categories of statistical monitoring: the participants, the people with injuries, and the rate of injuries by using the Excel program 2007. The statistical analysis of the results of epidemiological research has helped to illustrate the causes and factors (such as the level of preparation of skiers) to reduce accidents of skiers.

Results

A) Individual factors in the sample in relation to injuries

The 66 respondents were aged from 20 to 28 years (21,24 ± 1,59). The average height for men was 1,80 ± 0,06, while for women it was 1,66 ± 0,06. Also the weight of men was 75,08 ± 7,99, and women 58,38 ± 6,17 Finally, the values of Body Mass Index (BMI) of males was 23,19 ± 1,59, while that of women 21,02 ± 0,86, where the degree of obesity for both sexes were normal (Table 1). From Figure 1 it is concluded that women had injury rate (13%) to men (4%).

B) Factors preparation in the snow in relation to injuries

From Figure 2 it is concluded that depending on the level of technical training the highest rates of injuries were the following skiers: advanced (17%) and beginners (5%).

The largest percentage of injury rate depending

---

Table 1. The anthropometric characteristics of the skiers in Poland (students)

<table>
<thead>
<tr>
<th>SKIERS (N)</th>
<th>MEN (N=50)</th>
<th>WOMEN (N=16)</th>
<th>TOTAL (N=66)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>AGE (years)</td>
<td>21,36</td>
<td>1,66</td>
<td>20,88</td>
</tr>
<tr>
<td>HEIGHT (m)</td>
<td>1,80</td>
<td>0,06</td>
<td>1,66</td>
</tr>
<tr>
<td>WEIGHT (kg)</td>
<td>75,08</td>
<td>7,99</td>
<td>58,38</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>23,19</td>
<td>1,59</td>
<td>21,02</td>
</tr>
</tbody>
</table>

N - number of questions M – average SD - standard deviation

---

Figure 1. The comparison of injury rate by gender
Figure 2. The injury rate depending on the level of technical skills

Figure 3. The injury rate depending on years of experience in skiing

Figure 4. The injury rate depending on the experience of skiing day
on years of experience in skiing were people who had experience $6 < 10$ years (33%) and the lowest percentage of injury rate was that of people with experience of $0 < 0.5$ years (6%, Figure 3).

The major injury rates according to experience skiing days were experienced skiers $15 < 20$ days (20%) and $0 < 3$ days (8%), while those with experience of $4 < 14$ days had no injuries (Figure 4). From Figure 5 it is concluded that the skiers, who are taught to ski without an instructor had a higher injury rate (50%).

**C) Factors in training in dry soil in relation to injuries**

Table 2 show the highest percentage of injuries compared with the use of their ski equipment (8%) and

---

**Table 2. Involvement of skiers: ski equipment, wear a helmet? and method of learning**

<table>
<thead>
<tr>
<th>Participation of skiers in:</th>
<th>Participants</th>
<th>People with injuries</th>
<th>Percentage of injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ski Equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rent</td>
<td>42</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Yours</td>
<td>24</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Wear a helmet?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>40</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Occasionally</td>
<td>16</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Always</td>
<td>10</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Method of Learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal</td>
<td>46</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>Group</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Racing</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td><strong>66</strong></td>
<td><strong>4</strong></td>
<td><strong>100,0</strong></td>
</tr>
</tbody>
</table>

**Table 3. Involvement of skiers: the physical condition before the season, in warming up and corrective exercises**

<table>
<thead>
<tr>
<th>Participation of skiers in:</th>
<th>Participants</th>
<th>People with injuries</th>
<th>Percentage of injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Condition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>59</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Warm Up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>66</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Corrective exercises</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>26</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>No</td>
<td>40</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td><strong>66</strong></td>
<td><strong>4</strong></td>
<td><strong>100,0</strong></td>
</tr>
</tbody>
</table>
skiers who always had a helmet (20%), while the highest percentages of injuries compared with the type of training was personal training (9%). A remarkable phenomenon is that people (students of skiing), who did warm-up and corrective exercises had more injuries 6% and 8% respectively (Table 3). While on the other hand, as expected, skiers who their physical training in dry soil did not had more injuries (3%) than non-participants in the physical training (29%).

D) Factors of injuries

Figure 6 shows the percentage of injuries in relation to the cause of the reckless (50%), fall (25%) and speed (25%), but Figure 7 shows that skiers of Poland had the following injuries: sprains (50%), wounds (25%) and bruises (25%).

The most common area of injury is the legs (50%), the rarest was the torso (25%) and head (25%) - Figure 8. The largest percentage 75% of Polish skiers needed a recovery time of injuries until 7 days, while the least percentage 25% needed recovery time from 8 to 21 days (Figure 9).

Discussion

Summarizing this research, the greatest injury rate depending on years of experience in skiing were people with 6<10 years experience (33%), while relatively according to experience by counting skiing days, experienced skiers with 15 < 20 days had a percentage of (20%). Women had the largest percentage of injuries (13%), while skiers who learned without an instructor had a larger percentage of injuries (50%). The factor of training skill, the highest accident rate in Poland was observed in the group of advanced skiers (17%). Greater frequency of accidents were those skiers who prefer the individual skiing (9%), the use of their ski equipment (8%) and skiers who always had a helmet (20%), while the percentage of injuries in relation to the cause of the reckless (50%). The typical injuries of skiers from Poland was 50% sprain, while the largest percentage of Polish skiers 75%, need a recovery time from injuries of until 7 days.

By studying the epidemiology of accidents, injuries in skiing have been studied by scientists in such countries.
as: USA [20, 24], Norway [25], Austria [10, 26], Germany [27, 28], Canada [29, 30], Switzerland [2, 21], Poland [31, 32], Russia [33], Australia [23], Netherlands [9] and Greece [12, 15]. Chojnacki, & Kuson [7] have done an epidemiological study of 100 athletes of Poland in period 1987-2000, where 67% of participants had lesions, while the common place of injury were the lower extremities (80%). The most common injuries were to “Slalom” (42%), where the cause was a technical error. Giovanis [13] in his analysis, investigates the relationship between accidents and thus the injuries at the rates and indices of industrial path of giant slalom as: track geometry, speed, acceleration, frequency (tempo), endurance and tactics of the athlete. Chojnacki [3, 4] dealt with the organizational model of ski traffic and the algorithms presented in connection with the Skiing Safety Skiing (SSS). He compares the underlying causes of accidents (ex. by training - resulting in injuries) in athletes of different countries as: Poland 71% Austria 38% and Greece 37% [11, 13]. Shealy, et al. [34, 35] concluded that the use of a helmet was associated with a reduction in the number of minor head injuries, but no such reduction was observed for the more serious forms of head trauma. Tuli, et al. [28] and Young [36] dealt with the dangerous and likelihood of injury in relation to the practice of skiing.

For recreational skiers the percentages of injury in relation to their physical condition were as follows: Poland 19%, 71% in the Netherlands and Greece 26% [13]. The corresponding values for recreational skiers who participated in warm-ups before skiing, the percentage of injuries were: 16% for Poland, the Netherlands 44% and Greece 20% [13]. In this investigation the above percentages of injuries to athletes and recreational skiers of Poland in relation to fitness, warm-up and corrective exercises, totalled 3%, 6% and 8% respectively. The high values of the factors for fitness training and warm-ups were the consequence of poor preparation of training before winter and poor warm ups before skiing. Giovanis [15] concludes that the Greeks skiers have lower percentage of injuries compared to other countries that have a tradition in winter sports. In a total of 1165 Greek participants the percentage of injuries was 16% [15], for 2000 Polish...
skiers the percentage of injuries was 19%, 572 injured Dutch constituted 49% of participants skiers [6, 9] and for 49 Swiss skiers the percentage of injuries was 33% [22]. In the study of Amoutzas & Giovanis [12], we observe that Greek student skiers (136 participants) of the Department of Physical Education and Sports, University of Athens and the corresponding University of Komotini (Northern Greece) had high percentage of injuries (3% and 16% respectively) than those of recreational skiers (control group - 36%), while in the present study of 66 Polish student skiers the percentage of injuries was 6.3%.

Conclusions

Based on the above results about 6.3% Polish respondents’ skiers had earlier accidents in Alpine skiing. The Polish population mostly consists of advanced skiers, with a few years training in skiing, with abundant days training by using a skiing instructor, warming up and personal form of training. Skiers who don’t had physical fitness preparation before the winter season, had a greater percentage of accidents and injuries. Polish skiers usually had limb injuries lower extremities (sprains) due to the reckless of the skiers. The duration of treatment and rehabilitation of injured skiers in Poland lasted until 7 days. The answer to the case and questions of this research is: skiers who are physically training to be prepared before the season and warm-up before skiing have the chances escape of accidents and injuries. It is recommended to make investigations not only by the factors of choosing the right equipment, but investigations with choice factors of the best methodology, preparation and adaptation of physical capability in the difficult environment of skiing in relation to accidents and injuries.

Conflict of interests

The authors state that there is no conflict of interest.

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Comparison of the effect of game based on educational method and traditional approach on the performance of selected basketball skills

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2Department of Physical Education and Motor Behavior, Urmia University, Iran

Abstract
Purpose: The purpose of this study was to investigate the effect of the game based on educational method and traditional approach on the performance of selected basketball skills.

Material: The type of research was semi-experimental one. Participants included 30 adolescent girls who were divided into two groups based on the game-based practice (15) and traditional training (15) build on the pre-test scores. Both groups performed the intervention program for 8 weeks and each week for three 60-minute sessions. Then, a post-test was performed and the data were analyzed using SPSS 21 software at a significance level of 0.05.

Results: The results showed that both educational method and traditional approach groups had a significant improvement in basketball performance; there was no improvement in basketball dribbling performance in both groups. However, in the performance test, game based on educational method group had a significant improvement compared to the traditional practice one.

Conclusions: The results suggest that using a game-based educational method can significantly increase the important factors of basketball performance in youth, which can move into more complex situations.

Keywords: game, educational method, traditional practice, basketball, performance.

Introduction
Team sports can play an important role in attracting youth to sports and continuing their activities. But teens do not enjoy exercises and have little physical mobility when participating in team sports. Many of them do not know how and to which area of the field move, the traditional educational models in the physical education classes of the universities may be an effective factor in reducing the quality of play in team sports. As Butler & Griffin argued, as a result of the use of traditional models, in addition to children, adults also find little understanding of the game [1]. The traditional method of training and upgrading performance emphasizes the use of a teacher-centered technique and approach, the coach is the main controller of the learning environment and responsible for the content planning of the course [2, 3], the skills are practiced in a drill and distinct form from the real context. They are practiced in such a way that the learner focuses on the repetition of skill execution shown to him by the pattern [2]. Pritchard et. al. stated that one of the most important limitations of traditional models is the disability of transferring the practicing skills to the real field of play, resulting in a significant lack of performance in the game performance. Ultimately, using this approach leads to boredom and fatigue [4]. As a result of these observations, different educational approach, called PP-based learning, was developed by Bunker and Thorpe [5]. The goal of the game’s learning approach is to develop an understanding of the game insight, which makes the performer more confident.

Therefore, the main purpose of PP is understanding and appreciation of the game [6]. Advocates of the PP approach propose that action or decision-making choices should be taught before the practice or execution of the technique [7]. In fact, achieving the objectives of the PP approach is based on modified games and questioning [8]. Some researchers emphasize the valuable role played by sport education and order physical education instructors to provide educational issues in game tutorials. He also insists that coaches “Turn Practice into Play”. The change in practice to play has two kinds of beneficial effects: motivation and transfer [9, 10]. The motivational aspect of the game based educational model comes from the enjoyment of the game and the perceived progress of learning. The PP model replaces the training’s tedious condition with the challenging and enjoyable playing situations. In addition, if the learner overcomes the problems and challenges, he will feel progress and enjoyment. In general, enjoyment is the most important factor in the participation of children and youth in sport. Enjoyment is the main reason for the beginning and participation in the sport of youth, the researchers concluded that enjoyment of sport activities would increase the commitment of youth to exercise and physical activity and reduce interest in alternative activities, such as watching TV subsidies.

After the introduction of the PP method and other tactic-based models, several studies have been done on their impact on the growth of technique and performance of the game for children and youth. In some studies, game-based or tactical groups based on post-training techniques did not show significant differences in skill performance [8, 11] and some reported superiority of the game-based group [4, 12, 13]. In the area of decision making, the result of the research was contradictory. Research in some respects supported the relative superiority of the tactic group [8, 10, 13] and in some other aspects did not show such superiority [14, 15]. Further research supports the superiority of tactic training [4, 8, 16]. Miller in a review
of research on tactical models reported that 56% of the development studies, 58% of decision-making studies, 93% of support development studies and 59% of the studies supported of skill development [15]. Regardless of the support factor, these findings are consistent with what Lee and Ward stated [17]. According to them, research on tactical models has provided little support for cognitive outcomes and game performance, and there is still little empirical evidence that supports tactic-based approaches [17]. But according to McMorris, the learner learns what they are taught [18]. Game-based learning leads to the learning and improvement of tactical performance, and the teaching of techniques leads to learning and technical progress. McMorris also concludes that evidence suggests that technology-based learning leads to decision-making, and game-based learning may develop technical performance [18-20]. Miller suggests that long training courses (more than 8 hours) should be used in research [15]. Miller concluded that a longer-term training course had a great influence on progress and promotion of decision-making skills [15].

Also, Harvey and Jarrett, after reviewing the studies conducted since 2006, concluded that the length of the training period for research on game-based approaches is still low. They stated that the length of the intervention period of the research was usually seven to twelve sessions [21]. However, the length of the intervention period was appropriate in the research of Lee and Enter [17], Mesquita et. al. [13], and Pritchard et. al. [4]. But it seems that the only limited number of training sessions in most of the comparative studies is not important. McMurray [22] further criticized the comparative studies of the game-based approach with the traditional approach. McMorris states on the basis of the motor behavior approach that proposes a motor behavior for a technique-to-cognitive approach [18]. He claims that what they criticize of the game-based approach call it the “traditional approach” are poorly-documented training protocols that are different from the technique-to-cognitive approach [18]. Similarly, Chatzopoulous et al. put forward a similar critique, according to them, what has not been considered is the continuation of a technique-based approach using tactical strategies [11]. Given what has been said, the issues that have been neglected in previous research have been to prolong the course and, consequently, change the traditional approach of the classroom (ie, technique to tactics), as well as the ability to transfer learning to the actual field of play. Investigations have shown that with the increase in the training period, the results also change [15]. By increasing the number of sessions, the type of traditional group training will also change, and their training will change from the state modified technique to more complex situations, such as moderated games. But other features of the traditional approaches, namely, coach-centered, providing direct instructions and coaching decisions are still there.

The purpose of this study is to compare the effect of two educational methods, namely game based (PP) and traditional, on the performance of basketball.

**Materials and Methods**

**Participants.**

Participants included 30 teenage girls from Urmia who volunteered to participate in this research. None of the participants had a background of basketball practice. Participants were randomly divided into two equal groups (15 subjects). A group based on the practice-based training, the other group trained in the traditional way.

**Research Design**

The research method was semi-experimental, in which two groups participated. Participants were evaluated in two stages of pre-test and post-test. The participants requested to participate in the research after completing the consent, of which 45 were participants in the pre-test of basketball performance. The evaluations were carried out using the game performance assessment instrument measurement tool, based on three scales of shot, dribbling and pass. Participants’ scores were used for homogenization. 8 skilled participants, as well as 7 participants who appeared to have motion problems, were removed at this stage. Finally, 30 participants with a skill level of approximately equal were selected. For the PP group, a trainer with a 10-year history of basketball training and a trainer with eleven years of basketball training experience were used for the traditional group.

In addition, three first-rate basketball coaches with a history of training and coaching participated as research consultants. The practice protocol of each group was designed according to the general pattern of the model, using similar research and the opinion of the counselor’s mentors. Before each training session, information about the content of the lesson was given to the training coach. The groups trained for 60 minutes each week for six weeks and each session for 60 minutes each day after the last training session, a post-test (similar to the pre-test). Assessments of decision making, skill play and game support simultaneously were conducted by two coaches who were familiar with the performance test.

The percentage of agreement between the two evaluators was 82% for decision making, 87% for skill and 84% for support. The design of the PP group exercise program was done using the extended PP model [21, 22]. To design a traditional group training program, two distinctive features of the traditional approach, namely, teacher-centered and technically based, were considered. The group’s training program at initial meetings included training of techniques such as dribbling, pass and a variety of shots. Drilling the techniques was done individually and by team. The instructor used direct instructions, modeling and feedback for training. At the end of each training session, the participant played basketball for 10-15 minutes freely.

After the ninth session, after moderating progress in the execution of the techniques, moderated games were used to teach skill-utilization in challenging situations. Moderated games were also used to train attack and defense tactics such as outlet, counter-strike, regional defense. The complexity of the exercises increased gradually throughout the sessions. The main difference
between the use of moderated games in the traditional group and PP focused on the characteristics of the two approaches. For the traditional team, even after the ninth session and starting to practice moderated games, the coach played a pivotal role in all decisions. The coach guided the game with instructions, guides and concurrent feedback. The question was not used about how to freeze the game and what is better for a player to do.

The participants tried to execute the coach’s instructions in the form of the game. Game performance assessment instrument was designed by Oslin et al. to measure game performance [25, 26]. The mean of play is behaviors that represent the understanding of the game as well as the player’s ability to solve tactical problems through the selection and application of appropriate skills. The instrument for measuring the performance of the game has been examined by three groups of games: attack (football and basketball), net/wall (volleyball) and field /track/points (softball). The validity and reliability of the test were measured through three separate studies on guidance students, and the findings have shown that this tool is a valid and reliable test for measuring the game performance [26]. This tool was used to measure three indicators of decision making, skill execution and support. According to Oslin et al., these three indicators are important for success in assault games such as basketball [26].

Statistical Analysis
To investigate the present research data and compare the effect of two methods of training with traditional approach and game-based learning on the performance of selected basketball skills, first, the effect of each two methods in three skills was calculated by t-test and then for comparison of these methods effects in each three skills single-variable covariance analysis (ANCOVA) was used. Data were analyzed with confidence interval of 0.95 (P = 0.05) and analyzed by SPSS software version 22.

Results
Shapiro-Wilk test was used to examine the distribution of research data. The results showed that the data of all three skills in the two stages of the test were normal distribution (P> 0.05), therefore, for statistical analysis, parametric statistical method was used. In order to investigate the effect of traditional and game-based training on basketball triple skills in the present study, the scores of each two groups were compared in the pre-test and performance test, the results of which are shown in the following table.

**Table 1. The Effect of Two Methods of Teaching on Performance in Basketball Skills**

<table>
<thead>
<tr>
<th>Group</th>
<th>Skills</th>
<th>Test</th>
<th>M</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Approach</td>
<td>Shot</td>
<td>pretest</td>
<td>16.26</td>
<td>-5.9</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dribbling</td>
<td>pretest</td>
<td>12.16</td>
<td>3.5</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pass</td>
<td>pretest</td>
<td>26.93</td>
<td>-2.1</td>
<td>0.054</td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shot</td>
<td>pretest</td>
<td>17.2</td>
<td>-4.58</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Game Based Educational Method</td>
<td>Shot</td>
<td>Performance</td>
<td>20.47</td>
<td>4.71</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Dribbling</td>
<td>pretest</td>
<td>12.26</td>
<td>11.06</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pass</td>
<td>pretest</td>
<td>24.2</td>
<td>-5.31</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(educational method) is not statistically significant ($P = 0.338$, $F = 0.952$). After removing the impact of pre-test, there is no significant difference between the mean changes of two groups in the post-test. Therefore, we conclude that there is no significant difference between the two methods of teaching (traditional and game based) on the performance of basketball shots.

The results of the ANCOVA test for dribbling skills are shown in Table 3.

The results of the test in the above table indicate that the F value of the co-variance (pre-test) is significant ($P=0.001$, $F=106.329$), therefore, correlation assumption of coincidence variable is observed and the choice of pre-test score as a perfect match. But value of independent variable F (group) (educational method here) is not statistically significant ($P = 0.632$, $F = 234$). After removing the impact of pre-test, there is no significant difference between the mean changes of two groups in the post-test. Therefore, we conclude that there is no significant difference between the two methods of teaching (traditional and game based) on the performance of basketball dribbling skill in the present study.

For the skill level, ANCOVA test results are shown in Table 4.

The results of the test in the above table show that the F value of the co-variance (pretest) is significant ($P=0.001$, $F=4.147$), therefore, correlation assumption of convergent variable is observed and the choice of the pre-test score as a perfect match. The value of independent variable F (group) (educational method here) is statistically significant ($P=0.001$, $F=143.14$). After removing effect of pre-test, there is a significant difference between the mean variations of two groups in performance test. Therefore, we conclude that there is a significant difference between two methods of teaching (traditional and game based) on pass execution of subjects in the present study. According to the mean scores of the two groups, we conclude that the method of education based on the game had a more significant effect on pass performance of subjects than traditional teaching method. In general, the results of this study showed the game-based method of training compared to the traditional method significantly had a greater effect on pass performance of subjects, but there was no significant difference between the two methods of training on shots and dribbling skills.

### Discussion

The purpose of this study was to investigate the effect of two approaches based on the game (PP) and traditional training on the performance of selected youth girls’ basketball skills. Participants practiced basketball in two traditional and PP groups in 18 sessions. The results were evaluated in the form of pre-test and post-test.

