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Inta Bula – Biteniece
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Language Editor:
Ieva Rudzinska

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Editorial Contact Information.
Publisher Contact Information:

Inta Bula-Biteniece
Latvian Academy of Sport Education
Address: 333 Brivibas Street
Riga, LV1006, Latvia
Phone.: +371 67543410
Fax: +371 67543480
E-mail: akademija@lspa.lv

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ORIGINAL RESEARCH PAPER

**FAMILY INFLUENCE ON SPORT ACTIVITY
PATTERNS DURING EARLY ADOLESCENCE – A
COMPARATIVE APPROACH**

**Krzysztof Piech¹, Rolf Carlson², Juris Grants³, Dmitriy Cherenkov⁴,
Alexey Gatatulin⁵, Dzmitry Smaliakou⁵, Ulf Lindberg⁶**

¹Academy of Physical Education Warsaw, Biala Podlaska
Address: ul Akademicka 2, 21 – 500 Biala Podlaska, Poland
Phone: +48 607381070

E-mail: krzysztofpiech@wp.pl

²Swedish School of Sport and Health Sciences
Box 5626, S – 114 86 Stockholm, Sweden
E-mail: carlsonrolf@gmail.com

³Latvian Academy of Sport Education
Address: 333 Brivibas Street, Riga, LV – 1006, Latvia
Phone: +371 67543410
E-mail: Juris.Grants@lspa.lv

⁴Russian State University of Physical Education and Health
Address: 4, Sireneviy Boulevard, Moscow, 105122, Russia
E-mail: dmitriych61@mail.ru

⁵Belarusian State University of Physical Culture
Address: 105 Pobediteley Avenue, 220020, Minsk, Belarus
Phone: +375 172508008
E-mail: oo@sportedu.by

⁶Bosön Sport College, Sweden
Address: 181 47 Lidingö
Phone: +46 8 699 66 02
E-mail: ulf.lindberg@live.se

Abstract

The aim of research is to examine and describe young individuals who participate in extended sport education program. The main focus concerns family influences on the development of the investigated youngsters' sportive patterns. Data were collected through online and paper (whenever appropriate) questionnaires (elite sport training in secondary higher education – models of success in sport with pupils from a selection of sport schools in respective countries). Coaches from sports

schools representing all participating countries (Poland, Sweden, Latvia, Russia and Belarus) were interviewed. The results indicate that the influence of parents and physical education teachers on the decision to join a sport club and to continue sport career is rather low. Main reasons behind joining a sport club are: the desire to become an athlete, sport idols, and the subjects' own will. Staying in a sport club and pursuing a career is also determined by previous achievements in the field and good coaches. The parents' past engagement in psychical activities was not systematic. The subjects consider local sport facilities and a number of accessible sport clubs and sports coaches to be of high importance at the early stage of their engagement in sport.

Key words: *elite training, upper secondary education, sport career, family influence*

Introduction

Competitive sport has developed in a majority of cultures and is one of the most common leisure activities among children and youth, regardless of cultural backgrounds or ethnic identities. To practice sport, which is connected to personal achievements, is becoming popular among children at a lower age than ever before. The universal value of sport is evident and great efforts are devoted to the search for and the development of sports talents. Most countries have over the years developed methods for talent acquisition and development. There are also collaborative structures between countries, including cooperation between governmental bodies.

Youngsters who participate in e-tended training programmes based on sport schools or sport classes under selective processes that ensure they are capable of enduring intensive training. Issurin noted, the work volume required to achieve first international successes by the Olympic champions on the average took = 3084hrs (min 1840hrs – max 4495hrs) (Issurin, 2015). They must meet the criteria in motor and mental abilities as well as being talented. In order to involve them in sport and develop their physical abilities, it is not enough to create a proper environment for practice. Family support is equally indispensable. Talent in competitive sport is generally regarded as a process from childhood to adult age, with an emphasis on the interaction between the developing person and the surrounding environment (Csikszentmihalyi, Rathunde & Whalen, 1993; Soberlak & Coté, 2003; David, 2005; Kincer, 2005; Wolfenden & Holt, 2005; Carlson, 2009). Search for and identification of talent at an early age can often be difficult. Selection is usually based on performance achievements during or before

puberty. This infers great difficulties and risks of early-age drop-out rate. Early developers are favoured while late developers are left out based on factors beyond their own influence (Carlson, 2013). Malina (2015) states that: "Programs aimed at developing talented young athletes need to recognize several important features. First, talent development is a highly individualized and dynamic process. Second, the process is superimposed upon a constantly changing base, specifically the demands of physical growth, biological maturation and behavioral development and their interactions, as children pass from childhood into adulthood. Third, the process is exclusive; focus is often on the "most talented" individuals for a given sport or sport discipline/position, whereas many others are systematically excluded and/or voluntarily withdraw from the sport. Fourth, although some talent models view the developmental process as long term, paths to elite status are highly variable among individuals". Many of those young people deserve a second chance, a sort of talent recycling. Furthermore, research indicates that athletes who are successful internationally have practiced several sports simultaneously during early adolescence and got involved with their main discipline only in their mid-teens or later (Baker, Côté & Deakin, 2005; Carlson, 2007). The purpose of this research is to examine and describe young individuals who participate in extended sport education programs. The main focus concerns family influences on the development of the investigated youngsters' sportive patterns.

Material and methods

Financed by the Swedish Institute, the research project (Elite Sport Training in Upper Secondary Education – Models for Sportative Success) is a comparative study involving Russia, Belarus, Latvia, Poland and Sweden. A project group was established between leading universities in the field of physical education in respective countries. The project is led by prof. R. Carlson (Swedish School of Sport and Health Sciences, GIH, Stockholm). Data were collected through online and paper (whenever appropriate) questionnaires (elite sport training in secondary higher education – models of success in sport with pupils from a selection of sport schools in respective countries). Coaches from sports schools representing all participating countries were interviewed. Planning sessions took place in Riga, Latvia, and Moscow, Russia, at the end of 2012, as well as in Biala Podlaska, Poland, at the beginning of 2013. The collection of data commenced in March, 2013. In Poland the project included the group of young athletes who attended Sport Championship Schools or sport classes in secondary

schools. The most prevalent disciplines were: basketball, football, handball, athletics and wrestling; and to a smaller degree table tennis, gymnastics and martial arts. The study involved 221 individuals – 84 girls and 137 boys.

Results

The participants mostly originated from larger urban areas with 10 to 50 000 inhabitants or more. A small percentage grew up in communities with 10 000 residents or less. Early – life physical activities among the investigated youngsters varied by the sport they later specialized in. Hence, wrestlers, football-, basketball- and handball players had different sportive preferences during early adolescence. Furthermore, it is important to stress that the number of different types of psychical activities they engaged in childhood was rather low and unvaried. Figure 1. depicts the age at which the subjects entered organized sport. For most individuals this took place at the age of nine. Still there was number of subjects who engaged in organized sport at younger or at an older age.

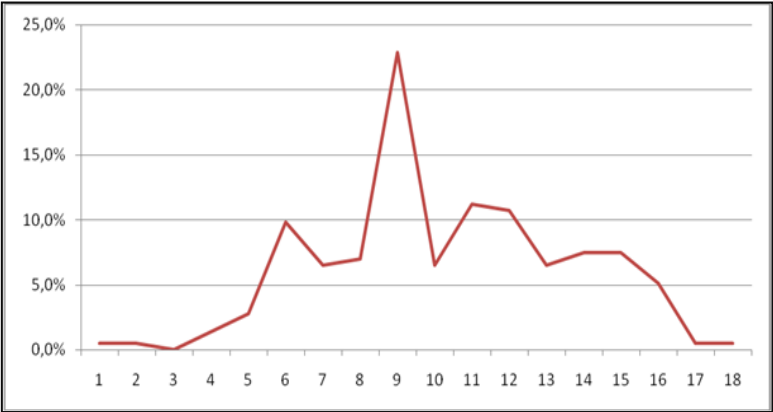


Figure 1. The age of sport debut

The research aims at determining the parents’ role in the decision making process of their children with regard to joining a sport club. Some of the reasons mentioned by the subjects include their own will to join a sport club, a desire to become an athlete and their admiration for sport idols. Other educational environments, such as physical education teachers, friends, parents and siblings, played a much smaller role (fig.2).

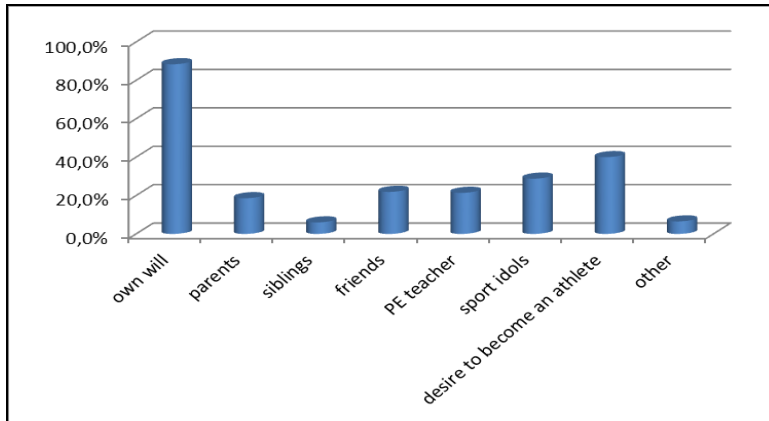


Figure 2. Main determinants of joining a sport club

The analyses of the next set of responses provide interesting data. The main reasons mentioned were good coaches and a will to become an athlete followed by early achievements in sports. Friends played a bigger role than sport idols. The impact of family, siblings, and physical education teachers seem to be of minor significance (fig. 3).

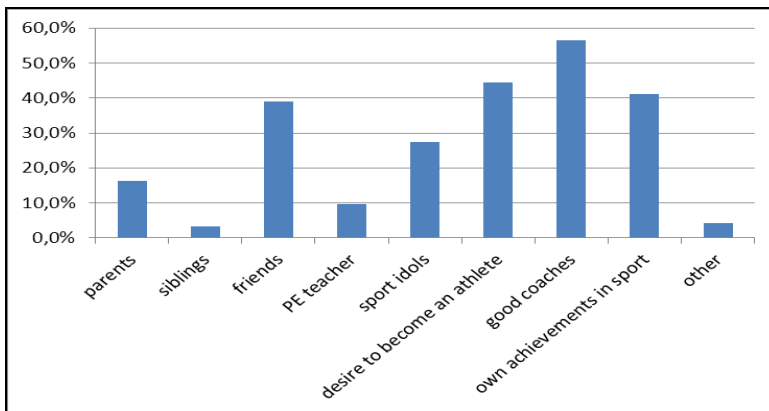


Figure 3. Main determinants behind remaining in a sport club

Data presented in Figure 4. concern the parents' involvement in sport. It is evident that fathers are more engaged in both competitive and amateur sports. A large percentage of the subjects' parents did not engage in sport at all, with mothers being significantly less active.

