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SPORT AS THE BASIC CONTENTS OF LEISURE IN BIODROMAL PERSPECTIVE. AN EXAMPLE OF LONG-DISTANCE RUNNERS

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ABSTRACT

Background. The study analyses sport as the basic contents of leisure in biodromal perspective ad the ascetic lifestyle of an athlete. Ascetic lifestyle is observed not only as it contributes to the best performances, but also to lifelong participation including, for instance, long-distance runners with the stage of minimally 20 years of competition racing. The latter is the centre of our attention. The object of the research is sport as the basic contents of leisure in biodromal perspective. Research aim is to analyse the ascetic lifestyle of an athlete; to map the real role of asceticism in the sports sphere on example of long-distance runners.

Methods. We researched a special group of long-distance runners with the stage of minimally 20 years of competition racing (168 athletes). A research questionnaire with this special group was implemented. Descriptive statistical evaluation was performed.

*Results***.** We found noticeable ascetic features of lifestyle among long-distance runners with the stage of minimally 20 years of competition racing. They exercise (it is an original meaning of the Greek word *askésis*) both body and will in lifelong horizon. They know that running (which is higher level of jogging) is also joined with some portion of pain and they are ready to sign a specific runners´ motto: "Pain is inevitable. Suffering is optional." If the option is "suffering", the situations open the way to peak experiences.

Conclusion. Promoting "reasonable asceticism" can be one aspect of raison d´être of today's sport in this postmodern world with the supremacy of hedonistic orientation.

Keywords: leisure, running, lifestyle, motivation**,** asceticism.

INTRODUCTION

Sport can be not only an enjoyable hobby, but also a firm linchpin of leisure. Can it hold true in biodromal (lifelong) perspective? What a big part of leisure can sports take? What is the relation between sports and lifestyle?

We followed a group of long-distance runners with the stage of minimally 20 years of competition racing. They were "tested" on the traditional 10K running race called "Běchovice" (small village near Prague) during many years. The race was founded in 1897 and has been hosted each year without break – at 117 years it is the oldest road race on the Continent. Each runner from that special group was able to participate in this race minimally 20 times. The route is very hilly and it is not possible to run it without good previous training.

We were interested in aspects of *motivation* to continue running for a long time and especially the role of *tradition* in it.

Scientific novelty: the present research will provide the first thorough analysis of long-distance runners with the stage of minimally 20 years of competition racing.

The object of the research was sport as the basic contents of leisure in biodromal perspective.

The aim of the research was to analyse an ascetic lifestyle of athlete, to map the real role of

asceticism in the sports sphere on the example of long-distance runners.

METHODS

We researched a special group of long-distance runners with the stage of minimally 20 years of competition racing (168 athletes). A questionnaire survey with this special group was implemented. Descriptive statistical evaluation was performed.

RESULTS

The role of tradition. There is an imperative of permanent *innovation* in topical management. We can see forced effort of running races organizers to change the route or distance each year. In "Běchovice" we can see an opposite approach, using the power of tradition – the route is the same from 1911 and we can compare the best results and each runner can compare their own personal results in the lifelong perspective. Here lies the perfect area of comparisons of different types for statisticians. One example: we are able to find the best performances not only at absolute scale, but even year by year during the whole history of the race (Figure 1).

Comparison of the results of males and females is presented in the Figure 2.

Aforementioned *constancy of the route* is only one aspect of tradition – it is also formed with

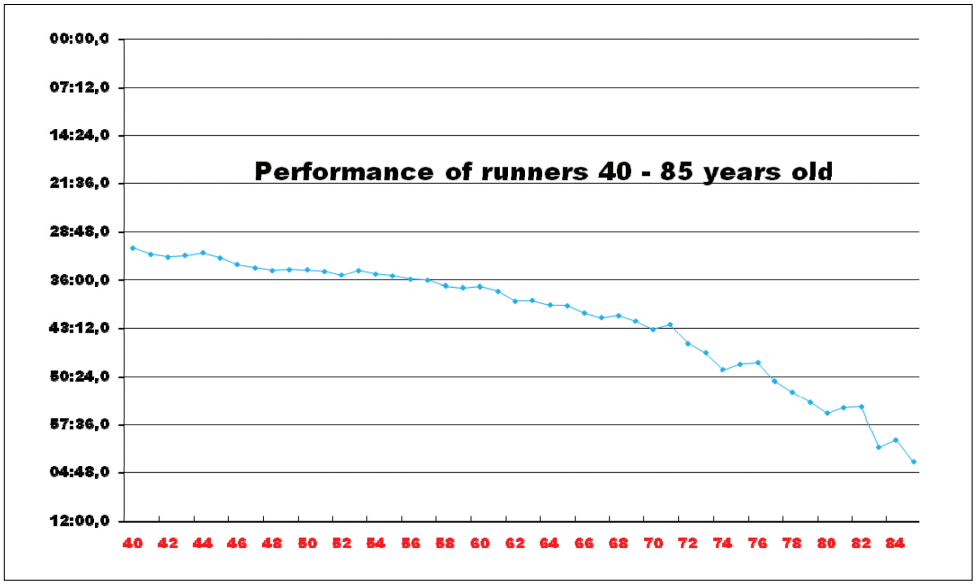

Figure 1. **Performance of 40–85-year-old runners (min, s)**

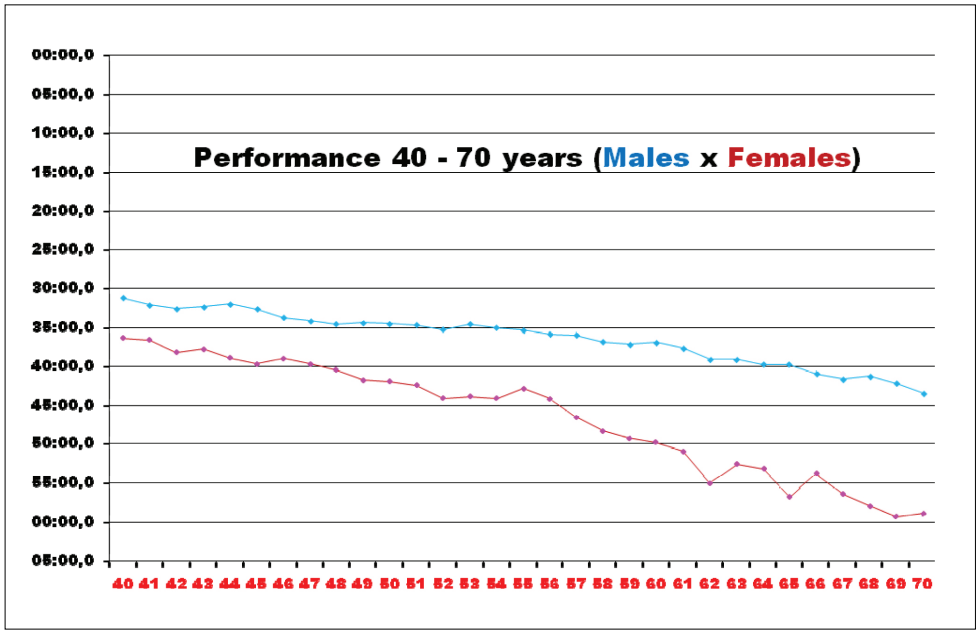

Figure 2. **Performance of 40–70-year-old male and female runners (min, s)**

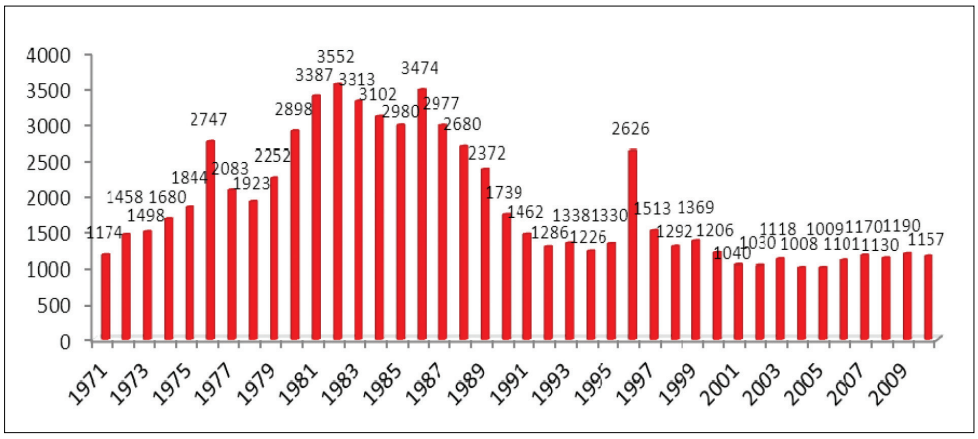

Figure 3. **Numbers of runners in the traditional 10K running race called "Běchovice" till 2009**

duration (not only 117 years, but non-stop tradition without break even during both World Wars), *number of attenders* (max. 3552 in 1982), *interest of media*, *"brand awareness",* etc.

We can speak about a "big" tradition, the tradition of the race itself. Yet we mean, there is a "small" tradition as well, tradition of concrete persons, families or groups, with no less meaning. It is due to the personal loyalty to the race, engagement of the whole families or groups of athletes from one institution in tradition.

Twenty five years ago there was a critical situation with the number of runners (in clear relation with political changes in so called Eastern Block). The fall from "golden 80´s" was very sharp (Figure 3).

In effort to improve the situation, we began to publish different types of statistics to attract runners and draw them back. We promoted running in any age – in biodromal (lifelong) perspective. One can say for example: I am a record holder for the age of 73 years... and the like. Yet there are runners with lower performance – the list of so called "loyal" runners with minimally 20 participations was done just for them. The first brochure (1991) had only 23 names; today there are 297 of them (35 is after death) and 125 from them participated in the last race (September 2014). The top of the list is presented in Table 1.

Finally in 2011the first book about "Běchovice" was published (Bednář, 2011) and among a number of statistics there are also the ones with ranking of the best families (e.g. one with 118 participations of their members and two with four generations of runners), the best married couples, father and son, etc. Much attention was given to the participation of women.

Each year all data are updated just after finishing the race and published on web sites. The aim was clear – to raise motivation to run in the race. Looking at increasing numbers of runners during last years, we can judge that the effort was successful (Figure 4). Of course, there can also be other influences, but what is considerable (and can support our "hypothesis") is: the increase in number of participants is due to women and veterans! By the way, during the last years the number of veterans has been higher than the number of younger runners.

Motivation and lifestyle of runners. Research on exercise motivation is often grounded in Deci and Ryan's self-determination theory (SDT; Deci, Koestner, & Ryan, 1999; Deci & Ryan, 1985; Malinauskas, 2008; Malinauskas, Batutis, & Jetkevičius, 2005). Attention is given to the fact that motivation has two sources – one flowing out of a person's inside (intrinsic) and the other coming from outside (extrinsic). Intrinsically motivated runners possess an intrinsic scheme that encourages them to be competent and to find their own way of solving and mastering a task, and to seek success. Competence, persistence, mastery and success are the goals that are pursued by intrinsically motivated runners and their achievements are a reward by itself. Extrinsic motivation comes from other people through positive and negative reinforcement (reinforcement means everything that increases or decreases the probability of the repetition of certain behaviour). It is thought that long-term maintenance of exercise behaviours (for instance, of running) depends more on intrinsic motivation (Gallagher & Updegraff, 2011). Nonetheless, a common perspective is that intrinsic motivation alone cannot sustain a physically active lifestyle (Edmunds, Ntoumanis, & Duda, 2006). Our research was concerned with how intrinsic and extrinsic motivations related to running might vary in biodromal perspective (across the lifespan).

Number of times	Name and surname	Life years/ *Birth years	Interval between the first and the last start
55	KOČÍ Jaroslav	1906–1999	1925–1994
55	OTČENÁŠEK Luboš	*1935	1958–2012
52	KŘÍŽ Vladimír	*1943	1963–2014
50	TŘEŠŇÁK Jiří	*1930	1956–2005
50	PLEŠINGER Stanislav	*1938	1963–2014
49	ŠIMON Miloš	*1944	1966–2014
48	HÁK Jaroslav	*1946	1965–2014
47	DOLEČEK František	*1943	1966–2014
46	MLEJNEK Jaroslav	*1934	1960–2011
46	STEHLÍK Oldřich	*1948	1966–2014
44	PAUL Josef	1904–1986	1924–1979
44	KLIMPERA Jaroslav	*1936	1961–2010
44	DOLEJŠ Jan	*1949	1971–2014
43	LAJČÍK Alois	*1940	1971–2014
43	KAPLICKÝ Vincenc	*1949	1971–2014
43	KAISLER František	*1940	1967–2014
42	ČTVRTEČKA Jan	*1941	1963–2008
42	KODYM Ladislav	*1938	1960–2012
42	JANŮ Luděk	*1954	1973–2014
42	MATIÁŠEK Petr	*1946	1972–2014
42	ROSSMANN Petr	*1946	1972–2014
42	MÁLEK Jaroslav	*1946	1970–2014
41	JANKA Jiří	*1948	1974–2014
41	BRŮŽEK Zdeněk	*1954	1972–2014
40	ZAHÁLKA Pavel	*1943	1969–2009
40	NOVÁK Pavel	*1953	1975–2014

Table 1. **The top of the list of so called "loyal" runners with minimally 40 participations**

Note. The right column shows the interval between the first and the last start.

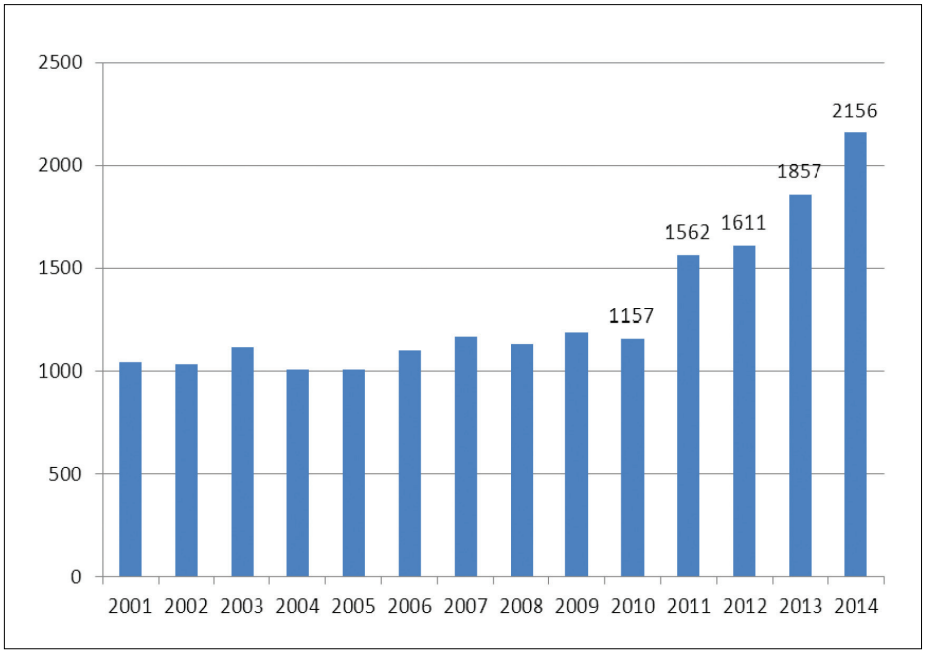

Figure 4. **Number of runners in the traditional 10K running race called "Běchovice" – showing increase since 2011**

Considering *motivation* of runners, we implemented special research about it in connection with *lifestyle* in the mentioned group of runners with minimally 20 participations. 220 runners (including 7 women) received our questionnaire and 168 (76.36%) answered (all women). The youngest was 38 and the oldest 93 years. Average age was 63.89 years.

Concerning motivation, we offered our respondents 10 possible motives for running and asked them to compare the motivation at the beginning of sports carrier and in the presence (it is evident that difference is minimally 20 years). They could choose more motives. Two "winning" motives were the same "earlier" and "now": 1) Running gives me the joy due to the optimal work of all bodily functions and "pleasant tiredness" with a relaxing state after training or race. 2) I like outdoor running and during it I enjoy to be a fighter against my indolence and vagaries of weather.

High position was held in the case of "appreciation that everything is result of my own efforts under the principles of fair play in running" (both "earlier" and "now"). Orientation on performance was detected – unsurprisingly – "earlier" and lost its power in the late periods of run carriers (also unsurprisingly). The last position gained the motive with orientation on rise of self-confidence through running (both "earlier" and "now").

Our runners could also add some other motives – and they were very creative in this. Set of the most interesting answers:

- "Run is for me a ´massage´ of creativity and sometimes even enter to the spiritual area."
- "It is positive addiction and endorphins "hunting" for me."
- "It is a good testing of my will, leading to a personal discipline and strict time management balancing work, leisure and family duties."
- "Run is within easy reach – from spatial, time and social point of view."
- "Run is the best way of monitoring your weight."

The target group is formed from mature personalities. In running they are able to find actualization of many needs from famous Maslow´s hierarchy ("pyramid") of needs (Maslow, 1954) – not only deficiency needs (D-needs), but also growth (or "being") needs (B-needs).

Comparing with a similar attitude to running, we can quote Japanese writer and marathon runner Haruki Murakami: "I run in order to acquire a void." It sounds like "high philosophy" of Buddhism, yet author explains that "human beings´ emotions are not strong or consistent enough to sustain a vacuum. What I mean is the kinds of thoughts and ideas that invade my emotions as I run remain subordinate to that void. "Another thought: "I just run." (Murakami, 2009, p. 17). The last sentence is very close to the way of thinking of Forrest Gump from the movies of the same name: "I simply run…".

Some results, especially in long-distance running, look as if they are achieved without special ("ascetic") effort. We speak about situations from so called "zone". It is a special state of euphoria or easiness. It was described by Douillard (1994) in the field of sport and can be ranked among peak experiences (Csikszentmihalyi, 2009; Bednář, 2009, 2011). Yet we are persuaded that state is not attainable without a previous period of "ascetic" training – it is hardly unattainable for "common" people. Many authors (Bednář, 2009; Overman, 2011) warn about the close relation between sports and asceticism. We can find many cases of ascetic commitment among athletes of the four professional leagues in North America (baseball, basketball, football, ice hockey) as well: "… dedicated athletes deny themselves sex, alcohol, tobacco, food, sleep, physical comfort, and other pleasures." (Overman, 2011, p. 171).

Other question aims to the number of years of participation in run *races*. It was obvious that the number must be higher than 20. Results are presented in Table 2. Average is 36.3 years. Fascinating – especially for laypersons – is the top of this ranking: 65 – 62 – 60 – 56 years, etc.

Table 2. **Number of years of participation in run races**

Number of years	20–29	30–39	40–49	> 50
Number of runners	37	74	37	20

Participation in races must be supported with good training – in running it is especially a question of the number of kilometres. We were

Lifelong kilometrage	≤ 20 000 km	20 001– 40 000 km	40 001– 60 000 km	60 001– 80 000 km	80 001– 100 000 km	>100 000 km
Number of runners	24	45	22	28	13	21

Table 3. **Number of kilometres in the lifelong horizon**

interested in how many kilometres they have run in the lifelong horizon. They ought to estimate it (if possible), yet 38 of them were able to send precise number; 15 respondents said "sorry" so that we received information from 153 of them (Table 3).

Average is 58 847 km. Fascinating (again) is the top of this ranking: 380 000 km (!)– 238 000 km – 203 570 – 170 000 km – 154 505 – etc. The leader was able to have run it during 40 years (between his 17 and 57), which means 26 km/day… Do not forget that we are the country of Emil Zátopek and his giant kilometrage goes viral among his followers…

On the other side there are respondents with a low kilometrage. It corresponds to their orientation not only on running. Another question aimed to other sports they go in and it is not surprising that the aforementioned group prefers more sports and that among "pure" runners (50 respondents in lifelong horizon, it means 29.8%) are these with high kilometrage. Which other sports are preferred? Cycling and ski running are leading; football is № 3 in youth, but it has been replaced by swimming. Some respondents are real all-round athletes with more than 5 done sports.

DISCUSSION

All mentioned bears witness about lifestyle and leisure contents of our special group. Other questions concerning profession and education, type of loyalty to "Běchovice" and relation to other races aimed – directly or indirectly – to a lifestyle. Respondents also had a lot of opportunities to add their own opinions and they used that plentifully. "Running is my lifestyle," sounded not only once. Or: "Running fulfils my leisure so that there is no boredom in my life." The last example: "Running is a good test of my will and helps me to stimulate the whole lifestyle." Can we doubt if run forms part of leisure of our respondents, or if their lifestyle is active?

It is obvious that so intensive engagement in running has influence on almost all aspects of lifestyle: leisure time activities, care of their own health, regimen, family life (including sexuality), working life. Yes, we know this influence can be not only positive: other leisure activities can be too reduced (e.g. there is no time or energy for cultural activities), too strong care of their own health can lead to hypochondria or egoism, a regimen can be too subordinated to running, family life can be disrupted; one elder (1981) similar research of Czech runners detected "higher irradiation of exhaustion on activities following a run", etc. Yet we do not find these negativities among our group: they speak about good feeling due to being fit, about the ability to arrange optimal time management, about support of their families, and instead of "irradiation of exhaustion" they speak about "pleasant exhaustion" and good start into a working day (if training is in the morning). They are active (and successful) in the other life activities as well: there is a former minister, well-known heart surgeon and astronomer, some university professors, etc. among our group members. We are sure the benefits of running exceed the losses, and our respondents would agree. As usual in our lives, we must know our limits and find balance in our activities.

We found noticeable *ascetic* features of runners' lifestyle – they are ready to sacrifice pleasant things or experience which can disrupt their preparation to races or endanger their fitness. They exercise (it is an original meaning of the Greek word *askésis*) both body and will in lifelong horizon. They know running (which is higher level of jogging) is also related to some portion of pain and they are ready to sign a specific runners' motto: "Pain is inevitable. Suffering is optional." If they suffer, such situations open the way to "peak experiences" (Maslow, 1954). *Per aspera ad astra!*

CONCLUSION

Promoting "reasonable asceticism" can be one aspect of raison d´être of today's sport in this postmodern world with the supremacy of hedonistic orientation.

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SUBJECTIVE PERCEPTION OF THE REALITIES OF MODERN PHYSICAL EDUCATION CLASSES AMONG PHYSICAL EDUCATION TEACHERS AND STUDENTS IN HIGHER GRADES

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ABSTRACT

Background. Intense changes in national education require new students' teaching technologies in physical education. There are a number of studies, published books or articles on the topics of modern physical education classes and they provide guidance for teachers, but we believe that there is a lack of modernity in the reality of physical education, still focusing on sports lessons avoiding non-traditional content of the lessons. Research aim was to reveal the subjective opinions of physical education teachers and students in higher grades about the realities of modern physical education classes.