Overall, the results show that subjects in both traditional training and game-based training played a significant role in basketball shots, but there was no significant improvement in dribbling, but in game-based training test they had meaningful progress in pass

### Table 2. Results of the covariance analysis test to examine the effect of two educational methods on the skill of basketball shots

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correction model</td>
<td>74.098</td>
<td>2</td>
<td>37.049</td>
<td>6.644</td>
<td>0.005</td>
</tr>
<tr>
<td>Pre-test</td>
<td>72.898</td>
<td>1</td>
<td>72.898</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>5.31</td>
<td>1</td>
<td>5.31</td>
<td>13.072</td>
<td>0.001</td>
</tr>
<tr>
<td>Error</td>
<td>150.569</td>
<td>27</td>
<td>5.577</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13038</td>
<td>30</td>
<td>0.952</td>
<td>0.338</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3. Results of the covariance analysis test to examine the effect of two educational methods on basketball dribbling skill

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correction model</td>
<td>72.919</td>
<td>2</td>
<td>36.459</td>
<td>53.198</td>
<td>0.001</td>
</tr>
<tr>
<td>Pre-test</td>
<td>72.872</td>
<td>1</td>
<td>72.872</td>
<td>106.329</td>
<td>0.001</td>
</tr>
<tr>
<td>Group</td>
<td>0.16</td>
<td>1</td>
<td>0.16</td>
<td>0.632</td>
<td>0.234</td>
</tr>
<tr>
<td>Error</td>
<td>18.504</td>
<td>27</td>
<td>0.685</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3789.944</td>
<td>30</td>
<td>0.685</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 4. Results of the covariance analysis test to investigate the effect of two educational methods on basketball shot skill

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correction model</td>
<td>473.538</td>
<td>2</td>
<td>236.769</td>
<td>7.748</td>
<td>0.002</td>
</tr>
<tr>
<td>Pre-test</td>
<td>126.738</td>
<td>1</td>
<td>126.738</td>
<td>4.147</td>
<td>0.001</td>
</tr>
<tr>
<td>Group</td>
<td>432.208</td>
<td>1</td>
<td>432.208</td>
<td>14.143</td>
<td>0.001</td>
</tr>
<tr>
<td>Error</td>
<td>825.129</td>
<td>27</td>
<td>30.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>32662</td>
<td>30</td>
<td>0.685</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
technique, while the traditional training group did not make any progress. These results are consistent with the findings of Nathan and Haynes [20] and inconsistent with the findings of French et al. [19]. A possible reason for these conflicting results may be the type of selected game.

In the French and colleagues’ research, the impact of tactic-based methods and the technique for learning was done in badminton play [19]. The badminton game in Bunker and Thorup division [5] is part of the net/wall game, but basketball in the game is part of an attack game, like hockey in Nathan and Haynes [20]. The PP group performed better than the traditional group in post-test of shots and pass technique. These results are inconsistent with more research findings [4, 10, 12, 27]. These results are consistent with the content of the tactical group training program in this study. The overall content of the tactics-based training program included warming up, skill drilling, and game play that after the ninth session changed to moderated games. Skill drilling is the most part of the training sessions, especially at the initial sessions, is given in static and unrestricted conditions. It seems that these conditions are very much in line with the requirements for executing skill tests such as basketball performance one. It seems that the skill drilling and practical skill at the end of each session has also been effective in the tactical progress of this group. But why the groups did not make a significant difference in terms of shooting test is interesting.

Participants at all stages of the warm-up phase and the interruptions between the games repeatedly practiced shooting technique and they constantly practiced it. Possibly, the frequent repetition of this technique by the participants may have made the groups differently meaningless. A review of the trend shows that both educational approaches have contributed to improved basketball performance.

As Thomas and Thomas stated, selection of the appropriate response or making appropriate choices in sport does not necessarily correlate with successful performance [28]. In accordance with the PP model, participants first develop game understanding and decision making, and later develop technical skills. There was no progress in dribbling performance; the relatively weak decision making by the PP group in the post-test was influenced by the weakness of the group in performing of the skill. Since technical weaknesses may limit the choices that are made in the situations of the game. In different situations, the target selection may be done correctly, but the allocation of the appropriate parameters to the chosen motor program is a basic problem for beginners [29], or, as Turner et al. assumes, the two processes, “What to do” and “How” is likely to be specific to complex motor skills such as playing [12]. The relatively long protocol of this study may have been able to improve the weak section of “How”, in post-test of PP group. However, in the field of pass technique performance and enhancement program of it after ninth session in PP group, is likely to improve the performance of the group. Perhaps this has led to a significant improvement in the PP group from pre-test to post-test.

Another important aspect of improving the performance of the pass in the PP group is the use of the question and answer training principle. As Pra’xedes et al. concluded, the use of the principle of question-and-answer questions in the field of moderated games makes decision-making progress [23]. Raab and Johnson emphasized that “the question” is a tool that can succeed in very complex situations because it leads the athlete's attention to important aspects of the game and receives positive results [30]. Similar results have been reported in other studies comparing technique-based and game-based groups [8, 10, 11]. But others have reported PP’s superiority in performing skill [4, 13, 14, 23].

Despite the superiority of PP group in pass and shot performance tests, these groups did not have a particular advantage in terms of skill performance in dynamic game play than the traditional group. Miller [15] concluded in a review article that there is a relationship between the duration of the game-based intervention and communication skill performance. In the present study, the groups trained for 18 sessions and each session for one hour. This volume of interventions seems to have been effective and promotes groups from pre-test to post-test. In the analysis and comparison of group changes in terms of shot and pass, the results showed that PP practice protocols have promoted performance.

**Conclusion**

The results reported in other similar studies [4, 8, 9, 16]. Contrary to skill performance, the support performance in game-based models can be developed faster. According to Miller’s conclusion, support in the game can also be developed in tactics based on short term training (8 sessions) [15]. In the game-based protocol in this study, 4 sessions (sessions 6, 7, 8, and 9) were devoted to the development of tactical awareness. The significant difference between the game-based group and the traditional one is in line with Miller’s deduction in the mid-test [15]. It seems that the exercises of these groups, based on moderated questions and games, have led to the development of cognitive and decision-making skills. This development in decision making is so deep that even in relatively more complex situations of basketball full games, game-based groups can take advantage of it. Considering the process of questioning in the form of moderated games as an effective and influential factor in decision-making, the PP team benefited from this process during the training program. But in connection with the traditional group, even the inclusion of training programs did not lead to the development of dribbling and pass technique during the game. However, the use of moderated games and the use of tactical strategies after the ninth session for the traditional group may not be fully appreciated by McMurray’s proposal technique [22] Technique-to recognition. As Pra’xedes et al. suggested [23], it seems the use of the question in the form of moderated games seems to be the most prominent feature of the PP model, which can, in particular, enhance decision
making in the game. It is suggested that a similar study would be conducted over a long period of time with more sample sizes in different age domains. It is also suggested that the impact of these models should be considered on psychological outcomes such as the motivation of continuing training, enjoyment of practice among youth.

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Conflict of interests
The authors state that there is no conflict of interest.
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Modern approaches to the problem of values’ formation of students’ healthy lifestyle in the course of physical training

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National University of Physical Education and Sport of Ukraine, Ukraine.

Purpose: to prove, develop and check the model of values’ formation of a healthy lifestyle of students in the course of physical training.

Material: students participated in an experiment (males – n=108; females – n=120; 18–20 years old).

Results: it is determined the values’ formation level of a healthy lifestyle. It is developed the model of students’ healthy lifestyle formation. The model includes the purpose, the task, the principles, the stages, the organizational and methodical conditions, stages, the program and criteria of efficiency. The program of extracurricular occupations of physical training is a component of the model. It is defined factors which determine values’ formation of a healthy lifestyle of student’s youth in the course of physical training. The following indicators were statistically and significantly improved: levels of physical activity, theoretical readiness, and motivation, level of physical health, values’ formation of a healthy lifestyle.

Conclusions: The stimulating factors are information and effective basis of justification, forecasting, and development of values’ formation model of a healthy lifestyle. It is revealed the need for a change of approaches to the modernization of the educational process of physical training for institutions of the higher education.

Keywords: model, values, students, physical training, healthy lifestyle, physical activity.

Introduction
Health maintenance and fulfilling life of citizens is one of the most important purposes of the world community [1]. This displayed in the principles of European policy «About Health 2020» [2]. The health problem of young age persons is called one of the priority activities of the World Health Organization in XXI century [3]. The following recommendations provided according to the results of researches:

- The influence of individual and national factors on self-rated health varies regarding generation. The target generation and the demographic structure of a country should be taken into account to develop more accurate health policies [4];
- REPOPA (REsearch into POlicy to enhance Physical Activity) will increase understanding use of research evidence in different contexts; develop guidance and tools and establish sustainable structures such as networks and platforms between academics and policy makers across relevant sectors [5];
- There is a need for harmonization of surveillance methodologies, indicators and target populations for between-country and over time comparisons. This inventory will serve to feed future discussions within the DEDIPAC-JPI major framework on how to optimize design and identify priorities within surveillance [6];
- The data collected under this HEPA (health-enhancing physical activity) monitoring framework provided, for the first time, an overview of the implementation of HEPA-related policies and actions at the national level throughout the EU [7].

Improvement of life quality and population’s health level are extremely relevant for Ukraine [8, 9]. Many scientists devoted researches to the theoretical principles of healthy lifestyle’s formation [10]. In such researches scientists consider:

- general-theoretical questions of a healthy lifestyle formation in different groups of the population [11, 12];
- the social value of health culture education [13, 14];
- the somatic health of youth [15];
- directions of increase in health’s level by means of a recreation and rehabilitation [16];
- The revealed high interest of experts in questions of students’ involvement in a healthy lifestyle [17]. Authors determine that the main formation criterions of healthy lifestyle values’ in students are:
- involving in regular training with physical culture [18, 19];
- interesting in obesity prevention and keeping a healthy diet [20, 21];
- health behavior and cardiometabolic risk factors [22];
- lifestyle factors connected with a depression [23];
- level of physical activity knowledge, students’ knowledge about healthy and unhealthy nutrition habits and nutrition knowledge [24].

Researchers define the low level of students’ physical activity [25, 26]. It is determined that:

- Promoting physical activity (PA) in low- and middle-income countries is an important public health topic as well as a challenge for practice [27];
- The emotional experience is a key aspect when promoting student’s well-being from the physical education. [28];
- Physical education programmes should consider what content is delivered and how to effectively integrate...
practical and theoretical content [29].

The available system of students’ physical training requires modernization [29]. This problem requires the subsequent studying in the practical sphere.

The purpose of the research is to prove, develop and check the model of values formation of students’ healthy lifestyle in the course of physical training.

Materials and methods

Participants. 228 students participated at the first (stating) stage of the pedagogical experiment (108 males and 120 females, 18-20 years old). 48 students from higher education institutions of Kiev (Ukraine) participated at the second (forming) stage (23 males and 25 females). The control and experimental groups were created at the beginning of the forming experiment. Groups divided by a random method and had no statistically significant differences between indicators at the beginning of the experiment. The first group was experimental (EG), the second group was control (CG). According to ethical standards, students gave the written consent to participation in the experiment. Protocols of experimental studies are supported by the bioethics commission of the university. 14 representatives of higher education institutions with more than 10 years work experience were involved in the experiment.

Organization of the research. Researches performed on bases of higher education institutions of Kiev (Ukraine). At the first stage was studied the motivation of students to respect the basic principles of a healthy lifestyle. It was also defined: value orientations; the level of physical health; the structure of students’ incidence rate.

The pedagogical experiment was the main method of a research. The structure of the experiment provided the implementation of state and forming procedures in a certain sequence. The state experiment was introduced for the purpose to obtain the output data. These data were applied for development the formation model of healthy lifestyle’s values of students. At this stage carried out the evaluation of health condition and structure of students’ incidence rate. Anthropometrical researches of students were carried out by the standard equipment according to standard and unified techniques [30]. Researches of incidence indicators carried out by copying information from primary medical documentation of education institutions (f. 086/O). In addition was considered the number of students’ absences due to illness, duration of one case of illness. During studying of incidence indicators processing of the obtained materials was carried out by classes of diseases according to «International Statistical Classification of Diseases and Related Health Problems» (ICD) [31]. Evaluation of health condition was carried out according to the express technique of somatic health evaluation [32]. It was determined the following parameters: strength and vital indexes, Robinson indexes, body weights, Ruffler. Sociological methods of a research (questioning) applied for evaluation of theoretical knowledge level; definition of students’ relation to physical training; definition of priorities in the choice of physical activity types. The questionnaire «Evaluation of students’ knowledge of health forming activity» was applied for studying and determination of students’ theoretical knowledge level. The questionnaire included 34 tests concerning health formation and healthy lifestyle. It was applied the questionnaire «The students’ relation to physical training». The questionnaire «Students’ motivation to physical training» allowed students to express the relation to physical activity.

During studying of incidence indicators were carried out by the standard equipment according to «International Classification of Diseases and Related Health Problems» (ICD) [31]. Evaluation of health condition was carried out by classes of diseases according to «International Statistical Classification of Diseases and Related Health Problems» (ICD) [31]. Evaluation of health condition was carried out according to the express technique of somatic health evaluation [32]. It was determined the following parameters: strength and vital indexes, Robinson indexes, body weights, Ruffler. Sociological methods of a research (questioning) applied for evaluation of theoretical knowledge level; definition of students’ relation to physical training; definition of priorities in the choice of physical activity types. The questionnaire «Evaluation of students’ knowledge of health forming activity» was applied for studying and determination of students’ theoretical knowledge level. The questionnaire included 34 tests concerning health formation and healthy lifestyle. It was applied the questionnaire «The students’ relation to physical training». The questionnaire «Students’ motivation to physical training» allowed students to express the relation to physical activity. The evaluation was carried out according to the 5-point grading scale: «1» – I don’t absolutely agree; «2» – it makes no difference to me; «3» – I partially agree; «4» – It is rather no than yes; «5» – I am completely agree. The questionnaire «The healthy lifestyle of the student» was directed to the identification of students’ lifestyle features. The questionnaire consisted of 69 questions concerned features of nutrition, daily mode, personal hygiene, cold water treatment, psycho hygiene, bad habits, capacity, physical activity. The questionnaire «Your physical health» consisted of 24 questions and defined a role and the place of physical activity in the healthy lifestyle’s values formation of student’s youth.

It was determined the level of physical activity of students [33]. Calculation of average energy consumption is carried out according to the formula:

\[
\bar{E}n = \sum_{i=1}^{k} RFA_i \cdot MET_i
\]

where: k – number of levels; \(\bar{E}n\) – average energy of consumption, kkal∙kg\(^{-1}\) per day; RFA – physical activity level, c.u.; MET – weight coefficient.

The modified technique of a research [34] became a basis for the development of the evaluation level of value orientations formation. The technique provided testing of students. Each performed task was estimated according to the 5-point grading scale. If the task is performed indistinctly (unsubstantially) – 1 point was given (a percentage indicator – 1–20%). If the performance of a task needed long considering (the answer was illogical) – 2 points were given (a percentage indicator – 21–40%). If the answer was evidential (though not rather accurate) – 3 points were given (a percentage indicator – 41–60%). If the answer was logical (it was carried out without long considering, but difficulties in scientific definitions were observed) – 4 points were given (a percentage indicator – 61–80%). If the answer of the student was accurate (scientifically constructed, evidential and logically complete) – 5 points were given (a percentage indicator – 81–100%). General evaluation of values’ formation level of a healthy lifestyle was: 1–35% – critical; 36–70% – sufficient; 71–100% – high. Technique «Values orientations» [35] applied for the determination of the initial level of a healthy lifestyle principles’ formation. The student was given two lists of values (18 items in each list) on the sheets of paper in alphabetical order. The student should rank each value in a list. The least
important item will take the 18th place. Firstly was given the set of terminal values, and then the set of tool values.

The expert evaluation of values formation factors of a healthy lifestyle was carried out by the method of advantage (ranging) (14 scientists and pedagogical staff of the higher education institutions with more than 10 years of work experience were involved as experts).

The forming pedagogical experiment was carried out at the second stage. The purpose of a forming pedagogical experiment was the introduction and evaluation of the efficiency of values formation model of students’ healthy lifestyle. Duration of the experiment was one academic year. The purpose of the experiment was assistance to the formation and development of healthy lifestyle values in students; formation of knowledge and skills to the application of physical culture means for improving the quality of life. The model contained the following stages: basic, organizational, educational and methodical, forming, productive. The basic stage has been directed to the acquaintance with bases of safety measures, the formation of interest to training, acquaintance with basic elements of traditional technique and innovative means of improving and recreational physical activity. The organizational stage included evaluation of the introduction conditions of values’ formation model of a healthy lifestyle. Basic and organizational stages were carried out in parallel during the first and second months of the academic year. The educational and methodical stage provided participation of students in the program of physical training. The program contained theoretical and practical parts. Experimental and control group trained according to the traditional program of physical training for the higher education institutions (once a week according to the program and twice a week according to extracurricular program). The frequency rate and duration of training per week for both groups were equal. The choice of means was carried out according to the motives and the interests of students in physical activity types. Participants in the experimental group were offered to keep the electronic diary of health. The Microsoft Corporation “The MSN Health & Fitness App — now available on iOS and Android” program [36] was installed on an operating system of the mobile phone. Students had the opportunity to expand independently the system of knowledge about formation, preservation, and promotion of health of the personality, to get acquainted with the techniques of self-checking and self-correction.

The students fixed indicators of a physical condition in the diary. The productive stage included identification of values formation levels of a healthy lifestyle in students. Criteria for the model efficiency were the following:
- cognitive (level of theoretical knowledge, awareness concerning need of maintaining own health),
- motivational (awareness of need for care of own health, behavioral stereotypes, motivation to sports and improving training),
- valuable (level of value orientations formation to a healthy lifestyle),
- active (level of physical activity, level of attraction to a regular physical activity trainings).

Statistical analysis. Systematization of material and primary mathematical processing were carried out by means of Microsoft® Excel 2010 tables. The well-known ways of transformation the empirical data of questionnaire [37] were applied for results processing.

Results
Most of the students have fragmental knowledge concerning health maintaining. Insufficient level of students’ knowledge is shown in non-compliance with a healthy lifestyle. Only 30% of females and 25% of males have rational nutrition.

Less than a third of the interviewed students have the good quality sleep. 60% of males and 90% of females regularly follow the rules of personal hygiene. Most of the students miss physical training classes. Only 26% of males and 10% of females practice physical activity in the spare time. Physical activity of high level in males is 34±3,72 min, in females 22±2,22 min (tab. 1).

Students defined the main reasons which made interference to the physical training: lack of conditions for training; the insufficient level of theoretical knowledge; features of the emotionally strong-willed sphere of the personality. Students demonstrated a negative attitude to physical training. It was defined the incentive motives of students to physical training: strengthening of health; receiving satisfaction from training; receiving of good mark or credit; application of the acquired knowledge and skills in everyday life; fashion and prestige of physical

<table>
<thead>
<tr>
<th>Gender</th>
<th>Level of physical activity</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>basic min, T; S</td>
<td>519±50,53</td>
<td>427±28,24</td>
</tr>
<tr>
<td>Males (n = 108)</td>
<td>low min, T; S</td>
<td>355±30,35</td>
<td>105±10,43</td>
</tr>
<tr>
<td></td>
<td>average min, T; S</td>
<td>34±3,72</td>
<td></td>
</tr>
<tr>
<td>Fema les (n = 120)</td>
<td>high min, T; S</td>
<td>420±31,81</td>
<td>134±12,52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22±2,22</td>
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culture training and sport; improvement of mood and health.

In the course of the research was studied hierarchy of terminal (fig. 1) and tool values (fig. 2) of students. In the system of terminal values of males prevails desire of active lifestyle; public calling; entertainments; financial security of life. The females had the following dominated values: entertainments, active lifestyle, the beauty of nature and art.

The leading tool values of males are the following: accuracy; ability to keep things in an order; an order on affairs; high requirements to life and high aspirations; self-checking; diligence. On the last positions there were the independence and high general culture. The leading tool values of females are the irreconcilability to shortcomings in own personality and in others, high aspirations and accuracy.

<p>| Table 1. Evaluation of indicators of students’ physical health |
|---------------------------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Male students (n = 108)</th>
<th>Female students (n = 120)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body-weight index, kg•m⁻²</td>
<td>25,95 ± 1,47</td>
<td>21,58 ± 1,52</td>
</tr>
<tr>
<td>Robinson index, c.u.</td>
<td>88,12 ± 9,34</td>
<td>86,14 ± 8,47</td>
</tr>
<tr>
<td>Vital index, c.u.</td>
<td>47,17 ± 4,84</td>
<td>44,23 ± 4,81</td>
</tr>
<tr>
<td>Strength index, %.</td>
<td>42,00 ± 0,40</td>
<td>41,00 ± 0,30</td>
</tr>
</tbody>
</table>

Fig. 1. Hierarchy of terminal values of students (males, n=108; females, n=120): 1 – active lifestyle; 2 – vital wisdom; 3 – health; 4 – interesting work; 5 – beauty of the nature and art; 6 – love; 7 – financial security of life; 8 – existence of good and loyal friends; 9 – public calling; 10 – knowledge; 11 – productive life; 12 – development; 13 – entertainments; 14 – freedom; 15 – happy family life; 16 – happiness of others; 17 – creativity; 18 – self-confidence. M – males; F – females.

Fig. 2. Hierarchy of tool values of students (males, n=108; females, n=120): 1 – accuracy; 2 – social training; 3 – high aspirations; 4 – vivacity; 5 – diligence; 6 – independence; 7 – irreconcilability to shortcomings in own personality and others; 8 – education; 9 – responsibility; 10 – rationalism; 11 – self-checking; 12 – courage to persist in own opinion; 13 – strong will; 14 – tolerance; 15 – liberality; 16 – honesty; 17 – efficiency on affairs; 18 – sensitivity. M – males; F – females.
The high self-esteem of own health by students doesn’t coincide with objective data. The majority of students’ health indicators belong to below average and low levels (in particular indicators of vital, strength and to Robinson index) (tab. 2).

In the structure of female students’ incidence (fig. 3) prevailed the following: diseases of the digestive system (25%); contagious and parasitic diseases (11.67%); sensory processing disorder (11.67%) and respiratory diseases (10%); skin diseases (8.33%); disease of genitourinary system (8, 33%). In males prevailed: diseases of the digestive system (31, 48%); sensory processing disorder (9.26%); skin diseases (9.26%); musculoskeletal disorders (9.26%); nervous disorders (7.41%); respiratory diseases (7.41%).