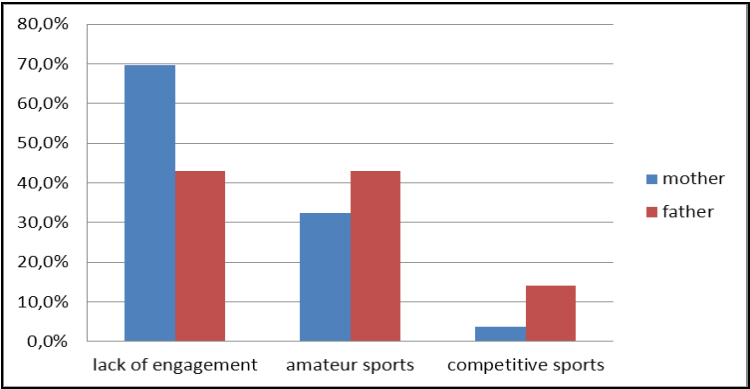


Figure 4. Parents’ sport careers

Even if the parents engaged in sport together with their children, it was not in a systematic way. Parents did either not practice any physical activity at all, or practiced it sporadically (fig. 5).

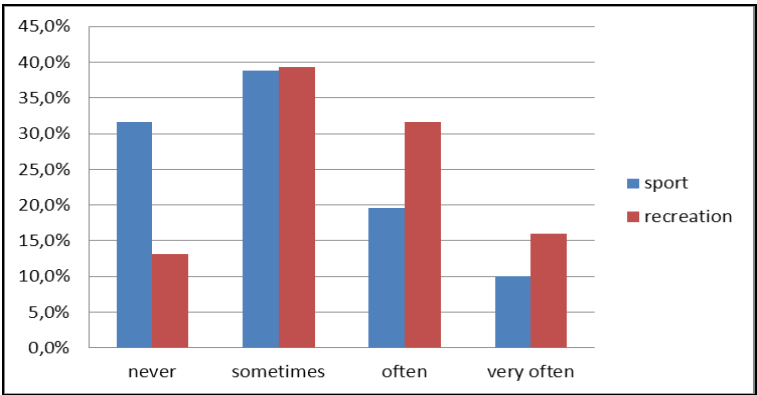


Figure 5. Parents and children’s joint physical activity

The environment in which young people were brought up might have a significant impact on their engagement in physical activities. Subjects revealed that 42.4% had access to a large number of sport facilities in their neighborhood area, 46.1% meant there were a few sport facilities around, where as 11.5% stated there were not enough facilities accessible. Figure 6 presents views on the number of sport facilities indispensable for practicing competitive sports.

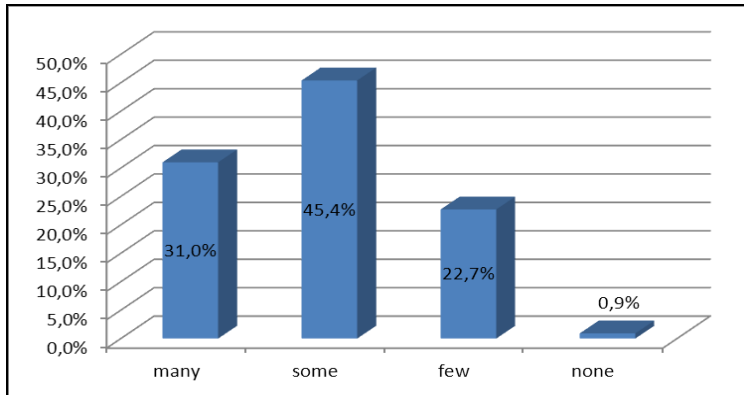


Figure 6. Distribution of local sport facilities indispensable for practicing competitive sports

According to the majority of respondents, the number of local sport clubs was large, as stated by 44.6% of the subjects. 26.3% revealed that there were not enough (fig. 7).

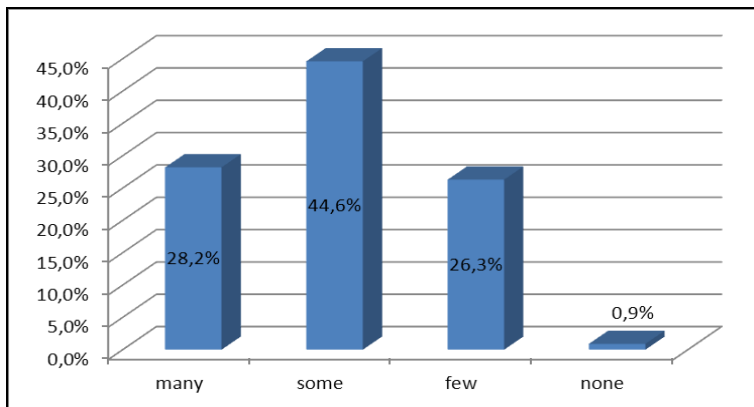


Figure 7. The number of sport clubs and school sport clubs accessible during childhood

According to the subjects, the number of coaches in their school sport clubs was large (27.3%), 50.9% stated that there were a few, while 21.8% stated the number of coaches was small.

Discussion

One of the issues tackled in the research concerns familial determinants of the participation in sport among people included in

extended sport education programs. We were particularly interested in examining the parents' influence on children's engagement in competitive sport. The research concerning physical activity of the family developed in two main directions. First to a much larger extent discussed in the literature, involves the impact of parents' engagement in physical activities on the psychical activity of their children (Atsalakis & Sleaf 1996; Bauer, et al., 2008; Piech & Michałowska 2012). Dempsey et al. (1993) highlights the fact that parents' influence is especially important in early childhood. Freedson & Evenson (1991) prove that active parents are more likely to raise more active children, while inactive parents will have inactive children. Brustad (1993) points out those parents are aware of the significant role they play in the early stage of children's engagement in sport. This is the key area where parents are able to influence a child's activity. Based on that, parents can decide which kind of psychical activity the child will engage in and how they will support his or her participation. Interesting research conducted by Sanchez (2013), where 723 parents and children engaged in sport were included, showed a positive relationship between parents' support of the sport and players' enjoyment and a negative relationship with players' motivation. Lastly, it was emphasized that appropriate parental participation can promote an increase of players' enjoyment and motivation for sport. Unfortunately, research conducted by Kaiser (2013), where parents of preschool children were included, showed that most of them were characterised by a declarative attitude towards their children's physical activity. Parents are aware of the need for physical activity of their children but they do not provide it. The author spotlights the cooperation between parents and preschool.

The second direction is more concerned with examining the influence of children's psychical activity on their parents' physical activity (Iannotti, 2005; Piech et al., 2013; Birontiene, 2012). It must be stressed that this phenomenon is not widely depicted in literature and mostly concerns families with younger children.

This follows the typology presented by Mead (1978), in which she identifies post-figurative cultures where children learn mainly from their parents; configurative cultures where both children and adults learn from their peers and finally pre-figurative cultures where adults also learn from their children. As stated by Pawlak (1998), in the field of sport the encouragement to engage in it is intentional and consistent. Taking that into consideration, it is important to discuss the role of family in the introduction to sport and the development of a sport career. The sportive family where one of the parents engages in competitive sport provides an interesting

issue. It is not to be forgotten that every family, also a non-sportive family, forms the primary environment for a child in his or her engagement in any physical activity. This can be illustrated by the most basic participation of parents and children in leisurely activities and simple sport games. The parents are indeed first psychical educators for their children. They pass on to them the ways of spending leisure time and family sport traditions. As highlighted by Atsalakis and Sleaf (1996), it is only logical that including children in various psychical activities is dependent on their parents will and financial support. The results indicate that parents and siblings together with physical education teachers had a smaller impact on the decision to join a sport club than a will to become a professional athlete or sport idol than children's own competitiveness. The main reasons behind staying in a sport club and continuing participation in sport also do not show a significant impact of the family, siblings or physical education teachers. Good coaches, the will to become a professional, friends, as well as early sport achievements and sport idols were more influential factors. These results indicate that young athletes follow the agonistic behaviour pattern. According to Nowak (2013), this model is common among youngsters who engage in sport and it remains a recognizable merit-namely the popularity of sport champions and winners. According to the results most of the parents did not engage in sport (70% of mothers and over 40% of fathers). It is, however, crucial to note that Poland falls into the group of countries with a generally low level of adults' engagement in physical activities. The most popular way of spending leisure time in Polish families is watching TV. They also point out the lack of variety of psychical activities that parents and children engage in together. The research conducted by Centre for Public Opinion Research (CBOS 2013) in 2013 is less pessimistic. The results also indicate a positive change. 66% of adults declare that they exercise, 40% of them regularly and 26% sporadically. Psychical activity, however, mostly is a young people's domain. The investigated youngsters regarded sport as the 4th most common way of spending leisure time with their families. Taking into consideration the whole population of Poland, the parents of the studied youngsters exhibited a higher level of involvement in physical activities (Mogil-Lisowska, 2010). A higher percentage engaged in amateur sport compared to competitive sport and fathers appear to be more active than mothers. Engagement of parents and children in physical activities was not systematic. The instances of such behaviour were rare. Literature show that more positive perceptions of social relationships are associated with more positive motivational outcomes, taking into account

parent-peer group and friendship variables in combination (Ullrich-French & Smith, 2006).

The research conducted by Domingues and Goncalves (2013) show that the impact of parents is a significant sport mechanism and that it influences young people's participation in sports. This influence has various levels of significance depending on how long an individual has been practicing sport with a high significance during the phase of specialization where attention is directed on dominant competitive and achievement-oriented behaviours. Emphasising the supportive role of parents in this professional environment, the research indicates that educational properties of parents were reflected in some of the lifelong social skills found in sport. Another interesting issue is the role the local environment plays in providing conditions that facilitate the practicing of sport. Our subjects highly valued the sport facilities available and the accessibility of sport clubs. This does not, however, mean that there is sufficient access to facilities across the country. On the contrary, the accessibility of such facilities is still unsatisfactory. The investigated youngsters attended schools where these conditions were much better. Only by qualitative actions in organized sports will the youth be able to take full advantage of continuous participation in sport. Parents are important social actors in the talent development programmes due to their strong impact on the attitude and expectations of the young adolescents in a demanding competitive environment. Further research should focus on family microsystems and connections to behaviours displayed by the youth in the process of sport talent development. Brustad (2010) states: "However, we should not lose sight of the fact that the family is the most important form of social influence upon physical activity, and family-based physical activity promotion efforts represent a greatly underutilized and cost-effective resource for the promotion of physical activity. Family-based approaches also have the potential to foster desirable lifestyle habits and enjoyment of physical activity that can facilitate physical activity involvement for a lifetime".