Methods. The sample included physical education teachers (n = 33) and 10–11th grade students (n = 324), who were selected applying the convenience sampling strategy from Kaunas city schools. The research employed a questionnaire by Pate, Corbin, and Pangrazi (1998), and some more questions of interest to the researchers were added. The survey was conducted in spring of 2012. The research participants were surveyed in their schools during the classes with the consent of physical education teachers and students and with the permission of school administration received in advance.

Results. Students more often pointed out the lack of attention to individual work and its implementation, just one-fifth of the students indicated that lessons met their needs and physical education teachers sometimes met modern requirements, showing sincerity, respect, etc. The survey showed that physical education classes were still largely dominated by sports and movement skills, and only sometimes by the non-traditional or healthy lifestyle. Teachers more often than students highlighted the progress and initiative criteria. The most common means of discipline for students in physical education were a whistle and loud shouting.

Conclusion. Physical Education teachers tend to subjectively better evaluate the contemporary realities of physical education classes compared to students. Teachers more often indicated that they applied independent work in their lessons, and thought that the lesson content met the needs of the students and led enough to unconventional physical activity and healthy lifestyle. Students more often pointed out that teachers never assessed them according to their progress in the development of their physical qualities and knowledge during lessons. In the opinions of teachers and students, physical fitness test results are still common evaluation criteria in the lessons.

Keywords: lesson, physical education, modern, teachers.

INTRODUCTION

Intense changes in national education require new students' teaching technologies in physical education. Modern general Physical Education program increases students' self-confidence, nurtures the need for physical activity, reasoned disposition to look for, try and find a variety of physical education activities, encourages students to be physically active not only during PE lessons at

school, free time, but after leaving school (*Pradinio ir pagrindinio ugdymo bendrosios programos,* 2008; Sandercock, Ogunleye, & Voss, 2013).

Lithuanian teachers play a very important role in helping students to acquire new knowledge, which would become personal self; skills enabling them to meaningfully explore, learn; formation of value orientations; creative and meaningful way of thinking, etc. (Bagdonienė & Blauzdys, 2005). Teachers of today and the future must also teach physical education to their students to remain physically active for the rest of their life (Himberg, Hutchinson, & Roussell, 2003; Shephard & Trudeau, 2000). Unfortunately, a lot of teachers of physical education conduct their classes using traditional rather than the modern methodology, apply usual tools which are boring to students. For these reasons, many secondary school students at the age of adolescence form a stereotype of passive learning, and the higher the grade, the students are more passive, their physical activity decreases, and the result is the deteriorating health of the country's students (Vilkas & Raškauskienė, 2005). However, this problem has not been widely analysed, there is a lack of a more detailed research on it by comparing the newly submitted ideas and recommendations to the General Physical Education Programme and its real execution.

Himberg et al. (2003) offers to give students the choice of all possible sports activities. Students having limited choice of sports lose the need for exercise, they feel that they can choose only a few physical activities, and if none of them appeals to them, the only option left is to be physically inactive. Choices have to focus on the life and health promoting activities (Shephard & Trudeau, 2000).

Knowledge is a cognitive tool of physical education and its important functions. Acquisition of knowledge is an important intelligence training method. Consequently, the traditional narrow physical education teachers' attitude to knowledge is unacceptable today. There are students who practice physical self-education, but not everyone has the necessary knowledge, clear goals and motives of sport. Therefore, knowledge promotes interest in not only the physical self-education in a narrow sense. It is a way of life planning, communication skills, and positive attitudes to learning, etc. (Blauzdys & Vilkas, 2007). The aforementioned statements reveal the topicality of the analysed problem and enable the formulation of the study aim - to reveal the subjective opinions of physical education teachers and students in higher grades of the realities of modern physical education classes.

METHODS

Research group included 33 physical education teachers (21 women and 12 men) and 324 students from 10–11th grades (168 girls and 156 boys) selected using a convenience sampling strategy from Kaunas city schools.

The research employed a questionnaire by Pate et al. (1998), and some more questions of interest to the researchers were added. The survey was conducted in spring of 2012. The questionnaire for teachers included 24 questions, for students – 22 questions. The answers to them helped reveal the subjective opinions of the research participants about the realities of modern physical education classes.

The research participants were surveyed in their schools during the classes with the consent of physical education teachers and students and with the permission of school administration received in advance. The survey was based on the ethical and legal research principles. All participants were informed about the objectives of the study and the anonymity of the data. It was emphasized that participation in the study was not compulsory. Participants were asked to answer the questions honestly.

Survey data were processed using the program *SPSS for Windows* 14. Comparing the groups for statistical difference of data, the significance was tested using Student's (t) and the chi-square (χ^2) criteria. Results were considered statistically significant if the error probability was $p \leq .05$ at 95% reliability.

RESULTS

According to the survey data, the students and teachers' opinions on the independent work in classes did not coincide ($p < .001$). More than half (63.6%.) of physical education teachers and 25.9% of students admitted that independent work was trained in lessons; however, 9.1% of teachers and 21.3% of students denied that. The study also found that students' and teachers' subjective opinions on the compliance of the content of the lessons with the needs of the students did not coincide as well ($p < .001$). Physical Education teachers more often

stated that they believed that the content of lessons met the needs of the students (63.6% and 22.2% respectively), while 53.7% of students and 9.1% of teachers indicated that only sometimes the content of lessons met those needs. Students (24.1%) and accordingly 27.3% of teachers indicated that physical education lesson content does not meet the needs of students.

Aiming at ascertaining whether the content of lessons really met the needs of the students, we asked teachers whether creating themed lesson plans they consulted with the students what sports activities they would like to do during PE lessons. It was found that 54.5% of physical education teachers consulted with students while developing annual thematic plans, while a third (36.1%) of students indicated that teachers just sometimes wanted to consult about sports activities ($p < .05$). Other students (63.9%) and teachers (36.4%) indicated that they never discussed about the desired sports activities ($p < .05$).

Analysing the realities of contemporary physical education classes, it is important to figure out what is taken into account while assessing students' achievements as seen by the teachers and students. It was observed that in this regard the opinions differed (Table).

Physical education teachers (Table 1) more often than students that the assessment was based on sports technical performance, progress in the development of physical skills and activity during lessons (effort, activity, initiative) ($p < .05$), but a quarter of students observed that teachers never valued their progress in the development of physical skills and activities in the lessons ($p < .05$). However, results of physical fitness tests are still common assessment criteria both for students and teachers.

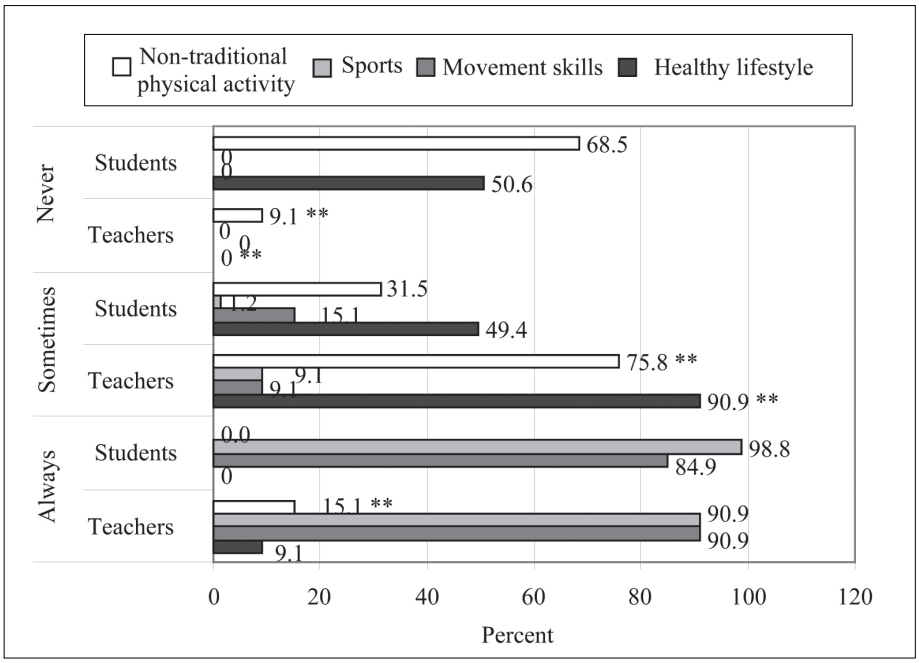
In addition, students were asked how often their physical education teacher met the modern requirements for teachers providing clear descriptions. It was noticed that half of the students surveyed (50.9%) stated that physical education teachers sometimes took care of poorer health or disabled students and ingeniously integrated them into physical education classes and non-formal education. Sometimes physical education teachers were friendly, creative, respected their learners considering their desires (40.7%), discussing sports, food supplements, nutrition, safe physical activity, sports clubs, and other topics relevant to the learners (49.1%). Also teachers sometimes gave the opportunity to try sports and find favourite forms of physical activity, appropriate physical exercises and encouraged the motivation for daily physical activity (46.3%). Fewer (41.9%) students thought that teachers sometimes selected the content of the lessons taking into account students' gender, age, health, physical fitness, physical and spiritual attitudes. Sometimes physical education teachers of 41.7% of students explained tasks and significance and benefits of exercises, and teachers of other 41.7% of students explained for what learners would be assessed and what parts of the assessment would be. One third (39.8%) of subjects indicated that for their teachers all students were equal, and students talented for sports as well as adolescent leaders were never distinguished. Meanwhile, half (50.9%) of subjects teachers never visited the class parent meetings to discuss the situation of students' physical education, solutions and support of parents and never personally communicated with parents of children with poorer health or other problems. Also, 63.9% of teachers never conducted questionnaire surveys on students' attitudes towards PE lessons, and physical

Variants of responses	Teachers	Students	Teachers	Students	Teachers	Students
	Always % (*n*)		Sometimes % (*n*)		Never % (*n*)	
Physical fitness test results	54.5 (18)	43.5 (141)	18.2 (6)	32.5 (105) *	27.3 (9)	24.1 (78)
Technical performance of a sport	81.8 (27)	38.6 (125)*	18.2 (6)	46.3 (150) *	0.0 (0)	19.7 (64) *
Knowledge	27.3 (9)	7.4 (24)*	63.6 (21)	38.6 (125) *	9.1 (3)	54.6 (177) *
Progress in the development of physical skills	81.8 (27)	35.2 (114)*	9.1 (3)	38.6 (125) *	0.0 (0)	25.3 (82) *
Efforts, initiative, activity	72.7 (24)	38.6 (125) *	27.3 (9)	37.0 (120)	00. (0)	25.3 (82) *
Attendance of classes	54.5 (18)	53.7 (174)	36.4 (12)	36.1 (117)	9.1 (3)	10.2 (33)

Table 1. **Distribution of assessment criteria for physical education teachers and students**

Note. * – $p < .05$, compared to teachers' responses.

Figure. **Distribution of frequency data of physical education lesson content**



Note. ** – $p < .01$ – compared to students' responses.

education teachers of 61.1% of students never improved their professional qualifications, looked for innovations, or communicated with Lithuania and / or foreign schools. Slightly fewer (45.4%) teachers never started lessons with presenting the objectives and never discussed the outcomes. The listed data show that the studied physical education teachers are partly consistent with the requirements of modern teacher.

The findings revealed that physical education teachers often conducted lessons of movement skills and sports (Figure).

Teachers more often than students (Figure 1) indicated that they always or sometimes conducted healthy lifestyle and non-traditional physical activity classes ($p < .01$), and about half of the students said that this never happened ($p < .01$). The findings showed that in most cases lessons on sports and movement skills are carried out. Teacher and student opinions did not coincide on this option.

The survey data showed that most teachers preferred traditional disciplinary measures for students which are not recommended in modern classes. Both teachers and students reported that most often the buzzer was used in the classes (90.9 and 92.3% respectively), students often pointed out that teachers screamed loudly (respectively 39.4 and 55.5%, $p < .01$), and teachers often stated that they clapped their hands (45.5 and 30.2% respectively, $p < .01$).

DISCUSSION

According to the survey conducted, independent work and its implementation are given too little attention, although research, teaching experience show that students' independent work during physical education lessons is one of the most important ways to not only improve the quality of the lessons, but also to teach and reinforce the need to act independently in the classes: increase physical activity, improve health. It is important to convince the students that taking care of their physical development and maturity is not only a personal matter, but also a civic duty. Independent work is the kind of activity that contributes to the achievement of knowledge, abilities and skills, and develops ownership of the process of learning, as well as helps to form the appropriate psychological attitude to cognitive activity. Finishing secondary school the students must be able to do physical exercises independently and consciously develop his/her body (Dumčienė, Malinauskas, Sipavičienė, & Klizas, 2007; Kviklienė, Vilkas, & Kontorovičienė, 2005).

Modern physical education not only promotes the autonomy of the students, but also encourages teachers to be innovative. Physical education program must be based on standards, but it also must take into account the needs of the students, focus on the development of skills, and emphasize students' understanding of how to become

physically active throughout their lives (Himberg et al., 2003; Shephard & Trudeau, 2000). This is confirmed by the Lithuanian General Education Programme (*Pradinio ir pagrindinio ugdymo bendrosios programos,* 2008), which states that the school programme must meet the various needs of a specific class of students. In our study, only one-fifth of the students reported that lessons met their needs, which reveals the poor response to model of the modern lessons. This is also confirmed by other research results, where we can see that in most cases physical education teachers did not discuss matters with the students what sports activities they would like to have in the classes and do not take into account their needs, which according to Himberg et al. (2003) reduces the need for students to play sports and be physically active at school and after school, which diminishes the main goal of the General Physical Education Programme – to develop students' physical activity for life. Strategic education documents set the goal to adapt the curriculum so that every pupil could mature according to their needs (*Bendrojo lavinimo ugdymo turinio formavimo, įgyvendinimo, vertinimo ir atnaujinimo strategija,* 2006).

Vilkas and Raškauskienė (2005) argue that the choice to attend physical education classes usually is influenced by physical education teacher, and the least it is influenced by the students' parents and friends. Therefore, the teacher's desire to be modern and not to be afraid of challenges is of great importance. A significant influence to physical education classes as well as the emotional atmosphere of learning and educational outcomes is achieved by the nature of teachers' relationships with students. Teacher morale, good will directly influence students' mood, work capacity, and approach to lesson content. Only a sincere and friendly relationship can create exhilaration that promotes efficiency and increases satisfaction with a teacher (Grigaliūnienė, Vėlavičienė, Šulga, & Keblys, 2007). Our study also shows that physical education teachers sometimes met modern requirements. Therefore Poteliūnienė, Blauzdys, & Juškelienė (2012) believe that in the development of modern physical education teacher, it is important to emphasize teachers' pedagogical and psychological maturity, which would lead the students' positive attitudes to become physically active throughout their lives.

During lessons it is advisable to use the methods of education which teach students to observe, try to choose what is most useful to them, which will help to improve and learn to explain, and and justify their choice for senior students. Unusual methods of physical education and methodological techniques should be applied (*Rekomendacijos dėl kūno kultūros dėstymo gerinimo*, 2005). The research showed that PE classes still largely dominated by sports and movement skills, and only sometimes they were non-traditional or about healthy lifestyle. Teachers conducted unconventional physical education lessons are very important and students are pleased (Lykesas, Koutsouba, & Tyrovola, 2009). According to Gudynas, Kazragytė, Motiejūnienė, and Žadeikaitė (2010), when a lesson is not only learning the subject, but also the learning objectives concerning general competences, such lesson is efficient. Non-traditional classroom includes not just students learning the subject. Students are taught to plan, responsibly implement their plans, work in groups, reflect on the learning process and results and set further goals. Students find out their favourite ways of learning, and sufficient capacity for improvement as well as their learning options. So, the lesson not only deepens the subject knowledge and skills, but also develops general competences.

While assessing students, the General Physical Education Programme (*Pradinio ir pagrindinio ugdymo bendrosios programos,* 2008) proposes to consider the students' physical abilities, to each student's individual characteristics and each student's progress. Our study revealed that teachers paid attention to assessing attendance, but more often they took into account their individual efforts and improvements, which according to Morgan Sproule, and Kingston (2005), gives all students the opportunity to experience success. Physical education teachers sometimes have difficulty in assessing students' physical abilities; they lack a uniform system of assessment and evaluation methods as well as specific examples. However, the traditional evaluation which involves the comparison of students' physical education results does not meet the personal expectations of students. Therefore, individual progress evaluation, promotion and monitoring observations encourage students' desire to improve in physical education classes (Gudynas et al., 2010).

Modern physical education is a successful lesson, and its success is in the hands of the teacher (Butrimienė & Damijonaitienė, 2013). So physical education teacher has the greatest impact on good

emotional environment. In the lessons teachers need to give up the dictate, autocratic command and the student's personality suppression. Teaching should be based on positive learner characteristics, viewing a learner optimistically, believing in them. When the teacher in the lesson emphasizes the positive things and relies on them, mostly schoolchildren justify their confidence and improve the emotional environment in the lesson (Kviklienė et al., 2005; Galkienė, 2011). Our findings suggest that physical education teachers are more likely to command and often take the easiest decision in class control - using acoustic signals. Meanwhile, Kardelienė Kardelis, & Bagdonas (2007) have found that teacher speaking is important for students. Most students enjoy when the teacher speaks figuratively, eloquently and correctly. National School Assessment Agency's annual report states that the lowest valued lesson aspects were learners' achievements assessment, student support and lesson planning, and in 2011, the teacher and student relationship remains the best evaluated lesson component (*Bendrojo ugdymo mokyklų veiklos kokybė*, 2012). The continuous development and use of modern methods enable physical education to become an integral part of other subjects, thus covering a harmonious physical and spiritual development of the students, which accompanies them to adulthood (Mededovic, Pljakic, Mededovic, Hožic, & Muric, 2013; Trudeau & Shephard, 2000).

CONCLUSIONS

Physical Education teachers tend to subjectively better evaluate the contemporary realities of physical education classes compared to students. Teachers more often indicated that they applied independent work in their lessons, and thought that the lesson content met the needs of the students and led enough to unconventional physical activity and healthy lifestyle. Students more often pointed out that teachers never assessed them according to their progress in the development of their physical qualities and knowledge during lessons. In the opinions of teachers and students, physical fitness test results are still common evaluation criteria in the lessons.

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INTENTIONS OF PATIENTS WITH DIABETES TO PARTICIPATE IN REGULAR PHYSICAL ACTIVITY: APPLICATION OF THE THEORY OF PLANNED BEHAVIOUR

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ABSTRACT

Background. The aim of this study is to evaluate the predictive power of affective and cognitive attitudes, perceived behavioural control, subjective norms and past behaviour for intentions to be physically active in a sample of patients with diabetes.

Methods. The study included 114 patients with diabetes, 31.2% were men, 62.3% had Type 1 diabetes. Mean age of participants was 44.08 ± 19.31 years. Past physical activity behaviour was measured using physical activity scale from Summary of Diabetes Self-Care Activities (SDSCA) (Cronbach alpha .62) (Toobert, Hamsted, & Glasgow, 2000). Variables within Theory of planet behaviour (intentions, affective and cognitive attitudes, subjective norms and perceived behavioural control) were developed based on the recommendations made by Ajzen (2006). All Theory of planet behaviour questions were scored using a 7-point Likert scale. Cronbach alphas varied from .61 to .96.

Results. Perceived behavioural control and subjective norm were significant predictors of intentions ($p < .05$). Emotional and cognitive attitudes as well as past physical activity were not related to intentions to exercise ($p > .05$).

Conclusions. Enhancing self-efficacy and ability to control the disease as well as strengthening positive relationships of patients with members of the team involved in the treatment, whose attitudes are regarded, should be considered developing interventions aimed at increasing the motivation of patients with diabetes to regularly practice physical activities.

Keywords: health behaviour, motivation, theory.

INTRODUCTION

Scientific literature states that physical activity (PA) helps patients with diabetes to control weight, blood pressure, strengthens bones, reduces the risk of cardiovascular disease and cancer (Standards of Medical Care in Diabetes-2012, 2011); Hayashino, Jackson, Fukumori, Nakamura, & Fukuhara, 2012). In addition, scientists, physicians, and organizations of patients with diabetes emphasize that PA is beneficial to the patients with diabetes even more than non-diabetic population as PA also helps to control sugar in the blood (Chimen et al., 2011). The American Diabetes Association (Standards of Medical Care in Diabetes-2011, 2010) recommends engaging in at least 150 minutes of moderate-intensity activity every week. So, PA is a "prescribed behaviour" for patients with diabetes.

However, despite the lot of information in the media about the benefits of PA, established guidelines for safe exercising, many patients are insufficiently physically active. Studies show that although PA level of patients with Type 1 diabetes is similar to that in the general population, the optimal health-enhancing level of physical activity is not reached (Resnick, Foster, Bardsley, & Ratner, 2006). Even a bigger problem exists among patients

with Type 2 diabetes. Of US adult individuals with Type 2 diabetes, 31% reported no regular PA and another 38% reported less than recommended levels of PA. Older individuals, women, and those with low income were more likely to report no regular exercise (Nelson, Reiber, & Boyko, 2002). On the other hand, inactive lifestyle is a modifiable risk factor.

Nevertheless, changing behaviour of a person or community is one of the most difficult challenges for health professionals. Many theories analyse the motivation for health-related behaviour. The theory is the basis for any health education methods. The theory generally outlines why people engage or do not engage in their health-care.

Looking from the perspective of fundamental science, the theory should be tested in various fields in different populations. For the intervention to be effective, in-depth understanding of behaviour is required and various aspects of behaviour should be studied in a specific population. Theories of health-behaviour change provide information about the psychosocial behavioural mechanisms and help to identify targets for intervention. Although an intervention may not affect the behaviour directly, it may affect indirectly through other psychosocial factors, such as perception or motivation. Testing the theory helps to highlight the mechanisms through which an intervention works in a specific population. Testing the theory in the different populations helps to explain why and under what circumstances an intervention is effective (e.g. intervention affects only a particular socio-demographic group) (Patrick & Williams, 2012).