It is established the high frequency of students’ incidence and chronic diseases. Most of the students don’t pay a lot of attention to the formation of own health. It is expressed in: chaotic nature of a daily routine; non-compliance with a rational nutrition and physical activity; the existence of addictions.

Males have the following levels of a healthy lifestyle formation: sufficient – 3.7%; satisfactory – 20.37%; critical – 75.93%. Females have the following levels of a healthy lifestyle formation: sufficient – 2.5%; satisfactory – 25%; critical – 72.5%. The received results became the background for the development of values formation model of students’ healthy lifestyle.

It is revealed the limiting and stimulating factors of values formation of students’ healthy lifestyle by means of expert evaluation. The major limiting factors are:

- limitation of knowledge concerning opportunities for improving and recreational physical activity in values formation of a healthy lifestyle (57.1%);
- lack of the evidence-based model of values formation of a healthy lifestyle in the course of physical training (28.6%);
- lack of the appropriate system of pedagogical control (14.3%).

Assessment of experts was coordinated – W=0.93 at p<0.01.

Among the stimulating factors, experts defined the following (W=0.91 at p<0.01):

- development of the accurate organizational model and methodical maintenance of educational and extracurricular forms of physical training (57.1%);
- creation of the corresponding conditions for ensuring regular physical activity of students (21.4%);
- providing students’ free choice of physical activity types according to their interests, requirements, and opportunities (14.3%).

Introduction of the model in process of physical training allowed to achieve the following results. The theoretical knowledge level of the experimental group students increased. The number of experimental group students with the initial theoretical knowledge level of a healthy lifestyle decreased by 30%. The number of students with a high level of knowledge increased (by 8.3%). It is a recorded increase (by 250%) the part of experimental group students with the high level of practical abilities. It wasn’t observed the significant changes in these indicators in students of the control

![Fig. 3. Structure of incidence of the studied contingent: N – number of students, %; C – class of disease; M – males; F – females. 1 – contagious and parasitic diseases; 2 – new growth; 3 – blood diseases; 4 – diseases of the endocrine system; 5 – mental disorders; 6 – nervous disorders; 7 – eye diseases; 8 – ear diseases; 9 – blood circulatory system diseases; 10 – respiratory diseases; 11 – diseases of the digestive system; 12 – skin diseases; 13 – musculoskeletal disorders; 14 – disease of genitourinary system.](image-url)
group. The motivation for physical activity training increased in experimental group students after the experiment. The part of experimental group students with the high level of motivation increased by 25%. Among them weren’t students with the initial level of motivation to a healthy lifestyle. Level of students’ physical activity in both groups increased. The positive changes were also in physical condition indicators of both groups. The students of the experimental group had statistically and significantly higher attitude to health at the end of the experiment (for n1=24, n2=24, p<0,01). In students of control, group indicator increased in: 4,17% – in comparison with sufficient level; 12,5% – in comparison with satisfactory level. It happened due to the decrease of a part of students with the critical formation level of a healthy lifestyle (by 16,67%). In the experimental group, the part of students increased by 4,17% – in comparison of with high, 41,67% – in comparison with sufficient level, 12,5% – in comparison with the satisfactory formation level of a healthy lifestyle. It is determined the decrease of a part of experimental group students with critical formation level (in 58,33%). Results of a research testified positive changes in values formation indicators of a healthy lifestyle of experimental group students. The received results defined expediency of the simulated process of values formation of students’ healthy lifestyle in the course of physical training.

Discussion

Received results confirm researches of authors concerning need of values formation of a healthy lifestyle [12, 14] and the recreational culture of students [38]. It is confirmed the data concerning the insufficient efficiency of physical training organization in higher education institution [26]. According to the results of our researches were expanded data [14] concerning approaches to modernization the physical training educational process in the higher education institutions. It was defined factors which determine values formation of a healthy lifestyle of student’s youth in the course of physical training. Stimulating factors are information and effective basis of justification, forecasting, and development of values formation model of a healthy lifestyle.

Our data supply the results of specialists’ research devoted to students’ motivation to physical training [38], evaluation of their physical health and physical activity levels [39]. We defined the incentive motives of students to physical training. Analysis of these motives will increase the efficiency of physical training educational process. It is expanded the results of a research concerning the students’ relation to a healthy lifestyle [40]. It is determined the considerable divergence between the declared value of health, a healthy lifestyle and behavioral intentions of student’s youth on the basis of the analysis of these empirical researches.

Organization features of the active leisure of students are proved in the research of Sadovs’kij O.O. [38]. We detailed information concerning quantitative and qualitative characteristics of spare time spending by student’s youth. Active recreation on the weekend, walks and outdoor games are usually only for 27,8% of males and 23,3% of females.

Our research confirmed and expanded scientific data [32] concerning the practical absence of students with the safe health level. According to the majority of health indicators, students have considerable deviations. It is established the high frequency of incidence in the course of the academic year, the existence of chronic diseases. Similar data are revealed in other researched [41].

Low health level, high incidence of students, induced us to new researches devoted to the problem of youth activation in a healthy lifestyle education. It is proved that insufficient physical activity is one of the reasons for students’ health condition deviations. It is confirmed the necessity of students physical activity optimization.

It is specified the developments [11] devoted to the effective application of the information technologies in the improvement of students’ quality of the study, improvement of youth theoretical readiness level. Improvement of youth theoretical readiness level of health formation was promoted to the application of the interactive approach: when information is given to students in the interesting form. It was also expanded the data of other authors [39] and reasonably proved the expediency of values formation of a healthy lifestyle with the application of physical training means. It is improved, expanded and deepened the works of Bojko Iu.S. [34] devoted to the technique of values formation evaluation level of a healthy lifestyle. We improved the criteria of evaluation of values formation level of students’ healthy lifestyle. The qualitative and quantitative characteristic of their formation levels is also revealed (high, sufficient, satisfactory, critical).

Questions of students’ health culture formation in extracurricular time in the course of physical training were investigated in the research [41]. We confirmed results of research that of values formation of a healthy lifestyle has the best opportunities in extracurricular work. It is proved, developed and approved the values formation model of students’ healthy lifestyle in the course of physical training. The feature of the offered model is the developed program. The program included interactive technologies and provided application of methods of the electronic, mobile, “turned”, mixed education. Results of the performed pedagogical experiment proved the efficiency of application the values formation technology of a healthy lifestyle of student’s youth. It is proved by the positive influence on physical condition indicators, theoretical readiness, the volume of physical activity, organization of useful leisure and active recreation.

Conclusions

Received results of researches confirmed the efficiency of the developed model of values formation of students’ healthy lifestyle in the course of physical training. This is given the grounds to recommend it for application in the course of students’ physical training at the higher education institutions.
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Conflict of interests

The authors state that there is no conflict of interest.

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Qigong training as a successful factor of fighter’s personal qualities development in students


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Authors’ Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

Abstract

Purpose: the analysis of fighter’s personal qualities development in students in the course of teaching and educational Qigong training.

Material: students who actively attended standard physical culture classes participated in the research (group N1, n=101, the 3rd course); students with a debilitated general condition who practised the program of Qigong training within 1-3 years (group N2, n=211). It was fixed: the level of fighter’s qualities development; a self-assessment (students estimated the level of fighter’s personal qualities development according to the scale from 0 to 10 points).

Results: Development of 6 main fighter’s personal qualities in students of group N1 was more successful and fast than in students of group N2. The average result on all 6 fighter’s personal qualities increases significantly and consistently with the increase in duration of training.

Conclusions: Qigong training is an important factor in fighter’s personal qualities development in students. In general, it is necessary to develop the health culture which becomes the way of maintaining a constant healthy lifestyle in students. It is necessary that male with strong-willed fighter’s qualities always sought to participate in the long physical self-improvement.

Keywords: students, physical culture, Qigong-training, fighter’s personal qualities.

Introduction

In all oriental martial arts, a huge significance is attached to the development of the fighter’s identity. Before initial martial arts training, it is necessary to develop a set of personal qualities. Without such qualities, the fighter won’t be successful in a fight. Moreover, he won’t be allowed to the knowledge of the deep secrets of martial art. In the Chinese martial art wushu, the system of development of identity bases of the future fighter is based on the gymnastics Qigong. In other oriental martial arts, there are similar systems of exercises.

There is a set of the personal qualities necessary for the fighter for constant victories. It is possible to extract the six most important qualities among them. Each of them is integrative. They include several private characteristics – traits of character or person’s abilities. They are: 1) positivity or the positive relation to life (ability to learn from own mistakes, optimism, etc.); 2) emotional stability (fearlessness, tranquility, lack of vulnerability, anxiety, irritability); 3) generosity in the attitude to other people (ability to understand and accept other people, friendliness, low aggression); 4) confidence (high self-assessment, independence, lack of inferiority complexes, etc.); 5) activity (consistency of aim, vital activity, etc.); 6) developed self-checking (consciousness in actions, self-perception as a person, ability to get rid off unnecessary emotions and thoughts etc.).

The most of students at our university are trained in physical culture classes. Such training includes games-based sports training, swimming, gymnastics, etc. But a part of students is trained on physical culture according to the program of specialization “Improving Qigong-training”. Generally, they are those students with a debilitated general condition.

This program provides training on which students perform special improving exercises: relaxation and articulate warm-ups; Chinese gymnastics Qigong; self-control exercises [1].

It is important to study features of sports activity influence on the identity of males and females. It is revealed that sports activities influence the identity of males and females was ambiguous. It is proved the interdependence of indicators of culturological parameters. The interrelation of factors of the athletes’ identity of various classification groups of sports and sports disciplines is also proved [2].

It was carried out own researches [3] and modern perspective researches [4] concerning the subject of the article. Scientists found out the degree of study influence at the university on the prevalence and strength of unhealthy habits in students. These researches determined that there is an urgent need to search the means and a solution to the problem of unhealthy habits impact on the
identity of students [5]. Such habits cause certain threats to students and distract them from study preparation. The entertaining websites and abundance of modern computer games demand a huge amount of time. All this causes threats to loss of education level. Similar habits lead to loss of concentration on the priority life directions. The modern student has to develop fighter’s special personal qualities. It is necessary to be able to resist life difficulties and to fight against unhealthy habits [6].

Many students have the debilitated general condition. The youth chooses active receiving modern higher education. Thereby the youth sacrifices the health. The healthy lifestyle becomes secondary. Students give up on sports hobbies. Consequently, the amount of incidences increases among students. The level of physical fitness decreases in youth. The number of the students who have a medical exemption from physical education for health reasons increases.

The fighter’s personal qualities develop in students in physical culture training. There are substantial grounds to believe that most of all it is shown in Qigong-training. These qualities develop more effectively under the influence of Qigong-training. Earlier we carried out the analysis of students’ personal development in the course of their Qigong-training [7]. The received results demonstrate high efficiency of Qigong-training for the general development of student’s identity. However, no studies had been conducted concerning the Qigong-training influence on the development of fighter’s personal qualities.

At the same time, there are some similar foreign researches on this subject. For example, concerning self-management as a condition for health culture creation among students. In this case, it is considered the formation of self-management skills for creating a new relation. It promotes the development of innovative processes in training and to use of skills of maintaining a healthy lifestyle by students [8]. It is very important to investigate the quality of life of students. It is also important to track a possibility of the greatest disclosure of the human capital in the course of activation of global processes in society [9]. Authors have revealed that:

- Found brain activation patterns result from different attentional focusing styles and breathing techniques performed during the investigated Health Qigong techniques [10];
- Dynamic and static body postures are a defining characteristic of mind-body practices such as Tai Chi and Qigong (TCQ). A growing body of evidence supports the hypothesis that TCQ may be beneficial for psychological health, including management and prevention of depression and anxiety [11];
- Baduanjin, a Chinese traditional Qigong exercise that focuses on a mind-body integration, is considered to be an effective exercise in promoting health [12];
- Mindfulness-based Baduanjin exercise may be effective for alleviating musculoskeletal pain and improving overall sleep quality in people with chronic illness [13].

According to our point of view, self-government of students gives the chance to turn strong-willed self-realization into a requirement. Students will be able to continue skills of healthy life for many years. The mission of the trainer on sports and the teacher of physical culture, in this case, is concentrated on the development of the identity of the student. Any more only full implementation of the program of training isn’t the main thing. Proceeding from these prerequisites in training, it is necessary to create for students of knowledge, ability, and skills. Then it is possible to guarantee healthy self-development and consciousness of the modern young man.

In foreign researches the idea that intellectual and sports activity of students has to be the best by results in certain age reveals. At the same time, in a research features of such an educational process are emphasized. In this case, all results for the student turn out under pressure of teachers on their personality. The same can be noted also for the results of athletes achieved under the influence of trainers. In this case athletes, students are exposed to physical and psychological abuse. It most often occurs during preparation for competitions [14].

Foreign researchers study the most important factors for the improvement of intellectual and physical activity of students. In this case, resistance to social problems is investigated. It is the result of the compliance of level of physical health and a psycho-emotional condition of students [15, 16]. In other researches, it is established that:

- Both males and females with high cognitive load scores had a non-significant trend toward higher BMIs, waist circumferences, and drinking more alcohol than low cognitive load counterparts [17];
- Abusive use of video games is associated with negative health consequences, such as musculoskeletal problems, eye disease, or cognitive and emotional problems. Therefore, it is vital to promote a sport practice associated with intrinsic motivations in order to avoid sport abandonment and develop a more hedonistic practice to avert sedentary habits [18];
- Physical activity, health-related quality of life, self-concept and body-mass index are indicators of a healthy lifestyle [19];
- Results show a dependent relationship between the acceptances of negative experiences and execution of physical activity. These results suggest a high probably of negative emotional experiences acceptance in people who makes intense or moderate physical activity [20];
- Electronic word-of-mouth on social network sites has been used successfully in marketing. In social marketing, electronic word-of-mouth about products as health behaviors has the potential to be more effective and reach more young adults than health education through traditional mass media. This study shed light on the application of the electronic word-of-mouth theoretical framework in promoting health behaviors. The findings can also guide the development of future social marketing interventions using social network sites to promote leisure-time
physical activity [21].

The Polish scientists investigated a subjective profile of positive health and survival in the females with differing physical activity. The physical activity is the important factor influencing health and ability to survive. Researchers have studied how under the influence of physical activity things change in a condition of somatic and mental health of females [22-24].

Scientists investigated the role of “Qigong” gymnastics in a restoration of an organism in high-speed and power load. They have developed panacea of a restoration of nervous, respiratory, cardiovascular and muscular systems. It occurs after a tiresome load in training process by means of Qigong training. The “Qigong” gymnastics was included in a warm-up and in a final part of a training. It is proved that the application of “Qigong” gymnastics is very effective. Especially in the training process of the heaviest microcycle of the high-speed and power period. The Qigong is an additional reserve of quality improvement of an athlete’s physical condition [25].

The method of self-assessment is very widespread in psychology and pedagogical researches [26-28]. In spite of this fact it is subjective and inexact. Young people with a low self-assessment have the low level of modern aspirations of the personality. Such students refuse any educational work with competitive elements [29, 30]. In the future life, such students will refuse for certain a positive spirit on successful vital self-realization. It is proved that in such cases the objective self-assessment is reached by the real attitude to the inner “I”. In certain cases, it is reached by an uncertain assessment of own abilities. Everything depends on the community and collective demands. According to some researchers’ point of views, the self-assessment is the main component in the structure of the personality. Only due to high self-esteem, young people will be able to find confidence in themselves. They will treat surrounding reality and transform it according to own opportunities and forces [31]. In our research, we have minimized the influence of these factors.

The research hypothesis. It was assumed that improving Qigong training is an important factor of development of fighter’s personal qualities development in students. They promote the improvement of fighter’s personal qualities in all groups of the students attending Qigong training. It occurs significantly higher than in students practicing other types of physical culture.

Purpose. To investigate the learning efficiency of students according to the Qigong training program for developing the fighter’s personal qualities.

Material and methods.

Participants. Two groups of the students who actively attending physical culture training at the university (n=101) and Qigong training (n=277) were created for carrying out a research. Experimental groups consist of the students who trained according to the Qigong training program during 1, 2 and 3 years (volumes of samples respectively 167, 66 and 44 persons). As control groups, we considered the students attending ordinary physical culture training at the university during three years (n=101).

Organization of a research. In an experiment were fixed fighter’s personal qualities development in students of experimental and control groups at the beginning of training and at the end of training of the corresponding academic year. Earlier we proved that such students have the best indicators of positive personal qualities. Including fighter’s personal qualities development in physical culture training during 1-3 courses [2].

At the end of the corresponding academic year, students of experimental and control groups were offered to estimate development degree of different personality qualities by a scale from 0 to 10 points. At the beginning and at the end of the training period students estimated private characteristics of each fighter’s personal quality. It was very important to increase the objectivity of a research. As an indicator of the influence of Qigong training program on fighter’s personal quality, we applied not absolute values of self-assessments of students. For this purpose was applied the difference between their estimation of the same quality value before training and during a research. For most of the young people, it is much easier to estimate the change in the development of personal qualities for any period of time. It is more difficult to do this and to estimate correctly extent of this development at present today.

We have the intentionally limited sample of participants in our research. It was only those students who are able to fix and estimate consciously the development and dynamics of development of own personal qualities. We were interested in those students who in the next 10-20 years can become chiefs of a different level. One of the tasks of this method is an increase in the consciousness of young people [1].

Statistical analysis. It was carried out the primary mathematical processing of results of each student: 1) calculation of a difference of final and initial estimates of each of private characteristics of each main quality of the fighter’s identity – growth of estimates during training (as positive assessment of negative quality was accepted size 10-N, where – is an assessment of development extent of negative quality); 2) calculation of average value of estimates growth of the separate qualities of the personality which are manifestations of each of six main fighter’s personal qualities.

It was applied the following statistical methods of data processing: 1) calculation of average values of estimates’ growth of the main fighter’s personal qualities for each group of students; 2) estimation of the reliability of differences between average values according to Student criterion. Differences were accepted as essential at significance value less than 0,05.

Results.

The final table of estimates’ average growth of six main fighter’s personal qualities development is given below: 1) in the 3rd year students who trained on ordinary physical culture classes; 2) in the students attending
Qigong training classes during the corresponding period of study (1, 2 or 3 years).

The pedagogical experiment has shown the following:

1. For all 6 main fighter’s personal qualities the estimates’ growth of all groups of the students attending Qigong training classes was significantly above, then in the students who practice other types of physical culture with the same term of study. Estimates’ growth of development of all fighter’s personal qualities in those who attended Qigong training classes during only one year: whether haven’t a significant difference, or have significantly higher than in the students who practicing other types of physical culture during three years.

Average estimates’ growth of all six fighter’s personal qualities for the students studying according to the Qigong training program after the first year of study is significantly above that in the students who practice other types of physical culture during three years. It may safely be said that fighter’s personal qualities development in students practicing Qigong training is more successful.

2. The average result on all six fighter’s personal qualities development of three fighter’s personal qualities (positivity, emotional stability, self-assessment) during the study of one, two and three years (C 1, C 2, C 3) is significantly and consistently grows. Estimates’ growth of development of other fighter’s personal qualities in students of the group C 3 (or groups C 3 and C 2) is significantly above this indicator in comparison with group C 1. It confirms that development of fighter’s personal qualities in students during Qigong training grows with the increase in duration of training.

Table 1. Estimates’ growth of total development of fighter’s personal qualities in students

<table>
<thead>
<tr>
<th>Personal qualities</th>
<th>Estimates’ growth in groups ±(0 -10) points</th>
<th>Important significant correlations</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td></td>
<td>3 C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C1</td>
<td>C2</td>
</tr>
<tr>
<td>Positive</td>
<td>0,8 ± 0,1</td>
<td>1,2 ± 0,1</td>
</tr>
<tr>
<td>Emotional stability</td>
<td>-0,2 ± 0,1</td>
<td>0,6 ± 0,1</td>
</tr>
<tr>
<td>Generosity</td>
<td>0,3 ± 0,1</td>
<td>0,8 ± 0,1</td>
</tr>
<tr>
<td>Confidence</td>
<td>0,8 ± 0,1</td>
<td>1,0 ± 0,1</td>
</tr>
<tr>
<td>Activity</td>
<td>0,7 ± 0,1</td>
<td>1,0 ± 0,1</td>
</tr>
<tr>
<td>Self-assessment</td>
<td>0,8 ± 0,1</td>
<td>1,4 ± 0,1</td>
</tr>
<tr>
<td>Average values in all qualities</td>
<td>0,5 ± 0,1</td>
<td>1,0 ± 0,1</td>
</tr>
</tbody>
</table>

Note. Designations in the table: C – data of all groups of the students attending Qigong training classes; C 1, C 2, C 3 – groups of the students attending Qigong training classes during 1, 2, 3 years respectively; 3 – data of group 3 (students who practicing other types of physical culture during three years).

It should be noted that in this research authors of the article managed to single out the scientific perspective connected with a certain increase in consciousness of young people. Authors pay attention to very current problems in the education system of students [29]. It is proved that improving Qigong gymnastic [7] is a dynamic factor of personal component development [6] of a healthy lifestyle in students. The conducted research confirms a hypothesis of authors of the article about the development of personal qualities of the fighter in students practicing Qigong training [1] depending on study duration.

Our results confirm conclusions of other research that it is possible to influence the process of formation of students’ health culture as a result of social, psychological, economic and social changes. Sports activity and vocational training of students has to be based on certain knowledge and physical activity. This activity has to have a certain purpose and develop the identity of the student [14].

Indirectly “Qigong” in the training process of the heaviest microcycle of the high-speed and power period confirms the main conclusions of the authors of the article concerning the application of gymnastics. It is proved also by other researches. It is an additional reserve of quality improvement of the athlete physical condition of the – the student. This factor influences the development of the identity of the fighter in athletes - students [25]. It will be coordinated with the main concept of authors of the article [22].