Conclusions

The results indicate that the influence of parents and physical education teachers on the decision to join a sport club and to continue sport career is rather low.

Main reasons behind joining a sport club are: the desire to become an athlete, sport idols, and the subjects' own will. Staying in a sport club and pursuing a career is also determined by previous achievements in the field and good coaches.

The parents' past engagement in psychical activities was not systematic. The subjects consider local sport facilities and a number of accessible sport clubs and sports coaches to be of high importance at the early stage of their engagement in sport.

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ORIGINAL RESEARCH PAPER

SPORT LESSON FROM STUDENT VIEWPOINT

Inta Bula-Biteniece, Rasma Jansone

Latvian Academy of Sport Education

Address: 333 Brivibas Street, Riga, LV – 1006, Latvia

Phone: +371 67544330

E – mail: inta.bula-biteniece@lspa.lv, rasma.jansone@lspa.lv

Abstract

Qualitatively organized sport education in schools contributes to not only the student physical preparedness and health, but also helps them to understand the impact of physical activity on the personality and their application throughout their lives – as one of the values in sport education. The aim of the research was to observe the implementation of sport lesson content and pedagogical principles from student point of view. In contemporary sport lesson the teacher uses didactic principles, enabling students to gain knowledge and skills to improve the quality of their lives. In the study was used the method of survey – questionnaire. Overall, the questionnaires completed 336 students (149 boys, 187 girls). The findings were analyzed with the method of descriptive statistics; the variable under investigation was mode – the value of the variable with the highest frequency of occurrence. From the summarized student views on the processes in sport lesson with the method of induction were drawn the conclusions. Results and conclusions: students strive for in-depth, explanatory assessment of their physical preparedness that they could use to develop their problematic aspects. Another important focus presented by the survey results, is emotional tie formation with the teacher or on the contrary – the absence of it; student look forward to an assessment that is not only academic, but also personal, expressed in personalized terms.

Key words: *pedagogical principles in sport lesson, attitude, physical activity, raising awareness*

Introduction

Qualitatively organized sport education in schools contributes to not only the students' physical preparedness and health, but also helps them to understand the impact of physical activity on the personality and their application throughout their lives as one of the value education basic standings in sport.

Sport education and its implementation helps students raise the awareness of their body physical and mental unity, providing a comprehensive picture of the "rules of the game" that students can easily use in other subjects or life situations.

Seymour Papert, US mathematician, computer scientist, educator, artificial intelligence project pioneer and Logo programming language author, in Imperial College London on 2 June 1998, said: "The model that says that you learn the skills that will be useful later in life, learn while you're in school while you're young – it is no longer in sight. These skills will not be applicable at the time when you will be in your workplace, except for one: *one really competitive skill is a skill to learn*. It is a skill not to give the correct answers to the questions which you have learned in school, but to respond to situations that are out of the school curriculum. "

Lesson quality is affected by teacher preparation for it, because it provides teacher and student targeted cooperation, creative working atmosphere, discipline and safety.

The aim of the research was to observe the implementation of sport lesson content and pedagogical principles from student point of view.

With the means of sports is encouraged the growth of a person that able to adapt to various changes, ready to learn, acquire new knowledge, skills and build awareness that taking care of one's health and physical capital is the value in the long term (Čuprika & Fernäte, 2016).

For students to regularly engage in physical activity, is necessary an available appropriate infrastructure, however, to foster comprehension, promote motivation and interest, a decisive role plays physical education in schools and high-quality processes in sport lessons, because sport lesson is the main form of study work organization.

The main objectives are to create for students an opportunity to engage in the systematic physical activity according to the learner's state of health, strengthening and improving health, developing physical abilities, promoting a harmonious physical and mental development, raising awareness about mutual interaction of health, physical ability, environment and specific sport exercises.

It is of paramount importance how Standards in the subject of Sport (6 August 2013 the Cabinet of Ministers Regulations No. 530 "Regulations on state basic education standard, basic education subject standards and examples of curriculum in basic education" and 21 May 2013 the Cabinet of Ministers Regulations No. 281 "Regulations on the state general secondary education standard, study subject standards and curriculum samples") are being implemented in life, in what proportions students acquire knowledge,

skills, what psychological climate prevails in lessons, how students are motivated to get involved in sport lessons, to what extent are promoted self-expression skills, how processes in sport lesson affect students' self-assessment and self-esteem, how lessons help restore mental working capacity in the long school day.

At present, the practical sport education process in sport lesson includes two controversial aspects. They are the implementation of the traditions of conservatism in the behavioral approach, the essence of which is professional teacher and students implement the program, students without objections try to accept it and act accordingly.

In competence approach based education system: student knows what to do with the acquired knowledge and skills, where and when they will be used.

Sport lessons will be more effective if students will be focused on *the growth of the dynamics of their results*, rather than on the comparison with the results of other students.

In sport education, as well as in general education as a whole, has happened the transition of focusing on *definite norms for everyone and assessment according to the tables* to the learning process, in which the student is given the opportunity to explore and develop oneself, learn to think and solve problems from the aspects of their personal mental and physical development.

In practice, often is observed the following error: teachers believe that in order to assess the level of the development of a physical characteristic should be used a norm. The attainment of the norm, however, often depends not on one characteristic, but on a whole complex of physical properties. In normative tests a half of students get below the midline and feel like losers, no matter how good is their physical performance. Thus, the assessment with norms is constantly undermining the learners' self-confidence, which already is low. *Teachers should consider that the desire to find the winners in all age groups is the main factor limiting student physical development, because functional preparedness, so important for student health, is not being developed.* Failure to take into account the peculiarities (sensitive periods) of student age group development can lead to injuries and problems in physical preparedness.

Sport lesson should be based on the pillars of the pedagogical principles, the theoretical background of which is the paradigm of Bloom taxonomy: knowledge, comprehension, application, analysis, synthesis and evaluation:

- exercise, practice and experiment (Gardner, 2006). Students should be given a lot of opportunities to practice, invent new exercises and interact with classmates.

- evaluate and analyze their achievements (Bruner, 1996, Piaget, 2001). The most important is self-assessment of own achievement, self-esteem, asking students the question: *"What did you learn in sport lesson?"*

- Act responsibly (Children's Rights Protection Law), physical activity in the lesson do with responsibility, thinking of one and classmates security.

- Capture learning joy and satisfaction (Edwards, Gandini & Forman, 1996)

- Develop students' abilities corresponding learning environment by selecting the appropriate inventory.

- Special attention pay to the creation of learning environment – friendly and positive (Montessori, 1999)

- Allow students feel joy from the performance of physical exercises in sport lessons.

- Implement child-centered learning (Lieġeniece, 2002). What I gained from sport lesson?

- Relate to the age group, interests and needs (Flemmen, 1996). Each exercise corresponds to each child's needs.

- Successfully achieve the aim set (Woogler & Power, 1993). Achieve at least some results of developed knowledge and skills.

In the contemporary sport lesson teacher implements in the pedagogical process the principles, as the result of which students gain the knowledge and skills to improve their quality of life.

Material and methods

In order to clarify the implementation of pedagogical principles in sport lesson, it is essential to explain the behavior of the students, what and why they do it. The approach is based on the Theory of Planned Behavior (Ajzen, 1991), in which are distinguished three beliefs: beliefs about behavior (external manifestation of an action, behavior, attitude), normative beliefs (to a person important people support or denial in a certain behavior) and controlling beliefs (factors determined by the experience, which controls what is being done).

Therefore, the student behavior in this study is characterized as attitude, specific action or activity and to support of the activity, which the student can express also as a specific opinion, based in individual understanding and in attitude.

In the study was used a kind of a survey: a questionnaire. The questionnaire consists of precisely defined questions, because the respondents had to answer them independently, without assistance of the

interviewer. To investigate the students' views on sport lessons in general secondary education (Grade 1 – Grade 12), was used a 16 questions questionnaire, 5 of which focused on the interests of the children, 5: the needs of the children and 6: the children's views on the processes ongoing in sport lessons. 10 of the questions were open, 3 – semi-closed and 3 – closed questions. In the survey participated Grade 1 – Grade 12 comprehensive secondary school learners from Riga, Valmiera and Rezekne.

In total, the questionnaire was completed by 336 students (149 boys, 187 girls). The findings were summarized with the help of mathematical statistics; the researched indicator was the mode: the value of the feature with the highest frequency of occurrence. From the analysis of the students' views on the processes ongoing in sport lessons, with induction or cognition method were drawn the conclusions.

Results

Below are illustrated the obtained student answers to the questions of the questionnaire.

Grade 1 to Grade 12 students – both girls and boys – most often marked that sport lesson is the one that they would like to attend every day (students chose the lesson from their existing timetable, the lesson of SPORT is in all grades) (fig.1).

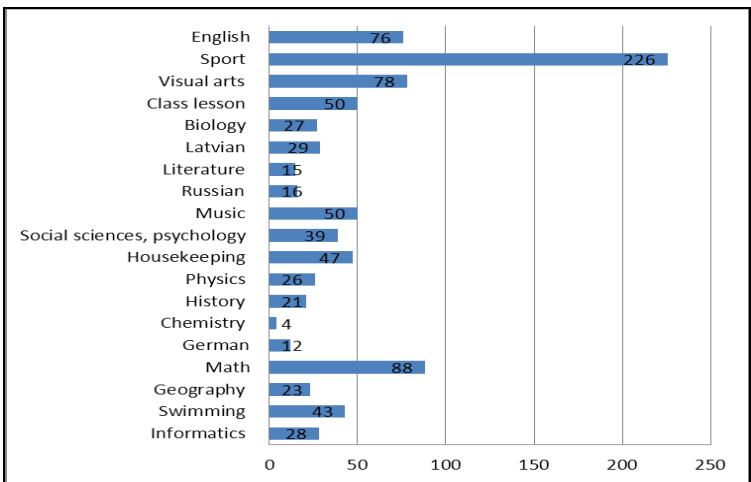


Figure 1. Girls, boys, together. What lessons would you like to have every day?