Unfortunately, executing educational programs in the institutions of health care, disease-oriented approach is the most common. Standard instructions for the patients are given and medication prescribed seeking compliance with treatment. However, various psychosocial factors are rarely taken into account. Meanwhile, diabetes control mostly depends not on medical progress but on health behaviour. Many theories have been used to understand PA behaviour. Theory of planned behaviour (TPB) is one of the most frequently used empirically tested theories applied to understand health-related physical activity behaviour in various populations (Boudreau & Godin, 2009; Hagger et al., 2007; Martin, Oliver, & McCaughtry, 2007).

Theory of planned behaviour. The theory posits that *intentions* are the proximal motivational predictors of behaviour. The intentions reflect the perceived probability that a person will perform a particular behaviour. Intentions indicate the degree a person is intended to perform certain behaviour. Intentions could be expressed only if the behaviour is under volitional control. They are assumed to include the motivational factors that influence behaviour. One of the main factors predicting intentions according to TPB is *perceived behavioural control* (PBC). PBC refers to the perception of how easy or difficult it is to perform certain behaviour and, depending on the accuracy of perceptions, might overlap or differ from actual control. PBC reflects self-efficacy and, if is realistic, then together with intentions could directly predict behaviour. Another salient construct predicting intentions is social factor – *subjective norms.* Subjective norms sum up the motivation to respect expectations of significant others' for personal involvement in a particular behaviour. Construct reflects the level of obedience to the norms of significant others. Finally, *attitudes* towards particular behaviour are a person's overall positive or negative evaluation of certain behaviour, considering its benefits and deficiencies (Ajzen, 1991). Although, TPB belongs to the group of social-cognitive theories, recently along the cognitive or instrumental attitudes (e. g. addressing behaviour as "harmful – beneficial"), also affective component of attitudes – feelings towards behaviour (e. g. addressing behaviour as "not enjoyable – enjoyable") received attention (Conner, 2013). Studies show that affective attitudes (desires) are stronger predictors of intentions than the cognitive ones (reasons) (Lawton, Conner, & Parker, 2009). Kraft, Rise, Sutton, and Røysamb (2005) suggest that the role of affective attitudes is often underestimated in the research.

TPB also considers past behaviour as one of the predictors of intentions and future behaviour. Initially past behaviour was considered as a habit, but Ajzen (1991) stated that past behaviour in TPB should be best treated not as a measure of habit but as a reflection of all factors that define behaviour. There are reasons to think that past behaviour is an experience which acts as a basis to form positive or negative attitudes and intentions towards the specific behaviour.

The present research. Theory of planned behaviour is well known as a useful framework for studying PA behaviour in a general population. But generalizability of findings to clinical populations may be problematic and studies have shown mixed

support of psychosocial factors within the TPB framework. Moreover, TPB has not been tested at all in diabetic population in Lithuania.

As subjective norms which represent social pressure is less prominent factor in predicting behaviour in general populations (Carter-Parker, Edwards, & McCleary-Jones, 2012; Plotnikoff et al., 2011), it could be hypothesized that they play a rather significant role in clinical populations as position of significant others such as physicians about specific behaviour is supposed to be regarded. Although, some studies with diabetic patients found evidence supporting the relationship between subjective norms and intentions to exercise (Blue, 2007; Omondi, Walingo, Mbagaya, & Othuon, 2010) while others failed (Boudreau & Godin, 2009). The same incongruity could be applied to perceived behavioural control as some studies reveal PBC as salient predictor of intentions (Boudreau & Godin, 2009), yet another did not indicate the association (Davies, 2008; Omondi et al., 2010). Meanwhile literature states that attitudes are the mostly evidence based factor in predicting intentions to exercise (Boudreau & Godin, 2009; Omondi et al., 2010; Plotnikoff, Courneya, Trinh, Karunamuni, & Sigal, 2008). Yet, up to the present examining the predictive value of attitudes to intentions in diabetic population emotional and cognitive attitudes were not distinguished. So, the present study attempts to add evidence to the existing research within the framework of TPB and to examine the psychosocial factors of physical activity behaviour taking into account both desire and reason to perform behaviour. It is expected that in diabetic population intentions to exercise would be predicted by both affective and cognitive attitudes, subjective norms, perceived behavioural control and past behaviour with the PBC as the most prominent predictor followed by the affective attitudes.

The aim of this study was to evaluate the predictive power of affective and cognitive attitudes, perceived behavioural control, subjective norms and past behaviour for intentions to be physically active in a sample of patients with diabetes.

METHODS

Participants

The study included 114 patients with diabetes, 31.2% were men, 62.3% had Type 1 diabetes. The age of participants varied from 18 to 78 years, the mean age was 44.08 ± 19.31 years. The study was approved by Lithuanian Ethics Committee.

Procedure

The present research was the part of a bigger study examining motivational factors of health behaviour (physical activity, diet, blood sugar testing and insulin/medication taking) in patients with diabetes. A cross-sectional study design was applied to determine the ability of the TPB to identify predictors of intentions to exercise. Questionnaires were delivered in local associations of people with diabetes in several Lithuanian cities and online, placing an invitation to participate in the study in Facebook profile of the Association of People with Diabetes.

Instruments

Past physical activity behaviour was measured using physical activity scale from Summary of Diabetes Self-Care Activities (SDSCA) measure (Toobert et al., 2000). The scale consisted of two items (*On how many of the last seven days did you participate in at least 30 minutes of physical activity?* (Total minutes of continuous activity, including walking) and *On how many of the last seven days did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work?*). Participants had to indicate the number of days from 0 to 7 on the scale. Authors of the SDSCA state that correlations with other measures of exercise generally supported the validity of the SDSCA subscales. The internal consistency of the scale in the present study is only satisfactorily (Cronbach alpha .62).

Questions within TPB were developed on the basis of the recommendations made by Ajzen (2006). All TPB questions were scored using a 7-point Likert scale.

Intentions to exercise were assessed from responses to 3-item statements (e. g. *The following month I plan to be physically active 30 min every day or engage in more vigorous physical activity three times a week*). Responses were given on 7-point semantic differential scales anchored by the *"totally disagree – totally agree"* at alternate ends of the scale. Internal consistency of the scale was very good (Cronbach alpha .96).

Attitudes were measured by question which was worded "*In your opinion, to be physically active 30 min every day or engage in more vigorous physical activity three times a week is...*" and a semantic differential scale was used to access

attitudes toward exercise. Answers (6 items) were constructed using bipolar adjective pairs, tree of them measured affective attitude (*boring – exciting, stressful – not stressful, unpleasant – fun*) and another three – cognitive (*bad – good, damaging health – healthful, harmful – useful*). The means of every 3 items were calculated to measure affective (Cronbach alpha .75) and cognitive (Cronbach alpha .61) attitudes.

Subjective norms were measured from the four items (e.g. *Most of people whose opinion I respect think I should be physically active every day for 30 min or engage in more vigorous physical activity three times a week* which was evaluated on a scale using the *"totally disagree – totally agree"* word pair (Cronbach alpha .84).

Perceived behavioural control (PBC) was averaged from three items (e.g. *I am sure that it's up to me that I can to be physically active 30 min every day or engage in more vigorous physical activity three times a week*) and assessed participants' perception of their ability to meet the exercise criteria. PBC was evaluated on a scale using the *"totally disagree – totally agree"* word pair (Cronbach alpha .77).

Statistical analysis

Statistical data analysis was completed using SPSS for Windows 19.0 software (SPSS Inc., Chicago, USA). Descriptive statistics was performed to show sample characteristics. Tests of normality were done and indicators of skewness and kurtosis showed that data on each scale approached the normal distribution. Correlational analysis using Pearson coefficient was used to indicate the relationships between variables. Stepwise regression analysis was performed in order to evaluate the influence of TPB variables on intentions to exercise controlling for block of socio-demographical and clinical factors. Results were considered statistically significant when a probability value (p) was less than .05 or equal.

RESULTS

Table 1 displays the sample characteristics of individuals with Type 1 (62.3%) or Type 2 (37.7%) diabetes, mostly women. The mean of glycaemic index HbA1c was higher than recommended by American diabetes association (ADA, 2010) of < 7%. The mean age was 44 years. Half of the sample reported that their incomes were enough for them. More than half of the sample had higher than high school education. More than two thirds of diabetes patients reported insufficient or no physical activity.

Table 1. **Sample characteristics**

Variable	Data (mean ± *SE* or %)
Type of diabetes	
Type 1	62.3
Type 2	37.7
HbA1c	8.19±1.97
Gender	
Men	31.2
Women	68.8
Age	44.08 ± 9.31
Education	
High school	45.6
College	15.8
Higher	38.6
Income	
Not enough	38.6
Enough	53.5
More than enough	7.9
Physical activity	7.09±3.56
Inactive	0.9
Insufficient	40.7
Recommended level	58.3

Correlational analysis reveals that intentions to exercise is correlated with past physical activity behaviour and every other variable included in the model of theory of planned behaviour. Perceived behavioural control and subjective norms were strongly correlated with intentions to exercise. Past PA behaviour and intentions correlated to a lesser degree. Past PA behaviour was moderately related to perceived behavioural control and weakly to both affective and cognitive attitudes, but no correlation existed between past PA behaviour and subjective norms. Affective and cognitive attitudes had weak inter-correlation.

Results in Table 3 indicate that the type of diabetes was significant predicting intentions to be physically active in the following month and showed the tendency that people with Type 1 diabetes were more inclined to exercise than Type 2 diabetes patients. However, the model was non-significant (p = .141). Nevertheless, when the variables of TPB were included in Step 2, the type of diabetes became non-significant. Perceived behavioural control and subjective norm were significant predictors of intentions (p < .05). Deeper analysis using stepwise method revealed that PBC accounted for 43.8%

Table 2. **Correlations between the study variables (Pearson's coefficient)**

Study variables	Affective attitudes	Cognitive attitudes	Perceived behavioural control	Subjective norms	Intentions
Past PA behaviour	.224*	.275**	.501**	.143	.434**
Affective attitudes	1	.448**	.337**	.220*	.312**
Cognitive attitudes	–	1	.371**	.215*	.349**
Perceived behavioural control	–	–	1	.385**	.706**
Subjective norms	–	–	–	1	.632**

Note. * – $p < .05$; ** – $p < .01$.

Table 3. **Multiple hierarchical regression analyses predicting intention to exercise from sociodemographic, clinical, theory of planned behaviour variables and past physical activity behaviour**

Variable	*Adj R²*	ß	*t*	*p*
Step 1 F(3)= 1.843, p = .146	.029			
Type of diabetes (1)		.296	2.009	.048
Gender		–.127	–1.173	.244
Age		–.273	–1.835	.070
Step 2 F(7)= 23.810, p < .001	.650			
Type of diabetes (1)		.160	1.757	.083
Gender		.097	1.408	.163
Age		–.176	–1.902	.061
Emotional attitude		.049	0.665	.508
Cognitive attitude		–.002	–.030	.977
Perceived behavioural control		.468	6.176	.001
Subjective norm		.490	6.643	.001
Step 3 F(8)= 2.148, p < .001	.652			
Type of diabetes (1)		.152	1.677	.098
Gender		.109	1.578	.119
Age		–.156	–1.666	.100
Emotional attitude		.043	0.596	.553
Cognitive attitude		–.004	–0.048	.962
Perceived behavioural control		.424	5.039	.001
Subjective norm		.494	6.710	.001
Past PA		.094	1.219	.226

and subjective norm added 19% to the variance of intentions. Altogether TPB variables accounted for 62.8% of variance of intentions. While emotional and cognitive attitudes were not related to intentions to exercise ($p > .05$). When past PA behaviour was added in Step 3, PBC and subjective norms remained significant. Yet, past behaviour was not related to intentions ($p > .05$).

DISCUSSION

The current study investigated the determinants of regular physical activity intentions among individuals with Type 1 and Type 2 diabetes within the framework of theory of planned behaviour. To our knowledge, this is the first study examining the unique impact of affective and cognitive attitudes separately on intentions to exercise.

Regular physical activity is considered as one of the cornerstones for managing diabetes. Results of our study support the statement that many diabetes patients fail to comply with the ADA recommendations of physical activity to be active at least 150 minutes a week only half of the sample reported daily physical activity (Nelson et al., 2002).

It was hypothesized that perceived behavioural control would be the strongest predictor of intentions. Results of multiple hierarchical regression analyses indicated that PBC was really a significant predictor of intentions to exercise controlling for the type of diabetes, gender and age of patients. This shows that perception of personal ability to control behaviour matters in forming plans to perform that behaviour. This emphasizes the significance of autonomous aspects in initiating and/or maintaining health-related behaviour. Result is in line with many other studies in general population (Muzaffar, Chapman-Novakofski, Castelli, & Scherer, 2014; Sniehotta, Scholz, & Schwarzer, 2005), population having illness other than diabetes (McGuckin, Prentice, McLaughlin, & Harkin, 2012) and among diabetes patients (Blue, 2007; Boudreau & Godin, 2014; Boudreau & Godin, 2009; Davies, 2008; Plotnikoff, Lippke, Courneya, Birkett, & Sigal, 2010). In the study of Boudreau and Godin (2009), PBC remained significant in patients with diabetes even when anticipated affect, moral norms, descriptive norm were entered into regression analysis. Yet, there is also contradictory evidence which did not show significant effect of PBC on intentions. Omondi et al. (2010) found that with regards to intentions for physical activity, perceived behavioural control was not the significant predictor indicating that the patients in their study had poor control over physical activity behaviour.

Nevertheless, in the current study subjective norms which reflect social pressure and encouragement were even stronger predictors of intentions to exercise. Some studies are in line with this result and their authors propose that it implies that norms including the perceived expectations of significant others (e.g. family, doctors, nurses or work colleagues) with regard to physical activity behaviour have significant influence on intention to engage in exercise (Blue, 2007; Omondi et al., 2010). However, in the study of Boudreau and Godin (2009), subjective norms were significant in predicting intentions only when attitudes and PBC were included in regression, but when anticipated effect, moral norms, descriptive norms were entered into regression analysis, subjective norms did not reach the significance level. Other authors explain that failure of subjective norms to predict intentions may partly be attributable to a poor measurement and the need for more accurate measure of the subjective norms component (Armitage & Conner, 2001). Yet, there is also suggestion that the exercise intention may relate to the patients with diabetes believing that exercise was their own responsibility, which shows that autonomous decisions are more important than being under control (Davies, 2008). Following the previous premises and regarding the results of the current study it could be concluded that social pressure aspect was well captured in the questionnaire in the present study and for diabetic patients in our sample both autonomous (PBC) and controlling (subjective norms) psychosocial aspects were almost equally important for intending to engage in PA.

Moreover, PBC and subjective norms were the only predictors and accounted for a significant amount of variance (62.8%) of intentions. The results match the findings of McGuckin et al. (2012) in mixed population of patients with chronic illness and Blue's (2007) study on adults at risk for diabetes, where these factors also were the sole predictors. This suggests that planning intervention programs for increasing PA of people with diabetes encouraging PBC and taking into account the empowering role of significant others is crucial.

No study to date has adopted a model where attitudes were distinguished between affective and cognitive in diabetic population. Although it is important as PA in case of diabetes is not only enjoyable activity but a part of the treatment. It was expected that affective attitudes in the present study along with the PBC would be the salient predictors of intentions. However, neither affective nor cognitive attitudes were prominent for planning future physical activity behaviour. Meanwhile studies in general samples highlight the importance of affective attitudes over cognitive (Lawton et al., 2007). Though, mixed attitudes in many other studies were among the most salient predictors of intentions to exercise (Boudreau & Godin, 2014; Boudreau & Godin, 2009; Davies, 2008; Omondi et al., 2010; Plotnikoff et al., 2010; Plotnikoff et al., 2008). The authors explain that intervention programs should focus on positive attitudes towards PA highlighting the benefits (cognitive attitudes) and enjoyment (affective attitudes) aspects of exercising (Plotnikoff et al., 2008). Other authors argue that the role of attitudes in initiating and maintaining behaviour may be limited and despite positive beliefs in relation to performing behaviour, do not relate to any greater intentions to behave in a certain way compared to those with less positive beliefs (McGuckin et al., 2012). This is especially true in chronically ill population when behaviour as a rule is prescribed by physician and the personal attitudes towards

health-behaviour become less important than the attitudes of those significant others as physicians. This explains our results that subjective norms were salient predictors while attitudes failed to predict intentions.

Finally, the importance of past behaviour was also tested as other studies suggest that it may be important in forming intentions for future behaviour (Boudreau & Godin, 2014) because it may act as positive or negative experience. In the current study correlational analysis revealed only weak correlation with intentions, yet regression analysis did not indicate any significant impact on intentions when other TPB variables were included into the regression. It was also hypothesized that past behaviour would be related to both affective and cognitive attitudes as supposed to be the basis for them, but correlations were although significant, yet weak.

The results should be interpreted in the context of study limitations. The study sample was small and cannot represent all of the diabetes population in Lithuania. Study design was cross-sectional and limited further and deeper analysis on how intentions are converted into physical activity behaviour.

CONCLUSION

Perceived behavioural control and subjective norms were two significant psychosocial determinants within the theory of planned behaviour which explain intentions to engage in physical activity among people with diabetes. So, enhancing self-efficacy and ability to control the disease as well as strengthening positive relationships of patients with significant others (e.g. members of the team involved in the treatment) whose attitudes then would be regarded, should be considered developing interventions aimed at increasing the motivation of patients with diabetes to regularly practice physical activities.

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BODY AND FUNCTIONAL CAPACITY OF LITHUANIAN DEAF BASKETBALL TEAM PLAYERS AND CHARACTERISTICS OF GAME INDICES

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ABSTRACT

Background. The purpose of the present study was to establish and evaluate body capacity and functional capacity of Lithuanian deaf basketball national team players, 2013 Deaflympic champions, and to provide the data analysis of the players' participation in Deaflympic Games comparing it with the data of participation in the Games of 2005 and 2009.

Deaflympic Games comparing it with the data of participation in the Games of 2005 and 2009.

Methods. The group of investigated persons included 12 Lithuanian deaf basketball national team members. Basketball players' body development, body and functional capacity testing was performed. Method of systemic analysis was employed to perform comparative analysis of Lithuanian deaf basketball national team players' game indicators.

Results. The results of our research showed that body development and physical capacity indices of Lithuanian deaf basketball national team players who participated in 2013 Deaflympic Games allowed accomplishing the technical and tactical requirements of contemporary basketball for players of such level. Lithuanian deaf basketball national team members have demonstrated better results in muscle mass and reached higher physical capacities comparing to those of the participants of the previous Games. This increase resulted in improved quality of the game and for the first time becoming gold medals winners.

Conclusion. Comparative analysis of game indices of the teams having participated in various Games showed that the majority of the competitive activity indices were better in 2013 Games in Sofia: field of goals precision was 49.2%, the high number of defensive rebounds and less turnovers during competitions allowed very effective fast breaks.

Keywords: muscle power, body composition, psychomotor functions, agility game activity.

INTRODUCTION

Deaf people in Lithuania form a social group which easily enough integrates into general society as its counterpart. This social group is rather active in sports life. Deaf athletes have been playing basketball for already 60 years, same as people without disability. Lithuanian deaf basketball players are the numerous prize winners in World, European Deaf Championships, as well as in Deaflympics. Recent significant achievement of Lithuanian deaf basketball players is becoming gold medallists in the XXII Deaflympics in 2013. Investigations have already been carried out on body and functional capacity of these athletes, as well as on their adaptation to training loads and sports activity (Dadelienė, Paulauskas, Skernevičius, & Šatas, 2011; Milašius, Šatas, & Dadelienė, 2007).

A person with deafness disability confronts with the problems of self-improvement, adaptation and social integration. However, physical education and active sport involvement provide conditions for good social adaptation and self-expression (Palmer, Katbeen, & Weber, 2006). Basketball game, teaching it and participation in competitions is one of the ways for self-expression.

Deaf basketball game has a lot in common with the basketball played by healthy people, but certain differences still exist (Steward, Robinson, & McCarty, 1991). Deaf basketball players' game activities, as well as investigations of their physical fitness, working and functional capacity provide background for projection of their development trend and management of players' preparation for the most important competitions. For thorough evaluation of team members' fitness, informative criteria need to be employed. Scientific criteria can be used to establish fitness and the quality of the game for both healthy and deaf basketball players (Gocentas, Landor, & Andziulis, 2004; Laplaud, Hug, & Menier, 2004). Existing scientific data on deaf basketball players' preparation (Milašius et al., 2007; Šatas & Milašius, 2008 a, b; Šatas, Milašius, & Dadelienė, 2005, 2010; Šatas & Radžiukynas, 2003) has not yet covered analysis of players' body and functional capacity, nor change in their game activity. The sport results of Lithuanian deaf basketball players prove that people of this social group are able to strive for remarkable sport achievements. This presumes that in the process of deaf basketball players' preparation for competitions, it is important to perform scientific investigation on their body and functional capacity change during preparatory period, and to carry out comparative analysis on the players' game activity in three Deaflympic Games.

The aim of the study was to establish and evaluate body capacity and functional capacity of Lithuanian deaf basketball national team players, 2013 Deaflympic champions, and to provide the data analysis of the players' participation in Deaflympic Games, comparing it with the data of participation in the Games of 2005 and 2009.

METHODS

The group of investigated persons included 12 Lithuanian deaf basketball national team members; they were the participants in the 20th Summer Deaflympic Games in Melbourne, 2005, the mean of age (± *s*) was 28.2 ± 5.5, in the 21st Summer Deaflympic Games in Taipei, 2009 it was 24.9 ± 4.8, and the 22nd Summer Deaflympic Games in Sofia, 2013 – 28.0 ± 5.0 years. The hearing loss of all the players, having participated in the latter Deaflympics, exceeded 55 decibels. Basketball players' body development, body and functional capacity testing was performed at the Institute of Sport Science of Lithuanian University of Educational Sciences, two weeks prior to each of the Games. Body height was measured to the nearest centimetre using a stadiometer (SECA 225, Seca GmbH & Co). Weight was measured using body composition analyzer TANITA BC418 MA (Japan), muscle and fat mass were measured using the methodology of Norton, Whittingham, Carter, Kerr, and Gore (1996) and body mass index (BMI) was established.

Basketball players' single muscle contraction power (SMCP) (Bosco, Luchtanen, & Komi, 1983) was established. For measuring anaerobic alactic muscle power, step ergometry test by recording running speed and lifting height (Margaria, Aghemo, & Rovelli, 1966), modified by Kalamen (1968), was employed. Psychomotor reaction time (PRT) and frequency of movements (FM) in 10 s, which reflects mobility of central nervous system, was measured by electric reactiometer (Baltec Sport, Lithuania). Repeated anaerobic alactic working test of 5x6 seconds duration with 24 seconds rest intervals performed with ergometer "Monark 894 E" (Sweden) was included into testing program (Ellis et al., 2000). Average capacity for each working interval was calculated, and fatigue index estimated with regard to capacity decrease after each time carrying out the load. "Hexagon" test was used to measure agility, performing 18 jumps on the special platform (Brittenham, 1996). Circulatory and respiratory systems' functional capacity was evaluated by Ruffier index (RI) and resting heart rate (Skernevičius, Raslanas, & Dadelienė, 2004).