Our results are confirmed by other research, revealed features of the influence of sports activity on the identity of males and females in culturological aspect. It is necessary to consider the extent of the culturological impact of sports activity on personal features of athletes of a different gender. It is determined that the self-assessment is important for females. Factors of emotional and strong-willed and communicative spheres find the equal amount of interdependence. At men prevail reliable communications with indicators of the emotional and strong-willed sphere [2].

Our results [3] and researches of foreign authors confirm the existence of the designated problem and need of its further studying [15]. It is also very important to solve this perspective and in further similar researches [9]. Development of fighter’s personal qualities in students should be studied by means of different types of sport. Therefore studying of influence on the personality.
practicing Qigong training has reasonable scientific prospects [4].

Thus, self-government of students [8] gives the chance to turn into requirement the strong-willed self-realization of continuation of healthy life without modern addictions [5] for years to come. Trainers and teachers have to be concentrated on efforts on the development of the student’s identity, but not on the organization and implementation of students training program. Thereby, there will be an increase in a self-assessment of students [31]. Young people will be able to find self-confidence. Due to development of strong-willed qualities of the fighter, they will be able to struggle with all vital difficulties. Our approaches are validated by other researches [32].

As the summary, it should be noted that the analysis of the received results allows to make an important conclusion. Researchers have proved the validity of a statement about the influence of training at the university with the application of Qigong training on the corresponding parameters of students’ identity. On the basis of comparison of the obtained data in control and experimental groups, it is possible to draw positive conclusions on the main scientific idea of the article. For experts and modern young people becomes clear: what training is a more effective factor of fighter’s personal qualities development in students.

Conclusions
1. The fighter’s personal qualities develop in students during Qigong training program. The intensity of this development is higher than in students practicing other types of physical culture.
2. Development of fighter’s personal qualities in students grows with the increase in duration of their study in Qigong training program.
3. Qigong training is an important factor of fighter’s personal qualities development in students.
4. In general, it is necessary to develop the health culture which becomes a way of maintaining a constant healthy lifestyle at students for them. It is necessary that the young man with strong-willed combatively always sought to participate in the long physical self-improvement.

Conflicts of interest
The authors declare that there is no conflict of interests.

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Religiosity and female participation in sport: exploring the perceptions of the Turkish university students

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Authors’ Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection.

Abstract

Purpose: This exploratory study tried to find out religiosity levels and perceptions of Turkish university students on female participation in sport. It also aimed to point out the possible relationship between religiosity and female participation in sport.

Material: For this purpose, 412 university students attending to different faculties in Bartin University in Turkey completed Religiosity Inventory and Female Participation in Sport Questionnaire. The findings derived from both scales were evaluated using SPSS 22.0 program through descriptive statistics, t-Test and Anova Tests, and the relationships between two scales were calculated using Pearson Correlation Test and Regression Analysis. Gender and field of study were used as variables to elaborate the results of the scales.

Results: According to the findings of the research, it was found that the university students had very high religiosity level and very positive perception of female participation in sport. Moreover, the study pointed out there is a weak positive correlation between the religiosity and female participation in sport which was contradictory to the study hypotheses of this research.

Conclusions: As a conclusion, this study conveyed that religiosity does not have a negative effect on the female participation in sport.

Keywords: religiosity, spirituality, female participation in sport, gender equality, university students

Introduction

Religion plays a key role in the lives of individuals in today’s society, but its function is not limited to the individuals at all. Religion affects the relationships between individuals, societies, and even states, therefore, is efficient in all domains of life. It is well-known that big majority of the world population identifies itself with a religion. The level of religiosity differs from one to another, but any level of religiosity has a direct influence on the behaviors, attitudes, feelings, and thoughts of individuals.

Female participation in sport is another topic on which sociologists and sports scientists have concentrated during the last few decades. Within the Muslim majority populated countries, female participation in sport has a primary importance due to the various number of constraints when compared to other countries with different sociological and religious backgrounds. Therefore it has primary importance to try to identify any kinds of relationships between religiosity and female participation in sport in Muslim countries.

Literature and Theory

Religiosity, spirituality, and religiousness

Altunsu-Sonmez [1] underlined that social scientists had conducted many studies on religion and each discipline had employed its own approach in the process of understanding and explaining the concept. Anthropology and sociology sciences are used when studying religion, its origin, its social effects and its functions. Religiosity studies, however, are reviewed by using the sciences of sociology and psychology, since religiosity involves socio-psychological elements. Many researchers (e.g.; [2-4]) stated that religion is not only an individual feeling or experience but also a sociological phenomenon including any kinds of beliefs, customs, and traditions of social groupings. For this reason, when conducting studies on religion and especially on religiosity, it is vitally important that psychology and sociology be reviewed together [1].

In order to establish a balance between the psychological and sociological aspects of the definitions, Allport and Ross [5] applied intrinsic and extrinsic religious orientation categorizations. According to these authors, intrinsically oriented individuals find their master motive in religion. Other needs are of less ultimate importance and are brought into harmony with the religious beliefs and prescriptions. Such kinds of people are privately religious having private, personal and transcendent experiences easily and often, accepting and making use of these experiences [6]. On the other hand, extrinsically religious oriented individuals also turn to God, but without turning away from themselves [5]. That means they are disposed to use religion for their own ends, such as, to provide security, status, etc. These individuals use religion for their benefits [5] and accept the conceptualization of the religion as, all of the symbols, ceremonies, words, etc. as can be seen from many people in many cultures [6]. Other than these points, the degree of cohesion of religion with the social structure can have varying effects on the religiousness of the individual [7]. Accordingly, when religion turns into a separate institution, as in secularism, its effects will depend on the differential construal of the individuals [8]. As a common definition, religiosity was defined as the adherence to religious dogma or creed, the expression of moral beliefs, and/or the participation in organized or individual worship or sacred practices. Anyone or all of these qualities may be present and the construct was measured in two dimensions as private and public religiosity [9].

Allport and Ross [5]’s theory and conceptualization of intrinsic and extrinsic religious orientations have been
the backbone of empirical research in the psychology of religion [10]. The research conducted in Muslim majority countries (e.g. in Iran and Turkey) proved that Allport’s conceptual framework was supported cross-culturally and these concepts were relevant to the Muslim psychology of religion as well [11,12].

In most of the literature, religiosity, spirituality, and religiousness have been used interchangeably although each word has different implications. Gallagher and Tierney [13] stated that religiousness and religiosity are used to define an individual’s conviction, devotion, and veneration towards a divinity. However, in its most comprehensive use, religiosity can encapsulate all dimensions of religion, yet the concept can also be used in a narrow sense to denote an extreme view and over dedication to religious rituals and traditions. This rigid form of religiosity, in essence, is often viewed as a negative side of the religious experience; it can be typified by an over-involvement in religious practices which are deemed to be beyond the social norms of one’s faith [13]. That’s why more people nowadays prefer to use spirituality in order to avoid misconceptions about institutional religions. Spirituality has become another term used interchangeably for religiosity or religiousness. However, these two terms may reflect different states of feelings when they are related to religions. Zwingman et al. [14] claimed that there are a growing number of persons, in particular in the so-called Western world, who identify themselves as “spiritual” or even as “spiritual, but not religious”. According to Rasool [15], when it comes to Muslim context, there is no distinction between spirituality and religiosity. However, Jafari et al. [16] underlined that while spirituality and religion may not be differentiated in an Islamic context; spiritual care consists of more than just religious care. It is understood that from an Islamic point of view, spirituality and religion are often intertwined with one another and pervade all aspects of a person’s life, but when it comes to healthcare context, spiritual care does not necessarily equate with religious care [15-17].

In order to measure religiosity/spirituality, many instruments have been developed so far. The instruments at the beginning were designed for Christianity and then adapted to the context of other religions. Studies on measuring religiosity got widespread in the second half of the twentieth century and reached the peak during the 1980s and 1990s [18]. The instruments of religiosity/spirituality have been moved from simple uni-dimensional scales to complex multi-dimensional scales; as Wach (1944) suggested three factors, Lenski (1961) four, Glock and Stark (1965) five, King (1967) nine, Hunt (1972) eleven dimensions [19].

The first attempts to develop religiosity scales in Turkish literature were conducted by Mehmet Taplamacioglu in 1962 and Erdogan Firat in 1977. These studies fell behind their period in terms of their methods and technical infrastructure [20]. The first and the most important study on measuring religiosity is the ‘A Scale of Religiosity’ created by Kayhan Mutlu in 1989 [21], which was the first study in Turkey to conduct validity and reliability tests. Moreover, the reliability coefficient of the scale was calculated as 0.94 which is a rather high score [21]. In this present study, the “Religiosity Inventory” which was developed by Kula [22] being strongly inspired by Mutlu [21] and finally revised by Aydemir [23] was used.

Gender equality and female participation in sport
Women had always been associated with gender-based characteristics and had to strive very hard to have an equal role in all domains of life when compared to men. In traditional societies, women always had a primary responsibility as a ‘wife’ and ‘mother’ which resulted in the exclusion of women in many social events, and of course main sports activities. Even the Olympic movement was very discriminative at the beginning and it took a very long time for female athletes to be represented almost equally in the Olympic Games. In Paris Olympic Games in 1900, 22 women participated for the first time which was only 2.2 percent of the total athletes. This trend grew up steadily, and finally in Rio Olympic Games in 2016, of the 11,444 athletes competing, 5,176 were women (45.2 percent) which has been the peak level of the Olympic history. IOC also took a historical decision in 1991 stating that any new sport seeking to be included on the Olympic programme had to include women’s events.

Although female participation in sport is growing up, this is the case primarily in those sports considered feminine. Various studies among different demographic groups stated that people identify sport disciplines as masculine, feminine, or neutral [24]. Koivula [25]’s research involving 400 university students found that participants categorized sports as feminine, masculine, or gender-neutral based on their perceptions of the sports’ aesthetics, speed, and risk. Sports such as tennis, volleyball, and swimming were ranked as neutral, gymnastics and aerobics were ranked as feminine, and baseball, soccer, and football were typed as masculine. Respondents incorporated the perceived purpose of a sport and its risk when assigning labels. Koivula [25] points out that definitions of a gender-appropriate sport can change because gender is constructed based on historically and culturally specific conditions. Channon [26] conveyed that mixed-sex training for challenging orthodox Western constructions of gender resulted with positive results. Anyhow, men still have a chance to practice a greater number of sports than women making gender equality not entirely attained. The governments all around the world, international policymakers such as United Nations and European Council, the world leading sport organizations are all concentrated on policy interventions in the area of gender equality in sport [27].

Female participation in sport in the Turkish and Muslim context
In considering how women’s participation in sport is influenced by Islam, it must be stated first of all that there is no general prohibition of sport (in a broad sense) in Islam, and this includes girls’ and women’s sport [28, 29]. Many Muslim scholars so far emphasized that health and fitness are equally important for both sexes and must be maintained by regular physical activity. It is frequently pointed out in this connection that Prophet Mohammed himself recommended horseback-riding, swimming, and
archery. Leila Sfeir and others infer from this that Islam originally showed a favorable attitude towards women’s physical activities, but certain religious elements, such as Islamic fatalism and Hindu mysticism, have had negative effects on general access to sport [30].

Harkness [31] conducted a research on the cultural barriers to female sport participation in Qatar. This study clearly concluded that even women with high degrees of religiosity, including those who quit teams or stopped playing sports, insisted that religion was not the reason. All interpreted Islam as wholly supportive of female athletic activity. Playing sports did not make them feel less religious or in violation of Islamic principals at all.

After studying Islamic sources and authorities Shahiza Daiman [32] concluded that physical activities ought to be obligatory for women for reasons of health. Nevertheless, in several countries, women’s sport (in a broad sense) is regarded as incompatible with the values and the concept of femininity prevailing in Islam, which forces women into subordination, dependence, and restriction of their roles to the house and family [30,32]. In sport and physical education girls and women must observe the precepts of Islam and maintain the honor of their families, which means above all that they must keep their bodies covered and not come into contact with other men [33]. That’s why some studies carried out on Muslim minorities pointed out that some of the Muslim girls do not participate in physical education classes since the practices and values of physical education are not perceived to be compatible with their cultural traditions and beliefs. Girls being together with boys for activities like dancing and swimming [34], being physically active during Ramadan [29], and wearing the physical education kit [35] were considered as some of the barriers for girls’ participation in the classes. Another study conducted in Pakistan on university students depicted that socio-cultural barriers are one of the main constraints of sport participation which would be more evident among female participants [36].

Various studies showed that athletes and coaches may use religion as a psychological support tool as they face stressors and challenges during training sessions and especially in competition [37-39]. They may also use aspects of religious practice to produce team cohesion [40]. What’s more, a study found out that those who are spiritual and/or religious indicate better outcomes of mental health in a Muslim society [41]. Najah et al. [39] stated that future studies on Muslim population require looking at elements accounting for these associations and need to be responsive to cultural and theological matters in their assessment.

Turkey is a Muslim populated secular country and Turkish women have a modern lifestyle but are also attached to their traditions and customs. According to Inal [42], as Turkish women become educated and economically independent, they gain the chance to have a much more modern lifestyle, but the essence of their traditions and customs may still be definitive in their daily attitudes and lives. This is also evident in sport participation as the rate of female athletes decreases in eastern and rural parts of the country [42]. In an analysis of the prospects and the barriers facing Turkish women in sport, one must take into consideration the great differences between orientations and the reality of living conditions in Turkey, which depend on where a person lives and to what social class he or she belongs [28]. In general, however, it can be stated that participating in sport has never been an integral part of Turkish culture [28].

During last few decades, female athletes have increasingly started taking part in sports which have been traditionally regarded as masculine sports (e.g., wrestling, weight-lifting, kick-boxing, bodybuilding). However, many sports have been considered inappropriate for women, and women who engage in gender-inappropriate types of sports are often perceived as acting outside of their gender role [43]. Consequently, they are treated as behaving immorally. It can be assumed that the close association between the attributes required for sport and the traditional concepts of stereotypical gender roles contribute to this attitude. The participation of women and men in the social institution of sport and the very shape of that institution are partly determined by the definitions of what men and women ought to be in society [44]. Turkey is a very diverse country and the participation in sport, as well as the general practice and experience of physical activity, varies considerably in the various regions of Turkey [28,42]. The number of female athletes’ in martial sports such as taekwondo, karate, and judo is growing tremendously which proves that an increasing number of women prefer to participate in sports traditionally dominated by men. It is also a reality that the society is changing, younger generation is more active in sport and families started to encourage their children especially girls, to enjoy sport, because sport is considered something positive. This continuing transformation and modernization process has led researchers to investigate the institution of sport as an important arena of gendered cultural practices in Turkish society [43].

According to the statistics taken from General Directorate of Sport of Turkish Ministry of Youth and Sport, by the end of 2017 only one-third of the licensed athletes are females (1,469,314 female athletes and 2,959,521 male athletes). These figures show that female participation in sports is exactly the half of male participation who are registered under 58 national sport federations.* Although this percentage seems to be negative for women, it is quite positive as this rate has raised from 27.96% in 2009 [42] up to 33.17% in 2017. Out of 58 calculated national federations, when the percentage of female athletes taken into consideration, only 5 of them have dominantly more female athletes which are namely; Gymnastics Federation (62%), Volleyball Federation (61%), Folk Dance Federation (60%), Dance Sports Federation (59%), and Skating Federation (58%). On the other hand only 7 of them can be regarded as neutral; Equestrian Federation (50%), Tennis Federation (46%), Badminton Federation (43%), Swimming Federation (43%), Curling Federation (42%),

* This data was taken from the website of General Directorate of Sport and excludes licenses registered in Basketball, Football, and School Sports Federations (http://sgm.gsb.gov.tr/Sayfalar/175/105/Istatistikler).
Orienteering Federation (40%), and Fencing Federation (%40).

It is noteworthy to point out that women had quite important successes in elite sports which create a positive impact on the perceptions of the society. Although women do still face various forms of discrimination, women have reached an important position in elite sport in Turkey, not the least because female athletes have been successful and thus have gained fame for the country [45]. In 2012, for the first time in Olympic history, the number of Turkish women was higher than the number of men, and women achieved to gain three of the five medals for Turkey. Besides, female volleyball teams both national and club level had outstanding results during last ten years. In the last eight seasons (between 2008 and 2016), Turkish teams managed to go the final fours of European Champions League, with two teams in five seasons, with one team in rest three seasons and won the cup four times. Turkish female volleyball club teams also managed to won World Clubs Champion title for four times during the same period. In a recent study, Bastug et al. [46] outlined that Turkish women are getting more visible in the society through work-life and social activities including organizational sport and physical activities which help them eliminate prejudices, negative value judgments, and sexism.

Purpose of the Current Study

The current study aimed to investigate the associations between religiosity and female participation in sport through the perceptions of the university students in the Turkish context. This topic has never been studied before. Various researchers have carried out studies separately on female sport participation and religiosity, no specific study has explored both subjects together on a relational basis. To our knowledge, the present study is unique as it investigated the relationship between religiosity and female participation in sport in Turkey for the first time. Specifically, this research empirically tried to explore: 1) whether there are gender and field of study differences in perceptions of university students about female participation in sport; 2) whether there are gender and field of study differences in the religiosity levels of the university students; and 3) whether religiosity and female participation in sport has a relationship; or whether we could expect to find that religiosity may play a negative role in girls’ and women’s participation in physical/sport activities due to some restrictions, such as dressing codes, and some other psycho-social barriers widely observed in Muslim societies, although it was clearly stated in the literature that Islam does not prohibit participation to sport [28, 29].

Material and methods

Participants

To explore the associations between religiosity and female participation in sport through the perceptions of university students, and their differences through gender and field of study variables, two different scales were adapted to 412 university students (X̄ = 20.4) attending to different faculties in Bartın University in Turkey during the spring term of 2016-2017 education season. During the data collection, 456 scales were returned by the students who attended the study on voluntary basis. All participants gave their informed consent for inclusion before completing the scales. After partially completed surveys were excluded, the number of usable responses dropped to 412, a response rate of 90.35%. As the non-response/partial completing rate was so low (9.65%), it was understood that students answered both scales voluntarily and sincerely. However, it must be noted that this sample cannot be considered representative of the whole university population across the country and needs to be verified with new studies conducted in other universities in different regions and especially those in metropolitan cities.

Table 1. Demographic information of the sample

<table>
<thead>
<tr>
<th>Information</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>217</td>
<td>52.7</td>
</tr>
<tr>
<td>Female</td>
<td>195</td>
<td>47.3</td>
</tr>
<tr>
<td>Total</td>
<td>412</td>
<td>100.0</td>
</tr>
<tr>
<td>Faculty of Education</td>
<td>71</td>
<td>17.2</td>
</tr>
<tr>
<td>Faculty of Economics and Administration</td>
<td>54</td>
<td>13.1</td>
</tr>
<tr>
<td>School of Physical Education and Sport (PES)</td>
<td>84</td>
<td>20.4</td>
</tr>
<tr>
<td>Faculty of Islamic Sciences</td>
<td>112</td>
<td>27.2</td>
</tr>
<tr>
<td>Other Faculties (Faculty of Letters, Faculty of Science, Faculty of Forestry)</td>
<td>91</td>
<td>22.1</td>
</tr>
<tr>
<td>Total</td>
<td>412</td>
<td>100.0</td>
</tr>
</tbody>
</table>

As seen in Table 1, 217 male (52.7%) and 195 female students (47.3%) attended the study. Three faculties which had fewer students in the study sample (Faculty of Letters = 39 students, Faculty of Science = 27 students, and Faculty of Forestry = 25 students) were gathered and calculated together. As religiosity is mainly associated with Faculty of Islamic Sciences, and sport participation with School of Physical Education and Sport, it was more important in this study to evaluate these two faculties separately both of which were expected to have meaningful differences when compared to others.

Measurements

Female Participation in Sport Questionnaire (FPSQ)

In order to gather data about the opinions of university students on female participation in sport, the “Female Participation in Sport Questionnaire” (FPSQ) which was developed by Kizilyalli [47] was applied to the sample. As the validity and reliability of the questionnaire were conducted on university students, this questionnaire was a very suitable measurement device for the actual study as well.

FPSQ is a 5-point Likert type scale (1 = totally disagree, 5 = totally agree) which consists of 39 questions to determine the participants’ opinions on females’ participation in sport activities. Regarding construct validity of the questionnaire,
factor analysis, and item-total correlation tests were used. Results indicated that factor values ranged from 0.30 to
0.80 and item-total correlation values ranged from 0.32 and
0.73. The Cronbach’s Alpha internal reliability coefficient
was computed as 0.769. 39 items were gathered into a
csingle factor.

Religiosity Inventory (RI)
In order to gather data about the religiosity levels of
the university students, the “Religiosity Inventory” (RI)
which was developed by Kula [22] being strongly inspired
by Mutlu [21] and finally revised by Aydemir [2008] was
used. RI developed by Kula was composed of 30 items in
total, and Aydemir dropped two items, which were about
Jumua (Friday) prayers as they were only addressing
males, and added two new items which were on hajj
(pilgrimage) and zakat (alms) as they were more related to
both sexes. This inventory was a 5-point Likert type scale
(1 = totally disagree, 5 = totally agree) and its revised form
was applied to the adults aged between 20 and 35, therefore
it is an appropriate tool for the present study as well.

In order to determine the validity of the inventory, factor
analysis, and item-total correlation tests were conducted
and 5 items of the inventory were eliminated as their factor
values measured different factors than the total inventory.
The rest of the items’ factor values ranged from 0.30 to
0.78. The Cronbach’s Alpha internal reliability coefficient
was calculated as 0.86. In the present study, the inventory
was evaluated as a single factor measurement device.

Statistical analyses
Statistical analyses were performed using the
Statistical Package for Social Sciences (SPSS 22
Version). Descriptive statistics (means and standard
deviations) were used to analyze the data. In order to test
the RI and FPSQ results using the variables (gender and
field of study), t-Test and Anova Tests were conducted.
Test of Normality was conducted on both scales in order
to verify normal distribution of data in both scales. Finally, Pearson Correlation test was conducted in order
to find out the relationship between the two scales and
Regression Analysis was conducted in order to explain
the relationship between these scales.