In response to the question "What do you usually do in the sport lesson?" the most frequently marked response (142 respondents) among girls and boys is "do sport, develop skills in different sports." (fig.2.)

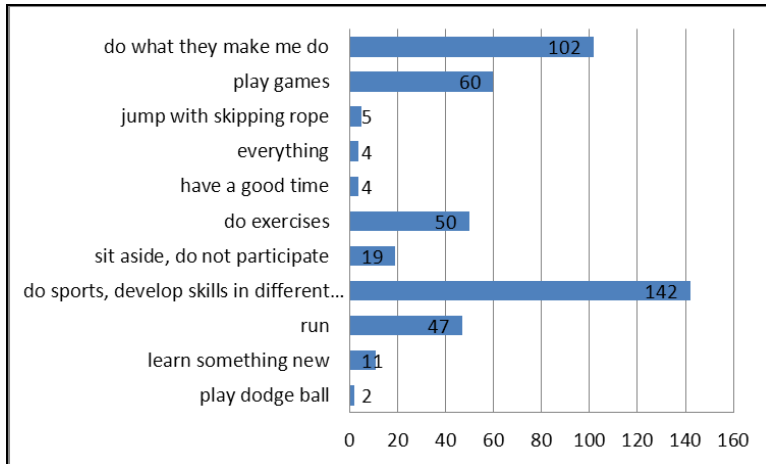


Figure 2. Girls, boys. What do you usually do in the sport lesson?

The first response is generalized, since it could involve a lot of specific activities, such as running, jumping, playing sport games and performing gymnastics exercise, all of which are included in the sport lessons at school. Answer "develop skills in different sports" could be a sign of mastering different sports as the main activity in sport lessons. The next most frequently chosen answer (102 respondents) is "do what they make me to do". This may suggest that students do not understand the aim or meaning of activities performed in sport lessons, instead of it they simply follow the teacher's instructions.

The question "What would you like to do in sport lessons?" (Tab.1) was an open question, and the students could choose from 23 multiple choice questions. From Grade 1 to Grade 12 the most selected response to the question was "Play games to make our class more cohesive" (41 respondents). The largest proportion of these responses was from Grade 5 to Grade 9, among girls (7 replies). It should be noted that this response was dominant among girls (31 respondents), while the boys chose to "play football" (28 respondents) as the main desired employed sport lessons. Considering that Grade 5 to Grade 9 students are adolescents, there dominate such dimensions as friendship, romance.

This may suggest that for adolescents, it is important to be aware of, to feel their place in the social environment – at school, in the classroom.

Table 1

What would you like to do in sport lessons?

| No. | What would you like to do in sport lessons | Girls | Boys | Total |
|-----|--|-------|------|-------|
| 1. | Master a sport more in depth | 8 | 7 | 15 |
| 2. | Do sport | 8 | 11 | 19 |
| 3. | Do pull-ups | 3 | 5 | 8 |
| 4. | Play games to make our class more cohesive | 31 | 10 | 41 |
| 5. | Perform strength exercises | 24 | 12 | 36 |
| 6. | Do nothing, I do not like sport, I am exempted | 2 | 3 | 5 |
| 7. | Learn acrobatics | 7 | 4 | 11 |
| 8. | Play basketball | 7 | 23 | 30 |
| 9. | Play football | 6 | 28 | 34 |
| 10. | Have yoga classes, do aerobics, rhythmic | 8 | 5 | 13 |
| 11. | What we are made to do; everything we do | 7 | 8 | 15 |
| 12. | Jump with a skipping rope | 10 | 1 | 11 |
| 13. | Run | 7 | 3 | 10 |
| 14. | Do what I myself like the most | 5 | 5 | 10 |
| 15. | Play volleyball | 6 | 7 | 13 |
| 16. | Play dodgeball | 13 | 20 | 33 |
| 17. | Play floorball | 1 | 15 | 16 |
| 18. | Play badminton | 3 | 2 | 5 |
| 19. | Ski in winter | 1 | 1 | 2 |
| 20. | Do not know | 1 | 0 | 1 |
| 21. | Play relays | 3 | 0 | 3 |
| 22. | Track and field | 0 | 1 | 1 |
| 23. | Swim | 1 | 3 | 4 |

They want to make new friends, get along well with them, therefore there is such a desire to play team sport games in sport lessons. Such class-building games could be movement games – such as "fishing net", those which include also verbal communication.

The question „What did you learn in the last sport lesson" (Tab.2) was an open question, were obtained 22 dominant responses. Many responses were grouped under one subgroup according to the same or similar feature, for example the response "improve physical preparedness" was grouped together with "perform strength exercises", because many students mentioned the execution of various physical exercises, such as pull-ups, abdominal press exercises, and all these activities imply the improvement of physical preparedness. Most frequent response „Play basketball, dribble, two-step lay-up, shots, play streetball, basketball rules" was given 58 times.

These results show that during the last sport lesson several grades were taught basketball and its elements.

Table 2

What did you learn in the last sport lesson?

| No. | What did you learn in the last sport lesson? | Girls | Boys | Total |
|-----|---|-------|------|-------|
| 1. | Play volleyball (volleyball passes) | 27 | 23 | 50 |
| 2. | Play floorball (handle the ball), techniques | 10 | 18 | 28 |
| 3. | Improve physical preparedness, perform strength exercises | 26 | 8 | 34 |
| 4. | How to be cohesive, team cooperation | 4 | 0 | 4 |
| 5. | Nothing | 14 | 17 | 31 |
| 6. | Properly run, properly breathe while running | 5 | 14 | 19 |
| 7. | Perform forward roll | 4 | 0 | 4 |
| 8. | Jump with a skipping rope | 4 | 5 | 9 |
| 9. | New warm-up, cool-down, stretching exercises | 1 | 1 | 2 |
| 10. | Play basketball, dribble, two-step lay-up, shots, play streetball, basketball rules | 27 | 31 | 58 |
| 11. | Improve dodgeball skills | 7 | 2 | 9 |
| 12. | Play movement games | 1 | 0 | 1 |
| 13. | Climb the rope | 1 | 1 | 2 |
| 14. | Throw the ball against the ground, against a wall | 0 | 4 | 4 |
| 15. | Run obstacle course | 1 | 0 | 1 |
| 16. | Play sport games | 0 | 2 | 2 |
| 17. | Better, faster, run; run sprints; correctly perform crouch start | 1 | 2 | 3 |
| 18. | Play football, kick at goal, passing, football history, rules | 0 | 7 | 7 |
| 19. | Aerobics | 1 | 0 | 1 |
| 20. | I already know everything | 3 | 10 | 13 |
| 21. | From the last class I was exempted | 4 | 0 | 4 |
| 22. | Badminton | 7 | 14 | 21 |

Most frequently the answer was provided in the fifth grade. 15 girls and 12 boys answered that last lesson they had mastered the basketball technique. In the Standard of the subject of SPORT from Grade 1 to Grade 9 basketball is mentioned as a compulsory content of the subject. The next most frequent answer was "improve physical preparedness, perform strength exercises", it was produced 34 times. This response was dominant among girls.

In drawing up this questionnaire, the initial aim of the question "What about would you like to hear more from your sport teacher?" was to find out student attitude and expectations regarding the content of sport lesson. (Tab. 3) From the students were expected such answers as "I would like to hear more about the history of the kind of sport, about floorball rules or volleyball technique." However, the obtained results of the surveys and student answers indicated something quite different – they wanted to comment on the teacher's attitude in communication, from the teacher they wanted to hear more praise, encouragement and kind words, as well as to

tell how they succeeded in performing the tasks of the lesson of sport and about their level.

We, adults, are so busy that we forget to praise children, but it for them is very necessary.

Table 3

What about would you like to hear more from your sport teacher?

| No. | What about would you like to hear more from your sport teacher? | Girls | Boys | Total |
|-----|---|-------|------|-------|
| 1. | <i>I am satisfied with the information provided by the teacher</i> | 16 | 14 | 30 |
| 2. | <i>On healthy eating</i> | 4 | 1 | 5 |
| 3. | <i>Nothing, information is enough</i> | 28 | 42 | 70 |
| 4. | <i>More about the kind of sport, techniques, history of the sport, the most outstanding athletes in the sport</i> | 9 | 10 | 19 |
| 5. | <i>On the theme of the next lesson</i> | 1 | 1 | 2 |
| 6. | <i>Support (praise) and advice (ideas); motivation</i> | 40 | 32 | 72 |
| 7. | <i>About swimming technique</i> | 0 | 0 | 0 |
| 8. | <i>How to run, breath properly</i> | 4 | 3 | 7 |
| 9. | <i>Dealing with sports injuries</i> | 6 | 2 | 8 |
| 10. | <i>An assessment of how exactly I work</i> | 8 | 2 | 10 |
| 11. | <i>How to warm-up, cool-down properly</i> | 7 | 3 | 10 |
| 12. | <i>How to keep myself in good shape; what exercises to perform at home</i> | 6 | 2 | 8 |
| 13. | <i>On the proper execution of exercises, the importance, essence of exercises</i> | 21 | 12 | 33 |
| 14. | <i>On marathons</i> | 2 | 0 | 2 |
| 15. | <i>On sport games, competitions</i> | 5 | 3 | 8 |
| 16. | <i>Larger load</i> | 7 | 4 | 11 |
| 17. | <i>Do not know</i> | 1 | 2 | 3 |

Question „What about would you like to hear more from your sport teacher? Was an open question were summarized 17 versions of responses. Grade 1 to Grade 12 students most of all would like to hear Support, praise, advice, ideas, motivation; this reply was mentioned 72 times. The greatest proportion of the answer was found in Grade 2 (9 girls), Grade 5 (12 girls), Grade 5 (10 boys) and Grade 9 (6 boys). In Grade 2 girl surveys were identified such answers as "some comforting", "sincerity" and "support". This could indicate that the 6 – 7 year old children still expect some comforting and empathy of the teacher, like in the pre-school education institutions. The next most frequently mentioned response was "Nothing, information is enough" – 70 respondents. This may suggest that in the schools where survey was carried out, the information provided by teacher is sufficient; the students do not want to hear anything more.

In Table 4 are summarized the responses to the question „Why do you go to sport lesson?“ This was an open question, from respondents 12 versions of responses.