Method of systemic analysis was employed to perform comparative analysis of Lithuanian deaf basketball national team players' game indicators. Results of the matches, which were achieved by the team in 2013 Deaflympics, were compared to the results of the same matches in 2005 and 2009, in which Lithuanian players became the winners of bronze and silver medals, respectively.

Using official FIBA game registration protocols during the matches, the following average indices were analysed:

1) total field goals (percentage);
2) two-points field goals (percentage);
3) three-points field goals (percentage);
4) free throws field goals (percentage);
5) defensive rebounds;
6) steals;
7) assists;
8) turnovers;

9) personal fouls;
10) number of fast breaks;
11) effectiveness of fast breaks during matches (percentage).

The research data were analysed using the methods of mathematic statistics. Mean ($\bar{X}$), standard deviation *(S)* and standard error of the mean *(Sx)* were calculated. Maximum and minimum values of indices of the investigated are provided, coefficient of variation (*V, %*) calculated. For establishment of reliability of mean differences for the investigated groups, Student's *t* criterion was applied, considering significant difference at $p < .05$.

The participants were fully informed of any risks and discomforts associated with the study. The health screen was repeated before each laboratory visit in Lithuanian Sports Medicine Centre. The study received approval from the institution's Ethics Advisory Committee.

RESULTS

The data of deaf basketball players' height shows (Table 1) that due to little change of team members, this index did not experience much change in all three Games. The highest index of a player of Lithuanian deaf basketball teams, having participated in all three Games, reached 198.5 cm. As for the 2013 basketball team members, average body mass was greater by 1.9 kilos and muscle mass – by 1.4 kilos comparing to 2009 team members body and muscle mass indices, while the data of 2005 body and mass results was exceeded by 6.0 kilos and 3.5 kilos respectively. However, these differences do not possess significance. Results of 2013 team members demonstrate rather wide area of muscle mass dispersion – it ranged from 37.9 to 60.0 kilos. Muscle mass of 2013 basketball team members was greater 3.5 times comparing to 2005 results, and this difference is statistically significant ($p < .05$).

Table 1. **Body development indices of Lithuanian deaf basketball national team members in 2005, 2009 and 2013**

Indices	Height (cm)	Body mass (kg)	BMI (kg/m²)	Muscle mass (kg)	Fat mass (kg)
2005					
X	189.3	81.3	22.7	43.4	9.1
Sx	1.7	2.8	0.6	1.5	0.7
S	6.0	9.7	2.2	5.2	2.5
2009					
X	189.8	85.4	24.0	45.5	8.7
Sx	1.9	2.5	0.5	1.5	0.7
S	6.7	8.5	1.8	5.2	2.3
2013					
X	190.1	87.3	24.2	46.9	9.0
Sx	1.5	2.5	0.7	1.4	0.5
S	5.4	9.1	2.4	5.0	1.7
p between testing I and III				<.05	

Comparison of absolute indices of SMCP shows that the indices of 2009 team players were higher than those in 2005 and 2013 (Table 2), with statistically significant difference ($p < .05$). Same as in 2005 and 2009, in 2013 the relative lowest SMCP of the team player was twice lower than the highest SMCP value of the player. Dispersion of this index in all the investigations ranged from 17.0 to 23.8%. Players' relative AAMP dispersion at the average was rather low ($V = 5.0–5.9$). The highest values of average relative AAMP were reached in 2013 and exposed 17.2 W/kilo. Difference of this value, comparing to the result of 2005, is 1.9 W/kilo, which is statistically significant ($p < .001$). In 2013, value of absolute AAMP also was the highest – it used to increase from 2005 to 2013 in average by 264.5 W, the increase being statistically significant. Psychomotor reaction time used to increase in each of the Games and reached a rather good level as for the persons of this social group. Dispersion of the latter indices also was rather small. PRT and frequency of movements in 10 sec indices of the deaf basketball players underwent not statistically significant changes during preparation for 2005, 2009 and 2013 Deaflympic Games. Agility test result of team members in 2013 was in average higher by 2.6 s than of 2005 team ($p < .05$).

Circulatory and respiratory systems' functional capacity data of 2013 team members were of little difference from 2005 and 2009 team members' average results. In 2005, team Ruffier index was 4.5 ± 1.8, in 2009 it was 4.6 ± 3.1; in 2013 this index increased on average to 3.6 ± 3.0, however, the changes were not significant. Dispersion area of this index for 2013 team members was from –0.4 to 8.4. Resting heart rate was slower (not significantly) for the players-Deaflympic Champions in 2013. For the 2005 team members it was in average 58.3 ± 6.6, for the players in 2009 – 58.8 ± 8.4, and for the 2013 – 54.2 ± 7.6 b/min.

Team players of 2013 were tested for 5 x 6 s duration anaerobic alactic repeated maximum load, as it allows presumption on players'

anaerobic alactic muscle capacity and endurance in performing repeated work. Fatigue index after each load used to be established, comparing it to the result of the first load. The data of this test are presented in Table 3 and show decrease in the result by 14.64 after the third load, by 20.16 after the fourth load, and by 21.60% after the fifth load.

Comparison of Lithuanian deaf basketball team game results in the 20th (2005), 21st (2009) and 22nd (2013) Deaflympic Games (Table 4) shows that the majority of competitive activity indices of the Lithuanian team in the Games of 2013 were higher than those of 2005 and 2009.

It is worth mentioning the number of matches played: in 2013 Games, 6 matches were played, and in 2009 – 5 matches. In 2009 Games in Taipei, Lithuanian team met Hong Kong, Taipei, Venezuela, Israel and the USA national teams, and in finals was defeated by the latter. In 2013, their opponents were the national teams of Taipei, Argentina, Greece, Russia, Ukraine, and Venezuela. Decreased precision of throws during

Table 2. **Comparative characteristics of Lithuanian deaf basketball national team members' muscle capacity, psychomotor functions, agility and blood circulatory system's functional capacity results in 2005, 2009 and 2013**

Indices	SMCP		AAMP		PRT, (ms)	FM (t/10 sec)	Agility (sec)	RI	Resting HR (b/min)
	W	W/kg	W	W/kg					
2005									
X	1741.0	21.8	1228.3	15.3	192.8	71.6	14.7	4.5	58.3
Sx	82.3	1.1	43.4	0.2	6.5	2.2	0.6	0.5	1.9
S	285.4	3.9	196.8	0.8	22.6	7.6	2.2	1.8	6.6
V, %	16.4	17.7	7.8	5.0	11.7	10.6	15.0	39.8	11.3
Min	1224	12.8	899	14.41	164	60	11.5	0.0	44
Max	2182	26.2	1425	17.0	250	84	18.9	6.8	69
2009									
X	2121.1	26.0	1407.8	16.6	177.5	78.1	12.5	4.6	58.8
Sx	137.4	1.8	33.9	0.3	4.5	1.9	0.3	0.9	2.4
S	476.1	6.2	117.6	1.0	15.7	6.6	1.1	3.1	8.4
V, %	22.4	23.8	8.4	5.9	8.9	8.4	9.0	66.7	14.7
Min	1511	16.1	1257	15.1	150	64	10.8	–1.6	44
Max	3184	38.8	1607	18.2	200	88	14.7	10.0	72
2013									
X	2113.1	24.2	1492.8	17.2	173.8	77.7	12.1	3.6	54.2
Sx	129.0	1.1	31.5	0.3	2.5	2.0	0.3	0.8	2.1
S	465.1	4.1	113.5	1.0	9.1	7.1	1.1	3.0	7.6
V, %	22.0	17.0	7.6	5.7	5.2	9.1	8.7	82.5	14.0
Min	1397	16.4	1287	15.5	159	62	10.7	-0.4	40
Max	3170	29.7	1736	18.6	195	92	13.8	8.4	68
p – I–III	< .05		< .01	< .001			< .05		

Table 3. **Lithuanian deaf basketball national team members' anaerobic alactic muscle power in performing repeated 5 x 6 s load and index of fatigue**

Indices	Load 1		Load 2		Load 3		Load 4		Load 5	
	W	W/kg	W	W/kg	W	W/kg	W	W/kg	W	W/kg
X	898.1	10.4	853.9	9.9	766.5	8.9	716.1	8.3	669.2	7.8
Sx	65.1	0.5	57.0	0.4	57.5	0.4	51.1	0.4	51.9	0.4
S	234.8	1.8	205.5	1.5	207.3	1.6	184.4	1.3	187.0	1.5
V, %	26.1	17.3	24.1	15.2	27.0	17.6	25.8	16.1	27.9	19.7
Min	572.0	7.2	607.0	7.6	528.0	6.6	526.0	6.6	465.0	5.8
Max	1486.0	14.4	1403.0	13.6	1330.0	12.9	1188.0	11.5	1120.0	10.9
Fatigue (%)			1–2	4.91	1–3	14.64	1–4	20.26	1–5	21.60

Table 4. **Characteristics of Lithuanian deaf basketball national team members in three Deaflympic Games**

No	Indices	2005 Melbourne	2009 Taipei	2013 Sofia
1.	Rank in the Deaflympic Games	3	2	1
2.	Precision of throws during the game, %	45.7	56.0	49.2
3.	Two-points field goals, %	51.1	64.0	55.3
4.	Three-points field goals, %	32.6	33.0	33.4
5.	Free throws field position, %	69.4	56.0	67.5
6.	Defensive rebounds	31.8	28.0	30.0
7.	Offensive rebounds	10.6	17.0	12.2
8.	Steals	10.2	17.8	14.7
9.	Assists	16.2	22.4	14.5
10.	Turnovers during the game	18.2	21.4	22.8
11.	Fouls during the game	26.6	21.0	22.7
12.	Number of fast breaks during the game	18.0	21.6	13.8
13.	Effectiveness of fast breaks, %	57.0	62.0	62.3

the matches was due to stronger opponents, victories were harder to achieve, and Lithuanian team's advantage was not so great comparing to Taipei Games.

Comparison of two-point throws precision results shows that it reached 51.5% in 2005, 64% in 2009, and 55.3 in 2013. Three-point throw precision since 2005 had a tendency to increase from 32.6 to 33.0 in 2009 and to 33.4 in 2013; in the last Games, free throws were also more precise (67.5%) than in Taipei. More successful participation of the Lithuanian team in 2013 was due to the increase of several other game parameters, such as the number of defensive rebounds, also more effective fast breaks. Even though the number of defensive rebounds was in a little increase, the number of offensive rebounds was less. Average number of steals and assists during the matches in 2013 Games was less, but it was covered by more effective fast breaks.

DISCUSSION

The presented review of Lithuanian deaf basketball players' sport results proves their strong position at international level for a number of years. The players' preparation and aspects of competitive activity have been constantly investigated (Dadelienė et al. 2011; Milašius et al., 2007; Šatas et al., 2005, 2010; Šatas, & Milašius, 2008 a, b; Šatas, & Radžiukynas, 2003). Indices of basketball players' height experienced little change during the period of investigation due to little change of the team players, however, muscle mass used to increase significantly ($p < .05$). Considering rather small number of people with deafness disability in general, some indices of basketball players selected to Lithuanian national team fall behind those of the healthy subjects in this sport (Paulauskas, Skernevičius, & Paulauskienė, 2009). The greatest lack is felt for high centre forward over 200 cm (Šatas, Milašius, & Dadelienė, 2010). Due to significant increase in muscle mass, body mass indices dispersion was rather wide – from 76.2 and 106.7 kilos.

Physical capacity analysis of deaf basketball players showed muscle mass increase due to training process, which was of influence for game activity. The same results were obtained by other authors who were investigating preparation of healthy basketball players (Apostolidis, Narsis, Balatoglaut, & Geloudas, 2004; Dembinski, 2003; Paulauskas, 2008). Comparison of Deaflympic champions' physical capacities, such as single muscle contraction capacity and anaerobic alactic muscle capacity with the indices of team players in previous years highlights the fact that in 2013, Lithuanian deaf basketball national team members were of greater physical capacity (Šatas et al., 2005, 2010; Šatas & Milašius, 2008 a, b). Capacity is very important in basketball players' take-off phase in performing jump, as well as in the first step and next three steps, as it determines the number of rebounds, quality of technique elements and game speed. We presume that higher values of capacity and agility indices before 2013 Games had positive impact on the game quality. Nevertheless, comparison of these indices with the ones of healthy basketball players shows lower

results for deaf players (Balčiunas, Garastas, & Stonkus, 2009; Paulauskas et al., 2009). 5 x 6 s repeated anaerobic alactic capacity and endurance test showed that working capacity after the fifth load had decreased by 21.6%, comparing to the first workload. These results, compared with Paulauskas et al.'s (Paulauskas, Dadelienė, Paulauskienė & Skernevičius, 2012) research data on elite and young basketball players' anaerobic alactic capacity and endurance, show the data difference of the healthy basketball players being only 9.48 and 9.12%. Circulatory and respiratory systems' functional capacity of deaf basketball players' national team members in the last period of preparation for 2013 Games was of good level and this allowed to keep sufficient working capacity throughout tournament.

Lithuanian deaf basketball national team performance in Deaflympic Games tournament was effective, which is confirmed by winning gold medals. Lower level of certain game components was covered by better quality of the other components.

CONCLUSIONS

1. Lithuanian deaf basketball national team members have demonstrated better results in muscle mass and reached higher physical capacities comparing to the participants of the previous Games. This increase resulted in improved quality of the game and for the first time becoming gold medal winners.

2. Comparative analysis of game indices of the teams, having participated in various Games showed that the majority of the competitive activity indices reflected certain positive trends of change in 2013 Games in Sofia: field of goals precision was 49.2%, the high number of defensive rebounds and fewer turnovers during competitions allowed very effective fast breaks.

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ASSESSMENT OF EMOTIONAL AND BEHAVIOUR DISORDERS OF GIRLS LIVING IN RESTRICTED ENVIRONMENT AND INTERVENTION STRATEGIES THROUGH PHYSICAL ACTIVITY

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ABSTRACT

Background. Students with emotional and behavioural disorders (EBD) represent one of the most challenging groups not only to provide effective educational services, but often present complex challenges for schools, families, and society. There is a lack of information about concrete research-based interventions and practices which could be helpful for delinquent students with EBD to cope with problem behaviour more effectively. The aim of the study was to assess the emotional and behaviour disorders of girls living in socialization centres and to review intervention strategies for changing behaviour through physical activity.

Methods. The study was conducted in two Children Socialization Centres where 50 girls aged 12 – 18 are housed following the decision of Child Welfare Commission. Behaviour Assessment System for Children (BASC-2), a Self-Report Personality Scale was used to find out emotional and behavioural disorders of girls.

Results. Analysis of our study results reveals that the girls with delinquent behaviour living in CSC show the risk of having problems in school, high level of social stress, anxiety, sense of inadequacy, atypicality, attention problems, hyperactivity and lower levels of self-esteem, self-reliance, interpersonal relations. The results support the conclusions of other studies which found significant relations between EBD students and weak levels of social skills, self-esteem and self-efficacy, cooperation.

Conclusion. Sport and physical activity settings are effective intervention setting for creation, practicing and maintenance of pro-social behaviour and emotion managing; furthermore those skills could be transferred to community settings in everyday life. The best education setting for EBD students could be provided in inclusive environment, where the positive behaviour skills could be copied and maintained.

Keywords: emotional and behavioural disorders, intervention strategies, delinquent behaviour, restricted environment.

INTRODUCTION

Students with emotional and behavioural disorders (EBD) represent one of the most challenging groups not only to provide effective educational services, but often present complex challenges for schools, families, and society (Cancio & Johnson, 2013; Cook, Landrum, Tankersley, & Kauffman, 2003). Individuals' with EBD usually demonstrated behaviours can be so disruptive that they can seriously complicate relationships with peers, parents, and teachers (Farrell, Shaw, & Webber, 2009; Kann, Traci, & Hanna, 2000). Unfortunately, these children and youth often demonstrate deficits in social skill and this can have profound effects on successful community integration and cooperation (Gendron, Royer, Bertrand & Potvin, 2004; Gresham, Sugai, & Horner 2001). Social skills are learned behaviours necessary for individuals to get along successfully with others in both school and community settings (Sheridan, Eagle, Cowan, & Mickelson, 2001).

Students identified as having an EBD tend to be less engaged, they are more likely to display off-task behaviours, and are more impulsive, uninvolved, and inattentive, often waste time, accomplish little, and require increased instructional attention and effort from teachers and supervisors, commonly demonstrate non-compliant behaviour that disrupts the class as a whole (Edwards-Duke, Boswell, McGhee, & Decker, 2002). Typical characteristic of individuals with EBD can be hyperactivity, restlessness, short attention span, and hyperkinesis. They engage in disruptive, destructive, aggressive and defiant behaviours that interfere with the educational progress and impede learning and social interactions, also reduce their self-esteem and self-efficacy (Daniels, 2002; Jolivette, Stichter, & McCormick, 2002; Szymanski & Zolotor, 2001)

Researchers have reported that EBDs are predictive of severe long-term difficulties across every aspect of life (Fitzpatrick & Knowlton, 2009; Scott & Shearer-Lingo, 2002) and found out disappointing outcomes for students with EBD compared to those without disabilities: higher school dropout rates (Edwards-Duke et al., 2002; Kaufman, Alt, & Chapman 2001); lower rates of participation in postsecondary education (Wagner, Cameto, & Newman 2003); higher unemployment levels (Carter & Wehby 2003); lower rates of community participation (Armstrong, Dedrick, & Greenbaum 2003; Samalot-Rivera & Porretta, 2013) delinquency and adult psychiatric problems such as mood disorders, anxiety disorders, antisocial behaviour in adulthood (Edwards-Duke et al., 2002). Historically, students with an EBD mostly were taught in segregated environment as they usually failed in the regular school setting (Cook et al., 2003; Kauffman, 2001; Scott & Shearer-Lingo, 2002). Over the past few years, seeking to eliminate all forms of discrimination, the idea of including students with disabilities into a general education classroom has become prevalent in many countries (DePauw & Doll-Tepper, 2000; Hunt & McDonnell, 2007). The consensus about the concept of inclusive education was found at the 48th session of the International Conference on Education in November 2008 (Conclusions and Recommendations of the 48th session of the International Conference on Education, 2008). This attitude concerns individual with EBD as well, though behaviour disorders still represent a major concern in today's schools. (Jing Qi & Amy Ha, 2012). Researchers report (Jolivette, et al., 2014; Wagner & Cameto, 2004; Wagner, Newnan, Cameto, & Levine, 2005) that some students with EBD due to their inadequate behaviour (argue with school personnel, fight with others during instructional contexts, do not control their behaviour appropriately in school situations) may receive educational services delivered in more restrictive settings (self-contained class, alternative schools, residential facilities, secure juvenile justice settings). Lehr (2004) found that most states in US are relying on these alternative settings to serve students with EBD and challenging behaviours, as result of this between 33% and 75% of students in alternative settings may be identified as having EBD.

According to Lithuanian Statistics (2012), about 80% of youngsters living in socialization centres are identified as having EBD. According to Lithuanian law, the aim of socialization centres is to improve individuals' prosocial behaviour and living skills, motivation for studies and positive self-esteem. The Report of Prosecution Service of the Republic of Lithuania (2013) and scientific publications (Enzmann et al., 2010; Zahn, Hawkins, Chiancone, & Whitworth, 2008) state that recently delinquency list becomes more ferocious; a lot of parents cannot cope with the inappropriate behaviour of their children and institutionalize them. According to Fitzpatrick and Knowlton (2009), despite the notable difficulties in translating research findings into effective evidence-based practices, practitioners continue to seek workable, evidence-based interventions that can help students who have an EBD to manage their own behaviour and achieve success with the general education curriculum. Although many existing practices are supported by research evidence, other popular, professionally recommended programs are grounded in little or no research supportive of their use with students identified as having an EBD. In the Report of National Audit Office of Lithuania (2013) it was reported that there is a lack of professionals in those institutions such as psychologists, social and special pedagogues; there is no common evaluation of progress for students with EBD; and there are difficulties in evaluating the efficiency of used intervention programmes, as they are different in each socialisation centre. Korbin et al. (2010) point out that delinquent behaviour of the girls is usually their efforts to understand their own feelings, and the problem really needs attention and studies to find out the reasons of such behaviour, risk factors, possibilities of effective prevention

and intervention. Girls with EBD avoid being open with their parents, teachers, or other adults. That is why self-report questionnaire could be very helpful for educators to get objective information about the psychological profile of a concrete girl. Additional information is needed about concrete research-based interventions and practices which could be helpful for delinquent students with EBD to cope more effectively with problem behaviour.

The aim of the study was to assess the emotional and behaviour disorders of girls living in socialization centres and to review intervention strategies for changing behaviour through physical activity.

METHODS

Research organization and Participants. The study was conducted in April and March, 2013, in two Children Socialization Centres where 50 girls aged 12–18 are housed following the decision of Child Welfare Commission. Our sample included one 12-year-old, one 18-year-old, two 13 year-old girls, eight 14-year-old girls, eight 17 year-old girls, fifteen 15 and 16 year-old girls. As many as 23 girls came from biological families, 23 girls came from foster homes, and 4 girls lived with foster-parents. The subjects were institutionalized due to absenteeism from school and vagabondage (50 girls), the use of alcohol and psychotropic substances (19 girls), stealing (3 girls), violent and aggressive behaviour (5 girls), and prostitution (1 girl). The permission to carry out the research was signed by the directors of both Children Socialization Centres.

Behaviour Assessment System for Children (BASC-2) (Reynolds & Kamphaus, 2004) a Self-Report Personality Scale (SRP –A, ages 12 through 18) was used to find out emotional and behavioural disorders of girls. SRP is an omnibus personality inventory consisting of statements that respondents answer in one of two ways. Some of its items require a *True* or *False* response, while others call for rating on a four-point scale of frequency, ranging from *Never* to *Almost always*. The individual profiles were created for every subject, identifying the strengths and weakness of each participant, and the reports of individual progress were obtained. The SRP takes about 20 to 30 minutes to complete.