According to Table 2, the Skewness and Kurtosis
values of the data proved that the data derived from both
scales had a normal distribution in the present study.

Results
This study tried to point out the relationships and
differences of religiosity and female participation in sport
through the eyes of Turkish university students using
gender and field of study as the variables. A total of 412
university students were included in the study attending
different faculties of Bartin University (Table 1).

Table 3 reports the results of religiosity levels and
perceptions of female participation in sport of the university
students according to the gender variable.

In Table 3, the total points and average scores of 412
university students were calculated separately for each scale. The score limitations and loads of both scales
according to this formula, n-1 = 5-1 = 0.80, was calculated
and classified in Table 4 (Kizilyalli 2014).

In Religiosity Inventory, the average score was found
as 4.32 and the total inventory score as 108.10. These
results show that the students have a very high religiosity
level. When it comes to the Female Participation in Sport
Questionnaire, the average score was found as 3.23 and
the total score as 126.24. These results also indicate that
the students have a very positive perception of female
participation in sport. Kizilyalli [47] conducted a research
on 750 university students attending Ankara University
and found positive perception of female participation in
sport. Therefore, it can be stated that the students of Bartin
University, in general, have more positive attitudes towards

<table>
<thead>
<tr>
<th>Table 2. Test of Normality of the two scales</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Statistic</td>
</tr>
<tr>
<td>RI Average</td>
</tr>
<tr>
<td>FPSQ Average</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3. Total and average scores of the scales</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>RI</td>
</tr>
<tr>
<td>FPSQ</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 4. Classification of the scales</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPSQ</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Negative</td>
</tr>
<tr>
<td>Less Positive</td>
</tr>
<tr>
<td>Positive</td>
</tr>
<tr>
<td>Very Positive</td>
</tr>
</tbody>
</table>
female participation in sport when compared to the students of Ankara University.

According to Table 5, there is no meaningful difference in religiosity levels and female participation in sport between female and male students. Therefore, it is understood that the religiosity levels of both sexes and their perceptions of female participation in sport is almost similar in the sample group of this study. In a previous study conducted by Akgul [48] on 197 male and 112 female participants, no meaningful difference was observed between religiosity and sport participation according to the gender variable. Although the study was not limited with the perceptions of female participation in sport, but sport in general, its findings are similar with the findings of the present study. On the other hand, Kizilyalli [47] found a contradictory result as female students had more positive attitude than males about female participation in sport.

In Table 6, it can be seen that there are meaningful differences in both scales when the field of study is taken into consideration (RI: $F = 14.164, p<0.000$; FPSQ: $F = 7.446, p<0.000$). In order to find out between which groups meaningful differences appeared, one of the Post-Hoc tests,

---

**Table 5.** t-Test results of the scales according to the gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>$\bar{x}$</th>
<th>ss</th>
<th>t</th>
<th>Sd</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>217</td>
<td>4.31</td>
<td>0.417</td>
<td>-0.520</td>
<td>410</td>
<td>0.604</td>
</tr>
<tr>
<td>Male</td>
<td>195</td>
<td>4.33</td>
<td>0.475</td>
<td>-0.352</td>
<td>410</td>
<td>0.705</td>
</tr>
<tr>
<td>FPSQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>217</td>
<td>3.22</td>
<td>0.417</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>195</td>
<td>3.24</td>
<td>0.433</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$p < 0.05$

**Table 6.** Anova Test results of the scales according to the field of study

<table>
<thead>
<tr>
<th>RI</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>N</td>
<td>$\bar{x}$</td>
<td>ss</td>
<td>Variance source</td>
<td>KT</td>
<td>Sd</td>
<td>KO</td>
</tr>
<tr>
<td>-------------</td>
<td>----</td>
<td>------------</td>
<td>-----</td>
<td>-----------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Faculty of Education</td>
<td>71</td>
<td>4.36</td>
<td>0.466</td>
<td>between groups</td>
<td>9.952</td>
<td>4</td>
<td>2.488</td>
</tr>
<tr>
<td>Other Faculties</td>
<td>91</td>
<td>4.21</td>
<td>0.550</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty of Economics</td>
<td>54</td>
<td>4.04</td>
<td>0.554</td>
<td>within groups</td>
<td>71.492</td>
<td>407</td>
<td>0.176</td>
</tr>
<tr>
<td>School of PES</td>
<td>84</td>
<td>4.33</td>
<td>0.280</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty of Islamic Sc.</td>
<td>112</td>
<td>4.52</td>
<td>0.235</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>412</td>
<td>4.32</td>
<td>0.445</td>
<td></td>
<td>81.444</td>
<td>411</td>
<td></td>
</tr>
</tbody>
</table>

**FPSQ**

<table>
<thead>
<tr>
<th>Faculty</th>
<th>N</th>
<th>$\bar{x}$</th>
<th>ss</th>
<th>Variance source</th>
<th>KT</th>
<th>Sd</th>
<th>KO</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty of Education</td>
<td>71</td>
<td>3.15</td>
<td>0.452</td>
<td>between groups</td>
<td>5.060</td>
<td>4</td>
<td>1.265</td>
<td>7.446</td>
<td>0.000</td>
</tr>
<tr>
<td>Other Faculties</td>
<td>91</td>
<td>3.15</td>
<td>0.420</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty of Economics</td>
<td>54</td>
<td>3.07</td>
<td>0.323</td>
<td>within groups</td>
<td>69.151</td>
<td>407</td>
<td>0.170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School of PES</td>
<td>84</td>
<td>3.37</td>
<td>0.411</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty of Islamic Sc.</td>
<td>112</td>
<td>3.32</td>
<td>0.416</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>412</td>
<td>3.23</td>
<td>0.424</td>
<td></td>
<td>74.211</td>
<td>411</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$p < 0.05$
Tukey HDS test, was conducted. According to the result of this test, differences between the faculties are listed below.

1. The average score of the students in Faculty of Education ($\bar{x} = 4.36$) is higher than the scores of the students in Faculty of Economics and Administration ($\bar{x} = 4.04$).

2. The average score of the students in Faculty of Economics and Administration ($\bar{x} = 4.04$) is lower than the scores of students in Faculty of Education ($\bar{x} = 4.04$), School of Physical Education and Sport ($\bar{x} = 4.33$), and Faculty of Islamic Sciences ($\bar{x} = 4.52$).

3. The average score of the students in School of Physical Education and Sport ($\bar{x} = 4.33$) is higher than the scores of the students in Faculty of Education ($\bar{x} = 4.04$), Faculty of Islamic Sciences ($\bar{x} = 4.52$), and Other Faculties (Science, Letters, and Forestry) ($\bar{x} = 3.15$).

4. The average score of the students in Faculty of Islamic Sciences ($\bar{x} = 4.52$) is higher than the scores of the students in Faculty of Economics and Administration ($\bar{x} = 4.04$), Faculty of Education ($\bar{x} = 3.15$), and Other Faculties (Science, Letters, and Forestry) ($\bar{x} = 3.15$).

Therefore, the comparison of the average scores between the faculties confirmed that religiosity level is the highest in the students attending to Faculty of Islamic Sciences, and perceptions on female participation in sport is the highest among the students attending to School of Physical Education and Sport.

Table 7 indicates that there is a positive weak correlation ($r = 0.185$, significant at 0.01 level) between religiosity levels of the students and their perceptions on female participation in sport which is contradictory to the study hypothesis. Although religiosity has a very weak positive effect, it can be stated that more religious students have more positive attitudes towards women’s participation in sport activities. This finding is also contradictory to the results of the study conducted by Akgul [48] which found no meaningful difference between religiosity and sport participation, either positive or negative. Similarly, Bastug et al. [46] could not find any meaningful relationships between doing exercises variable and religiosity.

Table 8 proves the meaningfulness level of the model through the calculation of the F score. In this study, as F

<table>
<thead>
<tr>
<th>Mode</th>
<th>R</th>
<th>R-Square</th>
<th>Adjusted R-Square</th>
<th>Std Error</th>
<th>R-Square Change</th>
<th>F Change</th>
<th>df-1</th>
<th>df-2</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.200</td>
<td>0.040</td>
<td>0.038</td>
<td>0.26782</td>
<td>0.040</td>
<td>17.021</td>
<td>1</td>
<td>410</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Dependent Variable: Religiosity
value (F = 7.173, P < 0.000) was found to be meaningful, the total model is approved statistically meaningful in terms of the relationship between the two scales. Adjusted R Square value was found 0.038 which points out that 3.8% of the students’ perceptions on female participation in sport can be explained as a direct result of the changes in their religiosity levels.

Discussion

Christl et al. [49] stated that there had been little research examining the complexity of the relationships linking gender and religiosity, and found that religiosity, in general, plays a more central role in the lives of girls than of boys. However, while the results show that girls are more interested in religious issues, believe in religious ideologies to a greater extent and place greater value on private religious practice such as prayer, there is neither gender difference in public religious practice, nor do girls report having more religious experiences than boys. This finding supports the idea that gender differences have been exaggerated in the literature [49]. Bastug et al. [46] were the first to investigate correlations between religiosity and the sub-factors of ambivalent sexism in Turkey. Their study found no significant difference between males and females for the correlation of religiosity and hostile sexism. In another study investigating the relationship between religiosity and gender conducted in German and Turkish individuals, at the behavioral level, the correlation between religiosity and gender egalitarianism was true for only Turkish respondents [50]. On the other hand, previous literature [51-53] had conveyed that hostile sexism is higher in males than females, but this attitude was not observed in sport domain [46]. All these studies confirm the findings of the present study as no meaningful difference was found in religiosity and female participation in sport according to the gender variable.

There has been a main interest in spirituality/religiosity and this interest has been mirrored in athletic activities. Many professional sports teams now hold church services on Sundays and many college teams have followed their lead. Pre-game prayer is also becoming customary for many teams. This includes the Texas Rangers professional baseball team who was featured in an article noting their religious character and values [54]. There are even organizations like the Fellowship of Christian Athletes and Athletes in Action that have been started to accommodate the growing number of athletes driven by their sport as well as spirituality [54]. A similar attempt in Turkey was the foundation of “Diyanet (Directorate of Religious Affairs) Sports Club” which was founded in 2007. The officials of Diyanet decided to found this club in order to go outside and compete with other religious communities in order to be taken seriously by the masses [55]. For this reason, Diyanet Sports Club had transferred world champion Moto GP driver Kenan Sofuoglu who competed in international arena on behalf of this club since 2009. In Turkey, many football stars appear in public prayer areas before competing in important matches. Therefore, it is out of question not to take religion into consideration in sport life.

Another issue closely interwoven with sport is body image which has positive relationship with religiosity. Demmrich at al. [56] conducted an exploratory study among 59 female Muslims between 17 and 46 years (n = 29 veiled, n = 30 non-veiled) in Turkey, measuring social appearance anxiety and religiosity. The results of this study showed that veiled women score much lower on social appearance anxiety than non-veiled women. Research in non-Muslim communities (e.g., [57-61]) also depicted that higher levels of spirituality predicted greater body satisfaction and self-esteem, and higher spirituality also predicted less appearance investment. Rossi and Castelli [60] carried out a comparative study on different religious groups and from another point of view; Lynch [62] stated that Physical Exercise and Health classes should be used to increase the spiritual experiences of the school children. Therefore, this perspective had underlined the reverse direction of the relationship between physical activity and spirituality/religiosity.

Conclusion

Very few studies (e.g. [46,48,63]) so far have focused on the relationship between religiosity and physical activity and sports in Turkey. Therefore this study has been a serious contribution to the literature as it elaborated a new dimension of sport, female participation, for the first time. This study is also significant as it tried to find out the possible associations between religiosity levels and perceptions of female participation in sport of the university students. Although a negative correlation was expected between religiosity levels and perceptions of female participation in sport, opposite result was found in this study. While the literature conveyed that the relationship between religiosity and sport participation is neutral, this study found a very weak positive relationship. The result found in this quantitative analysis does not mean that the meaningful relationship is applicable to all university students or all social groups. Future research should also apply qualitative methods of data collection and analysis in order to gain a better understanding of the subjective experiences of religiosity and the perceptions of female participation in sport.

The results of this study must be evaluated in light of its limitations. It involved university students in Bartin University, who cannot represent the total population of university students in Turkey. Students attending universities in metropolitan cities may have different opportunities, attitudes, and habits when compared to the students of Bartin University, which is located in a small city, therefore future studies should also focus on university students in different cities and regions as study samples. Another limitation is the understanding of sport as most of the students do not have a clear picture of the difference between sport and physical activity. Physical activity, as a direct result of its health benefits, is taken much more positively than regular sports activities and most of the students use both terms alternatively. This is why future studies need to clarify the distinction between physical activity and sport while exploring female
participation in sport and/or physical activity and the relationship between them and religiosity.

Future research should also investigate health benefits of religiosity for athletes as there is a vast literature (e.g. [39-61]) depicting that religiosity play a central role in the process of reconstructing the coping strategies and reducing depression, anxiety and stress. Moreover, previous research conveyed associations between religiosity and substance misuse (i.e., alcohol, cigarette smoking) and potential doping behavior [65-67] which is another topic to be studied among Turkish athletes. Last, but not the least, Spirituality in Sports Test (SIST) which was developed by Dillon and Tait [68] should be adapted to Turkish-Muslim context in order to measure religiosity in sports.

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Conflicts of Interest

The author declares no conflict of interest.

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Examining the attitudes of physical education teachers towards special education (the handicapped)

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Abstract

Purpose: The purpose of the present study was to determine the education of physical education teachers working at special education schools or classes in this field and to determine the attitudes of them towards students who need special education.

Material: Our study was designed in the form of review model, and 164 questionnaires were included in the analyses. The questionnaires were filled fully by teachers who were selected with the Random Sampling Method and who were contacted in person. The data collection tool used consisted of two parts; Personal Information Form and the Attitude Scale for the Handicapped. Non-parametric tests like Mann Whitney U-Test and Kruskal Wallis H-Test were used in the study because the data did not show normal distribution.

Results: According to the findings, it was determined that the attitudes of the participants in the family life sub-dimension were moderate; and the scores were high in educational medium, interpersonal relations, working life, personal characteristics, competence-independent life and total attitudes.

Conclusions: As a result, there is a significant loss of productivity due to the lack of special training in physical education teachers who are appointed to special education schools and to job training centers through centralization method.

Keywords: special education, attitude, physical education, sports, teacher, student.

Introduction

Attitudes are not acquired at birth. They are acquired later in life through learning along with social environment in which the interaction takes place in the culture where individual lives. As a social environment, parents, friends, mass media, and personal experiences play a role in the formation of attitudes. It is possible that the attitudes we gain through learning can change [1]. Education and information are effective methods for the society to change their attitudes positively towards the handicapped [2]. Relationship between attitude and behavior is influenced by past experiences and new knowledge [3]. People involved in physical education and sports need to develop positive attitudes toward the handicapped because it is necessary for physical education teachers and for those who will train in this area to have some field-related qualifications for the success of the programs and for the adaptation of the handicapped to physical activity environments. Well-known attitude hypotheses in social psychology may be benefited to explain how the attitudes towards the handicapped are formed and how they can be changed. These hypotheses can help to explain both the formation and the change of attitudes. At the top of these hypotheses, the Learning Approach ranks the first [4, 5, 6]. In addition, many techniques are used to change the negative attitudes towards the handicapped. The most commonly used techniques are informing, simulating and establishing personal relationships.

Education is a long-term process and there are many factors that affect this process. Everybody in training knows that there are individual differences in education. These differences are sometimes so deep that some of the students’ social, emotional, physical, and cognitive competences and developments in the teaching process do not proceed at the same level as their peers. Children who need additional support services due to their social, emotional, physical and cognitive difficulties also need additional resources to benefit from the training they receive [7]. These sources are daily instructional processes and teacher-student relations and other factors shaping the classroom setting [8]. With a clearer statement, the needs of students who need special education can be met with classes that address them, with special education materials, and with teachers who are trained in that area.

Teachers responsible for education and the relevant departments of the universities need to act and cooperate with each other to work on enhancing the quality of teachers in order to develop a comprehensive and collaborative approach to the qualifications of the private
educators, to fully discuss the teacher competencies in the special education and to develop comprehensive reforms to eliminate these problems [9, 10].

It is known that branch teachers working in special education schools and classes can be assigned to these schools without having undergraduate education on special education. One of these branches is physical education. Physical education teachers, like other branch teachers who work in special education schools, also experience difficulties. Some of physical education teachers working in these schools have not received any training in special education at the undergraduate level, or they continue to work in these institutions by taking courses for two or four credits only for one semester. For this reason, teachers assigned to special education institutions face difficulties both for themselves and for their students.

Previous studies show that if people are conscious about special education, their attitudes towards individuals who need special education will experience a positive development. This study was carried out in order to determine the education of the physical education teachers working in the special education schools or classes; and the attitudes of the physical education teachers to the individuals who need special education. At the end of the study, it will be possible to enlighten the scientific relevance of the attitudes of physical education teachers towards the education levels of special education and the individuals who need special education.

Material and Methods
This study was designed in the screening model to determine the attitudes of physical education teachers towards students who need special education and to determine how physical education teachers are trained for students with special education needs. In this context, in our examinations on the programs at universities, we determined that as of 2017, we can see that the special education course exists in the undergraduate programs of physical education and sports teachers as 2 credits in the 4th semester and physical education and sports for the handicapped exists in the 7th semester a 2 credit-classes in the curriculum of the Higher Education Council (HEC).

When we examine the undergraduate programs of Ege University, Manisa Celal Bayar University, Marmara University, Gazi University and Sakarya University Sport Science Faculties, which we determined by the Random Sampling Method, we see that there are different practices. For example, Gazi University, Ege University, Marmara University and Manisa Celal Bayar University, although some of which have them in different periods, special education and physical education and sports classes for the handicapped students are included in the compulsory courses. When we look at Sakarya University, Sports Sciences Faculty, Physical Education and Sports Teaching Program, we can see that these courses are not included in the compulsory or elective courses. Taking these differences into consideration, this study was carried out in order to determine the competence of today’s physical education and sport teaching programs in terms of special education and the quantity and quality of previous physical education and sport teacher education programs.

Participants
The sample group of our study consisted of the participants who worked at physical education teachers’ departments of schools of the Ministry of Education in various areas of Turkey. Our survey was applied to 180 physical education teachers who were selected and reached by Random Sampling Method. 21 of the questionnaire forms that were collected were excluded from the study because of having incomplete data or being filled mistakenly, and 164 questionnaire forms were included in the study.

Procedure
The questionnaires were used to collect the data. The questionnaire form applied to physical education teachers consisted of two parts; Demographic Information and Attitude Scale towards the Handicapped.

The Attitude Scale towards the Handicapped
The scale was prepared by the Project Research Team of the Optimar Research Company in order to evaluate the social attitudes towards disability by the Prime Minister’s Office, Administration for Disabled People [11]. There are a total of 43 statements in the scale, which consists of 6 sub-dimensions.

The Cronbach Alfa Internal Consistency Coefficients of the Attitude Scale towards the Handicapped were computed as; Educational Medium - EM 0.54; Interpersonal Relations - IR 0.74; Work Life - WL 0.71; Family Life - FL 0.61; Personal Characteristics - PC 0.75; Competence - Independent Life - CIL 0.82; for the whole test as 0.88.

As shown above, the Cronbach Alpha Internal Consistency Coefficients of the subscales and total scores that of the scale vary between 0.54 and 0.88. Therefore, it is accepted that the scale is a reliable measurement tool.

Statistical Analysis
The SPSS 22.0 Program was used for the analysis of the obtained data. Before comparing the scale scores according to the demographic information of the participants, it was examined whether the scale scores showed normal distribution or not. It was determined in the normality test that the scale subscales and total scores did not show normal distribution. For this reason, non-parametric tests were used to compare the scale scores according to demographic information of the participants.

The Mann Whitney U-test was used to compare the scale scores according to the gender of the participants, their level of education and whether they wanted to work in a school that provided special education. The Kruskal Wallis H-test was used for the comparison of the scale scores according to age groups, graduated departments, receiving special education status, working status in a special education institution and whether they found themselves competent about special education.
Results

When the table is examined, it is seen that the scores of the participants are high in Family Life sub-dimension, and their scores are high in Educational Medium, Interpersonal Relations, Work Life, Personal Characteristics, Competence - Independent Life and Total Attitude.

When the table is examined it is seen that the attitudes of the participants towards the handicapped do not differ according to the gender variable in sub-dimension and in general attitude levels at a statistically significant level (p>0,05).

When the table is examined, it is seen that the attitudes of the participants towards the handicapped do not differ at a statistically significant level in terms of age groups in sub-dimensions and in general attitude levels (p>0,05).