Table 4

Why do you go to sport lesson?

| No. | Why do you go to sport lesson | Girls | Boys | Total |
|-----|--|-------|------|-------|
| 1. | <i>Because I want to</i> | 35 | 47 | 82 |
| 2. | <i>It is a compulsory subject</i> | 45 | 40 | 85 |
| 3. | <i>I like to be sporty, move, actively spend time, exercise; to do sport</i> | 33 | 48 | 81 |
| 4. | <i>In order to stay in shape; I want to I have muscles</i> | 8 | 18 | 26 |
| 5. | <i>In order to be healthy; people need to move</i> | 27 | 10 | 37 |
| 6. | <i>Because I am learning something new</i> | 5 | 20 | 25 |
| 7. | <i>Because in the subject are put grades</i> | 4 | 5 | 9 |
| 8. | <i>To have a good time with classmates</i> | 3 | 3 | 6 |
| 9. | <i>Not to get the entry "No assessment"</i> | 12 | 2 | 14 |
| 10. | <i>Not to become fat</i> | 1 | 3 | 4 |
| 11. | <i>Because I want to get Grade 10</i> | 0 | 4 | 4 |
| 12. | <i>In order to "put out" energy</i> | 2 | 2 | 4 |

It was found that students go to sport lessons because it is a compulsory subject; this answer was given by 85 respondents (45 girls, 40 boys). This may suggest that students do not understand why sport lessons are necessary, therefore they attend it only driven by obligation, and they do not feel enough motivation to go to sport lessons voluntarily. To the question "Why do you go to sport lesson?" 82 students (33 girls, 48 boys) responded "Because I want to, I like it." This trend is positive, it shows that nearly a third of the surveyed students understand why sport lessons are necessary and feel the motivation to attend them, therefore they do it voluntarily. The next three most frequently chosen responses "In order to be healthy; people need to move "(37 times)," In order to stay in shape; I want to have muscles" (26 times) and "Because I am learning something new" (25 times) indicate a positive trend that students understand the importance of sport and its effect on health, as well as they do it because they want to learn something new.

We wanted to find out what student motivation to attend sport lessons in each Grade group, the results are summarized in Table 5, in which are displayed each Grade dominant responses.

Summary of the results, presented in table 5 shows that from Grade 1 to Grade 5 the response trend is positive – students at this age like to move, to do sports, actively spend time, they are interested in it, and they want to do it, and they also know that the movements have positive effect on human health.

Table 5

Student motivation to attend sport lessons

| <i>Grade, girls, boys</i> | <i>Dominating answer</i> | <i>No. of respondents</i> |
|-----------------------------------|--|-------------------------------|
| 1. | <i>In order to be healthy; people need to move</i> | 2 |
| 2. | <i>I like to be sporty, move, actively spend time, exercise; to do sport</i> | 6 |
| 3. | <i>I like to be sporty, move, actively spend time, exercise; to do sport</i> | 2 |
| 4. | <i>I like to be sporty, move, actively spend time, exercise; to do sport</i> | 3 |
| 5. | <i>Because I want, I like</i> | 9 |
| | <i>I like to be sporty, move, actively spend time, exercise; to do sport</i> | 9 |
| 6. | <i>It is a compulsory subject</i> | 8 |
| 7. | <i>I like to be sporty, move, actively spend time, exercise; to do sport</i> | 27 |
| 8. | <i>It is a compulsory subject</i> | 23 |
| 9. | <i>It is a compulsory subject</i> | 12 |
| 10. | <i>Because I want, I like</i> | 11 |
| 11. | <i>I like to be sporty, move, actively spend time, exercise; to do sport</i> | 13 |
| 12. | <i>Because I want, I like</i> | 12 |

The author Rasma Jansone says that the body of primary school children (Grade 1 to Grade 3) drastically differs from the senior student body – the younger the student, the closer is a direct correlation between the movements and child mental development. Students at this age are very active, natural desire for movement activities is large – at this age children should move from three to four hours a day. If this amount of movement activity is not reached, it can affect not only the child's physical, but also mental development. Movement activity is also needed because at this age occurs very rapid growth, which without adequate amount of movement activities can be impeded. Grade 4 and Grade 5 students have also answered they attend sport lessons, because movement activities give them pleasure, and they want to be active. Not so positive answers are in Grade 6: "It is a compulsory subject" – 8 answers. This may suggest that students are not interested in sport lesson activities. Probably, they do not like sports lesson, but they attend it, because it is included in school program. Grade 7 students have most of all answered that they like to move and spend time actively (27 times), but Grade 8 and Grade 9 students have also answered "It is a compulsory subject." This trend can be explained by changes that occur in teenage body during Grades 8 and 9. The greatest growth manifestation or growth "spurts" is observed in adolescence, which is due to puberty, when

during two-year time the height increases by 15 cm. This growth "spurts" in girls is generally observed at 10 – 12 years of age and in boys at 12 – 14 years of age. Such changes in the body lead to the decrease also in the body's physical ability diminishing in such physical characteristics as speed, strength, flexibility, coordination. Students become clumsier, thereby they psychologically feel incomplete. These factors could be the reason for their reluctance to attend sport classes. In secondary school Grades (Grade 10 – **Error! Not a valid link.**12) reappears positive trend "Because I want, I like" and "I like to be sporty, move, actively spend time, exercise; to do sport." If sport pedagogue can explain young people why they need physical activity during sport lessons and outside them, and if the motivation is based on the recognition that sport is health promotion, knowledge acquisition and physical preparedness tool for future long-term loads, which are necessary in any professional activity after graduation then it creates in students reasonable interest to participate in sport lessons. This factor - students (youth) interest – could be an explanation of why they attend sport lessons. This factor – students (youth) interest – could be an explanation of why they attend sport lessons.

Table 6 shows the results of the students' answers to the question "How do you usually feel after sport lessons?" This was an open question, and students have responded to it with 20 versions.

Table 6

How do you usually feel after sport lessons?

| No. | How do you usually feel after sport lesson? | Girls | Boys | Total |
|-----|---|-------|------|-------|
| 1. | <i>tired</i> | 63 | 68 | 131 |
| 2. | <i>good</i> | 64 | 44 | 108 |
| 3. | <i>bad</i> | 15 | 0 | 15 |
| 4. | <i>super</i> | 2 | 4 | 6 |
| 5. | <i>my legs hurt</i> | 3 | 1 | 4 |
| 6. | <i>I want more</i> | 0 | 2 | 2 |
| 7. | <i>alert</i> | 6 | 1 | 7 |
| 8. | <i>I want to drink water</i> | 8 | 3 | 11 |
| 9. | <i>I want to die</i> | 1 | 0 | 1 |
| 10. | <i>hot</i> | 3 | 2 | 5 |
| 11. | <i>normally</i> | 15 | 8 | 23 |
| 12. | <i>great</i> | 1 | 3 | 4 |
| 13. | <i>energized</i> | 5 | 6 | 11 |
| 14. | <i>relaxed</i> | 2 | 0 | 2 |
| 15. | <i>hungry</i> | 2 | 2 | 4 |
| 16. | <i>easy, no load</i> | 5 | 10 | 15 |
| 17. | <i>it depends, sometimes tired, sometimes not</i> | 4 | 8 | 12 |
| 18. | <i>sweaty</i> | 8 | 19 | 27 |

This was an open question, and students have responded to it with 20 versions. The dominant answer was “tired”. This result indicates that mostly students after sport lessons feel physically tired, which is also one of the tasks of sport lesson – give students a lot of different exercises, in the result students learn a variety of movement skills, forming movement acquirements and promoting the development of physical characteristics, leading to health strengthening.

Discussion

In the framework of the investigation about the popularity of competitiveness or sporting spirit among students was investigated the issue about result comparison among students of the Grade (fig.3).

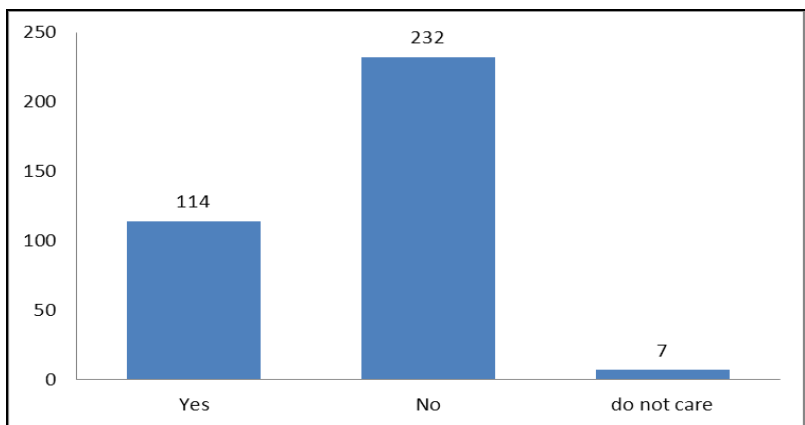


Figure 3. Girls, boys. Would you like your results to be compared with your classmates' results?

By contrast, in the publication "Letters to parents from 6 to 10 years", issued by the Ministry of Welfare, says that children want to get an assesment of their performance and that they want to be compared with others, and they just want to know what their level is. This study does not confirm the results of other studies because students talk about what is necessary for them and they do not want to be compared with other students. They are worried about what others think and also afraid of looking bad and not showing themselves from a good side and, therefore they do not want their results to be compared with the ones of their classmates.

Studies of similar nature in Latvia have been carried out by other educational institutions, dealing with the problems of value education in society. *Gunta Ošeniece*, Latvian University and the Latvian Academy of

Culture lecturer in the newspaper "Education and Culture" issue from March 6, 2008, reviewing the results of the study, wrote: "On average, learners may finish school with poor basic knowledge, skills and inadequate, labor market demands not meeting state of health." Learning, knowledge, and care for their physical health is becoming increasingly superficial. Empty calls to be well prepared physically, morally and ethically is just as "effective" as parents persistent accusations "do not do it" and "do not do that." Instead of this should come a true understanding of the motivation and a model, which, at least in part has already become an example to emulate for the learner, not the educator.

Some answers from an anonymous survey:

- *"First September associates with a hideous time and robbing your liberty, when you are forcibly being pulled back into the building known as SCHOOL"*
- *"Especially unnecessary seem to me mathematics, chemistry, physics and physical education, which, unfortunately, are a must"*
- *„I do not know any doctor, and are not entitled to other allowances too, so I'm forced to learn what they make us to and in the amount they make us to. Everything is so tiresome, tedious and long known ".*

Class teacher says that the desire to learn and go on to sport lessons emerges when there is motivation. However, the teacher could not say how to find motivation already in basic school. I guess everything will come with time (Ošeniece, 2008).