The data were processed by means of *Behaviour Assessment System for Children* Scoring and Reporting System BASC-2 ASSIST™ Plus (Reynolds & Kamphaus, 2004). Each program generates profiles, calculates validity indexes, identifies strengths and weaknesses, and computes multirater comparisons and progress reports. The BASC-2 ASSIST™ Plus offers the additional features of reporting content scales, target behaviours for intervention, and relationships to DSM-IV-TR diagnostic criteria. A descriptive label may be applied to each scale of BASC-2 system and a composite score using the classification system in Table 1.

Table 1. **Scale and composite score classification**

Classification		T-Score Range
Adaptive scales	**Clinical scales**	
Very High	Clinically Significant	70 and above
High	At-Risk	60–69
Average	Average	41–59
At-Risk	Low	31–40
Clinically Significant	Very Low	30 and below

According to the classification system (T-score range), it could be determined if the girls' emotions and behaviour are normal or not. If the score is above 60, the behaviour is determined as risky. Filling in the BASC scale, the attitudes of girls towards emotions, thoughts and perception were detected and divided into two groups, the ones that strengthen delinquency (depression, anxiety, social stress, hyperactivity, aggressiveness, behaviour problems**,** withdrawal) and those reducing delinquency (good relationship with parents and peers, leadership, self-respect, adaptation, psychological resistance). The data were processed using a Statistical Package for Social Science (SPSS 19.0 for Windows).

RESULTS

As the number of participants was not big and the girls had quite different emotional and behavioural problems, the average scores of the Emotional Behaviour scale did not show any significant risk, so it was relevant to point out individually how many girls were at risk (Table 2).

The results of our study pointed out that on the *Attitude towards School* and on the *Attitude towards Teachers* scales the T score mean indicated the risk for 20% of the girls who participated in the study. In this scale *Attitude towards School* is defined as feelings of alienation, hostility, and dissatisfaction regarding school; *Attitude towards Teachers* reflects feelings of resentment and dislike of teachers,

Table 2. **Average scores of the Emotional Behaviour scale of girls with delinquent behaviour**

Scales		T Score mean	Min–Max
School Problems 52.94 ± 10.716	Attitude to School	50.7 ± 11.59	35–80
	Attitude to Teachers	50.7 ± 10.61	34–79
	Sensation Seeking	55.2 ± 10.20	33–79
Internalizing Problems 58.36 ± 11.533	Atypicality	58.0 ± 12.29	42–93
	Locus of Control	59.0 ± 10.01	40–79
	Social Stress	55.0 ± 11.94	35–90
	Anxiety	57.1 ± 9.76	34–80
	Depression	57.4 ± 11.49	40–84
	Sense of Inadequacy	56.24 ± 11.98	35–82
	Somatization	50.62 ± 8.13	40–69
Inattention/ Hyperactivity 56.54 ± 10.544	Attention problems	54.64 ± 10.74	34–79
	Hyperactivity	56.8 ± 11.96	36–81
Emotional Symptoms Index		**59.1 ± 10.81**	37–85
Personal Adjustment 42.92 ± 12.188	Relations with Parents	44.9 ± 11.45	21–65
	Interpersonal Relations	45.6 ± 14.19	10–62
	Self–Esteem	39.2 ± 12.16	16–62
	Self–Reliance	41.9 ± 10.86	16–58

beliefs that teachers are unfair, uncaring, or overly demanding. T score mean on *Sensation Seeking* was indicated risk for 36% of girls. Evaluating their internalization problems the T score mean signalled risk for 3% of girls on the *Atipicality* scale, which means having unusual thoughts and perceptions and the tendency to bizarre or odd thoughts and behaviours. *Sense of Inadequacy* indicates a relatively high number of feelings of inadequacy, and the child may display or report quitting easily, sense of failure, and 34% of the girls were at risk. Emotional Symptoms Index results showed the risk for more than 50% of the girls and the average mean of whole group was 59.1 ± 10.805, which shows that the whole group was also at risk. Three of the scales included in the ESI – *Social Stress, Anxiety and Depression* – may be referred to as the *SAD Triad*. High scores on the SAD Triad represent significant emotional distress characterized by depression with substantial tension. In general, high scores also reflect the presence of poor support mechanisms or coping skills for life's difficulties. All these three feelings showed risk for 40% of the girls. *Social stress* reflects feelings of stress and tension in personal relationships and/or feeling of being excluded from social activities. *Anxiety* is defined as feelings of nervousness, worry, and fear; the tendency to be overwhelmed by problems, as *Depression* means feelings of unhappiness, sadness, and dejection, a belief that nothing goes right. Even 18% of the girls felt some kind of somatization and T score means on *Locus of Control* scale showed risk for 50% of girls, and average scores of this feature also showed risk for the whole group of participants. *Locus of Control* indicates a below-average sense of control, and the child may report being controlled by parents or just as bad things happening. Even 32% of girls were at risk for hyperactivity and attention problems. *Attention Problems* indicates problematic levels of paying attention, and the child may report having a short attention span, forgetting things. *Hyperactivity* reflects the tendency to be overly active, rush through work or activities, and act without thinking. Personal adjustment scale showed the problems for 48% of girls on self-esteem, and this value was at the lowest limit of the scale, it means that most of the girls demonstrated too low self-esteem. *Self-Esteem* indicates below–average levels of self-esteem, the child may show or report concerns about looks and want to be someone else. The girls (38%) were at risk for self-reliance and relations with parents. *Self-Reliance* indicates below–average levels of self-reliance; the child may show or report lack of dependence, difficulty in making decisions. *Relations with Parents* indicate problematic relationship with parents; the child may show or report lack of trust, not being close with parents. Interpersonal relations were poor for 24% of the girls. *Interpersonal Relations* scale reflects the perception of having good social relationships and friendships with peers. Scale scores in the Clinically Significant range suggest a high level of maladjustment. Scores in the At-Risk range may identify to problem that needs careful monitoring.

DISCUSSION

Analysis of our study results reveals that the girls with delinquent behaviour living in CSC show the risk of having problems at school, high level of social stress, anxiety, sense of inadequacy, atypicality, attention problems, hyperactivity and lower levels of self-esteem, self-reliance, interpersonal relations. The results support the conclusions of other studies which found significant relations between EBD students and weak levels of social skills, self-esteem and self-efficacy, cooperation (Gendron et al., 2004) and delinquency (Pileckaitė-Markovienė, 2006). In their research Remschmidt and Walter (2010) stress that the first factor for delinquency is a behavioural disturbance in early childhood, such as attention deficit–hyperactivity disorder (ADHD), aggressiveness, or disturbances of social behaviour, which limit the individual's developmental possibilities. We support the conclusions of Korbin et al. (2010) who point out that delinquent behaviour of the girls is that problem which need to be really perceived, researched trying to find out the reasons of such behaviour, risk factors, possibilities of effective prevention and intervention. We believe that it is very important to determine and evaluate emotional and behaviour problems of girls with delinquency, but it is more important to find out and apply the most effective intervention methods for both changing behaviour and preventing delinquency in adulthood. Research (Salkind, 2002) shows that once a pattern of aggressive, defiant, and impulsive behaviour has been established, it is highly resistant to change. Because of countless repetitions over time, maladaptive patterns of emotion regulation become deeply ingrained by years to the extent that they become core components of a child's personality structure. Moreover, children who show high levels of aggression and other antisocial behaviour or have EBD are more likely to be rejected by their peers and to receive negative attention from teachers, which in turn leads to more aggression. Later on, these children are frequently suspended and/or expelled, begin to fail academically, and develop adversarial relationships with the school system, and by the time these children have had a lifetime of training and preparation for delinquent behaviour in adolescence, they easily find peers who reinforce their patterns of behaviour. One of the strongest findings that we have to stress is that delinquent children associate with and commit many of their offenses in the company of delinquent peers. So if such a child is taken to segregated environment (e.g. CSC), it can lead to reinforcement of aggressive habits and behaviours, as in these segregated/isolated settings power-assertive discipline strategies are usually used. The question we have to answer is what should be done to stop this perverse cycle? There are many different techniques that can be used to teach and promote youths' use of appropriate social skills. Researchers suggest different intervention programmes – family management, community based, motivation/level systems shaping the behaviour (Cancio & Johnson, 2013), choice as an intervention (Jolivette, Wehby, Canale, & Massey, 2001; Kern, Bambara, & Fogt, 2002), inclusive education and other practices, self-directed intervention strategies (e.g. self-management, self-monitoring, self-instruction) (Fitzpatrick & Knowlton, 2009), replacement behaviours and many others. It is equally important that teachers understand that their behaviour not only influences student behaviour, but is itself influenced by student behaviour. A greater understanding of those reciprocal interactions that transcend typical linear models of teaching and learning should strengthen the quality of instruction for students with learning and behaviour problems. One of the main things that we would like to discuss is the importance of applied practices in inclusive settings. As one of the factors for delinquency is internal problems, the other factor are deleterious influences and living environments that make allowance for antisocial behaviour. Skerbetz and Kostewicz (2013) also stress that from an educational perspective, teachers in segregated settings provide fewer positive learning opportunities and less academic growth (Sutherland & Wehby, 2001) as compared with general education settings. Wagner et al. (2006) point out that peer interaction effects occur when students with ED spend the majority of time with other students with ED. Gunter and Coutinho (1997) described segregated settings for students with ED as negatively reinforcing. Teachers in these settings often maintain a curriculum of non-instruction (Sutherland & Wehby, 2001); students tend to display learned helplessness behaviours (Sutherland & Singh, 2004); and together students and teachers partake in a cycle of coercion (Gunter, Denny, & Venn, 2000). In contrast, students with disabilities educated in inclusive settings have more opportunities for appropriate peer models, for meaningful and appropriate contact with students without special needs; greater expectations placed on academic

performance and promote the social and educational development of students with EBD (Tapasak & Walther-Thomas, 1999; Walther-Thomas, Korinek, McLaughlin, & Williams, 2000). Teachers perceive the inclusion of students with EBD as undesirable mostly because of behavioural concerns (Sutherland & Singh, 2004), however, the educational climate has seen a change with inclusive practices occurring more often providing more opportunities for students with special needs to receive education together with their nondisabled peers (Burstein, Sears, Wilcoxen, Cabello, & Spagna, 2004; Snyder & Dillow, 2011). Problems connected with the integration of children with EBD into regular education system are relevant nowadays not only in Lithuania, but in other countries as well. Students with emotional and behaviour disturbance do not follow the inclusion trend in the same way as other students with disabilities do, and the former group has a greater likelihood to receive segregated instruction as compared with students with learning disabilities, intellectual disabilities, or hearing impairments (Bullock & Gable, 2006). Evans, Weiss, and Cullinan (2012) point out that in US "The Individuals with Disabilities Education Act" (IDEA 2004) indicated the desirability of an inclusive educational environment for all students with disabilities, including those with emotional disturbance, but recent national data show that only 37% of students with ED experienced the intended level of inclusion (at least 80% of the day the child should be taught in regular education classrooms). Although educators declare (Kauffman, 2010) that best educational practice should be more important than any particular educational placement, Zigmond, Kloo, and Volonino (2009) pointed out the significance of *where the* special education has been implemented. Despite an increasing trend toward more inclusive settings, the researchers (Landrum, Katsiyannis & Archwamety, 2004) point out that the movement toward less restrictive environments has been far slower than for students with disabilities overall. Other researchers (Cullinan & Sabornie, 2004; Nelson, Benner, Lane, & Smith 2004; Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005 a) suppose that the interaction between characteristics and educational environment is still not clear. On the other hand, findings (Fekkes, Pijpers, Verloove-Vanhorick, 2006; Skerbetz & Kostewicz, 2013) show that frequent and active bullying of EDB children at school is associated with delinquent behaviour and carries with it the risk that children may develop an antisocial lifestyle as both personal and environmental factors thus seem to influence the development of EBD, therefore, environmental factors may be used to prevent or reduce characteristics of EBD. Kauffman et al. (2002) suggest that teachers cannot deliver, monitor, and adapt instruction for students with ED with the level of structure and intensity required for general education settings. Therefore, to promote successful inclusive opportunities for students with EBD, it is imperative that teachers are provided with the knowledge and skills that will enable them to develop the most effective academic and behavioural interventions programs for their students.

Physical education and sport offer unique opportunities for students with EBD to learn and exhibit appropriate social skills. Usually students in inclusive settings participate in small or large groups and are expected to socially interact. According to Bruen (2012), engaging in physical activity requires concentration and paying attention to one's bodily movements. Sports such as martial arts, ballet, yoga, dance, or any physical activity that requires deep concentration, memorization, and sequencing of behaviours can help a person to focus their attention. Exercise helps students to cope more effectively with stress, negative affect, stress, anxiety, and depression, as well as self-destructive behaviour, have a more positive identity, and have clearer thought and improved memory (Akande, VanWyk, & Osagie, 2000; Archer & Kostrzewa, 2012). There are indications that movement increases mental performance in the parts of the brain involved in memory, attention, spatial perception, language, and emotion, can strengthen learning, motivation and morale (Jensen, 2005; Olsen, 1994). Research show that purposeful exercising with music and dance can increase pro-social behaviour skills, supports cooperation and communication, inhibits aggressive behaviour, social dysfunction, and the most important thing is that learned positive behaviour habits could be transferred to everyday life (Rėklaitiene, 2003). Research by Ostaseviciene, Gaižauskienė, Rėklaitienė, Požėrienė, & Adomaitienė (2013) identified that educational games for delinquent girls increased such behaviour aspects as decision-making, social-interaction, leadership, problem-solving, critical thinking skills and decreased levels of aggression, tension and dissatisfaction. Other evidence indicates that exercise activities used throughout the day can help improve academic performance and reduce disruptive classroom and social behaviour problems (Barkley, Fischer,

Smallish, & Fletcher, 2004). Yet the researchers (Hellison, 2003, Rėklaitiene, 2003) stress that while sports and physical education settings offer unique educational experiences where students can act socially, the development of social skills does not happen automatically. According to Buchanan, Flouri, and Brinke (2002), specific instructional strategies need to be used to develop social skills for students with EBD.

CONCLUSION

Girls with delinquent behaviour usually have emotional and behaviour disorders externalized as high level of social stress, anxiety, sense of inadequacy, atypicality, attention problems, hyperactivity and lower levels of self-esteem, self-reliance, and inter-personal relations. Sport and physical activity settings are effective intervention setting for creation, practicing and maintenance of pro-social behaviour and emotion managing; furthermore those skills could be transferred to community settings in everyday life. The best education setting for EBD students could be provided in inclusive environment, where the positive behaviour skills could be copied and maintained.

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ATHLETIC IDENTITY AND SELF-ESTEEM OF WHEELCHAIR BASKETBALL PLAYERS

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ABSTRACT

Background. Disabled persons do not consider and use a single identity to represent themselves. Athletic identity as a wheelchair basketball player can help the process of acceptance and support psychological adjustment. Thus, there is a need to research the association between and the influence of the wheelchair basketball player's qualification and a strong athletic identity on a person's self-esteem (Hawkins, Coffee, & Soundy, 2014; Martin, Adams-Mushett, & Smith, 1995).

Methods. The multidimensional Athletic Identity Measurement Scale (Brewer & Cornelius, 2002) was used to assess self-identity, social identity, exclusivity and negative affectivity of 36 wheelchair basketball players. Self-esteem was evaluated by the adapted V. Stolin's (Столин, 1983) test including nine self-evaluation scales: internal integrity, self-confidence, self-direction, self-image, self-interest, self-content, self-orientation, self-contradiction and self-accusation.

Results. It was found out that the athletic identity value of the players participating in international level competitions (30 points) is statistically significantly higher compared to that of participating in national level events (18 points, $p < .05$).

Conclusions. Disabled persons of the competition group with better athletic identity represented stronger self-integrity and were less self-accusative, more self-content, their self-confidence grew and they had a better self-image in comparison with the national level group.

Keywords: self-confidence, self-image, persons with physical disability.

INTRODUCTION

Little is known about the psychological characteristics and preparation of wheelchair basketball players with disabilities (Stephan & Brewer, 2007; Sherrill & Williams, 1996; Stryker & Burke, 2000). Many reasons have been offered as to why athletes with disabilities have been underrepresented in sport psychology research (Sherrill, 1998; Tasiemski, Kennedy, Gardner, & Blaikley, 2004; Wu & Williams, 2001). A common theme throughout these writings suggests that a lot of individuals do not consider athletes with disabilities as legitimate or real athletes. Lack of awareness and indifferent as well as negative attitudes towards sport opportunities for disabled people have limited not only the number of research but also funding and recruitment of coaches, sports psychologists, and athletes (Martin et al., 1995; Nasco & Webb, 2006; Miller, 2009; Hawkins et al., 2014).

Past research works have not been able to demonstrate how athletic identity is associated with characteristics of self-esteem. Disabled persons do not consider and use a single identity to represent themselves. The reason for this is that disabled persons often experience the paradox of chronic illness. The paradox suggests that individuals are simultaneously impelled to accept and defy the limitations of their disability. Moreover, the understanding of which limitations disabled individuals can accept or defy is likely to vary, change and evolve (Hawkins et al., 2014; Martin et al., 1995). One consistency in this experience

can be the sport group which individuals associate themselves with, their athletic identity as a wheelchair basketball player can help the process of acceptance and act as a factor supporting and facilitating the adjustment. Thus, there is a need for research to consider the association between and influence of wheelchair basketball player's qualification and a strong athletic identity on a person's self-esteem.

The aim of the research was to determine athletic identity and self-esteem of wheelchair basketball players and to evaluate influence of athletic identity on wheelchair basketball players' self-esteem according to the level of participation in wheelchair basketball.

The object of the research was athletic identity and self-esteem of wheelchair basketball players.

Hypothesis: athletic identity can positively influence wheelchair basketball players' self-esteem.

METHODS

The Athletic Identity Assessment Scale (Brewer & Cornelius, 2002) was used in the research. The scale is a seven-item questionnaire assessing the person's feelings of self-attribution to the athlete's role. The athletic identity grading scale is divided into three sub-categories: social identity (the depth of the athlete's perception of the role), differentiation (the athlete's perception of the role compared with other roles, such as a friend's role, a family member's role, etc.), and negative effects (negative emotional response rates due to inability to practise and participate in sports competitions). The answers to the questions scored from one (answer "strongly disagree") to seven ("strongly agree"). The scores of individual subscales were summed, and the total score of each individual athletic identity score was derived.

Self-esteem – one of the most important indicators of psychosocial health of disabled persons – was evaluated by the adapted Stolin's (Столин, 1983) test including nine self-evaluation scales: internal integrity, self-confidence, self-direction, self-image, self-interest, self-content, self-orientation, self-contradiction and self-accusation. The result points of each scale refer to a certain evaluation: 1–3 points refer to a low scale evaluation, 4–7 points – average evaluation, 8–10 points – high evaluation.

From 2011 till 2012 the research included 36 disabled persons from all over Lithuania (34 males and 2 females). The participants were selected using the improbability sampling strategy. The group included persons after spinal cord injury, cerebral palsy and amputations. The age of the subjects ranged from 18 to 45 years. According to the level of participation in sport two groups of respondents were formed: persons participating in national level competitive sport – involved in sport activities 2–3 times per week and participating in competition in Lithuania several times per year (20 subjects), and persons participating in international competitive sport – regularly involved in sport activities 6-8 times per week and participating in international competitions (16 subjects).

The research results were processed applying the software program SPSS 12.0. The arithmetic mean ($\bar{x}$) and the standard deviations (S) were calculated. Data statistical differences between subjects were assessed using Student's (t) test. Data was considered statistically significant at the significance level of $p < .05$.

RESULTS

Only a small number of players participating in national level competitive sports identify themselves as athletes. Only 9.3% of athletic identity scores equal to 28 points. Research revealed that athletic identity depends on sports qualification. The players participating in international competitions reported moderate to (26 points) strong (30 points) athletic identities.

It was found out that athletic identity value of the players participating in international competitions (30 points) was statistically significantly higher compared to that of the players participating in the national level competitive sports (18 points, $p < .05$).

Most self-esteem indicators – self-confidence, self-image, and self-content – of wheelchair basketball players participating at the international competition level were better if compared to those from the group participating in the national level. Wheelchair basketball players participating at the international competition level represented stronger self-integrity and were less self-accusative, more self-content, their self-confidence grew and they had a better self-image (Table).

DISCUSSION

The research has proved that the athletic identity disabled persons depends on the level of their involvement in sports activities. Wheelchair

Table. **Self-esteem of wheelchair basketball players**

Self-esteem indicators	Mean values of lower athletic identity group (points)	Mean values of higher athletic identity group (points)
Internal integrity	5.4 ± 0.64	5.3 ± 0.11
Self-confidence	7.8 ± 0.12	8.7* ± 0.2
Self-direction	6.7 ± 0.23	7.0 ± 0.41
Self-image	7.9 ± 0.14	8.5* ± 0.09
Self-interest	8.1 ± 0.15	8.3 ± 0.24
Self-content	7.6 ± 0.08	8.4* ± 0.03
Self-orientation	5.6 ± 0.26	5.7 ± 0.15
Self-contradiction	3.8 ± 0.38	3.7 ± 0.24
Self-accusation	4.7 ± 0.72	4.1 ± 0.84

Note. * – statistically significant difference ($p < .05$) among the participants with different athletic identity.

basketball players participating in international competitive sports showed moderate and strong athletic identities.

The comparison of the research data with the data of similar research works on athletic identity values reveals the fact that athletic identity of wheelchair basketball players participating in international competitions is similar to that of disabled swimmers (Martin, Adams-Mushett, & Smith, 1995) and lower than athletic identity of able-bodied athletes (Brewer & Cornelius, 2002) from Great Britain. The results show that athletic identity of wheelchair basketball players in comparison to that of able-bodied persons is highly affected by injury, social limitations caused by the disability and absence of status of the disabled athlete.

The present study revealed the fact that the relationship of self-identity to competitiveness suggests that athletes with strong athletic identities also had good self-esteem indicators leading to a strong desire to achieve success and satisfaction in athletics. This finding supports similar research by Tasiemski et al. (2004).

The self-esteem test showed that the disabled persons identifying themselves as athletes gained more self-confidence, represented a stronger self-integrity and were less self-accusative, also accepted their physical disability easier. Such changes may have been caused by a different environment in which the disabled person identifies himself/herself with persons similar to him/her easier, also by the example set by other disabled athletes. The interpretation confirms the opinion of other researchers that the socialization process is more successful in a homogenous group which is isolated from the wider society (Skucas, 2012). In such environment values are fostered or changed to different ones quicker. Such results may have been caused by successful internalization process, achieving personal and team goals and the desire to attain those goals. Disabled persons with strong athletic identity had a possibility to identify themselves as active society members acquiring more relevant knowledge and skills, getting physically and spiritually stronger. This finding supports similar research by Martin (2008).