Table 1. Frequency Distributions on the Demographical Data of the Participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sub-variables</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
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<td>62</td>
<td>37,8</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>102</td>
<td>62,2</td>
</tr>
<tr>
<td>Age groups</td>
<td>22-30 age</td>
<td>2</td>
<td>1,2</td>
</tr>
<tr>
<td></td>
<td>31-40 age</td>
<td>77</td>
<td>47,0</td>
</tr>
<tr>
<td></td>
<td>41-50 age</td>
<td>78</td>
<td>47,6</td>
</tr>
<tr>
<td></td>
<td>50+ age</td>
<td>7</td>
<td>4,3</td>
</tr>
<tr>
<td>Educational Status</td>
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<td>130</td>
<td>79,3</td>
</tr>
<tr>
<td></td>
<td>Postgraduate</td>
<td>34</td>
<td>20,7</td>
</tr>
<tr>
<td>Department graduated</td>
<td>Class Teachers Department</td>
<td>152</td>
<td>92,7</td>
</tr>
<tr>
<td></td>
<td>Sports man. tra. Ad.</td>
<td>3</td>
<td>1,8</td>
</tr>
<tr>
<td></td>
<td>I did not receive education</td>
<td>108</td>
<td>65,9</td>
</tr>
<tr>
<td>Receiving special education status</td>
<td>I received phy. ed. and sports for the Handicapped</td>
<td>39</td>
<td>23,8</td>
</tr>
<tr>
<td></td>
<td>I received course and seminars about the handicapped</td>
<td>17</td>
<td>10,4</td>
</tr>
<tr>
<td>Working status at a school providing special education</td>
<td>I did not work</td>
<td>134</td>
<td>81,7</td>
</tr>
<tr>
<td></td>
<td>I worked</td>
<td>24</td>
<td>14,6</td>
</tr>
<tr>
<td></td>
<td>I still work</td>
<td>6</td>
<td>3,7</td>
</tr>
<tr>
<td>Feeling competent in the field of special education</td>
<td>No</td>
<td>72</td>
<td>43,9</td>
</tr>
<tr>
<td></td>
<td>Partly</td>
<td>78</td>
<td>47,6</td>
</tr>
<tr>
<td>The desire for working at a school that provides special education</td>
<td>Yes</td>
<td>14</td>
<td>8,5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>73</td>
<td>44,5</td>
</tr>
<tr>
<td></td>
<td>Partly</td>
<td>91</td>
<td>55,5</td>
</tr>
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</table>

Table 2. Definitive Statistics on the Attitude Levels of the Participants towards the Handicapped

<table>
<thead>
<tr>
<th>Sub-dimensions</th>
<th>X</th>
<th>Sd</th>
</tr>
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<tbody>
<tr>
<td>Educational Medium</td>
<td>13,62</td>
<td>1,674</td>
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<tr>
<td>Interpersonal Relations</td>
<td>37,80</td>
<td>4,763</td>
</tr>
<tr>
<td>Work Life</td>
<td>37,16</td>
<td>5,131</td>
</tr>
<tr>
<td>Family Life</td>
<td>10,00</td>
<td>2,381</td>
</tr>
<tr>
<td>Personal Characteristics</td>
<td>28,44</td>
<td>3,845</td>
</tr>
<tr>
<td>Competence - Independent Life</td>
<td>49,22</td>
<td>6,330</td>
</tr>
<tr>
<td>Total Attitude Score</td>
<td>176,25</td>
<td>20,483</td>
</tr>
</tbody>
</table>

Table 3. Comparison of Attitude Levels of the Participants according to Gender Variable

<table>
<thead>
<tr>
<th>Sub-dimensions</th>
<th>Gender</th>
<th>N</th>
<th>X</th>
<th>Sd</th>
<th>Rank Ave.</th>
<th>Rank total</th>
<th>U</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Medium</td>
<td>Female</td>
<td>62</td>
<td>13,48</td>
<td>1,627</td>
<td>76,15</td>
<td>4721,0</td>
<td>2768,0</td>
<td>.161</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>102</td>
<td>13,71</td>
<td>1,704</td>
<td>86,36</td>
<td>8809,0</td>
<td>2878,5</td>
<td>.335</td>
</tr>
<tr>
<td>Interpersonal Relations</td>
<td>Female</td>
<td>62</td>
<td>37,45</td>
<td>4,738</td>
<td>77,93</td>
<td>4831,5</td>
<td>2919,0</td>
<td>.409</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>102</td>
<td>37,80</td>
<td>4,789</td>
<td>85,28</td>
<td>8698,5</td>
<td>3096,5</td>
<td>.482</td>
</tr>
<tr>
<td>Work Life</td>
<td>Female</td>
<td>62</td>
<td>36,76</td>
<td>5,059</td>
<td>78,58</td>
<td>4872,0</td>
<td>2973,5</td>
<td>.522</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>102</td>
<td>37,41</td>
<td>5,183</td>
<td>84,88</td>
<td>8658,0</td>
<td>3071,5</td>
<td>.758</td>
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<tr>
<td>Family Life</td>
<td>Female</td>
<td>62</td>
<td>10,15</td>
<td>2,604</td>
<td>85,81</td>
<td>5320,5</td>
<td>2956,5</td>
<td>.493</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>102</td>
<td>9,91</td>
<td>2,243</td>
<td>80,49</td>
<td>8209,5</td>
<td>3071,5</td>
<td>.758</td>
</tr>
<tr>
<td>Personal Characteristics</td>
<td>Female</td>
<td>62</td>
<td>28,34</td>
<td>3,862</td>
<td>81,04</td>
<td>5024,5</td>
<td>2973,5</td>
<td>.522</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>102</td>
<td>28,50</td>
<td>3,853</td>
<td>83,39</td>
<td>8505,5</td>
<td>2956,5</td>
<td>.493</td>
</tr>
<tr>
<td>Competence - Independent Life</td>
<td>Female</td>
<td>62</td>
<td>49,00</td>
<td>6,445</td>
<td>79,46</td>
<td>4926,5</td>
<td>2973,5</td>
<td>.522</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>102</td>
<td>49,35</td>
<td>6,288</td>
<td>84,35</td>
<td>8603,5</td>
<td>2956,5</td>
<td>.493</td>
</tr>
<tr>
<td>Total Attitude Score</td>
<td>Female</td>
<td>62</td>
<td>175,18</td>
<td>21,051</td>
<td>79,19</td>
<td>4910,0</td>
<td>2957,0</td>
<td>.487</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>102</td>
<td>176,90</td>
<td>20,207</td>
<td>84,51</td>
<td>8620,0</td>
<td>2957,0</td>
<td>.487</td>
</tr>
</tbody>
</table>
Table 4. Comparison of the Attitude towards the Handicapped Scores of the Participants according to the Age Groups

<table>
<thead>
<tr>
<th>Sub-dimensions</th>
<th>Age Groups</th>
<th>N</th>
<th>X</th>
<th>Sd</th>
<th>Rank Ave.</th>
<th>x²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Medium</td>
<td>22-30 Age</td>
<td>2</td>
<td>12,00</td>
<td>4,243</td>
<td>68,00</td>
<td>5,144</td>
<td>.162</td>
</tr>
<tr>
<td></td>
<td>31-40 Age</td>
<td>77</td>
<td>13,81</td>
<td>1,442</td>
<td>84,69</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>41-50 Age</td>
<td>78</td>
<td>13,38</td>
<td>1,832</td>
<td>77,69</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50+ Age</td>
<td>7</td>
<td>14,71</td>
<td>488</td>
<td>74,21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal Relations</td>
<td>22-30 Age</td>
<td>2</td>
<td>37,50</td>
<td>7,778</td>
<td>83,25</td>
<td></td>
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<td>31-40 Age</td>
<td>77</td>
<td>38,13</td>
<td>4,134</td>
<td>84,38</td>
<td>,420</td>
<td>.936</td>
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<tr>
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<td>41-50 Age</td>
<td>78</td>
<td>37, 67</td>
<td>5,045</td>
<td>78,03</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50+ Age</td>
<td>7</td>
<td>37,29</td>
<td>6,550</td>
<td>85,64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Life</td>
<td>22-30 Age</td>
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<td>11,00</td>
<td>1,414</td>
<td>105,00</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>31-40 Age</td>
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<td>2,449</td>
<td>81,41</td>
<td>4,640</td>
<td>.200</td>
</tr>
<tr>
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<td>10,18</td>
<td>2,666</td>
<td>86,04</td>
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</tr>
<tr>
<td></td>
<td>50+ Age</td>
<td>7</td>
<td>8,00</td>
<td>2,517</td>
<td>48,29</td>
<td></td>
<td></td>
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<tr>
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<td>22-30 Age</td>
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<td>82,00</td>
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<td>37,64</td>
<td>5,199</td>
<td>87,47</td>
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<tr>
<td>Total Attitude Score</td>
<td>41-50 Age</td>
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<td>36,77</td>
<td>5,045</td>
<td>78,03</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50+ Age</td>
<td>7</td>
<td>37,29</td>
<td>6,550</td>
<td>85,64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Comparison of the Attitudes of the Participants towards the Handicapped according to Educational Status

<table>
<thead>
<tr>
<th>Sub-dimensions</th>
<th>Educational Status</th>
<th>N</th>
<th>X</th>
<th>Sd</th>
<th>Rank Ave.</th>
<th>x²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Medium</td>
<td>Undergraduate</td>
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<td>13,61</td>
<td>1,659</td>
<td>81,88</td>
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<tr>
<td></td>
<td>Post-graduate</td>
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<td>1,753</td>
<td>84,88</td>
<td>2868,0</td>
<td>2105,0</td>
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<tr>
<td>Interpersonal Relations</td>
<td>Undergraduate</td>
<td>130</td>
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<td>4,852</td>
<td>83,31</td>
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<td></td>
<td>Post-graduate</td>
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<td>4,474</td>
<td>79,41</td>
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<td>1948,5</td>
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<td>36,24</td>
<td>5,774</td>
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<td>2576,5</td>
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<td>Undergraduate</td>
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<td>86,02</td>
<td>11183,0</td>
<td>1948,5</td>
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<td>2,463</td>
<td>69,03</td>
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<td>1914,0</td>
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<td>1914,0</td>
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<td>3,683</td>
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<td>2486,0</td>
<td>1914,0</td>
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<td>6,682</td>
<td>84,26</td>
<td>10953,5</td>
<td>1981,5</td>
</tr>
<tr>
<td></td>
<td>Post-graduate</td>
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<td>4,812</td>
<td>75,78</td>
<td>2576,5</td>
<td>1981,5</td>
</tr>
<tr>
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<td>20,759</td>
<td>84,78</td>
<td>11021,0</td>
<td>1981,5</td>
</tr>
<tr>
<td></td>
<td>Post-graduate</td>
<td>34</td>
<td>173,44</td>
<td>19,428</td>
<td>73,79</td>
<td>2509,0</td>
<td>1981,5</td>
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</table>

Table 6. Comparison of the Attitude towards the Handicapped Scores of the Participants according to the Graduation Fields

<table>
<thead>
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<th>Sub-dimensions</th>
<th>The department graduated</th>
<th>N</th>
<th>X</th>
<th>Sd</th>
<th>Rank Ave.</th>
<th>x²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Medium</td>
<td>Phy. Ed. Teach.</td>
<td>152</td>
<td>13,55</td>
<td>1,710</td>
<td>80,64</td>
<td>4,475</td>
<td>.107</td>
</tr>
<tr>
<td></td>
<td>Class Teach.</td>
<td>9</td>
<td>14,67</td>
<td>500</td>
<td>113,50</td>
<td>4,475</td>
<td>.107</td>
</tr>
<tr>
<td>Interpersonal Relations</td>
<td>Sports Manag. Tra.</td>
<td>3</td>
<td>14,00</td>
<td>1,000</td>
<td>83,33</td>
<td>1,888</td>
<td>.389</td>
</tr>
<tr>
<td></td>
<td>Phy. Ed. Teach.</td>
<td>152</td>
<td>37,67</td>
<td>4,813</td>
<td>81,11</td>
<td>2,210</td>
<td>.331</td>
</tr>
<tr>
<td>Work Life</td>
<td>Class Teach.</td>
<td>9</td>
<td>39,89</td>
<td>3,219</td>
<td>105,22</td>
<td>2,210</td>
<td>.331</td>
</tr>
<tr>
<td></td>
<td>Sports Manag. Tra.</td>
<td>3</td>
<td>38,33</td>
<td>6,110</td>
<td>84,67</td>
<td>2,210</td>
<td>.331</td>
</tr>
<tr>
<td>Family Life</td>
<td>Phy. Ed. Teach.</td>
<td>152</td>
<td>37,09</td>
<td>5,157</td>
<td>81,66</td>
<td>2,210</td>
<td>.331</td>
</tr>
<tr>
<td></td>
<td>Class Teach.</td>
<td>9</td>
<td>39,11</td>
<td>5,551</td>
<td>101,33</td>
<td>2,210</td>
<td>.331</td>
</tr>
<tr>
<td></td>
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<td>3</td>
<td>35,33</td>
<td>8,021</td>
<td>86,50</td>
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<tr>
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<td>Phy. Ed. Teach.</td>
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<td>2,392</td>
<td>86,32</td>
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<td></td>
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<td>Personal Characteristics</td>
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<td>9</td>
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<td>2,598</td>
<td>68,72</td>
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<tr>
<td></td>
<td>Sports Manag. Tra.</td>
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<td>10,00</td>
<td>1,000</td>
<td>82,50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phy. Ed. Teach.</td>
<td>152</td>
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<td>3,868</td>
<td>82,40</td>
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<td></td>
</tr>
<tr>
<td>Competence - Independent Life</td>
<td>Class Teach.</td>
<td>9</td>
<td>29,33</td>
<td>3,873</td>
<td>94,56</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sports Manag. Tra.</td>
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<td>1,732</td>
<td>91,33</td>
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<td></td>
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<td>Phy. Ed. Teach.</td>
<td>152</td>
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<td>3,428</td>
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</tr>
<tr>
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<td>3,606</td>
<td>90,67</td>
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</tr>
<tr>
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<td>Sports Manag. Tra.</td>
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<td>3,606</td>
<td>90,67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

210
When the table is examined, it is seen that the attitudes of the participants towards the handicapped do not differ at a statistically significant level in terms of educational status in sub-dimensions and in general attitude levels ($p>0.05$).

When the table is examined, it is seen that the attitudes of the participants towards the handicapped do not differ at a statistically significant level in terms of the fields graduated in sub-dimensions and in general attitude levels ($p>0.05$).

When the table is examined, it is seen that the attitude score levels of the participants do not differ at a statistically significant level in terms of having received education in sub-dimensions and in general attitude levels ($p>0.05$).

When the table is examined, it is seen that the attitude levels of the participants do not differ at a statistically significant level in terms of having received education in sub-dimensions and in general attitude levels ($p>0.05$).

**Table 7. Comparison of the Attitudes of the Participants towards the Handicapped according to Having Received Education on Special Education (the Handicapped)**

<table>
<thead>
<tr>
<th>Sub-dimensions</th>
<th>Educational status</th>
<th>N</th>
<th>X</th>
<th>Sd</th>
<th>Rank Ave.</th>
<th>$x^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Educational Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>I did not receive education</td>
<td>108</td>
<td>13.44</td>
<td>1.731</td>
<td>76.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I received education on Phy. Ed. &amp; Sports for the Handicapped</td>
<td>39</td>
<td>13.97</td>
<td>1.405</td>
<td>91.58</td>
<td>5.176</td>
<td>.075</td>
</tr>
<tr>
<td></td>
<td>I received course and seminar on the Handicapped</td>
<td>17</td>
<td>14.00</td>
<td>1.768</td>
<td>97.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interpersonal Relations</strong></td>
<td>I did not receive education</td>
<td>108</td>
<td>37.71</td>
<td>4.630</td>
<td>81.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I received education on Phy. Ed. &amp; Sports for the Handicapped</td>
<td>39</td>
<td>38.05</td>
<td>4.651</td>
<td>82.83</td>
<td>.115</td>
<td>.944</td>
</tr>
<tr>
<td></td>
<td>I received course and seminar on the Handicapped</td>
<td>17</td>
<td>37.82</td>
<td>6.013</td>
<td>85.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Work Life</strong></td>
<td>I did not receive education</td>
<td>108</td>
<td>37.01</td>
<td>4.877</td>
<td>80.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I received education on Phy. Ed. &amp; Sports for the Handicapped</td>
<td>39</td>
<td>37.28</td>
<td>5.740</td>
<td>84.60</td>
<td>.785</td>
<td>.675</td>
</tr>
<tr>
<td></td>
<td>I received course and seminar on the Handicapped</td>
<td>17</td>
<td>37.88</td>
<td>5.487</td>
<td>90.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Family Life</strong></td>
<td>I did not receive education</td>
<td>108</td>
<td>10.11</td>
<td>2.361</td>
<td>84.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I received education on Phy. Ed. &amp; Sports for the Handicapped</td>
<td>39</td>
<td>10.05</td>
<td>2.554</td>
<td>82.63</td>
<td>2.076</td>
<td>.354</td>
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<tr>
<td></td>
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<td>17</td>
<td>9.18</td>
<td>2.038</td>
<td>67.18</td>
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<td></td>
</tr>
<tr>
<td><strong>Personal Characteristics</strong></td>
<td>I did not receive education</td>
<td>108</td>
<td>28.47</td>
<td>3.824</td>
<td>83.50</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>17</td>
<td>28.41</td>
<td>3.589</td>
<td>81.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Competence - Independent Life</strong></td>
<td>I did not receive education</td>
<td>108</td>
<td>48.99</td>
<td>6.257</td>
<td>80.50</td>
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<td></td>
</tr>
<tr>
<td></td>
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<td>39</td>
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<td>6.175</td>
<td>86.63</td>
<td>.571</td>
<td>.752</td>
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<tr>
<td></td>
<td>I received course and seminar on the Handicapped</td>
<td>17</td>
<td>49.06</td>
<td>7.369</td>
<td>85.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Attitude Score</strong></td>
<td>I did not receive education</td>
<td>108</td>
<td>175.73</td>
<td>20.101</td>
<td>81.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I received education on Phy. Ed. &amp; Sports for the Handicapped</td>
<td>39</td>
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<td>21.255</td>
<td>83.45</td>
<td>.066</td>
<td>.967</td>
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<tr>
<td></td>
<td>I received course and seminar on the Handicapped</td>
<td>17</td>
<td>176.35</td>
<td>22.192</td>
<td>84.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
significant level in terms of working in a school that provides special education in Sub-dimensions and in general attitude levels (p>0.05).

When the table is examined, it is seen that the attitude scores of the participants do not differ at a statistically significant level in terms of feeling competent in special education for the handicapped in sub-dimensions and in general attitude levels (p>0.05).

When the table is examined it is seen that the attitude scores of the participants do not differ according to the desire for working in a special education school in sub-dimensions and in general attitude levels at a statistically significant level (p>0.05).

**Discussion**

When the literature is examined, similar studies were observed although they did not cover the same study topic of ours. When we examine the studies conducted so far, it seems that the techniques of establishing personal relationships, simulation and informing (training in a specific subject) significantly affect the attitudes of people in a certain set of subjects [12]. In the study by Sazak-Pınar [13] conducted on classroom teachers with classroom integration students to determine their in-service training needs, it was stated that more than 50% of the teachers needed all knowledge or skills except 4 items in data collection tool. The knowledge or skills

<table>
<thead>
<tr>
<th>Sub-dimensions</th>
<th>Working Status</th>
<th>N</th>
<th>X</th>
<th>Sd</th>
<th>Rank Ave.</th>
<th>x²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Medium</td>
<td>I did not work</td>
<td>134</td>
<td>13.57</td>
<td>1.753</td>
<td>81.96</td>
<td>.160</td>
<td>.923</td>
</tr>
<tr>
<td></td>
<td>I worked</td>
<td>24</td>
<td>13.88</td>
<td>1.296</td>
<td>85.90</td>
<td>.885</td>
<td>.643</td>
</tr>
<tr>
<td></td>
<td>Still at work</td>
<td>6</td>
<td>13.83</td>
<td>1.169</td>
<td>81.08</td>
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</tr>
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<td>37.85</td>
<td>4.553</td>
<td>82.74</td>
<td>.885</td>
<td>.643</td>
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<td>6.115</td>
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</tr>
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<td>91.50</td>
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<td>.817</td>
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<td></td>
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<td>5.213</td>
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<td>9.99</td>
<td>2.255</td>
<td>81.69</td>
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<td>.817</td>
</tr>
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<tr>
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<td>10.43</td>
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<td>3.736</td>
<td>86.71</td>
<td>1.839</td>
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<td>28.93</td>
<td>3.812</td>
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<tr>
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<td>6.062</td>
<td>78.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Partly</td>
<td>78</td>
<td>49.40</td>
<td>6.519</td>
<td>83.33</td>
<td>1.749</td>
<td>.417</td>
</tr>
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<td>No</td>
<td>72</td>
<td>174.88</td>
<td>19.985</td>
<td>79.18</td>
<td>.789</td>
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</tr>
<tr>
<td></td>
<td>Partly</td>
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<td>176.96</td>
<td>20.792</td>
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<td>179.36</td>
<td>22.239</td>
<td>89.79</td>
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</tr>
</tbody>
</table>
required by the vast majority of teachers were often summarized in the “general information on students with special needs” sub-dimension. In the study, it was also stated that the department graduated by the teachers and the seniority levels have effects on the in-service needs of special education. In this study in which the in-service training requirements for special training on the field were determined, it was found that there are differences between the years of service of the teachers and the service level variables. In another study conducted with the same scale that we used in our study, a study was conducted on university students who were educated in the child development department by using a single group and pre-test–post-test control groups without a control group by using the experimental design. In the study conducted in Namık Kemal University, SHMYO Child Development Department, the purpose was to determine the effectiveness of a training program for the handicapped students on the attitudes of the students towards the handicapped.

In order to determine the effect of the training program on the attitudes of the students towards the disabled individuals, the attitude scores obtained by OYTO in the pre-test and post-test sessions of the participants were compared in the scope of the total scale and all other sub-dimensions. The increase in the scores obtained from the total and each subscale of the SCM is interpreted as the increase in the attitude of the students towards the handicapped individuals in the positive direction. When the results obtained from the analysis based on the total of the scale are examined, it may be said that the training program applied has positive effects on the attitudes of the participants towards the handicapped in general terms [14]. It is believed that students with integration students in their classes will develop positive attitudes towards their handicapped classmates [15]. In a study of teacher attitudes, it was revealed that class teachers were in a negative attitude towards working in classrooms where mentally handicapped children were present, and that they had to focus their efforts to change their attitudes positively [16]. The information program has a positive effect on the attitudes of normal classroom teachers to the hearing-impaired children in the integration environment [17]. In a similar research, it has been examined whether the integration process has been carried out in terms of the attitudes towards the integration of classroom teacher candidates and it has been found that a course related to integration affects attitudes positively [18]. Teachers’ effectiveness in changing their attitudes towards cohesion to being informed about the integration of special needs children was examined and positive changes were found in attitudes [19]. In a research conducted, the opinions of the teachers who applied the mainstreaming were examined. It has been found out that teachers do not have enough knowledge to integrate [20]. In another research, it has been determined that the special education counselling and integration course has a positive effect on the attitudes of prospective teachers to the integration education [21].