Conclusions

Studying the implementation of sport lessons in general secondary education from student point of view (Grade 1 – Grade 12), we came to the following conclusions:

At present students do not care anymore about the compliance with the Standard, or maybe they rather do not want to explore the Standard. Students strive to obtain in- depth, explanatory assessment of their physical preparedness, such an assessment that they could use to develop, work on problematic aspects. Another important focus presented by the survey results, is the formation of emotional connections with the teacher, or on the contrary – the absence of such ties with the teacher, that is – the student wants the assessment to be not only academic, but also personal, expressed in personalized terms.

In public and social media found views at large do not coincide with the ones obtained from student surveys, because adult point of view is based on the memories about the experience in Latvian education system at soviet and national awakening times, but actual happenings in schools seem to

have naturally evolved, the situation has changed and the focus of current student problematic is different.

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ORIGINAL RESEARCH PAPER

LATVIAN SPORTSPEOPLE REPRESENTATION IN ENGLISH AND LATVIAN WIKIPEDIAS

Ieva Rudzinska

Latvian Academy of Sport Education

Address: 333 Brīvības Street, Riga, LV-1006, Latvia

Phone: 37167543445, fax: +37167543480

E-mail: Ieva.Rudzinska@lspa.lv

Abstract

The goal was to study Latvian sportspeople representation in English and Latvian Wikipedias in 2015. The analyses allowed identifying three main Latvian sportspeople related categories in English Wikipedia: “Latvian sportspeople”, “List of Latvian sportspeople” and “Latvian sports related lists”, a category “Latvijas sportisti” in Latvian Wikipedia. In “Latvian sportspeople” 1018 sportspeople were listed by family names, starting with Artis Ābols and ending with Ainārs Zvirgzdiņš, by sports – from Latvian alpine skiers to Latvian weightlifters. In “List of Latvian sportspeople” were included 99 most notable Latvian sportspeople, representing 24 sports. The largest athlete frequency per sport (14) was in 3 sports: athletics, basketball and luge. From 5 to 10 sportspeople were in 6 sports: rowing, bobsleigh, volleyball, ice hockey, judo and tennis, 15 sports were represented by 1 to 4 athletes. In Latvian Wikipedia in the category “Latvijas sportisti” were 1186 sportspeople from 38 sports. Statistical analysis allowed finding moderate Pearson correlations between the numbers of sportspeople in the category “Latvian sportspeople” and “List of Latvian sportspeople”, EN (0.60; Sig.<0.01); “List of Latvian sportspeople”, EN and “Latvijas sportisti”, LV (0.62; Sig.<0.01), strong correlation between “Latvijas sportisti”, LV and “Latvian sportspeople”, EN (0.93; Sig.<0.01), $n=25$. Wilcoxon Signed Ranks Test showed that difference between the number of Latvian sportspeople per sport in “Latvian sportspeople”, EN and “Latvijas sportisti”, LV is moderate and significant (Sig.<0.05), but the difference between “Latvian sportspeople”, EN and “List of LV sportsmen”, EN, and between “List of LV sportsmen”, EN and “Latvijas sportisti”, LV is large and significant (Sig.<0.01).

Key words: Latvian sportspeople, English Wikipedia, Latvian Wikipedia

Introduction

Wikipedia, launched in 2001, is a collaborative global encyclopedia, which is continually created and updated: people of all ages and cultural and social backgrounds can write Wikipedia articles, add information, cross-references, or citations within Wikipedia's editing policies and to an appropriate standard. Wikipedia announces that contributors do not need any qualifications (Wikipedia, 2013).

Wikipedia is a valuable resource, which depends on people work, and covers their interests and wants (Edwards, 2011). On the other hand, Wikipedia as knowledge formation online presents uncritical stance, conceptualizing the cyber world as an unfiltered expression of real world social trends (Adams, Brückner, 2015).

Back in times of Enlightenment was published French Encyclopedia (1752-1771), which had major contribution to civic society. It not only summarized public good, but also expanded public rights and liberties. It had 28 authors – brilliant philosophers like Voltaire and Diderot, who were not paid, but highly privileged to make their contribution. Wikipedia has about 318 times more articles and about 85 000 active contributors, and it also expands freedom, being an enormous public forum. Its creation is based on the idea that a vast number of people are able to generate more knowledge than a small number of outstanding experts (Edwards, 2011).

At present, however, the circle of English Wikipedia authors is limited; its articles are written and edited by largely anonymous volunteers. Anyone can write and make changes to Wikipedia articles, except in limited cases where editing is restricted to prevent disruption or vandalism. In Latvian Wikipedia it is not required to be logged-in to create a new article on the Latvian Wikipedia (Wikipedia, 2016).

Wikipedia context is organized in categories. However, there persists difficulty in generating and maintaining a coherent system of categories, Wikipedia content is somewhat incoherent and amorphous. Adams, and Brückner analyzed the category of 452 living “American Sociologists” listed on Wikipedia in August 2014, and found a mixture of notable academics (about 60%), social activists and social workers, the occasional motivational speaker, and a surprising number of not particularly notable sociologists ... (Adams & Brückner, 2015).

Wikipedia is becoming increasingly popular globally and by far it is the most visited on educational and reference material (Raine & Tancer, 2007). From a philosophical point of view Jandric (Jandric, 2010) asserts that Wikipedia creates a virtual anarchist society, based on knowledge

network. Those, writing to the world, participate in the creation of collective intelligence.

Oliveira has revealed a paradox in young people attitude to Wikipedia as a source of knowledge: although young people consider Wikipedia to be unreliable source of information (more credible sources of information are books), it is declared to be their primary source of information (Oliveira, 2013). Also Blikstad-Balas investigation has revealed “a didactic challenge: the students’ preferred knowledge source ... is a knowledge source they are not intended or in many cases not allows to use” (Blikstad-Balas, p.2.). Wikipedia uses reliable sources – information must be supported by footnotes and general references, therefore students engage in correct citation practice. Szesnat research shows that educational use of Wikipedia is at least twofold: it can be used as a database for knowledge and as a teaching tool (Szesnat, 2006). Main drawback of Wikipedia in Tardy (Tardy, 2010) opinion is that students use it as a primary research source of information (Tardy, 2010). In this article is explored the potential of Wikipedia as a database for knowledge.

The number of entries in national Wikipedia per countries is different. In 2011 Latvians (with less than 20,000 entries) were less active than Lithuanians (less than 50,000 entries) and considerably less active than Estonians (slightly less than 70,000 entries). In 2014 share of Latvian Wikipedia in Baltic Wikipedias was 26.5%, share of Lithuanian Wikipedia was 67.3% (List of Wikipedias, 2014).

Material and methods

The aim of the article was to investigate how Latvian sportspeople were represented in English and Latvian Wikipedias in 2015.

The objective of the study was to find out which sports are most widely represented in English and Latvian Wikipedias, what are the differences in sportspeople representation in both languages.

The subjects of the study were Latvian sportspeople in English and Latvian Wikipedias.

The methods of study were qualitative – text analysis, and quantitative – mathematical statistics. The tasks of the study were to study how was the information categorized in both languages.

Starting from year 2010 in Latvian Academy of Sport Education has been conducted research on Latvian sportspeople representation in Latvian in English Wikipedias.

First, an attempt was made to identify categories, in which Latvian sportspeople are represented in both languages. Latvian sportspeople in

English Wikipedia was sought for by entering most popular sportsmen names, like Jānis Lūsis, Jānis Daliņš, Laura Ikauniece, etc.

From the pages, devoted to these sportspeople, were found categories, in which they were included. The identified categories were used for finding more sportspeople.

Further attempts to seek for Latvian sportspeople were made, using such categories as: Latvian sportsmen, Latvian sportswomen, Latvian hockey players, and Latvian race walkers – representatives of most popular sports in Latvia.

With SPSS Statistics 20 were found Pearson correlations between sportspeople representation and significant differences in the number of sportspeople in different sports, and in both English and Latvian Wikipedia.

Results

Information about Latvian sportspeople in Wikipedias is organized in categories, sub-categories and pages.

The analyses allowed identifying three main Latvian sportspeople related categories in English Wikipedia: “Latvian sportspeople”, “List of Latvian sportspeople” and “Latvian sports related lists”, and a category “Latvijas sportisti” in Latvian Wikipedia.

Less widely represented categories are: “Sport in Latvia” and “Latvia at the Olympics” in English Wikipedia and “Latvijas labāko sportistu top 10” and “Sports Latvijā” in Latvian Wikipedia. In the category “Sports Latvijā” were represented main sports buildings in Latvia and national teams in different sports, but in “Sport in Latvia” was provided information about seven sports, besides there was a photo gallery.

In the category “Latvian sports related lists” were 3 sub-categories: Association football in Latvia, Baltic States sports-related lists, Lists of Latvian sportspeople and 18 pages: List of ASK Riga players, Latvian Chess Championship, List of football clubs in Latvia, List of Latvian football transfers summer 2007, 2010, 2011, 2012, 2013, 2014, 2009-2010, 2010-2011, 2011-2012, 2012-2013, 2013-2014, 2014-2015, list of football stadiums in Latvia, Latvian records in athletics, List of Latvian records in swimming.

For each sportsperson were identified many other categories, in which they were included. Thus, for outstanding Latvian javelin thrower Jānis Lūsis were found the following categories: 1939 births, Living people, Olympic athletes of the Soviet Union, Olympic gold medalists for the Soviet Union, Olympic silver medalists for the Soviet Union, Olympic bronze medalists for the Soviet Union, Soviet javelin throwers, Latvian javelin throwers, Athletes (track and field) at the 1964 Summer Olympics,

Athletes (track and field) at the 1968 Summer Olympics, Athletes (track and field) at the 1972 Summer Olympics, Athletes (track and field) at the 1976 Summer Olympics, Armed Forces sports society athletes, People from Jelgava, Olympic medalists in athletics (track and field, European Athletics Championships medalists, International Association of Athletics Federations Hall of Fame inductees.

Further are reflected the peculiarities of sportspeople representation in the main categories – Latvian sportspeople, EN; List of Latvian sportspeople, EN and Latvian sports related lists, EN and “Latvijas sportisti”, LV in both Wikipedias.