The results of the study support the importance that sport holds athletes with disabilities and provides information that should help increase awareness and acceptance of athletes with disabilities. The results of the current study suggest that coaches and support staff of athletes with disabilities should be aware that their athletes may be highly invested in their sport. Expressing low performance expectations or patronizing attitudes toward performance potential can be psychologically and athletically harmful (Stryker & Burke, 2000). Coaches should acknowledge these athletes and continue to provide them with challenging, competitive opportunities for athletic excellence.

CONCLUSIONS

1. Athletic identity of wheelchair basketball players participating in national and competition sport level was different:
   - only a small number of the players participating in national level competitive sport identified themselves as athletes.
   - the players participating in the international competition level reported moderate to strong athletic identities.
2. Disabled persons of international competition level group with a higher athletic identity showed stronger self-integrity and were less self-accusative, more self-content, their self-confidence grew and they had a better self-image in comparison with the national level group.

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ANALYSIS OF CHANGES IN BODY BALANCE FOR WOMEN WITH MULTIPLE SCLEROSIS

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ABSTRACT

Background. To obtain changes in postural control the method of static posturography is usually used. The analysis of posturogram lets us determine the character of these changes, presumes that the body balance complexity, which is expressed in body coordinates of the centre of pressure variation, is less in multiple sclerosis patients than in healthy women. This study aimed at determining the effect of multiple sclerosis on changes in balance control of patients.

Methods. Twelve women with multiple sclerosis (mean age – 43.0 ± 5.5 years, body mass index – 24.7 ± 4.2 kg/m^2) and 15 healthy women (mean age – 44.5 ± 3.5 years, body mass index – 25.5 ± 2.9 kg/m^2) were included in this study. The balance of subjects was assessed applying the method of static posturography. We calculated changes in the coordinates of the centre of body pressure displacement in the lateral and anterior-posterior directions. To assess changes in the displacement of the centre of body pressure in the lateral and anterior-posterior directions two characteristics of advanced signal processing methods, i.e. sample entropy and the index of spectral power dependence on frequency were calculated.

Results and conclusion. Traditional posturogram analysis does not show statistically significant changes between women with multiple sclerosis and healthy women. The results of the study, applying advanced signal processing methods, have shown that the complexity of the centre of body pressure displacement of women with multiple sclerosis is statistically significantly smaller compared to that of the healthy women studied. This may be a prerequisite for better rehabilitation of stroke control.

Keywords: multiple sclerosis, posture control, assesement of posture.

INTRODUCTION

Balance impairments are common in persons with multiple sclerosis (MS), but clinical balance tests may not detect subtle deficits in adults with MS who are not yet experiencing functional limitations or disability. Karst, Venema, Roehrs, & Tyler (2005) observed that in the early stage of MS testing patients using Berg Balance Scale (BBS) did not reveal any balance disorders, whereas the analysis of the posturogram of changes in the coordinates of the centre of body pressure (COP) showed statistically significant differences between persons with MS and age-matched healthy adults. It has been recently found that balance parameters of persons with MS, i.e. the frequency of fluctuations and the length of trajectory of COP fluctuations, are greater among age-matched healthy subjects (Chung, Remelius, Van Emmerik, & Kent-Braun, 2008; Karst et al., 2005; Pérennou et al., 2005; Rouger, Thoumie, Cantalloube, Lamotte, 2007)

In order to study the dynamics of functions of human motor systems, the system of balance control included, methods of non-linear dynamics have been applied. It has been established that the complexity of physiological dynamic systems enables the human body to react fast to internal and

external alterations (Hong & Newell, 2008; Lipsitz, 1997; Slifkin & Newell, 1999). The complexity of behaviour of physiological systems is calculated by applying the index of entropy (Cavanaugh, Mercer, Stergiou, 2007; Richmann & Moorman, 2000; Sabatini, 2000). Thus, for example, for calculating the complexity of balance system behaviour Approximate Entropy (ApEn) is applied most frequently (Cavanaugh et al., 2007; Sabatini, 2000). The criterion of Sample Entropy (SampEn), a more precise method for calculating the complexity of dynamic system, has been proposed by Richman and Moorman (2000). For the analysis of the spectrum of signals registered by the trajectory of fluctuations in COP, the Spectral Slope index that indicates spectral power dependence on frequency has been used (Vaillancourt & Newell, 2003). It is known that under the impact of various neurological diseases there occurs an increase in the regularity of other physiological processes in human behaviour and as a result the complexity of these systems decreases (Lambert, Archer, & Evans, 2001). The purpose of this study was to determine changes in postural sway of patients with multiple sclerosis.

METHODS

Subjects. Twelve women with MS (mean age – 43.0 ± 5.5 years, body mass index (BMI) – 24.7 ± 4.2 kg/m^2) (group 1) and 15 healthy women (mean age – 44.5 ± 3.5 years, body mass index (BMI) – 25.5 ± 2.9 kg/m^2) (group 2) were included in the study. The data of the group of women subjects affected by MS are shown in Table.

The group of persons included in the study was formed taking into consideration the severity of the disease as measured by the Kurtzke Expanded Disability Status Scale (EDSS) (Kurtzke, 1983), with the values not exceeding 4.5 points. Such a form of disease does not require inpatient care since patients are able to look after themselves. The subjects were residents of Kaunas and Kaunas region. They were invited to participate in the study by "OREMUS", the community of persons affected by the disease of multiple sclerosis (MS). Diagnosis and the form of disorder were given by neurologist after carrying out magnetic resonance imaging examination. The subjects were acquainted with the objectives of the research and the protocol.

Research protocol. The balance of the subjects was assessed by the method of static posturography. Kistler force plate was used for this purpose. Every subject stood on the force plate for 60 s. The position of the subjects on the platform was as follows: eyes open, looking straight ahead; feet put together, arms down at the sides, palms inwards. The duration of registering the posturogram was 60 s, sampling rate – 100 Hz. We registered the changes in COP displacement in the lateral (COP dx) and anterior-posterior (COP dy) directions. The registration of the posturogram was started when the subjects took the correct posture on the force plate. By applying traditional methods the balance of subjects was assessed as follows:

COPdx – changes in COP displacement in the lateral direction (mm/s);

COPdy – changes in COP displacement in the anterior-posterior direction (mm/s).

Assessment of the complexity of balance: The posturograms of the two groups of subjects, women patients with MS and healthy women aged 40–50 years were assessed on the basis of two advanced signal processing methods – SampEn (Richman & Moorman, 2000) and Spectral Slope (Vaillancourt & Newell, 2003).

SampEn was calculated as follows:

$$SampEn(m, r, N) = -\ln(A/B),$$

where B – total number of matches of length m sequences (within a tolerance r) in length N line; A – total number of matches of length m + 1 sequences (within a tolerance r) in length N line; A/B stands for conditional probability that two sequences, similar within a tolerance r in segment m, will remain similar within a tolerance r in segment m + 1 too; sample entropy indicates the regularity of time series:

when $SampEn \rightarrow 0$, the process is regular;

when $SampEn \geq 2$, the process is stochastic;

Spectral Slope indicates the dependence of power spectral density on frequency and it is calculated according to the equation (Vallancourt & Newell, 2003):

$$S = a*f^b,$$

where S – power spectral density, f – frequency, b – coefficient that indicates the dependence of power spectral density on frequency and a represents the intercept of the equation. To calculate the coefficient the following equation is used:

$$\ln(S) = \ln(a) + b*\ln(f).$$

Spectral Slope values smaller in absolute quantity reflect the properties of the signal studied and the importance of higher frequencies. When

Spectral Slope values are greater in absolute quantity they reflect the concentration of frequencies of the signal studied in the spectrum of lower frequencies.

Statistical analysis. SampEn and Spectral Slope results of the two groups of subjects, i.e. women patients with MS and healthy women, were compared. For comparison of these parameters in respect to group factor (healthy vs. MS) the method of analysis of variance (ANOVA) was used. The level of significance was set at 0.05.

Statistical significance of results obtained was calculated on the basic of three criteria:

- p indicates statistical significance of the difference between the means compared;
- partial eta square (η^2) indicates effect size of group factor on the parameter estimated or more precisely – partial eta-square is the percent of total variance in the dependent variable accounted for by the variance between categories formed by the independent variable;
- observed power shows the power level for the effect (as usual, ≥ .80 is considered acceptable to have confidence that one has not made a Type II error when accepting a null significance finding for the effect).

RESULTS

The overall severity as measured by EDSS scale was 3.6 points (Table). No significant difference in COP fluctuations between healthy subjects and persons with MS was found (Figure 1).

The results of the research showed SampEn of COP dy fluctuations in group 1 to be statistically significantly (p = .008, η^2 = .277, observed power = .792) smaller compared to the respective SampEn in group 2 (Figure 2), whereas there was no significant difference in SampEn of COP dx fluctuations between groups 1 and 2. A smaller SampEn indicates that the complexity of COP dy fluctuations decreases, i.e. fluctuations tend to become more regular (less complex).

The data of spectral analysis showed that the Spectral Slope of COP in the anterior-posterior direction (COPdy) in group 1 was statistically significantly (p = .014, η^2 = .233, statistical power = .717) higher than the respective Spectral Slope (COP dy) found in group 2 (Figure 3). No significant difference in the Spectral Slope of COP dx fluctuations between groups 1 and 2 was found.

Spectral Slope absolute mean values of women patients with MS were greater and that shows fluctuations in the case of persons with MS to be concentrated rather in the range of low frequencies.

Table. **Data of women with multiple sclerosis**

No	Age	Year of diagnosing MS	Duration of disease	Form of disease	Height (cm)	Weight (kg)	BMI	EDSS
1.	46.3	1996	12	Secondary in progress	164	69.4	25.8	4.5
2.	43.4	1998	10	Secondary in progress	172	89	30.1	4.5
3.	54.1	1999	9	Secondary in progress	165	54.6	20.1	3.5
4.	37.8	1998	10	Secondary in progress	169	64.8	22.7	4
5.	43.5	2004	4	Secondary in progress	173	76.1	25.4	4.5
6.	46.4	2002	6	Secondary in progress	162	67.4	25.7	3.5
7.	39.5	2001	7	Secondary in progress	178	61.2	19.3	3
8.	43.9	2000	8	Secondary in progress	172	89	30.1	3.5
9.	33.2	1999	9	Secondary in progress	171	61.2	20.9	3
10.	46.3	2000	8	Secondary in progress	174	66.9	22.1	3
11.	44.8	1999	9	Secondary in progress	186	76.1	22	3.5
12.	37.0	2001	7	Secondary in progress	175	98.1	32	3

Notes. BMI – body mass index; EDSS – Kurtzke Expanded Disability Status Scale.

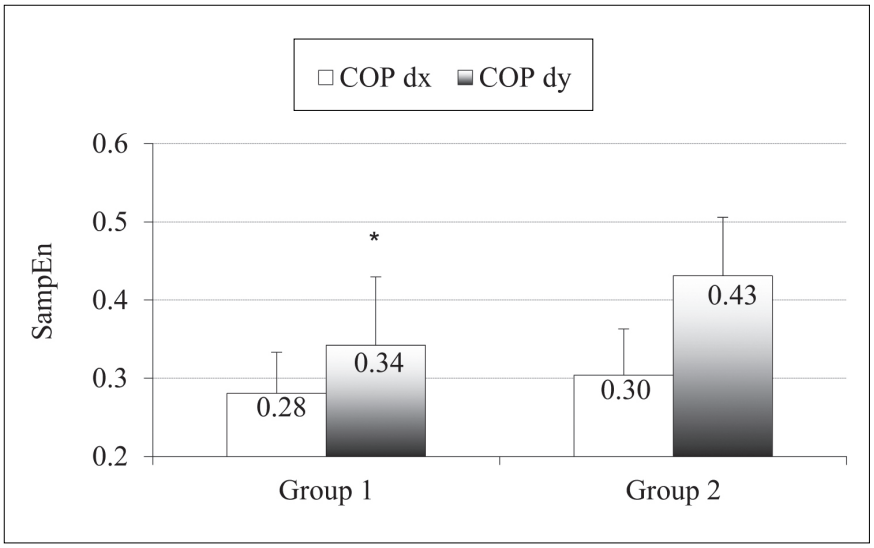

Figure 1. **Mean values (mm/s) of changes in COP in the lateral (COP dx) and anterior-posterior (COP dy) directions**

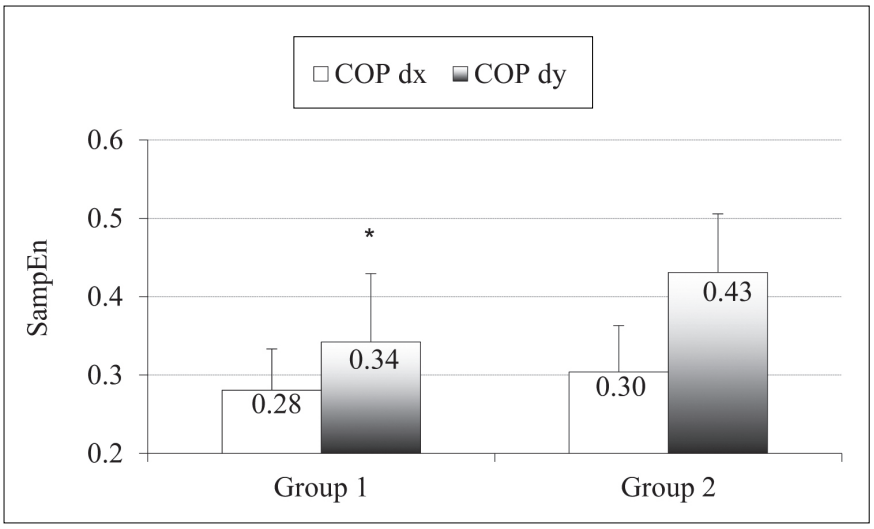

Figure 2. **Mean values of Sample Entropy (SampEn)**

Note. * – $p < .01$, group 1 compared to group 2.

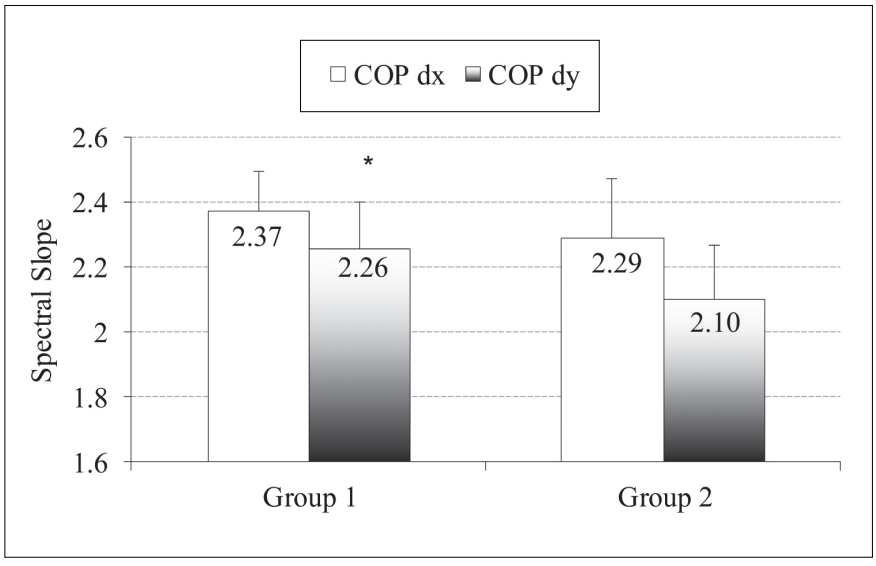

Figure 3. **Mean values of Power Spectral Density dependence on Spectral Slope**

Note. * – $p < .05$, group 1 compared to group 2.

DISCUSSION

The results of this study have shown that there were no statistically significant differences in the rate of changes in the coordinates of COP both in the lateral and anterior-posterior directions between women patients with MS and the controls. This contradicts to the conclusions of other researchers who maintain that in case of MS the rate of changes in the coordinates of COP and its trajectory increases (Chung et al., 2008; Karst et al., 2005; Perennou et al., 2005; Rouger et al., 2007). We have established that in patients with MS the signals of COPdy fluctuations are more concentrated in the range of low frequencies. It could be assumed that with low fluctuation frequencies prevailing, the system of balance control becomes slower.

We have found the complexity of balance system behavior (SampEn) of women with MS to be statistically significantly smaller compared to that of the healthy women studied. This is in accord with the data of other researchers who consider the complexity of the unhealthy physiological system to be smaller than that of the healthy one (Lipsitz & Goldberger, 1992). Multiple sclerosis is a disease of CNS characterized by demyelization of the nervous neural pathways and derangement of nervous impulses from CNS (Deuschl, Bainm, & Brin, 1998). The exacerbation of the disease gives rise to multifarious foci of demyelization. Some axons are therefore no longer remyelinized and start dying out. Due to disintegration of the myelin sheath in the cases of exacerbation of the disease patients with MS fail to activate the muscle and to effectively control it (Lambert et al., 2001). This is the main reason why the complexity of balance maintenance of patients with MS is poorer than that of healthy persons. In other words, in conditions of MS disease motor control slows down. Then the brain fails to plastically adapt itself to the various conditions of movement performance. Consequently, this failure in adaptation decreases the complexity of balance control. With a decrease in the complexity of balance control, the control of balance system becomes more vulnerable. This does not rule out balance disorders that will have a negative effect on the functional condition of patients with MS. Balance control impairment in persons with multiple sclerosis (MS) is one of the main reasons decreasing the functional capacity of the patient.

Our results have shown that while registering the posturogram at the frequency of 100 Hz, it is difficult to detect displacement of the centre of pressure in the linear measurements affected by changes in the disease. The study by Huisingaa, Yentesa, Filipi, & Stergioua (2012) showed that for patients with multiple sclerosis at a very early stage of disease, changes in the trajectory of the centre of pressure and the velocity of sway were observed compared to healthy subjects. Inconsistencies in the results of these two studies can be explained by different research conditions. We believe that the registration of posturogram for 5 minutes leads to changes in balance control due to fatigue, which significantly increases the length of the path and the velocity of sway of the centre of pressure. Recording posturogram for 60 seconds was sufficient time to fully register changes in balance behaviour for patients with multiple sclerosis and healthy controls using nonparametric methods.

The results of the study, applying advanced signal processing methods, have shown that the complexity of the centre of body pressure displacement of women with multiple sclerosis is statistically significantly smaller compared to that of the healthy women studied. The balance system of patients with multiple sclerosis is less complex than that of healthy adults of the same age and it confirms the optimal movement variability hypothesis.

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RELATIONSHIP BETWEEN SELF-ESTEEM, SELF-CONFIDENCE AND ANXIETY FOR ADOLESCENT ATHLETES AND NON-ATHLETES OF KAUNAS CITY

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ABSTRACT

Background. It is stated that the anxiety issue of adolescent pupils has been increasing a concern in teachers and society (Lee & Hankin, 2009; Mocus, Schoot, Klimstra, & Branje, 2011). The analysis of the reasons affecting a poor emotional state, anxiety processes and low self- esteem of adolescents leads to the following factors: socio-economic status, parenting styles (Cohen, Mansoor, Gagin, & Lorber, 2008), insecure attachment and non-functional beliefs (Lee & Hankin, 2009), adaptation difficulties, relationship with peers (Mocus et al., 2011), emotional pressures at school (Klizas, Ramanauskienė, Dumčienė, & Linonis, 2010). Meanwhile, it was found that involvement in sports activities positively affects adolescents' self-esteem, contributes to adolescents' identity and positive self-evaluation development, encourages cooperation with peers, develops physical skills, character, creativity, and value system, distracts from harmful habits, and helps to integrate into society (Dunn, Dunn, & Bayduza, 2008; Šniras & Malinauskas, 2006). Thus, it is evident that today's adolescents, facing growing demands in environment, society, experience more anxiety, which may affect their self-evaluation, self-confidence, self-esteem and vice versa, deteriorate their quality of life and mental health. So, it is highly important for educators (school teachers, coaches, etc.) to understand what causes anxiety in adolescents and how such factors as sport may have an influence on it. *Research aim* was to determine the relationship between the self-esteem, self-confidence and anxiety for adolescent athletes and non-athletes. *Research object* was the relationship of adolescents' self-esteem, self-confidence and anxiety.

Methods. The pilot survey was carried out in Kaunas, in 2013. Adolescent athletes and non-athletes aged 16 were selected for the research. The study employed questionnaires survey method.

Results and conclusions. It was discovered that the self-esteem and self-confidence of athlete adolescents was higher compared with non-athlete adolescents. The results showed that comparing the different anxiety factors of athlete and non-athlete adolescents no significant differences were found with the exception of anxiety related to social stress experience, and it is lower for athlete respondents. The analysis of self-esteem, self-confidence and anxiety relationship, depending on the sport activity, determined that the sport element had little relevance to these factors.

Keywords: students, self-determination, anxiety, sport.

INTRODUCTION

It is stated that the anxiety issue of adolescent pupils has been increasing a concern in teachers and society (Juškelienė, Proškuvienė, Černiauskienė, & Zlatkuvienė, 2003; Klizas et al., 2010; Lee & Hankin, 2009; Martišauskienė, 2004; Mocus et al., 2011). The feeling of experiencing anxiety can be attributed to adolescents due to their search for authenticity, desire to separate from adults' opinion, free themselves from parental care while preserving their own selves among peers.

Anxiety experienced by adolescents can have a positive impact on their activities, learning success

unless the influence received becomes too strong. Otherwise, it may impair the success of learning and impede activities and activeness (Kepalaitė, 2011). According to Burghes (Nasvytienė & Balnonytė, 2006), the children who tend to worry and feel fear, have low responsiveness threshold – they are easily excitable and very sensitive to impressions. They also have a tendency to inhibit their activeness. Longitudinal studies suggest that emotional issues can negatively affect the quality of life and mental health in later life due to the interaction between multiple risk and protective factors in adolescence (Nasvytienė & Balnionytė, 2006).