In a study conducted by Ağbuğa and Gürsel [3], the effectiveness was evaluated for reading a panel text about family matters and social experiences by 1st and 2nd grades of the School of Physical Education and Sports in changing their attitudes towards the disabled. The panel text was read after the pre-test by 1st and 2nd year students of Ankara University BESYO who did not take any courses related to disabilities. The students were then given the post-test. There was a significant and positive change in the attitudes of these students measured by the YEKYT Scale adapted to Turkish for those affected by physical disabilities. According to the result of this study, informing may be effective in changing the attitudes of university students.

The basic aim of the present study of ours was to examine the education level if any- of the physical education teachers on special education and determine their
awareness levels on special awareness. When we look at the descriptive statistics in our study, it is determined that 37.8% of the participants were female, and 62.2% were male. There was no statistically significant difference in the attitudes towards the handicapped according to Gender and Age. Female and Male participants were found to have very close sub-dimensions and total attitude scores.

When we examined the level of awareness of the participants according to the educational status of the participants, it was seen that there were no doctorate level participants and the Post-graduate and Undergraduate students did not differ at a statistically significant level in both sub-dimensions and in terms of general awareness (p>0,05). 92.7% of the participants were graduated from departments that were close to physical education, 5.5% were from classroom teachers' departments and 1.8% were graduated from sports administration, recreation and coaching departments. We can see that there is no statistically significant difference when we look at the study results according to the departments where the participants graduated (p>0,05). However, it is seen that the total attitude scores of classroom teacher graduates are higher. We may claim that the reason for this is the existence of compulsory courses on special education in classroom teaching departments.

When we examined the level of awareness on disabilities according to whether or not participants were educated about special education, it was determined that they did not differ at a statistically significant level in both sub-dimensions and general awareness levels (p>0,05). This conclusion is an expected finding in our study and is an opposite finding for similar studies because education or information on a topic affect the attitudes. We can evaluate it as one of the limitations of the present study; and also, it is possible that the experiences of the participants might have been influential on this result.

When we look at the levels of awareness about the handicapped according to the working status in a special education school, it is seen that they are not statistically different in both sub-dimensions and general awareness levels (p>0,05). Although there is no statistically significant difference, it is seen that the average attitude scores of the participants who are currently working in a special education institution are higher than those who do not work in the private education institution at all.

One of the interesting findings of our study is that the level of awareness on the disabilities did not differ at a statistically significant level in the sub-dimensions and general awareness levels, depending on whether participants found themselves adequately qualified for special education (p>0,05). But the important point here is that 91.4% of the participants answered as “Partly” and “No” to the question “Do you think that you are qualified for special education?”. Only 8.6% of respondents feel competent about special education. When we think that all of the participants have the qualifications to be assigned to special education institutions, the number of the teachers who feel competent attracts attention as being very few.

Finally, when we look at the levels of awareness on disabilities according to whether or not the teachers want to work in a school that provides special education, it is seen that they do not differ statistically in both sub-dimensions and general awareness level (p>0,05). However, we see that 55.4% of the participants do not want to work in a school that provides special education. As one of the reasons, it is possible to say that they see themselves as incompetent in this regard.

Conclusion
As a result, in-service training comes to the mind first as a remedy in this respect when it is considered that branch teachers who are assigned to special education schools and job training centres do not have a specific education because there were no Undergraduate departments in their university years and they only received a few-credit special education courses in their departments. However, the quality of in-service training and the qualifications of those who provide in-service training do not appear to be sufficient to fill this gap. For this reason, it seems necessary to open special education teaching departments as specific to the area that will provide education at undergraduate level. The first field of study that may be opened specifically for this field is the Special Education-Physical Education Teaching. An education at the undergraduate level in this area will provide that teachers are directed to this field; and it will also increase the quality of education.

Recommendations
It is known that branch teachers who are assigned to special education and business practice schools are appointed to these schools without any qualifications for special education. It is clear that there will be negative consequences of this. For this reason, if the teachers to be assigned to these schools are inadequate, trainings related to the subject can be provided (in-service training, etc.).

Informative work such as in-service training may not be sufficient in an area where such expertise is required. Therefore, special education teaching departments can be opened for departments offering undergraduate education such as “Special Education-Physical Education Teacher”.

Special education groups are subject to many different classifications in their own group. Even students with special education needs within the same classification can have different characteristics. This requires different expertise for each special education group that is categorized. Based on this, physical education teachers can be given specialist training for different special education groups.

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Conflict of interests
The authors declare that there is no conflict of interests.
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The acute effects of repeated static apnea on aerobic power

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Authors’ Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

Abstract

Purpose: Apnea exercises cause a rise in hematocrit, erythropoietin, hemoglobin concentration, lung volume and oxygen store in muscle and blood, and a decrease in blood acidosis and oxidative stress. These types of physiological changes that occur in the body result in developments in both time to exhaustion and VO\textsubscript{2}max. The purpose of the current study was to investigate the acute effect of repeated static apneas on aerobic power.

Material: Twenty physically active male university students (age:22.80±3.84 year, height:177.40±7.49 cm and weight:68.20±8.72 kg) volunteered to participate in the current study. They were divided as the static apnea and control groups randomly. The static group performed multistage exercise treadmill test to exhaustion (maximal aerobic power) after three maximal apneas with 2-min interval in sitting position. The control group performed only the maximal aerobic power test without apnea. Their maximal oxygen consumption (VO\textsubscript{2}max), gas exchange rate (RER), heart beat rate (HR) and rate of perceived exertion (RPE) values were measured during maximal aerobic test. Their hemoglobin (Hb) and hematocrit (Hct) values were measured before and immediately after the apnea for both groups.

Results: There were no significant differences found between the control and static apnea groups for VO\textsubscript{2}max, HR, Hb and Hct. However, RPE values measured after the static apnea were lower (17.55±0.51) than the control (18.75±0.62).

Conclusions: The repeated static apneas immediately prior the maximal aerobic effort cannot increase aerobic power in untrained breath hold participants. However, the lower RPE after static apnea may be used as an ergogenic effect.

Keywords: Hypoxia- Static, Apnea, Respiratory, Exchange, Ratio, Rate of Perceived, Exertion, Hemoglobin, Hematocrite.

Introduction

Hypoxia is defined as a decrease in oxygen (O\textsubscript{2}) availability. It occurs with ascent to altitude. Exposure to hypoxia leads to considerable challenges in the cardiovascular and respiratory systems and hematological adjustments (related to the O\textsubscript{2} transport capacity of the blood). Both acute and chronic exposure to hypoxia increases erythropoietin concentration (EPO) [1, 2, 3]. Increased EPO concentration triggers erythrocyte production. An increase in erythrocyte leads to an increase in circulating reticulocytes, hemoglobin concentration (Hb), hematocrit (Hct) and red blood cell (RBC) mass [2]. Similarly, apnea (breath holding) affects a lot of physiological processes in the human body as well. The most important physiological effects of apnea on the human body are the altered hemodynamics, and apnea induced splenic contraction [4]. Long term apnea exercises cause a rise in Hct, EPO, Hb mass, lung volume [5, 6, 7], and oxygen stores in muscle (myoglobin) and blood, and a decrease in blood acidosis and oxidative stress [8, 9]. Moreover, an increase in the total amount of RBC is predominantly synthesized by the kidneys in response to the chronic apnea [2, 10].

There are also some studies focusing on the acute effect of repeated apneas on human physiology [11, 12, 13]. According to these studies, repeated apneas (2-min intervals) cause splenic contraction. Thus, Hct and Hb are increased independently [14], arterial oxygen saturation is decreased, and apnea duration is prolonged [13, 14, 15]. The average human spleen has a blood reserve of approximately 200-250 ml, and if triggered, it can typically increase the total number of circulating RBC by 2-4% [16]. Furthermore, it has been indicated that repeated apnea triggers hypoxemia in the kidney and spleen, and increase Hct and Hb and serum EPO, respectively [11]. However, these increments in Hct and Hb generally last around ten minutes [11, 12, 13].

It is well known that aerobic performance in sport is highly dependent on V\textsubscript{O2max}, which reflects the ability to maximally uptake, transport and utilize of O\textsubscript{2}. Moreover, there is a close correlation between V\textsubscript{O2max} ability and factors that contribute to the availability of oxygen such as Hb and Hct [17, 18, 19]. Previously, it has been demonstrated that increments in Hb and Hct result in developments in both time to exhaustion and V\textsubscript{O2max} [20].

These findings support that apnea exercises may have ergogenic effects on aerobic power in human. Because the major determinant of aerobic performance depends on the capacity of transport oxygen to the tissues [21]. Repeated apneas may play an important role in O2 availability to enhance O2 transport to the body by inducing splenic contraction and increasing Hb and Hct. [11, 12, 22]. Therefore, the question arises as to whether aerobic power of participants can be improved by repeated static apneas immediately prior to the maximal aerobic effort.

The aim of the present study was to investigate the acute effects of static repeated apnea exercises on aerobic power.

Materials and Methods

Subjects

Twenty physically active male university students (age:22.80±3.84, height:177.40±7.49 and weight:68.20±8.72) volunteered to participate in the current study. All participants had no health history of cardiovascular, metabolic or pulmonary disease and had no history of sleep apnea. Moreover, participants had no previous apnea experience (e.g. free divers, under water rugby players or synchronized swimmers).
They had no significant altitude experience (≥ 2,000 m. for more than one week) for at least six months prior to the participation in the study. The study was approved by the local ethics committee of the university. It was in accordance with the ethical standards of the Helsinki Declaration. Each participant signed the written informed consent before the start of the study.

Experimental Design
To examine the effects of repeated apneas on aerobic power, participants were divided as control and static apnea groups randomly. The static group performed multistage exercise treadmill test according to the Bruce protocol to exhaustion after three maximal apneas with 2-min interval in sitting position. The control group performed the same test without an apnea intervention.

Measurements
Participants’ hemoglobin (Hb) and hematocrit (Hct) values were obtained before and immediately after the static apnea protocol and from the control group. Their maximal oxygen consumption (VO_{2max}), gas exchange values (RER), heart beat rate (HR), and the rate of perceived exertion (RPE) values were obtained during maximal aerobic power test for both groups. The multistage exercise treadmill test according to the Bruce protocol was used as an aerobic power test.

VO_{2max} and the gas exchange values were measured with a respiratory gas exchange analyzer VO2000 (Medlogica, USA). Heart beat rate was determined with a heart rate monitor (Polar Vantage NV, Polar Electro Oy, Kempele, Finland). The rate of perceived exertion from 6 to 20 (RPE) was calculated according to the Borg scale [23]. Venous blood samples were collected from the right cubital vein for determination of Hb and Hct.

Analyses were carried out with Celldyn 3500 automated hematology analyzer (Abbott, USA) at the Biochemistry laboratory of the state Hospital.

Repeated apnea protocol
After a 10-min of warm-up exercise which included cycling on a bicycle ergometer and free stretching, participants were familiarized with static apnea exercises. We wanted the participants to hold their breath for maximally during familiarization session to ensure a participant was able to reach required breath hold time during static apnea. The minimal cut off criteria for breath hold duration was 90% of each participant static apnea time measured during familiarization testing. External encouragement and information was provided to the approach for maximal apnea time and VO_{2max}. VO_{2max} achievement criteria: RER > 1.10; HR > 90%; less than 100 mL.min^{-1} change in VO_{2} (over two consecutive minutes).

Data Analysis
SPSS for Windows version 18.0 was used to analyze the obtained data. Besides mean and standard deviation of values, repeated measures analysis of variance (ANOVA) test was used to compare measurements for Hb and Hct. When the assumptions of sphericity were violated, a Greenhouse–Geisser adjustment was used. To identify significant differences between pairs of measurements a Bonferroni post hoc test was used. An independent t test was used to compare the VO_{2max}, RER, HR, RPE values of two groups. The alpha level was set at 0.05.

Results
Table 1 shows the means and SDs of the apnea duration.

Table 2 shows the means and SDs of the VO_{2max}, HR, RER and RPE results of two trials from the same participants. There were no significant differences found between protocols for VO_{2max} and HR, RER results. However, the RPE results measured after the static apnea were lower (17.55±0.51) than the control (18.75±0.62).

Table 3 outlines the means and SDs of the Hb and Hct results. There were no significant differences found with regard to Hb and Hct results.

<table>
<thead>
<tr>
<th>Table 1. means ± standard deviation of apnea duration</th>
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<tbody>
<tr>
<td>First apnea (sec)</td>
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<td>Second apnea (sec)</td>
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<td>Third apnea (sec)</td>
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<table>
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<tr>
<th>Table 2. Effects of repeated static apneas on VO_{2max}, HR, RER, RPE results (means ± standard deviation)</th>
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</thead>
<tbody>
<tr>
<td>CON</td>
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<tr>
<td>VO_{2max}(ml/kg/min)</td>
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<tr>
<td>HR (bpm)</td>
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<td>RER</td>
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<td>RPE</td>
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*= p<0.05, CON= Control, SA= Static Apnea, HR= heart rate, RER= Respiratory Exchange Ratio, RPE= Rate of Perceived Exertion

<table>
<thead>
<tr>
<th>Table 3. Effects of repeated static apneas on Hb and Hct results (means ± standard deviation)</th>
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<tr>
<td>CON</td>
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<tr>
<td>Hb (g dL−1)</td>
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<tr>
<td>Post-apnea Hct (%)</td>
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<tr>
<td>Baseline</td>
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<td>Post-apnea</td>
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CON= Control, SA= Static Apnea, Hb= Hemoglobin, Hct= Hematocrit
Discussion

In the current study, we investigated the acute effects of the repeated static apneas on aerobic power. There were no significant differences found for VO_{2max}, HR, RER, Hb and Hct results. However, the RPE values measured after the static apnea was lower than the control group.

There are limited studies investigating repeated apnea and aerobic performance in the literature. Similar to the present study, Sperlich et al. investigated whether acute repeated four maximal apneas with 2-min recovery improve a 4-km time trial performance of cyclists. They found no significant difference in mean power [26]. These results are similar to the outcomes obtained in the study of Du Bois who demonstrated no significant difference in V_{O2max} and in time to exhaustion test [4]. Many studies have determined that performing repeated apneas increases Hb [27, 11, 12, 28], Hct [14, 29, 27, 15, 28], and RBC [14] by inducing spleen contraction in the trained and untrained breath hold subjects. However, Bakovic et al. did not find any significant change in untrained breath hold participants [14]. These results are consistent with the findings of the current study considering that the participants of the present study were untrained breath hold subjects. In contrast to the present study, Lemaître et al. determined an enhanced maximal and submaximal swimming performance after long-term apnea exercises because of the improved M_{max} [31]. It means that apnea during several weeks of training may enhance performance. Therefore, it is likely that adaptation of the body to the repeated apnea induced increments in Hb, Hct and aerobic power occurs as a result of the long-term apnea training.

The Rating Scale of Perceived Exertion (RPE) is used extensively as a psycho-physical method during the exercise to determine subjective perception of effort. It has been suggested by the American College of Sports Medicine for monitoring exercise intensity to add precision to heart rate [32]. Therefore, it can be used as an inexpensive and valid method to monitor an intensity of the exercise [33]. Another significant change reported in the current study was that SA demonstrated significantly lower RPE value than CON trial. A hypothesis explaining these findings could be that the participants mostly stimulated anaerobic glycolysis during the SA trial. Because there is a high relationship (quadratic regression = 0.84, p<0.001) between RPE and blood lactate [33]. Previous research reported that when a human enters the last stages of the static apneas, oxygen saturation decreases [30, 34, 35, 36]. A decrease of oxygen saturation can last at least two minutes before the full recovery [30]. In the present study, there was only a 2-min rest between the repeated apneas and the multistage incremental exercise test. It is possible that the participants began the trial to exhaustion with the full recovery position. Moreover, starting the test at the low intensity level might trigger the body to consume more oxygen because of oxygen deficit during the repeated apnea trials. This situation might decrease RPE values in the repeated apnea group when compared with the control group.

Conclusion

In the current study, we investigated the acute effects of repeated static apnea exercise on aerobic power. There were no significant differences detected between protocols for VO2max, HR, RER, Hb and Hct results. However, the RPE values measured after the static apnea trial was lower than the control trial. The repeated static apnea prior the maximal aerobic effort cannot increases aerobic power in untrained breath hold participants. The lower rate of perceived exertion may be used as an ergogenic effect.

Conflict of Interests

The author declare that there is no conflict of interest regarding the publication of this paper.

Reference


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Pedagogical tests for assessing the physical preparedness of the students practicing Muay Thai

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Authors’ Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection.

Abstract
Purpose: detection of significant pedagogical tests for assessing the physical preparedness of the students practicing Muay Thai.
Material: it was performed the pedagogical testing of students athletes (n=32) of the lightweight categories specializing in Muay Thai (n=8 – weight category to 51 kg; n=14 – weight category to 54 kg; n=10 – weight category to 57 kg).
Results: Testing was directed to receiving indicators of the general and special physical preparedness of Muay Thai boxers.
Connections between indicators of the general and special physical preparedness were defined. It was revealed 16 significant tests for assessment of the general physical preparedness of students. Tests consist of five groups: running, jumping, with weight, on coordination, on flexibility. The combined 3-minute test is developed for determining the level of special physical preparedness of athletes. The test consists of 9 exercises. It includes elements of punching technique of Muay Thai. Reliability and informational content of the test were proved mathematically (correlation coefficients of results of two measurements was in the range from r=0,79 to r=0,86 with significance p < 0,05).
Conclusions: Management of training process of Muay Thai boxer students is based on a basis of objective information on their physical preparedness. The main requirement of obtaining this information is the availability of means of carrying out a research without considerable expenses of time and the diagnostic equipment.

Keywords: Muay Thai, physical preparedness, sports training, pedagogical control

Introduction
The International Olympic Committee on December 6, 2016, previously recognized Muay Thai as the Olympic sport. The Muay Thai can gain final recognition and become a part of the Olympic Games program in 2019 [1]. This prospect induces athletes to increase results of the competitive activity. This also forces experts to look for new ways to increase in efficiency of the training process.

Muay Thai experts note that physical activity in athletes’ training process is the base of Muay Thai boxers’ skills [2, 3]. However, the literature provided data concerning receiving information on the general physical preparedness of athletes. In the same time, the special physical preparedness is still unstudied [3, 4]. Nowadays there is no scientifically based control system of athletes’ physical preparedness practicing Muay Thai [5]. Authors suggest applying tests for other types of striking martial art [5, 6] to the identification of indicators of this or that physical quality.

It is recommended to apply the following running tests during control: 30 m run, 100 m run, 3000 m run. It is recommended to apply the following tests to the assessment of force of the girdle of the superior extremity: push-ups, pull-ups [3, 4]. Other researches devoted to the endurance of Muay Thai boxers; the special test was developed as a result of these researches [3]. The group of tests for determination of force and high-speed and power abilities of athletes in Muay Thai are the following:

- standing long jump, bench pressing, front squats, stuffed ball put, 4 kg shot put [7]. The test exercises for determination the flexibility are the following: forward and cross splits; bridge training; body bending from a sitting position or from a standing position on a gymnastic bench [8]. It should be noted that authors didn’t check informational content and significance of tests. A number of authors during control focus on testing only one or two physical qualities [9]. In other research, it is recommended to apply a choice reaction test [10]. Authors determined that the high informational content of the test allows to recommend it as screening at selection of prospective athletes in “striking” martial arts styles – karate, tae kwon do, hand-to-hand fight, etc. The researches devoted to judo [11, 12] and Greco-Roman style [13] suggest applying special tests for sports selection. The authors give preference to psychophysiological tests for elite athletes [14]. The authors point to the importance of tests’ application during the selection of young athletes [15, 16].

The Muay Thai belongs to striking martial arts [17]. During the competitions, athletes work in the submaximum zone of power. It leads to considerable indicators of accumulation of a lactate in blood, high values of an oxygen debt. Therefore manifestation of working capacity in Muay Thai boxers [18] substantially depends on the level of special endurance.

We revealed that the question of physical preparedness control of athletes is unstudied and require further researches. We haven’t revealed special exercises which application will allow to obtain information of athletes preparedness without additional diagnostic equipment.
For determination of the level of physical preparedness and identification of perspective of Muay Thai boxer athletes, it is necessary to pick up a complex of test exercises for assessment of the general and special physical preparedness. We have studied questions of testing of physical preparedness in other sports: taekwondo [19], boxing [20], kickboxing [21, 22], mixed martial arts [23, 24], karate [25, 26]. It has allowed selecting tests by means of which it is possible to estimate comprehensively the general physical preparedness of students athletes.

The hypothesis of a research is the assumption that control of students’ physical preparedness in Muay Thai training will be more effective by applying a complex of significant pedagogical tests.

The purpose of the research is the detection of significant pedagogical tests for assessment of students’ physical preparedness in Muay Thai.

**Material and methods.**

Participants. 32 students athletes of the lightweight categories practicing Muay Thai participated in a research (n=8 – weight category to 51 kg; n=14 – weight category of 54 kg; n=10 – weight category of 57 kg). The age range of athletes was 19 – 22 years. Sports qualification was the I category. Student-athletes before performed the researches have undergone inspection in medical a clinic. Athletes were allowed to training and were almost healthy. The student-athletes gave the written consent to participation in researches.

Organization of a research.

The research was conducted on the basis of North-Eastern Federal University (Yakutsk, Russia). It was performed the pedagogical testing, processing of the received results of testing, the analysis of the competitive activity of athletes.