1. Latvian sportspeople

In 2015 in the category “Latvian sportspeople” were 56 subcategories, among them: Latvian sportsmen, Latvian sportswomen, Lists of Latvian sportspeople, Sportspeople from Liepāja, Latvian sportspeople in doping cases, Latvian expatriate sportspeople, Olympic competitors from Latvia, Latvian ice hockey coaches, Latvian tennis coaches, Latvian volleyball coaches, Latvian sports coaches, Latvian sportspeople stubs, Latvian tennis coaches, and Latvian football managers. In 2016 the category “Sportspeople from Liepāja” was changed to “Sportspeople by city or town in Latvia”. Sportspeople were listed by family names in the order of Latvian alphabet, starting with “A” (Artis Ābols) and ending with Z (Ainārs Zvirgzdiņš), and also by their sports, listed in alphabetic order, starting with “A” (Latvian alpine skiers) and ending with “W” (Latvian weightlifters). Listed by sports altogether were 1018 sportspeople from 42 sports.

In the category “Lists of Latvian sportspeople” were 3 pages: List of Latvians in Kontinental Hockey League, List of Latvians in NHL, List of Latvian sportspeople.

In the category “Latvian sportsmen” were 6 categories: Latvian male Alpine skiers, cyclists, ice dancers, single skaters, sport shooters, tennis players, and 2 separate pages, devoted to Martins Dukurs and Guntis Osis.

2. List of Latvian sportspeople

In the category “List of Latvian sportspeople” in English Wikipedia in 2015 were included 99 sportspeople, representing 24 sports: athletics, basketball, beach volleyball, biathlon, bobsleigh, canoeing, cycling, fencing, figure skating, gymnastics, ice hockey, judo, luge, modern pentathlon, rowing, shooting, short track speed skating, skeleton, speed skating, swimming, tennis, volleyball, weightlifting, wrestling.

Considering athlete frequency by sport, was noticed that the greatest number of athletes (14) was found in 3 sports: athletics, basketball and luge. From 5 to 10 sportspeople were in 6 sports: rowing (9), bobsleigh (8),

volleyball (7), ice hockey (7), judo (6), tennis (5). 15 sports, however, were represented just by 1 to 4 athletes. No sportspeople were in the category of Alpine skiers.

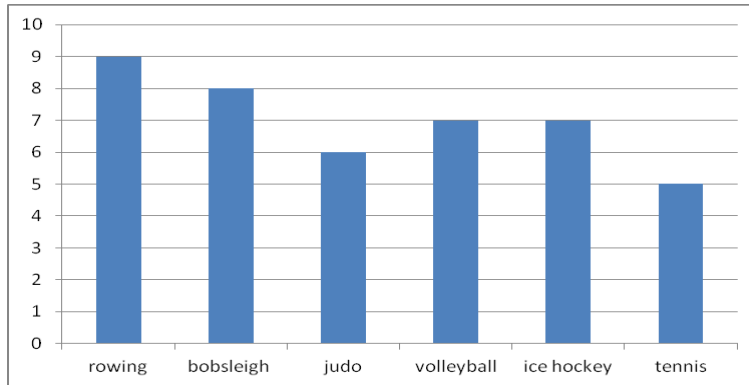


Figure 1. Frequency of sportspeople per sports in the category List of Latvian sportspeople, EN. Group 2

Athletics in the category was represented by 14 athletes, among them the most famous are: Jānis Daliņš, born in 1904 – the best athlete of pre-World War II Latvia, Jānis Lūsis, who in 1987 IAAF was nominated as the all-time greatest javelin thrower in the world, raising heptathlon star Laura Ikauniece-Admidaņa, born in 1992.

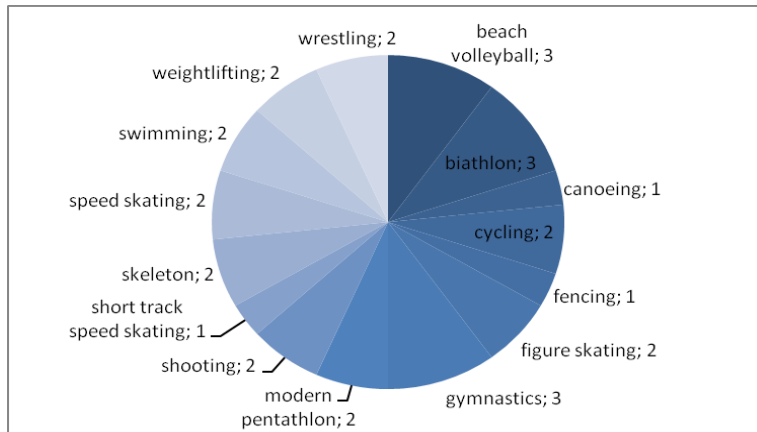


Figure. 2. Frequency of sportspeople per sports in the category List of Latvian sportspeople, EN. Group 3

Political background has influenced culture: personal information in Soviet times was given according to the norms of Russian culture, for

example, Jānis Lūsis native name in 2015 still was given as Яанис Волдемарович Лусис and Full name as Yanis Voldemarovich Lusis ("Jānis Lūsis", Wikipedia, 2015).

Separate pages in the category were devoted to 3 more sportsmen: Guntis Lavrinovičs, Haralds Blaus and Juris Silovs.

The number of sportspeople in the category per sport was grouped in 3 frequency groups:

- More than 10 (3 sports: athletics, basketball, luge)
- From 5 to 10 (6 sports, Fig.2)
- From 1 to 4 (15 sports, Fig.3)
- No sportspeople (Alpine skiing)

3. *Latvijas sportisti*

In Latvian Wikipedia in the category “Latvijas sportisti” in 2015 were represented sportspeople from 38 sports, altogether 1186, in the category were 41 sub-categories. Categories in Latvian and English Wikipedia are different. Thus, in Latvian Wikipedia in the category “Latvijas sportisti” there was not such a category as “Latvijas šķēpa metēji”, there is only a category “Šķēpa metēji”, where were the sportsmen from the whole world.

In Latvian Wikipedia were also such categories as “Thus, the content of the categories “Sports Latvijā” in Latvian Wikipedia, and “Sport in Latvia” in English Wikipedia is completely different.

4. *Frequency of sportspeople per sports*

Table 1 with two continuations presents the numbers of sportspeople per sports in in 3 main Latvian sportspeople related categories

Table 1

Frequency of sportspeople per sports in three main Latvian sportspeople related categories

| Categories/ sports | Alpine Skiing | Athletics | Basketball | Beach Volleyball | Biathlon | Bobsleigh | Canoeing | Cycling |
|--------------------------|---------------|-----------|------------|------------------|----------|-----------|----------|---------|
| Latvian sportspeople, EN | 3 | 110 | 79 | 4 | 12 | 26 | 7 | 3 |
| List of LV sportsmen, EN | 0 | 14 | 14 | 3 | 3 | 8 | 1 | 2 |
| Latvijas sportisti, LV | 0 | 144 | 164 | 0 | 20 | 32 | 7 | 62 |

Table 1. Continuation 1

| Categories/ sports | Fencing | Figure Skating | Gymnastics | Ice Hockey | Judo | Luge | Modern Pentathlon | Rowing | Shooting |
|--------------------------|---------|----------------|------------|------------|------|------|-------------------|--------|----------|
| Latvian sportspeople, EN | 2 | 21 | 44 | 141 | 7 | 22 | 5 | 10 | 7 |
| List of LV sportsmen, EN | 1 | 2 | 3 | 7 | 6 | 14 | 2 | 9 | 2 |
| Latvijas sportisti, LV | 1 | 5 | 5 | 207 | 8 | 28 | 3 | 14 | 5 |

Table 1. Continuation 2

| Categories/ sports | Short Track Speed Skating | Skeleton | Speed Skating | Swimming | Tennis | Volleyball | Weightlifting | Wrestling |
|--------------------------|---------------------------|----------|---------------|----------|--------|------------|---------------|-----------|
| Latvian sportspeople, EN | 2 | 3 | 4 | 11 | 3 | 9 | 5 | 0 |
| List of LV sportsmen, EN | 1 | 2 | 2 | 2 | 5 | 7 | 2 | 2 |
| Latvijas sportisti, LV | 4 | 4 | 6 | 13 | 9 | 17 | 9 | 11 |

5. Correlations between main Latvian sportspeople related categories

Table 2 summarizes Pearson correlations between the numbers of sportspeople in 3 main Latvian sportspeople categories: Latvian sportspeople, EN; List of LV sportsmen, EN, and Latvijas sportisti, LV.

Table 2

Pearson correlations between 3 main Latvian sportspeople related categories

| | | Latvian sportspeople, EN | List of LV sportsmen, EN | Latvijas sportisti, LV |
|--------------------------|---------------------|--------------------------|--------------------------|------------------------|
| Latvian sportspeople, EN | Pearson Correlation | 1 | ,600** | ,926** |
| | Sig. (2-tailed) | | ,002 | ,000 |
| | N | 25 | 25 | 25 |
| List of LV sportsmen, EN | Pearson Correlation | ,600** | 1 | ,621** |
| | Sig. (2-tailed) | ,002 | | ,001 |
| | N | 25 | 25 | 25 |
| Latvijas sportisti, LV | Pearson Correlation | ,926** | ,621** | 1 |
| | Sig. (2-tailed) | ,000 | ,001 | |
| | N | 25 | 25 | 25 |

**. Correlation is significant at the 0.01 level (2-tailed).

According to Raščevska and Kristapsone Pearson correlation between category “Latvijas sportisti”, LV and “Latvian sportspeople”, EN is strong, and between category “Latvijas sportisti”, LV and “List of Latvian sportspeople”, as well as between category “List of Latvian sportspeople”, EN and “Latvian sportspeople”, EN is moderate (Raščevska & Kristapsone, 2000).

6. Significant differences in the number of sportspeople in 3 main categories

Table 3 shows significant differences in the number of Latvian sportspeople in 3 main categories in English and Latvian Wikipedia.

Table 3

Test Statistics, Wilcoxon Signed Ranks Test

| | num_ Latvian sportspeople, EN – num_List of LV sportsmen, EN | num_List of LV sportsmen, EN- num_ Latvijas sportisti, LV | num_ Latvian sportspeople, EN – num_ Latvijas sportisti, LV |
|------------------------|--|---|---|
| z (r) | -3,874 ^{b1} (r= 0.55) | -4,003 ^{b2} (r= 0.57) | -2,175 ^{b2} (r= 0.31) |
| Asymp. Sig. (2-tailed) | ,000 | ,000 | ,030 |

^{b1}. Based on positive ranks. ^{b2}.Based on negative ranks.