A close interrelation was identified between the high anxiety level and low level of self-esteem among adolescents. The study results of many researchers suggest that an increase in self-esteem results in a decline of internal and reactive anxiety, and vice versa – an increased internal and reactive anxiety diminishes self-esteem (Erol & Orth, 2011; Lee & Hankin, 2009; McCarroll, Lindsey, MacKinnon-Lewis, Chambers, & Frabutt, 2009; Zaeema, Nasreen, Riaz, & Sarwat, 2013). Storch, Brassard, and Warner (2003) determined a direct correlation between the sense of loneliness and social anxiety while measuring pupils' social anxiety.

The analysis of the reasons affecting a poor emotional state, anxiety processes and low self-esteem of adolescents leads to the following factors: socio-economic status, parenting styles (Cohen et al., 2008; Malinauskiene & Žukauskienė, 2004), insecure attachment and non-functional beliefs (Lee & Hankin, 2009), adaptation difficulties, relationship with peers (Mocus et al., 2011), emotional pressures at school (Klizas et al., 2010). Meanwhile, sports activities appear to be singled out among the factors that can help in the prevention of these processes. It was found that involvement in sports activities positively affects adolescents' self-esteem, contributes to adolescents' identity and positive self-evaluation development, encourages cooperation with peers, develops physical skills, character, creativity, value system, distracts from harmful habits, and helps to integrate into society (Dunn et al., 2008; Šniras & Malinauskas, 2006).

For instance, the analysis of self-esteem of adolescent athletes and non-athletes discovered that the general self-esteem of adolescent athletes was higher than that of non-athletes (Laskienė, Laskytė, Šertvytienė, & Jamantienė, 2010; Masiliauskas, 2009; Vainienė & Kardelis, 2008), the same can be said about the self-confidence of adolescent athletes (Čepelionienė, Ivaškienė, Velička, Vyskupaitis, & Danilevičienė, 2012; Malinauskas & Juodsnukis, 2012; Masten, Tušak, & Faganel, 2006). It is also indicated that participation in sports reduces anxiety and negative emotions, a tendency to depression, hostility towards others (Batutis & Kardelis, 2002; Kardelis & Stakytė, 2003; Scully, Kremer, Meade, Graham, & Dudgeon, 1998). The study carried out by Griciūtė and Cibulskytė (2010) pointed out that people involved in sports activities had better ability to handle the anxiety-evoking situations and lower anxiety level. In their study of interrelation of self-esteem and anxiety of team and individual sport athletes, Arous, Baccouche, Trabelski, Masmoudi, and Elloumi (2013) show that the level of anxiety and self-esteem depends on the characteristics of the sport – the representatives of team sports are characterized by low self-esteem and a high level of anxiety, while the representatives of individual sports possess a high level of self-esteem and low anxiety level. However, some research findings also show that sports activities will not necessarily help suppress the anxiety states, for example, Donti, Theodorakou, Kambiotis, and Donti (2012) found that girls not participating in competitions had lower anxiety levels than those taking part in the competition. Scientists explain this finding that an anxious athlete can achieve better results in sports, if they discover more confidence-reinforcing resources (Cresswell & Hodge, 2004; Hanton, Mellalieu, & Hall, 2003).

Thus, it is evident that today's adolescents, facing growing demands in the environment, society, experience more anxiety, which may affect their self-evaluation, self-confidence, self-esteem and vice versa, deteriorate their quality of life and mental health. So, it is highly important for educators (school teachers, coaches, etc.) to understand what causes anxiety in adolescents and how such factors as sport may have an influence on it.

Research aim was to determine the relationship between the self-esteem, self-confidence and anxiety for adolescent athletes and non-athletes. Research object was the relationship of adolescents' self-esteem, self-confidence and anxiety.

METHODS

Procedure. The pilot survey was carried out in Kaunas, in 2013. Adolescent athletes and non-athletes aged 16 were selected using random sampling strategy. Distribution of the respondents

by gender and sport is presented in Table 1. As many as 150 questionnaires were distributed to the subjects, 126 of them were completed correctly and thus used in the study.

Table 1. **Distribution of adolescents by sport activity and gender**

Sport activity	Gender				Total	
	Girls		Boys			
	abs. num.	%	abs. num.	%	abs. num.	%
Athletes	24	48.0	57	75.0	**81**	**64.3**
Non-athletes	26	52.0	19	25.0	**45**	**35.7**
Total	**50**	**100**	**76**	**100**	**126**	**100**

Methodology. The research questionnaire was based on the self-esteem methodology of D. Bogdanov and J. Kiseliov (Palaima, 1984; questionnaire reliability and validity procedures are described according to Galinauskas, 2007). The respondents had to evaluate 20 personality traits using a 20-point scale, appointing twenty points for the most significant trait and one point for the least significant trait. Self-esteem was divided into low, high (adequate) and too high levels.

The survey methodology was based on the self-confidence methodology by V. Stolin (Столин & Пантилеев, 1987; questionnaire reliability and validity procedures were described in the article of Тилиндене и др., 2014) included 14 questions. The respondents were asked to choose one of two response options: "yes" or "no". Self-confidence was divided into the following levels: low, normal (adequate) and too high (excellent).

The approved methodology "Assessment of Adolescent Anxiety" by Petrulytė (2003) consisted of 30 anxiety-evoking situations, each situation was assessed using a 5-point system: 5 points – a situation of very high anxiety level; 0 points, respectively – the situation, including no anxiety, is neutral. Anxiety structure includes three components: school anxiety, self-esteem anxiety and interpersonal anxiety. School anxiety is anxiety associated with a group (team) work; interpersonal anxiety – anxiety associated with interpersonal relations in a group (team) and self-esteem anxiety - the anxiety associated with the person's self-esteem. Research showed good internal consistency for all subscales, all of them Cronbach (α) were higher than 0.7.

The test by Fillips "For Determination of Pupils' Anxiety Level" (Рогов, 2001; test reliability and validity procedures were described "Bendrojo ugdymo klasėje besimokančio specialiųjų ugdymo(-si) poreikių vaiko socialinės – psichologinės charakteristikos atskleidimas", 2003). The test consists of 58 questions; each answer choice includes the answers "yes" or "no". The methodology includes the eight factors of anxiety: the general level of anxiety at school; social stress experience; frustration in achieving goals; fear of self-expression; knowledge assessment fear; fear not to meet somebody's expectations; low physiological resistance to stress; problems and fears in relation to teachers. The test was to evaluate the factors by their non-compliance to the key methodology techniques. Three levels were identified. Very low and low anxiety levels included those answers of the respondents, whose non-compliance to the key methodology techniques was lower than ½, increased anxiety level – higher than ½, high anxiety level – higher than ¾.

Statistical analysis. The research data were processed using the SPSS program (Statistical Package for the Social Sciences), version 17.0. The arithmetic means and percentage frequencies were calculated. The *t*-test and Chi-square test and Gamma coefficient were applied in the study.

RESULTS

The self-esteem study of adolescent athletes and non-athletes revealed that low self-assessment was attributed to even 82.2% of adolescent non-athletes, and one-third of pupils engaged in sport were characterized by high self-evaluation (Figure 1) ($p < .05$, χ^2 (2) = 15.652).

The study found out that adolescent athletes are more self-confident than non-athletes, 25.9% of adolescent athletes had great self-confidence characteristics, while low self-confidence was noted by 13.3% of adolescent non-athletes (Figure 2) ($p < .05$, χ^2 (2) = 6.940).

The analysis of anxiety results of athlete and non-athlete respondents showed that there are no statistically significant differences among the general anxiety ($p > .05$, $t = –1.346$), school anxiety ($p > .05$; $t = –1.456$), interpersonal anxiety ($p > .05$, $t = –1.522$) and anxiety related to self-assessment ($p > .05$, $t = -0.457$) (Figure 3).

With the help of the methodology by B. Fillips the anxiety level of the respondents was established referring to 8 anxiety factors. It shows that a statistically significant difference was found in experiencing social stress, it being lower for adolescent athletes (Table 2).

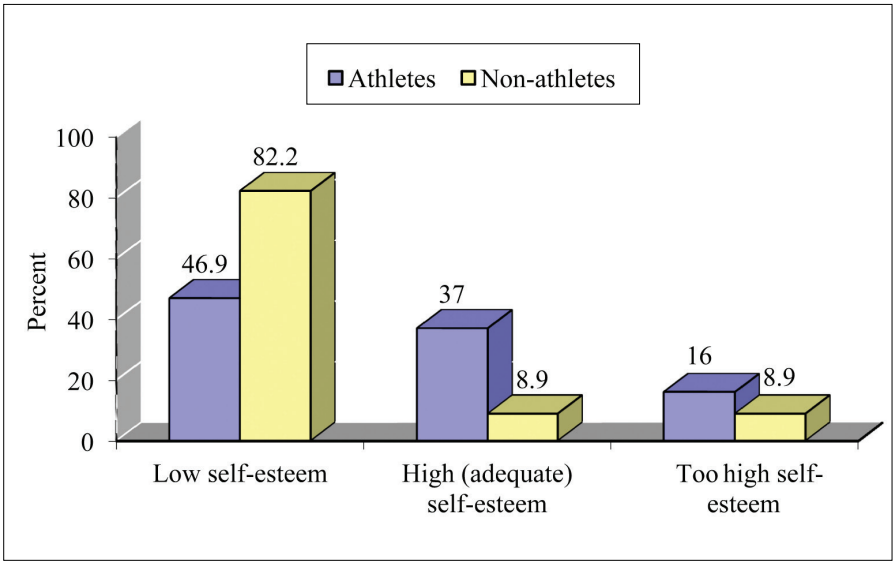

Figure 1. **Self-esteem of adolescent athletes and non-athletes**

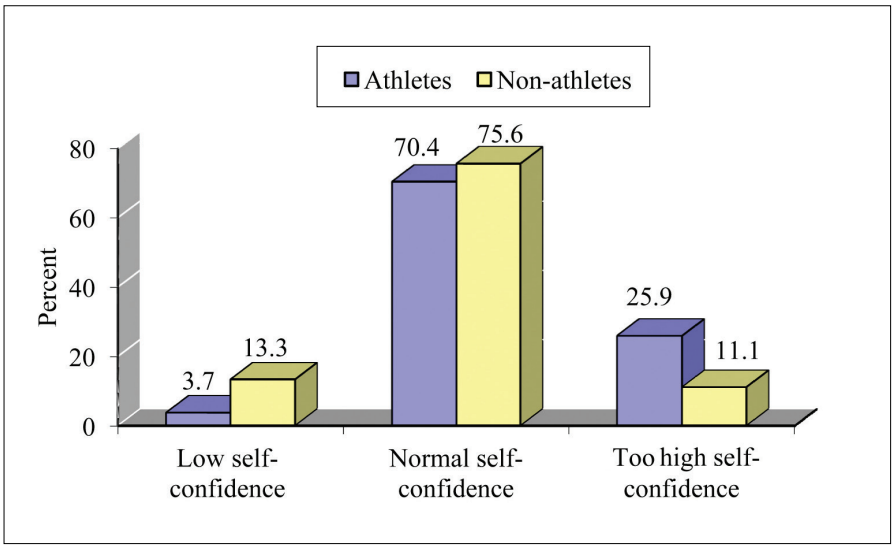

Figure 2. **Self-confidence of adolescent athletes and non-athletes**

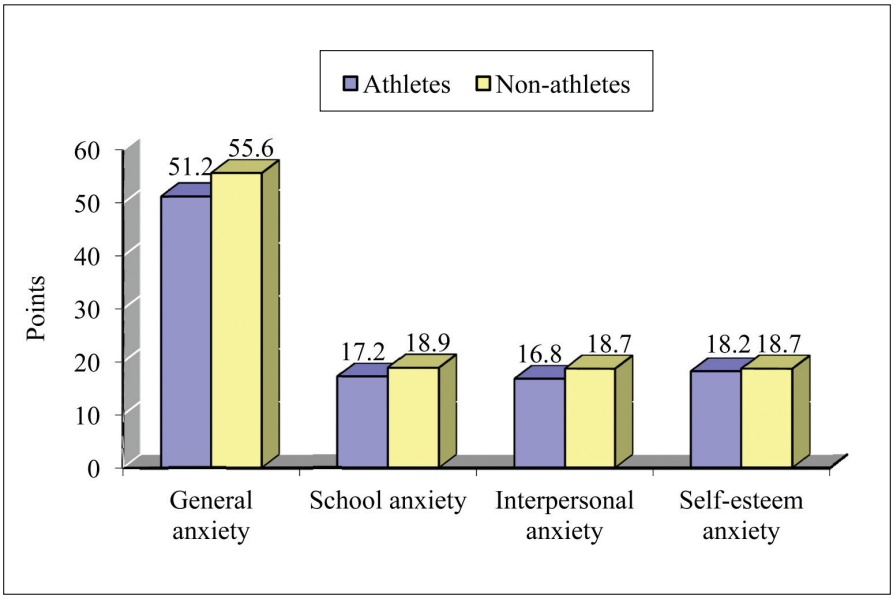

Figure 3. **Anxiety evaluation of athlete and non-athlete adolescents (points)**

Table 2. **Comparison of anxiety factors in adolescent athletes and non-athletes**

Factors of anxiety	Low anxiety (%)		Increased anxiety (%)		High anxiety (%)		χ^2 and p
	Athl.	Non-athl.	Athl.	Non-athl.	Athl.	Non-athl.	
General school anxiety	67.9	71.2	29.6	24.4	2.5	4.4	$p > .05$; $\chi^2(2) = 0.67$
Experiencing social stress	74.1	46.7	25.9	51.1	0	2.2	**$p < .05$; $\chi^2(2) = 10.43$**
Frustration of achieved task	77.8	66.7	21.0	24.4	1.2	8.9	$p > .05$; $\chi^2(2)=4.91$
Self-expression anxiety	61.7	60.0	28.4	33.3	9.9	6.7	$p > .05$; $\chi^2(2) = 0.58$
Fear of checking knowledge	46.9	49.0	43.2	44.4	9.9	7.6	$p > .05$; $\chi^2(2) = 0.37$
Fear of not justified expectations of people	59.2	64.5	27.2	13.3	13.6	22.2	$p > .05$; $\chi^2(2) = 3.91$
Low physiological immunity to stress	63.0	64.4	19.8	6.7	17.2	28.9	$p > .05$; $\chi^2(2) = 5.11$
Fear of relationships with teachers	53.1	64.4	43.2	26.7	3.7	8.9	$p > .05$; $\chi^2(2) = 4.17$

The analysis of self-esteem and general anxiety of adolescent athletes and non-athletes did not reveal the relationship between these variables referring to the analysis results of school, interpersonal and self-esteem anxiety (athletes – $\chi^2(6) = 9.75$, $p > .5$, $\gamma = .08$; $p > .05$; non-athletes – $\chi^2(6) = 7.50$, $p > .05$, $\gamma = .05$, $p > .05$) as well as general school anxiety (athletes – $\chi^2(10) = 8.51$, $p > .5$, $\gamma = .02, p > .05$; non-athletes – $\chi^2(10) = 5.84, p > .05$, $\gamma = .01$, $p > .05$). The same tendency continued in the search for a link among the self-confidence of adolescents and school, interpersonal and self-esteem anxiety (athletes – $\chi^2(6) = 3.16$, $p > .5$, $\gamma = .12$, $p > .05$; non-athletes – $\chi^2(6) = 4.71$, $p > .05$, $\gamma = .15$, $p > .05$) respectively, and general anxiety at school (athletes – $\chi^2(10) = 12.26$, $p > .5$; $\gamma = .13, p > .05$; non-athletes – $\chi^2(10) = 8.56$, $p > .05$; $\gamma = .05$; $p > .05$).

DISCUSSION

The research results demonstrated that the self-esteem of adolescent athletes was at a higher level. These findings contradict to most of studies where it is stated that athlete adolescents are more confident and their popularity level among classmates is high (Dunn et al., 2008; Masiliauskas, 2009), therefore they gained appreciation and respect among coevals (Bump, 2000) and higher social integration (Šniras & Malinauskas, 2006; Šukys & Jankauskienė, 2008). However, studies that exhibit the opposite view can be found, for example, Zajančkauskaitė-Staskevičienė & Milerytė (2010) argue that too much involvement in sport activities disturbs the social relationships of adolescents, restricts their relationship with peers and self-perception.

Research literature suggests that non-athletes are less self-confident as compared to athletes and physically active pupils (Dunn et al., 2007; Rutkauskaite & Miškinis, 2009; Weinberg & Gould, 2003). Our study also revealed such tendency.

The researchers point out that participation in sports reduces anxiety and negative emotions, a tendency to depression, hostility towards others (Batutis & Kardelis, 2002; Henker, Whalen, Jamner, & Delfino, 2002; Kardelis & Stakytė, 2003; Schumacher & Seiler, 2010) and positively affect health and psycho-emotional well-being (Dumčienė & Leiputė, 2010). Meanwhile, our study revealed that the school, self-esteem and interpersonal anxiety rates of athlete and non-athlete respondents were not statistically significant.

According to Fillips' methodology based on the analysis of 8 anxiety factors, it was found that the results differ only when anxiety is associated with social stress experience and it is more common (higher) among adolescent non-athletes than their peer athletes. Thus, our results has not confirmed the opinion of some authors that participation in sport reduces anxiety (Batutis & Kardelis, 2002; Kardelis & Stakytė, 2003; Scully et al., 1998), but it confirms the findings of other researchers who found no significant differences in the anxiety of athletes and non-athletes (Griciūtė & Cibulskytė,

2010) or a higher level of anxiety was determined in the athletes participating in competitions than in the subjects not involved in sports and competitions (Donti et al., 2012).

Relationships between the self-esteem, self-confidence and anxiety of athlete and non-athlete adolescents were not found. It means that sport has no significant impact on these variables, although the studies (Cresswell & Hodge, 2004; Hanton et al., 2003; Schumacher & Seiler, 2010) show that more self-confident athletes have lower levels of anxiety.

CONCLUSIONS

It was discovered that the self-esteem and self-confidence of athlete adolescents was higher compared with non-athlete adolescents. The results showed that comparing the different anxiety factors of athlete and non-athlete adolescents no significant differences were found with the exception of anxiety related to social stress experience, and it was lower for athlete respondents.

The analysis of self-esteem, self-confidence and anxiety relationship depending on the sport activity determined that the sport element had little relevance to these factors.

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PRE-TRAINING HYDRATION STATUS OF WELL-TRAINED SOCCER PLAYERS IN MODERATE TEMPERATURE AUTUMN AND COOL WINTER

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ABSTRACT

Background. Pre-training hydration status is considered a factor influencing efficacy of training. Research literature does not contain data regarding the potential impact of natural alternation of seasons on pre-training hydration status in athletes. The purpose of this study was to assess and compare pre-training hydration status in well-trained male soccer (football) players in moderate temperate autumn and cold winter.

Methods. Research participants were 57 male soccer players from two Latvian First League teams, who were studied prior to their ordinary training session. Participants provided a midstream urine sample for analysis of urine specific gravity (USG), and their body mass (kg), body fat percentage and total body water percentage were measured.

Results. Pre-training hydration status did not differ in moderate temperature autumn (mean USG 1.020 ± 0.010; mean total body water 64.2 ± 2.9%) in cold winter (mean USG 1.020 ± 0.008; mean total body water 64.8 ± 2.7%; for both parameters $p > .05$). Prevalence of hypohydration and serious hypohydration (defined as USG 1.021 – 1.030 and USG > 1.030, respectively) was similar in moderate temperate autumn (47.4%) and cold winter (60%), ($\chi^2 = 1.50$; $p > .05$). Significant correlation between the within-subject USG values measured in moderate temperate and cold environment was observed ($r = .60$, $p = .009$).

Conclusion. In well-trained soccer players pre-training hydration status does not differ in moderate temperature autumn and cold winter. Individual-related factors such as nutritional behaviour (including pattern of voluntary fluid intake) may have stronger impact on hydration status than environment-related factors like natural alternation of seasons.

Keywords: hydration status, football, environmental temperature, autumn, winter.

INTRODUCTION

Soccer (football) could be considered an endurance sport involving 90 min of varying-intensity exercise (Reilly, Bangsbo, & Franks, 2000) and placing high demand on cognitive abilities of athletes (Burke & Hawley, 1997). Due to prolonged nature and depending on environmental conditions, a competitive soccer match may induce sweat losses in the range of approximately 0.8 to 2.6 L (Burke & Hawley, 1997). However, in some individuals in hot humid weather sweat losses up to 3.5 L (Ekblom, 1986) or even 3.9 L (Burke & Hawley, 1997) have been observed. Regarding training sessions, Maughan, Shirreffs, Merson and Horswill (2005) reported mean sweat losses from 1.7 L in cool humid environment (air temperature 5˚C, relative humidity 81%) to 2.2 L in hot humid weather (air temperature 28˚C, relative humidity 56%).

It is a common finding that soccer players do not fully replace sweat losses by fluid intake during a competitive match or a training session, neither in cool nor in hot environment (Burke & Hawley, 1997; Kurdak et al., 2010; Maughan et al., 2005). According to Burke and Hawley (1997),

fluid replacement lags behind water losses through sweating by approximately 50% independently of weather conditions. Therefore, dehydration occurs during competitive matches and training sessions, usually in the range of 1 – 3% of body mass (Burke & Hawley, 1997; Kurdak et al., 2010; Maughan et al., 2005). Shirreffs (2010) recently summed up that the average calculated sweat losses, fluid intake and degree of dehydration for soccer players is typically in the order of 1.5 L/h, 0.7 L/h and 1.5%, respectively.

There is evidence that even mild dehydration may impair physical performance in soccer players. Guerra, Chaves, Barros and Tirapegui (2004) studied young male athletes participating in a 75-min football game in a hot environment under two conditions: with and without ingestion of a 6% carbohydrate-electrolyte drink. Mean body mass loss of 1.14 and 1.75 kg during the games with and without drink ingestion revealed approximately 1.7 and 2.6% dehydration, respectively. Approximately 0.9% greater dehydration without fluid ingestion associated with significantly reduced time spent running and the number of sprints performed in comparison with the game with fluid ingestion. Similarly, Edwards et al. (2007) reported that moderate dehydration (approximately 2.4% of body mass) was detrimental to performance in a soccer-specific test. Shirreffs (2010) has generalized that soccer players, in order to avoid decrease in physical performance, should limit the degree of dehydration to less than 2% of body mass loss.

The impact of dehydration on cognitive function is less clear. In young adults there is little evidence that dehydration disrupts cognition, but both elderly adults and children may be at higher risk (Benton, 2011). Regarding soccer players, Bandelow et al. (2010) reported that in young males exercising in the heat dehydration up to 2.5% of body mass had no clear effect on cognitive function, and Edwards et al. (2007) observed a decrease in physical performance but no impairment of mental concentration in moderately dehydrated young males.