The complex of tests for determination the general physical preparedness included the following exercises: 30 m in motion (s); 150 m in motion (s); 300 m in motion (s); 1000 m from a standing start (min, s); standing long jump (m); standing triple jump (m); 5-fold hopping in place on the right foot (m); 5-fold hopping in place on the left foot (m); standing vertical jump (touching with the right hand, cm); standing vertical jump (touching with the left hand, cm); standing long jump back in the direction of the movement (m); 4 kg shot put below-forward (m); 4 kg shot put below-back (m); bench pressing (kg); pull-up (quantity of times); 50% reproduction of force of the right and left wrist with visual and without visual analyzer (kg); body bending from a sitting position (cm); body bending forward from a standing position on a gymnastic bench (cm). The developed combined 3-minute test applied to assessment of special physical preparedness. It included 9 exercises:

- two-sided double punches: left hand jab – right leg body strike (quantity of combinations);
- two-sided double punches: right hand jab – left leg body strike (quantity of combinations);
- one-sided combinations of straight right knee strikes, left knee strikes (quantity of strikes);

- two-sided combinations of straight strikes by knees (quantity of strikes);
- three-punches combinations of hands: straight left hand punch – straight right hand punch – side left-hand punch (quantity of combinations);
- one-sided combinations of side strikes by the left leg, right leg (quantity of strikes);
- two-sided combinations of strikes by elbows: straight strikes by the left elbow – by the right elbow – side strikes by the left elbow – by the right elbow – side roundhouse strike by the right elbow (quantity of combinations).

In the first day, the general physical preparedness was tested. In the second day, the special physical preparedness was tested. For identification of the general physical preparedness indicators the athletes alternately performed test tasks. They began with the coordination and running exercises directed to speed definition. Then athletes performed jumping exercises. The last in the block of exercises were tests for definition the endurance and force indicators. We revealed that testing was preceded by a preliminary traditional warm-up. The day before athletes had a training of low intensity. The complex of test tasks for definition the general physical preparedness indicators included 23 exercises.

For determination of the significance of combined 3-minute test repeated researches were conducted in 7 days devoted to the reproducibility test of testing results.

The technique of testing performance consisted of the following. Athletes performed warm-up. Then athletes in boxing gloves and focus mitts on command continuously (within 3 min) performed a set of exercises: 9 tasks (punches, combinations of punches are performed on a bag). Each exercise was performed during 20 s. The trainer signaled about time. Testing time was calculated considering the round duration (3 min). The athlete should perform as much as possible physical actions according to a task in the available time.

Statistical analysis. Processing of experimental material was performed by means of integrated statistical and graphics packages – IBM SPSS, Statistics-22, Excel. It was defined average values, a standard deviation, Brave-Pearson correlation coefficient. The correlation analysis of the general and special physical preparedness indicators was performed for the definition of significant pedagogical tests of physical preparedness of students.

**Results.**

It is selected the complex of pedagogical tests for assessment of physical preparedness of the students athletes practicing Muay Thai. The complex included not difficult tests in performance in the coordination plan. These tests don’t demand special readiness for their performance. It was considered the age of athletes and a stage of sports improvement in selection of pedagogical tests. However the importance of these exercises hasn’t been proved yet. Therefore selection of significant tests is made for assessment of physical preparedness of Muay Thai boxers in two stages. On the first stage by the analytical way on the basis of the theoretical analysis...
of references, on the second – by mathematical (after processing of the received results of pedagogical testing on the basis of the correlation analysis).

Testing has allowed obtaining information on the development of the following physical qualities:
- speed (running test − 30 m in motion);
- high-speed endurance (running tests: 150 m and 300 m in motion);
- general endurance (running test − 1000 m standing start);
- force (tests with weight: bench pressing, pull-up);
- high-speed and power abilities [jumping tests: Standing long jump; Standing triple jump; 5-fold hopping in place on the right foot; Standing vertical jump, touching with the right/ left hand. Tests with weight: 4 kg shot put below-forward, below-back];
- coordination and proprioceptive sensuality (standing long jump in the direction of the motion, 50% reproduction of force of the left and right wrist with (without) visual analyzer);
- flexibility (body bending from a sitting position; body bending forward from a standing position on a gymnastic bench).

For significant objective assessment of the general physical preparedness, it is necessary to define indicators of special physical preparedness. We developed a set of exercises and an algorithm of conducting pedagogical testing of special physical preparedness of students. It was based on the general exercises of the punching technique of Muay Thai.

Tests for identification of indicators of special physical preparedness of students are presented in table 2. Repeated researches in 7 days shown that coefficients of correlation of results of two measurements were in range from $r = 0.79$ to $r = 0.86$ with significance of $p<0.05$; ($n = 64$). It demonstrates the high reliability of testing results. Therefore, the developed combined test of special physical preparedness is reliable.

The analysis of the pair correlation of special physical preparedness indicators (results of testing) shown that they have an average and high communication among themselves (tab. 3). Value of correlation was in range from $r = 0.49$ (p ≤ 0.05) to $r = 0.90$ (p ≤ 0.01). The obtained data demonstrate that all nine exercises in the combined test are interconnected among themselves.

The correlation analysis of the general and special physical preparedness indicators allowed to reveal how indicators connected among themselves in pedagogical tests. Thus, the correlation pleiades presented in figures 2, 3 show tests with high and average coefficients of correlation. 300 m run in motion and Standing vertical jump touching with the left hand correlate only at coefficient not higher than 0.3 (p<0.05). It demonstrates the weak connection between indicators of these exercises and special physical preparedness. Indicators in the shot put below-forward correlate with two (strong connection)

### Table 1. Tests for definition the general physical preparedness indicators of the students practicing Muay Thai (selected by the analysis of scientific and methodical literature)

<table>
<thead>
<tr>
<th>Tests</th>
<th>Run</th>
<th>Jump</th>
<th>With weight</th>
<th>On coordination</th>
<th>On flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 m in motion, s</td>
<td>Standing long jump, m</td>
<td>Shot put below-forward (4 kg), m</td>
<td>50% reproduction of force of the right wrist with visual analyzer, kg</td>
<td>Body bending (hands forward) from a sitting position, cm</td>
<td></td>
</tr>
<tr>
<td>150 m in motion, s</td>
<td>Standing triple jump, m</td>
<td>Shot put below-back (4 kg), m</td>
<td>50% reproduction of force of the left wrist with visual analyzer, kg</td>
<td>Body bending forward from a standing position on a gymnastic bench, cm</td>
<td></td>
</tr>
<tr>
<td>300 m in motion, s</td>
<td>5-fold hopping in place on the right foot, m</td>
<td>Dynamometry of wrist (right, left), kg</td>
<td>50% reproduction of force of the right and left wrist without visual analyzer, kg</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>1000 m standing start, s</td>
<td>5-fold hopping in place on the left foot, m</td>
<td>bench pressing, kg</td>
<td>50% reproduction of force of the left wrist without visual analyzer, kg</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>–</td>
<td>Standing vertical jump, touching with the right hand, cm</td>
<td>pull-up, quantity of times</td>
<td>Standing long jump back in the direction of the movement, m</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>–</td>
<td>Standing vertical jump, touching with the left hand, cm</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
</tbody>
</table>
and with three (average connection) indicators of special physical preparedness tests (fig. 2).

It should be mentioned that the strongest connection is revealed between special physical preparedness indicators and exercises on coordination and proprioceptive sensuality (tab. 4). It is strongly connected with indicators in such exercises as 50% reproduction of force with and without visual analyzer; standing long jump back in the direction of the movement; exercises for definition of indicators of explosive strength (4 kg shot put below-forward); high-speed and power abilities (Standing long jump, standing vertical jump, 5-fold hopping in place on the left and right foot); athletes’ strength (pull-up, bench pressing).

It is necessary to apply only indicators with average and high correlation interrelation among all set of test exercises during testing of physical preparedness of athletes. These exercises are grouped and presented in table 5.

**Discussion.**

We have developed the 3-min combined test of special physical preparedness. It is defined the correlation interrelation of the general and special physical preparedness indicators. The significant pedagogical tests for assessment of the general physical preparedness of the students practicing Muay Thai are revealed on this basis.

In scientific and methodical literature there are no data concerning tests of special physical preparedness of Muay Thai boxers. Duration of a round in Muay Thai is 3 minutes. During this time the athlete has to perform all punching technical actions. Therefore the 3-minute combined test developed by us included general exercises of all types of the punching technique of fists, elbows, legs, and knees. The correlation analysis of the general and special physical preparedness indicators performed by us allowed revealing significant pedagogical tests for the students practicing Muay Thai.

Our results are confirmed with data of other authors of [3, 5, 7, 8] concerning the need to apply for assessment:
- a speed of Muay Thai boxers − 30 m run in the motion;
- force − bench pressing and pull-up;
- high-speed and strength abilities − horizontal and vertical standing jumps (Standing long jump and standing vertical jump), shot put below-forward;
- flexibility − body bending forward from a standing position on a gymnastic bench.

We have revealed not effective exercises for the definition of the general physical preparedness indicators of students practicing Muay Thai. They are following: 300 m run in the motion (high-speed endurance); Standing triple jump, Standing vertical jump with touching of the left hand (high-speed and strength abilities); throwing shot put below-back (explosive force); body bending forward (hands forward) from a sitting position (flexibility); dynamometry of the right and left wrist. The correlation analysis performed by us indicates a weak connection between these exercises and of special physical preparedness indicators (r ≤ 0,270, p<0,05).

It is expanded the data concerning estimates of high-speed and general endurance and coordination [1, 3]. The following running tests are significant: 150 m in the motion (high-speed endurance); Standing triple jump, Standing vertical jump with touching of the left hand (high-speed and strength abilities); throwing shot put below-back (explosive force); body bending forward (hands forward) from a sitting position (flexibility); dynamometry of the right and left wrist. The correlation analysis performed by us indicates a weak connection between these exercises and of special physical preparedness indicators (r≤0,270, p<0,05).

We have revealed not effective exercises for the definition of the general physical preparedness indicators of students practicing Muay Thai. They are following: 300 m run in the motion (high-speed endurance); Standing triple jump, Standing vertical jump with touching of the left hand (high-speed and strength abilities); throwing shot put below-back (explosive force); body bending forward (hands forward) from a sitting position (flexibility); dynamometry of the right and left wrist. The correlation analysis performed by us indicates a weak connection between these exercises and of special physical preparedness indicators (r≤0,270, p<0,05).

The comparative analysis of other similar researches shown:
- we revealed only several pieces of research devoted to the physical training of Muay Thai. Researches of other authors show the development of only one or two physical qualities of athletes in Muay Thai. The tests offered by
Table 3. Correlation connection between special physical preparedness indicators (results in pedagogical testing) of students practicing Muay Thai

<table>
<thead>
<tr>
<th>Test</th>
<th>left hand jab – body side right leg strike (quantity of combinations)</th>
<th>Right hand jab – body side left leg strike (quantity of combinations)</th>
<th>One-sided combinations of straight right knee strikes (quantity of strikes)</th>
<th>One-sided combinations of straight left knee strikes (quantity of strikes)</th>
<th>Two-sided combinations of straight strikes by knees (quantity of strikes)</th>
<th>Left hand jab – right hand jab – side left hand strike (quantity of combinations)</th>
<th>One-sided combinations of side strikes by the left leg (quantity of strikes)</th>
<th>One-sided combinations of side strikes by the right leg (quantity of strikes)</th>
<th>Straight strikes by the left elbow – by the right elbow – side roundhouse strike by the right elbow (quantity of combinations)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,00</td>
<td>0,90**</td>
<td>0,76**</td>
<td>0,59**</td>
<td>0,88**</td>
<td>0,54**</td>
<td>0,25</td>
<td>0,22</td>
<td>0,27</td>
</tr>
<tr>
<td></td>
<td>0,90**</td>
<td>1,00</td>
<td>0,71**</td>
<td>0,61**</td>
<td>0,79**</td>
<td>0,49*</td>
<td>0,09</td>
<td>0,11</td>
<td>0,28</td>
</tr>
<tr>
<td></td>
<td>0,76**</td>
<td>0,71**</td>
<td>1,00</td>
<td>0,63**</td>
<td>0,53**</td>
<td>0,54**</td>
<td>0,45*</td>
<td>0,19</td>
<td>0,47*</td>
</tr>
<tr>
<td></td>
<td>0,59**</td>
<td>0,61**</td>
<td>0,63**</td>
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<td>0,56**</td>
<td>0,69**</td>
<td>0,47*</td>
<td>0,22</td>
</tr>
<tr>
<td></td>
<td>0,88**</td>
<td>0,79**</td>
<td>0,53**</td>
<td>0,60**</td>
<td>1,00</td>
<td>0,73**</td>
<td>0,19</td>
<td>0,04</td>
<td>0,15</td>
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<tr>
<td></td>
<td>0,54**</td>
<td>0,49*</td>
<td>0,54**</td>
<td>0,56**</td>
<td>0,73**</td>
<td>1,00</td>
<td>0,12</td>
<td>0,21</td>
<td>0,08</td>
</tr>
<tr>
<td></td>
<td>0,25</td>
<td>0,09</td>
<td>0,45*</td>
<td>0,69**</td>
<td>0,19</td>
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<td>1,00</td>
<td>0,68**</td>
<td>0,27</td>
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<td>0,22</td>
<td>0,11</td>
<td>0,19</td>
<td>0,47*</td>
<td>0,04</td>
<td>0,21</td>
<td>0,68**</td>
<td>1,00</td>
<td>0,22</td>
</tr>
<tr>
<td></td>
<td>0,27</td>
<td>0,28</td>
<td>0,47*</td>
<td>0,22</td>
<td>0,15</td>
<td>0,08</td>
<td>0,27</td>
<td>0,22</td>
<td>1,00</td>
</tr>
</tbody>
</table>

Note: *- р≤0,01; **- р≤0,05
Fig. 1. The correlation pleiade with high degree of interrelation of the general and special physical preparedness indicators of the students practicing Muay Thai: 1 — left hand jab — right leg body strike; 2 — right hand jab — left leg body strike; 3 — one-sided combinations of straight right knee strikes; 4 — one-sided combinations of straight left knee strikes; 5 — two-sided combinations of straight strikes by knees; 6 — straight left hand punch — straight right hand punch — side left-hand punch; 7 — one-sided combinations of side strikes by the left leg; 8 — one-sided combinations of side strikes by the right leg; 9 — straight strikes by the left elbow — by the right elbow — side strikes by the left elbow — by the right elbow — side roundhouse strike by the right elbow.
Fig. 2. The correlation pleiade with average and weak degree of interrelation of the general and special physical preparedness indicators of the students practicing Muay Thai: 1– left hand jab – right leg body strike; 2– right hand jab – left leg body strike; 3– one-sided combinations of straight right knee strikes; 4– one-sided combinations of straight left knee strikes; 5– two-sided combinations of straight strikes by knees; 6 – straight left hand punch – straight right hand punch – side left-hand punch; 7– one-sided combinations of side strikes by the left leg; 8 – one-sided combinations of side strikes by the right leg; 9 – straight strikes by the left elbow – by the right elbow – side strikes by the left elbow – by the right elbow – side roundhouse strike by the right elbow.
us for control of physical preparedness of athletes were carried out on the basis of results of researches in others of types of striking martial arts. But researches on the determination the importance of these tests for Muay Thai haven’t been conducted; − in Muay Thai athletes performed punches with fists, elbows, knees, legs. During a combat rivals can work in a clinch, also apply throw methods, reaps [1]. In other types of striking martial arts, the athlete performs punches only with hands (boxing) or hands and legs (kickboxing, karate) [27]. Therefore it is completely undesirable to apply tests to the assessment of physical preparedness, borrowed from other types of single combats. It is necessary to apply significant tests to develop the training programs on the basis of reliable assessment of Muay Thai boxers readiness; − the importance of the pedagogical tests offered by other authors isn’t proved mathematically; − there are no research works devoted to testing of special physical preparedness in Muay Thai.

The advantages of our research are the following: − comprehensive complex assessment of the general and special physical preparedness that allows paying attention to development gap of components of physical preparedness; − availability of conducting pedagogical testing by the trainer without application of the additional diagnostic equipment;

Table 4. Correlation connection between the special and general physical preparedness indicators (results in pedagogical testing) of students practicing Muay Thai (r ≥ 0,57, p < 0,05)

<table>
<thead>
<tr>
<th>The tests reflecting special physical preparedness</th>
<th>The tests reflecting the general physical preparedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-sided double punches: left hand jab – right leg body strike</td>
<td>30 m in motion, 150 m in motion, standing long jump, 5-fold hopping in place on the right foot, shot put below-forward, pull-up, 50% reproduction of force with visual analyzer (right)</td>
</tr>
<tr>
<td>Two-sided double punches: right hand jab – left leg body strike</td>
<td>standing long jump, 5-fold hopping in place on the left foot, shot put below-forward, pull-up, 50% reproduction of force with visual analyzer (right), 50% reproduction of force without visual analyzer (left)</td>
</tr>
<tr>
<td>One-sided combinations of straight right knee strikes</td>
<td>30 m in motion, standing long jump, shot put below-forward, bench pressing, standing long jump back in the direction of the movement, 50% reproduction of force with visual analyzer (right), 50% reproduction of force without visual analyzer (left)</td>
</tr>
<tr>
<td>One-sided combinations of straight left knee strikes</td>
<td>standing vertical jump (right), shot put below-forward, bench pressing, pull-up, standing long jump back in the direction of the movement, 50% reproduction of force without visual analyzer (left)</td>
</tr>
<tr>
<td>Two-sided combinations of straight strikes by knees</td>
<td>150 m on in motion, 5-fold hopping in place on the right foot, shot put below-forward, bench pressing, pull-up, 50% reproduction of force with visual analyzer (right), 50% reproduction of force without visual analyzer (right)</td>
</tr>
<tr>
<td>Three-punches combinations of hands: straight left hand punch – straight right hand punch – side left-hand punch</td>
<td>5-fold hopping in place on the right foot, bench pressing, 50% reproduction of force with visual analyzer (right), 50% reproduction of force with the visual analyzer (left), 50% reproduction of force without visual analyzer (right)</td>
</tr>
<tr>
<td>One-sided combinations of side strikes by the left leg</td>
<td>1000 m standing start, standing long jump, standing vertical jump (right), pull-up, standing long jump back in the direction of the movement, body bending forward from a standing position on a gymnastic bench, 50% reproduction of force with the visual analyzer (left), 50% reproduction of force without the visual analyzer (right)</td>
</tr>
<tr>
<td>One-sided combinations of side strikes by the right leg</td>
<td>Pull-up, a long jump from the place a back in the direction of the movement, reproduction of 50% of force with the visual analyzer (left), reproduction of 50% of force without visual analyzer (right)</td>
</tr>
<tr>
<td>Two-sided combinations of strikes by elbows: straight strikes by the left elbow – by the right elbow – side strikes by the left elbow – by the right elbow – side roundhouse strike by the right elbow</td>
<td>standing long jump back in the direction of the movement, a back in the direction of the movement, standing vertical jump (touching of the right hand)</td>
</tr>
</tbody>
</table>
the received data of physical preparedness tests of students athletes practicing Muay Thai allow trainers: to control efficiency of training programs; to introduce timely amendments in process of sports preparation taking into consideration a condition of athletes. The advantage is the possibility of forecasting of sports results of athletes; it is shown the positive influence of the developed pedagogical tests for assessment of physical preparedness of Muay Thai boxers for competitive results. Students regularly passed test during the preparatory period of a year training cycle. These students have successfully spent a competitive season. Throughout 4 competitions (Championships of Sakha Republic, Far Eastern Federal District, International Tournament, Russian Cup) have won 6 gold, 3 silver, and 10 bronze medals.

Conclusions.
1. Management of training process of students practicing Muay Thai is based on a basis of objective information on their physical preparedness. However, the main requirement of obtaining this information is the availability of means to carry out a research without considerable expenses of time and the diagnostic equipment.

Table 5. Significant pedagogical tests for definition of the general physical preparedness indicators of the students practicing Muay Thai

<table>
<thead>
<tr>
<th>Groups tests</th>
<th>Tests (units of measure)</th>
<th>Physical qualities and abilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running</td>
<td>30 m in the motion, (s)</td>
<td>speed</td>
</tr>
<tr>
<td></td>
<td>150 m in the motion (s)</td>
<td>High-speed endurance</td>
</tr>
<tr>
<td></td>
<td>1000 m standing start (min, s)</td>
<td>endurance</td>
</tr>
<tr>
<td></td>
<td>standing long jump (m), 5-fold hopping in place on the right foot (m), 5-fold hopping in place on the left foot (m), standing vertical jump (touching with the left hand) (cm)</td>
<td>High-speed and power abilities</td>
</tr>
<tr>
<td></td>
<td>4 kg shot put below-forward (m)</td>
<td>High-speed and power abilities</td>
</tr>
<tr>
<td>With weight</td>
<td>bench pressing (kg), pull-up (quantity of times)</td>
<td>power</td>
</tr>
<tr>
<td></td>
<td>50% reproduction of force of the right wrist with visual analyzer (kg); 50% reproduction of force of the left wrist without visual analyzer (kg), 50% reproduction of force of the right wrist without visual analyzer (kg)</td>
<td>Propriotseptivny sensitivity</td>
</tr>
<tr>
<td>On coordination</td>
<td>standing long jump back in the direction of the movement (m)</td>
<td>coordination</td>
</tr>
<tr>
<td>On flexibility</td>
<td>body bending forward from a standing position on a gymnastic bench (cm)</td>
<td>flexibility</td>
</tr>
</tbody>
</table>

2. It is revealed significant tests for assessment of the general physical fitness of the students practicing Muay Thai. The complex of significant tests includes 16 exercises referred to five groups: running, jumping, with weight, on coordination, on flexibility. The combined 3-minute test is developed for the determination of the level of special physical fitness of students practicing Muay Thai. It consists of 9 exercises, the including elements of the punching technique of Muay Thai. Reliability and informational content of the test have been proved mathematically (coefficients of correlation of results of two measurements was in the range from $r = 0.79$ to $r = 0.86$ with significance $p < 0.05$).

Conflicts of interest
The authors declare that there is no conflict of interests.
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