It is important to recognize, that keeping the degree of dehydration within the acceptable limit of approximately 2% during a match or training session may be not possible if the players begin exercise in a hypohydrated state. Hence, pre-training hydration status in soccer players should be considered an important factor potentially influencing efficacy of training. Surprisingly, data regarding pre-training hydration status in soccer players is scarce. Maughan et al. (2005) studied elite male soccer players training in a cool environment (5°C) and reported pre-training mild hypohydration (defined as urine osmolality above 900 mOsm/kg) in 35% of athletes. Da Silva et al. (2012) monitored elite male Brazilian adolescent soccer players during three consecutive training days in the heat (27.6–33.1°C) and observed occurrence of pre-practice hypohydration in 45–85% of athletes in different days. Regarding other team sports, Stover, Zachwieja, Stofan, Murry and Horswill (2006 a) observed consistently high pre-training urine specific gravity (USG) indicating hypohydration in a group of adolescent American football players during five consecutive days of two-a-day practices in mild environmental conditions (wet bulb globe temperature 15.5–23.2°C). Furthermore, although it is commonly recognized that environmental temperature influences body water balance (Sawka et al., 2007), there seems to be no studies providing direct comparison of pre-practice hydration status in soccer players training in different environmental conditions due to natural alternation of seasons.

Thus, considering the paucity of relevant data in the literature, the purpose of this study was to assess and compare pre-training hydration status in well-trained male soccer players in autumn and in winter, i.e. in moderate temperate and cold environmental conditions.

METHODS

Participants. Fifty-seven male soccer players from two teams of the First League of the Latvian Football Federation voluntary participated in the study the protocol of which was approved by the Ethics Committee of Latvian Academy of Sports Education. At the beginning of the study, the mean age of the participants was 21.5 ± 3.2 years. They had nine to ten years training experience in soccer and they had regular training sessions or competitive matches of 1.5–2 hour duration six times per week on average.

Study design. We compared pre-training hydration status and body composition in well trained male soccer players in moderate temperate and cold environments. Therefore we asked the participants to consume the fluid as they usually did according to their subjective thirst sensation and not to change their drinking habits before training. The pre-training urine samples of soccer players were collected within two days at the end of August and at the beginning of September (in autumn). The average ambient temperature at that time was 16°C

and 13°C for August and September, respectively. Forty soccer players from the same two teams participated in the study again in cold environment in February and the first week of March (in winter). The average ambient temperature in that period was between –1.9°C and –5°C.

Anthropometry and body composition analysis. Athlete's height was measured by Ultrasound Height Measuring Unit MZ10020 (ADE, Hamburg). Body mass (to the nearest 0.1 kg; wearing briefs), body fat percentage and total body water content in percent were measured using Body Composition Analyzer BC-418 manufactured by Tanita Corporation, Japan.

Urine sampling, analysis and interpretation of the USG values. Before training, participants provided a midstream urine sample into a sterile polyurethane container (15 ml, Sarsted Aktiengesellschaft & Co, Germany). USG was measured within three hours after collection of the samples using digital hand held refractometer PAL-10S (Atago, USA). USG measuring range of this device is 1.000–1.060, resolution 0.001 and accuracy ± 0.001 units.

Some discrepancy exists in the literature regarding the definitions of euhydration and hypohydration based on USG values. In particular, USG values of 1.010–1.020, which are considered consistent with euhydration according to American College of Sports Medicine (Sawka et al., 2007) and National Collegiate Athletic Association (National Collegiate Athletic Association, 2003) criteria, indicate minimal hypohydration compared to the National Athletic Trainers' Association's (NATA) more detailed classification system (Casa et al., 2000). In the current paper, we classify our soccer players with USG ≤ 1.020 "euhydrated", those with USG 1.021–1.030 "hypohydrated", and those with USG > 1.030 "seriously hypohydrated".

Statistics. The SPSS version 20 software was used for the statistical analysis of the data. The mean values and standard deviations were calculated for all characteristics. An independent *t*-test was employed to determine differences between the characteristics in the temperate and cold environment. χ^2 analysis was performed to compare the prevalence of hypohydration status among the soccer players in moderate temperate and cold environments, and linear correlation analysis was used to determine relationships between various characteristics. Statistical significance was set at $p < .05$.

RESULTS

The anthropometric and body composition data of the participants are summarized in Table.

In temperate environmental conditions, euhydrated status (USG ≤ 1.020) was observed in 30 soccer players out of 57, i. e. in 52.6% of the athletes participating in the study (Figure 1). Hypohydration (USG 1.021–1.030) was evident in 25 athletes (43.9%), and serious hypohydration (USG > 1.030) occurred in 2 athletes (3.5%).

In cold environment, 16 soccer players out of 40 (40%) were euhydrated (Figure 2), 23 athletes (57.5%) were hypohydrated, and 1 athlete (2.5%) was seriously hypohydrated.

χ^2 analysis revealed that the prevalence of hypohydration and serious hypohydration among soccer players studied did not differ in moderate temperate (47.4%) and cold (60%) environment ($\chi^2 = 1.50$; $p > .05$).

In those 40 soccer players who participated in the study both in autumn and winter, a positive

Environment conditions	Moderate temperate environment (13°C–16°C)	Cold environment (–1.9°C––5°C)	Statistical significance of difference
Number of players	57	40	–
Age (years)	22.0 ± 2.8	20.6 ± 3.6	not significant
Height (cm)	182 ± 6	180 ± 7	not significant
Body mass (kg)	76.7 ± 8.0	76.7 ± 8.3	not significant
Body mass index (kg/m^2)	23.2 ± 1.7	23.6 ± 2	not significant
Body fat (%)	10.8 ± 3.6	10.5 ± 3.2	not significant
Body water (%)	64.2 ± 2.9	64.8 ± 2.7	not significant
USG	1.020 ± 0.010	1.020 ± 0.008	not significant
USG range	1.004–1.034	1.004–1.031	–

Table 1. **The anthropometric and body composition data and pre-training urine specific gravity (USG) of well-trained soccer players in moderate temperate and cold environments**

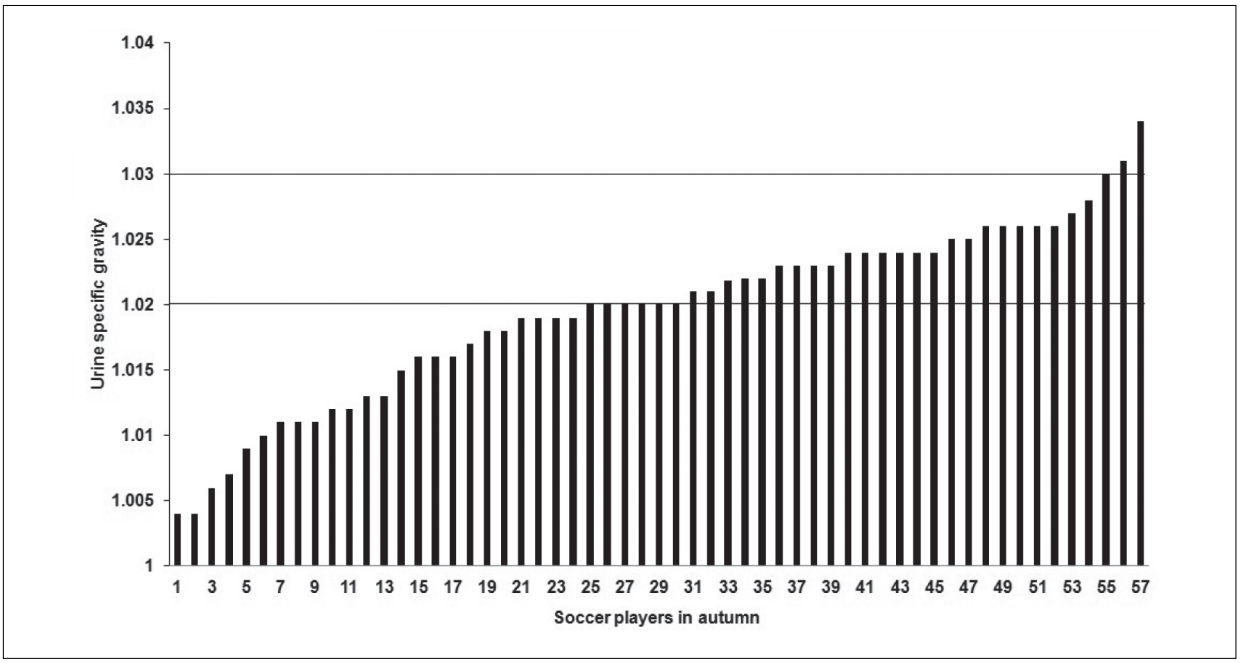

Figure 1. **Individual values of pre-training urine specific gravity in soccer players in moderate temperate environment (in autumn). Horizontal lines at 1.02 and 1.03 indicate cut-off values for hypohydration and serious hypohydration, respectively**

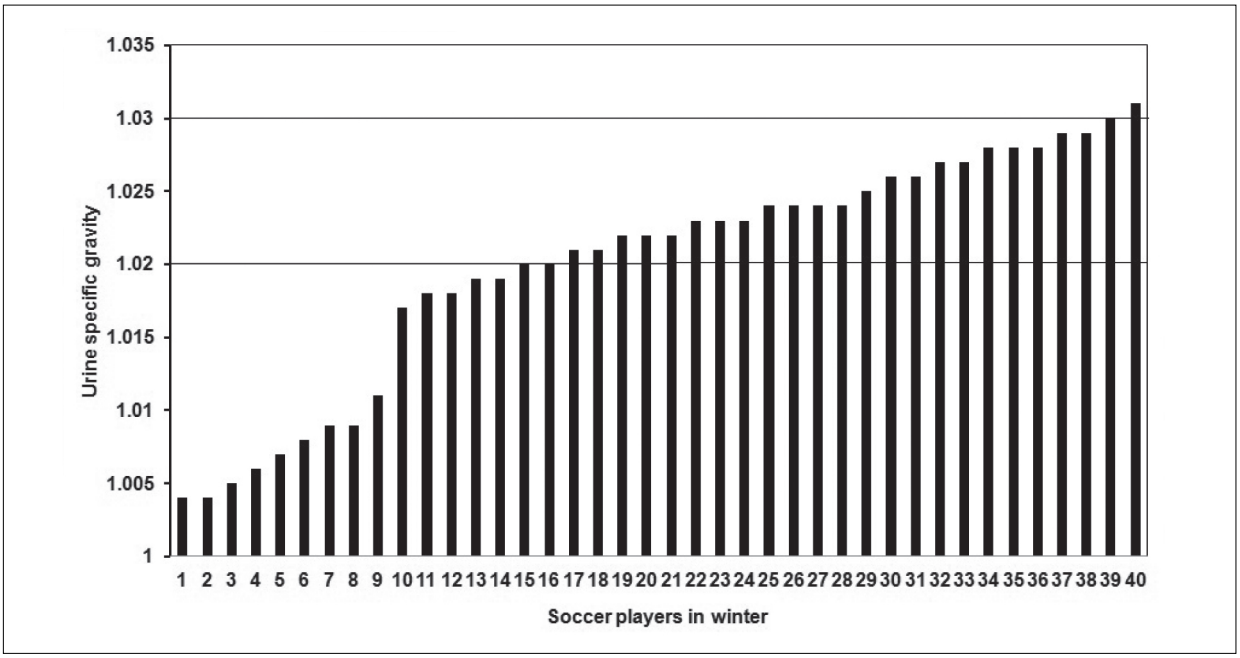

Figure 2. **Individual values of pre-training urine specific gravity in soccer players in cold environment (in winter). Horizontal lines at 1.02 and 1.03 indicate cut-off values for hypohydration and serious hypohydration, respectively**

significant correlation between the USG values measured in moderate temperate and cold environment was observed (r = .60, p = .009). This relationship is characterized by the equation: USG (winter) = 0.572 + 0.440 · USG (autumn), the standard error of the equation is 0.005.

The correlation between the body fat percentage and pre-training urine specific gravity was not significant (r = .02, p = .87). Similarly, the correlation between the total body water percentage and pre-training urine specific gravity was not significant (r = .002, p = .99).

DISCUSSION

The novelty of this study was repeated assessment of pre-training hydration status in a group of well-trained soccer players in the environmental conditions that changed due to the natural alternation of seasons. Such approach enabled to elucidate the potential influence of a season on hydration status in athletic community. The main finding of the study was that pre-training hydration status evaluated on the basis of USG and body water percentage did not differ in moderate temperature autumn and cold winter in the athletes studied. In the two environmental conditions mean pre-training USG was identical (1.020) and body water percentage (mean values 64.2 and 64.8 in autumn and in winter, respectively) was similar.

An accurate assessment of the hydration status of the human body is a difficult task and there is no single gold standard method for that (Armstrong, 2007). Nevertheless, USG is considered an acceptably valid indicator of hydration status (Armstrong et al., 2010; Bartok, Schoeller, Sullivan, Clark, & Landry, 2004; National Collegiate Athletic Association, 2003; Oppliger & Bartok, 2002; Sawka et al., 2007) and it is commonly used in the field of sports medicine and exercise science for both practical and scientific purposes (Da Silva et al., 2012; Osterberg, Horswill, & Baker, 2009; Stover et al., 2006 a, b; Volpe, Poule, & Bland, 2009). Generally, USG of ≤ 1.020 is considered consistent with euhydration whereas USG > 1.020 refers to hypohydration (National Collegiate Athletic Association, 2003; Oppliger & Bartok, 2002; Popowski et al., 2001; Sawka et al., 2007). NATA's more detailed classification system differentiates a well-hydrated status (USG values < 1.010), minimal (USG values 1.010–1.020), significant (USG values 1.021–1.030) and serious (USG values > 1.030) hypohydration (Casa et al., 2000). In the current study, we applied a combined approach and classified our soccer players with USG ≤ 1.020 as euhydrated, those with USG 1.021 – 1.030 as hypohydrated, and those with USG > 1.030 as seriously hypohydrated.

Although the average pre-training USG value of 1.020 observed in our players was consistent with the upper range of euhydration, the prevalence of hypohydration and serious hypohydration was notably high in both temperate and cold environments (47.4 and 60%, respectively). Significant positive correlation between USG values measured in autumn and winter suggest that individual-related factors such as nutritional behaviour may have stronger impact on hydration status than environment-related factors like natural alternation of seasons. Generally, our findings are consistent with the observation of Stover et al. (2006 b) who reported similar average pre-training USG values in two big groups of recreational exercisers living in Chicago and Los Angeles, where the ambient temperature during the study averaged –5°C and 20.6°C, respectively. These authors (Stover et al., 2006 b) did not report the prevalence of pre-training hypohydration for the two groups separately, but in the pooled sample from the two cities the prevalence was 49%. Altogether the data of the two studies (Stover et al., 2006 b; the current one) suggest that in the range of ambient temperature from –5°C to 21°C maintenance of body fluid balance presents about equal challenge in the athletic community.

χ^2 analysis revealed similar prevalence of hypohydration and serious hypohydration in our soccer players in moderate temperate autumn and cool winter, but it still deserves attention that the relevant numerical value was greater in the cool season. Difficulties in maintaining body fluid balance in cool climate could be explained by the changed thirst sensation. Kenefick, Hazzaed, Mahood, and Castellani (2004) demonstrated that when either euhydrated or hypohydrated, thirst at rest and during moderate-intensity exercise was attenuated by up to 40% in cool compared to moderate temperate environment in young men. Maughan et al. (2005) compared sweat losses and fluid intake in football players training in temperate (25°C, relative humidity 60%) and cool (5°C, relative humidity 81%) environments. Sweat losses were only 8.1% greater in moderate temperate environment, but fluid intake exceeded that observed in cool conditions by 97.2%. As a result of a substantial difference in voluntary fluid consumption, acute training-induced dehydration was greater (1.62% of body mass) in cool than in moderate temperate environment (1.22%).

According to Casa et al. (2000), USG values between 1.021 and 1.030 may correspond to a degree of hypohydration of 3–5% of body mass, and Shirreffs (2010) suggested that soccer players, in order to avoid decrease in physical performance, should limit the degree of dehydration to less than 2% of body mass. If these estimates are correct, then it is likely that in our soccer players who were hypohydrated prior to training, performance was suboptimal during the whole subsequent training

session. The likelihood of negative impact of pre-training hypohydration on performance is further supported by the data of previous research which exclusively showed that soccer players were not able to compensate sweat losses with fluid consumption during training in warm (Da Silva et al., 2012; Duffield, McCall, Coutts, & Peiffer, 2012) and in cool (Maughan et al., 2005) environment. Therefore, in players who are hypohydrated before training the degree of dehydration developing during training is certainly greater than in players who start training in euhydrated status. Consequently, in players experiencing hypohydration before training, relatively greater decrease in performance during training could be expected. In a long-time perspective, such a scenario could lead to suboptimal efficacy of the whole training process.

It is important to note that the scenario outlined in the preceding paragraph is logical, but still speculative. To the best of our knowledge, no study has directly evaluated the relationship between pre-training USG and performance during subsequent training session in well-trained soccer players. Nevertheless, literature suggests that pre-practice hypohydration of a similar degree as observed in our soccer players may indeed significantly impair performance. Recently Davis et al. (2014) studied well-trained recreational runners who completed a 10-km run in two cases: being euhydrated (pre-run mean USG in the group 1.014) or hypohydrated (pre-run mean USG 1.026). In these runners, pre-run hypohydration associated with a significant 3% decrease in performance compared to pre-run euhydrated status. High-standard soccer players cover similar distance (9.7–11.0 km) during a competitive game (Mohr, Krustrup, & Bangsbo, 2003) and their training bouts are of the same magnitude. Therefore, further studies with the aim to assess potential relationship between pre-training USG and subsequent soccer-specific performance in well-trained players seem to be warranted.

Hypohydration can compromise cardiovascular function, heat dissipation and exercise performance (Maughan, 2003). Chronic hypohydration and inadequate fluid consumption have been linked to chronic illnesses (Stookey, Purser, Pieper, & Cohen, 2004). Therefore, our findings suggest that evidence-based recommendations and qualified guidance for adequate fluid replacement are needed for high level soccer players.

CONCLUSIONS

The results of this study indicate that in well-trained soccer players pre-training hydration status evaluated on the basis of USG and body water percentage does not differ in moderate temperature autumn and cold winter. The results also suggest that individual-related factors such as nutritional behaviour (including pattern of voluntary fluid intake) may have stronger impact on hydration status than environment-related factors like natural alternation of seasons. High prevalence (47–60%) of pre-training hypohydration warrants further research to elucidate potential relationship between pre-training USG and subsequent soccer-specific performance in well-trained players and refers to the need for evidence-based recommendations and qualified guidance for adequate fluid replacement for high level soccer players.

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Acknowledgements. On the Acknowledgement Page the authors are required to state all funding sources, and the names of companies, manufacturers, or outside organizations providing technical or equipment support (in case such support had been provided).

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All abbreviations should be explained in parentheses what they stand for on their first occurrence in the text. Non-standard special abbreviations and symbols need only to be defined at first mention. The results of all measurements and symbols for all physical units should be those of the System International (SI) Units. In the text of the article all numbers up to ten are to be written in words and all numbers starting from eleven on – in Arabic figures.

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In the reference section, references should be listed in alphabetical order taking account of the first author. First the references in Latin characters are given, then – in Russian (Cyrillic) characters. For works up to seven authors, list all authors. For eight or more authors, list the first six, then ellipses followed by the last author's name. In the case when there are several references of the same author published at the same year, they must be marked by letters, e.g. 2001 a, 2001 b, etc. in the list of references and in the article, too.

Examples:

Books (print and online)

Author, A. A. (year). *Title of work.* Location: Publisher.

Author, A. A. (year). *Title of work.* doi:xx.xxxxxxxxxxxxxxx

Author, A. A. (year). *Title of work*. Retrieved from http://www.xxxxxxxxxx

Author, A. A. (year). *Title of work*. Retrieved from xxxxxxxxxxx database.

Chapter in a book:

Author, A. (year). Title of chapter. In E. Editor (Ed.), *Title of book* (pp. xx–xx). Location: Publisher.

Author, A. (year). Title of chapter. In E. Editor (Ed.), *Title of book* (pp. xx–xx). Retrieved from http://xxxxxxxxx

Author, A. (year). Title of chapter. In E. Editor (Ed.), *Title of book* (pp. xx–xx). doi:xxxxxxxxxx

Journal and newspaper articles (print and online)

Author, A. A., Author, B. B., & Author, C. C. (year). Article title. *Journal Title, volume number* (issue number), page numbers.

Author, A. A., Author, B. B., & Author, C. C. (year). Article title. *Journal Title, volume number* (issue number), page numbers. doi:xx.xxxxxxxxxxxxx

Author, A. A., Author, B. B., & Author, C. C. (year). Article title. *Journal Title, volume number* (issue number), page numbers. Retrieved from http://www.xxxxxxxxxxxxxxx

These are the most common examples cited. For a complete list of examples please consult *Publication Manual of the American Psychological Association*, 6th ed.

Congratulations!

We congratulate **Edita Vainienė**, the student of doctoral studies at Lithuanian Sports University, to have defended her thesis "Manifestation of students' identity in the context of physical education knowledge and university studies" (Social Sciences, Education, Physical Education, Motor Learning, Sport) at Lithuanian Sports University on September 29, 2014.
Scientific supervisors: Prof. Dr. Habil. Kęstutis Kardelis
Prof. Dr. Saulius Šukys
Scientific consultants: Prof. Dr. Laimutė Kardelienė
Dr. Giedrė Judita Rastauskienė

We congratulate **Gintarė Dargevičiūtė**, the student of doctoral studies at Lithuanian Sports University, to have defended her thesis "Force depression after muscle shortening is dependent on fatigue, post activation potentiation and mechanical work" (Biomedical Sciences, Biology) at Lithuanian Sports University on September 30, 2014.
Scientific supervisor Assoc. Prof. Dr. Nerijus Masiulis
Scientific consultants: Prof. Dr. Hakan Westerblad
Prof. Dr. Kazimieras Pukėnas

We congratulate **Andrius Brusokas**, the student of doctoral studies at Lithuanian Sports University, to have defended his thesis "Self-efficacy of young basketball players and peculiarities of its development" (Social Sciences, Education, Physical Education, Motor Learning, Sport) at Lithuanian Sports University on December 3, 2014.
Scientific supervisor Prof. Dr. Romualdas Malinauskas
Scientific consultant Prof. Dr. Audronė Dumčienė

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