In accordance with Cohen differences are large, if $r = 0.5$; moderate, if $r = 0.3$, and small, if $r = 0.1$ (Cohen, 1988). The difference between the number of Latvian sportspeople per sport in the category Latvian sportspeople, EN and Latvijas sportisti, LV is moderate and statistically significant (Sig.<0.05), but the difference between the number of Latvian sportspeople per sport in the categories Latvian sportspeople, EN and List of LV sportsmen, EN, and between the categories List of LV sportsmen, EN and Latvijas sportisti, LV is large and statistically significant (Sig.<0.01).

More vividly the differences between the number of Latvian sportspeople per sport in the categories Latvian sportspeople, EN and Latvijas sportisti, LV per different sports are shown in Fig. 4. to Fig. 6.

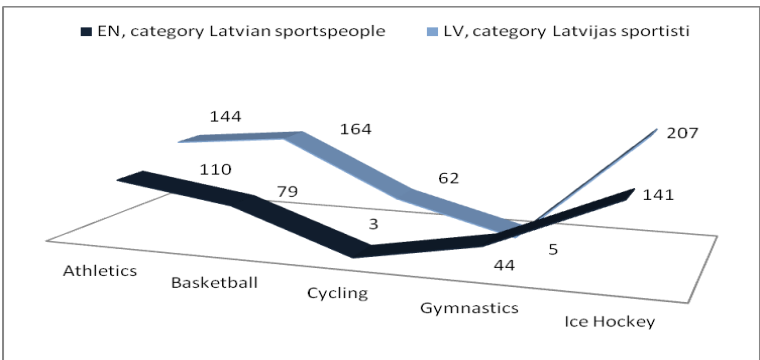


Figure 4. Number of Latvian sportspeople per sport in the category Latvian sportspeople, EN vs category Latvijas sportisti, LV. Largest Latvian sportspeople representation per sport

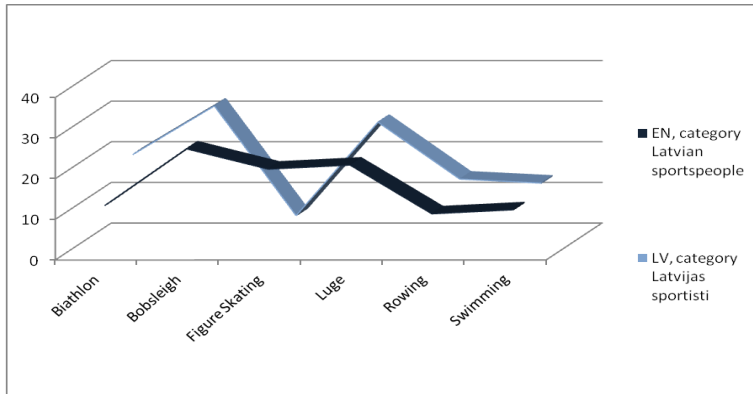


Figure 5. Number of Latvian sportspeople per sport in the category Latvian sportspeople, EN vs category Latvijas sportisti, LV. Medium Latvian sportspeople representation per sport

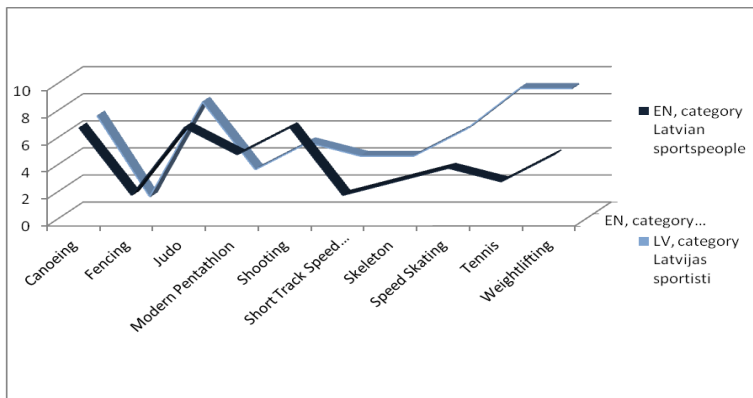


Figure 6. Number of Latvian sportspeople per sport in the category Latvian sportspeople, EN vs category Latvijas sportisti, LV. The smallest Latvian sportspeople representation per sport

Conclusions

Three main Latvian sportspeople related categories in English Wikipedia are Latvian sportspeople, List of Latvian sportspeople and a category “Latvijas sportisti” in Latvian Wikipedia.

Less widely represented categories are “Latvian sports related lists”, “Sport in Latvia” and “Latvia at the Olympics” in English Wikipedia and “Latvijas labāko sportistu top 10” and “Sports Latvijā” in Latvian Wikipedia. Separate pages in the categories are devoted to sportspeople, who do not fit any of the formed ones.

Categories in Latvian and English Wikipedia, as well as their contents are different, e.g., in Latvian Wikipedia in the category “Latvijas sportisti” there was not such a category as “Latvijas šķēpa metēji”, there was only a category „Šķēpa metēji”, where were represented the sportsmen from the whole world. To obtain the number of Latvian javelin throwers, one must use the List of all javelin throwers in the world, represented in the category “Šķēpa metēji”, and count the Latvian ones.

In the category “Sports Latvijā”, LV were represented main sports buildings in Latvia and national teams in different sports, but in the category “Sport in Latvia” was provided information about seven sports, besides there was a photo gallery. The conclusion can be drawn that the content of the categories “Sports Latvijā” in Latvian Wikipedia, and “Sport in Latvia” in English Wikipedia is completely different.

In 2015 in the category “List of Latvian sportspeople” were included 99 most notable Latvian sportspeople, representing 24 sports. The number of sportspeople per sport was grouped in 3 frequency groups: more than 10 (athletics, basketball, and luge), from 5 to 10 (6 sports), from 1 to 4 (15 sports). In the category “Latvian sportspeople”, EN were 1018 sportspeople, and in Latvian Wikipedia in the category “Latvijas sportisti” were 1186 sportspeople from 38 sports.

Three main Latvian sportspeople related categories in both English and Latvian Wikipedias correlate: moderate Pearson correlations exists between the numbers of sportspeople in the category “Latvian sportspeople” and “List of Latvian sportspeople”, and between “List of Latvian sportspeople”, EN and “Latvijas sportisti”, strong correlation exists between “Latvijas sportisti”, LV and “Latvian sportspeople”, EN. Still in the numbers of sportspeople in the mentioned categories were found significant differences: the difference between the number of Latvian sportspeople per sport in “Latvian sportspeople”, EN and “Latvijas sportisti”, LV is moderate, but the difference between “Latvian sportspeople”, EN and “List of LV sportsmen”, EN, and between “List of LV sportsmen”, EN and “Latvijas sportisti”, LV is large.

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ORIGINAL RESEARCH PAPER

PHYSICAL ACTIVITY AND HEALTH BEHAVIOR OF STUDENTS OF UNIVERSITY OF PHYSICAL EDUCATION AND SPORT IN BIALA PODLASKA

Artur Litwiniuk¹, Ryszard Cieśliński¹, Elżbieta Huk-Wieliczuk¹,
Władysław Jagiello², Bartłomiej Barczyński²

¹J. Piłsudski University of Physical Education in Warsaw,
Faculty of Physical Education and Sport in Biała Podlaska,
Address: 2 Akademicka Street, Biała Podlaska, 21-500, Poland

²Gdańsk University of Physical Education and Sport,
Faculty of Physical Education, Gdańsk, Poland
E-mail: artur.litwiniuk@awf-bp.edu.pl

Abstract

Increasing physical activity is more and more often accompanied by an incorrect lifestyle and health disorder. The aim of this research was to diagnose physical activity and health behavior students of University of Physical Education and Sport in Biala Podlaska (Poland). The research comprised 162 students (47 sportsmen) of University of Physical Education and Sport in Biala Podlaska (Poland). The average age of respondents was ($M = 20.27$ years). The subject was interviewed by means of questionnaire IPAQ (Sjöström et al. 2000) and HBUSQ (Litwiniuk & Grants 2010) and physical features body height and body weight were assessed. Slightly less than every third one (28.1%) is a person who systematically attends sporting activities organized at various kinds of sports clubs, including Academic Sports Associations while the remaining 71.3%, of respondents participated individually in organized recreational activities as well as in agility-based educational activities. The largest contribution in total volume of weekly physical activity of students and their energy expenditure have physical effort of medium and high intensity. Healthy behaviors promoting health in the field of nutrition prevailed mainly among sportsman students taking sports. Physical Education students as future teachers, instructors and trainers are well prepared to represent authority and to promote healthy behaviors among alumnus.

Key words: *physical activity, health behavior, students, IPAQ 7 days, HBUSQ*

Introduction

From the point of view of health sciences, university students constitute a social group of extraordinary significance (Barabasz & Zadarko, 2011). Insufficient physical activity constitutes an important but still underestimated factor which affects health condition, morbidity and mortality of societies (Leon, 1987). A decline in physical activity among school-aged children and youth as well as among university students and the rest of the population is becoming more and more a public health issue (Pate et al., 1995; Blair et al., 2001).

A meta-analysis of the available studies shows that physical activity reduces the occurrence of atherosclerosis risk factors among healthy population and contributes to the reduction of the incidence of other lifestyle diseases. The positive effects of regular physical exercise in prophylaxis were demonstrated in long-lasting epidemiological studies carried out in the United States (Morris, et al. 1993; Paffenbarger et al., 1993; Drygas et al., 2000).

Physical culture at universities and in other types of higher education institutions should play an important role by stimulating the subsequent psychophysical development as well as by constituting a continuation of previously acquired movement, hygiene and health habits of students. The tradition of conducting research on physical culture of students in Poland can be traced back to the late 19th century. The very first dissertations referred to health conditions, physical development and physical fitness as well as habits and conditions of hygiene (Mirkiewicz, 1983; Muszkieta & Bronikowski, 2003; Litwiniuk et al., 2004; Baj-Korpak et al., 2010).

Until a few years ago, there was a scarcity of research concerning physical and sports activity of students. Recently, however, the situation has been slightly changing as new projects emerge, including the ones undertaken in cooperation with partner universities not only from Europe.

Numerous studies prove that additional advantage resulting from physical activity is the role it plays in the fight against social pathologies such as tobacco smoking, alcohol abuse and the use of psychoactive substances, including harmful drugs. As a rule, physical activity eliminates addictions mainly due to physiological reasons. Physical activity is a form of leisure-time occupation (sporting, recreational and tourism activity). The level of physical activity and the diet, indirectly, may be indicative of the vitality of not only students but also of the whole population. Physical activity should be an important element of health behaviours of young people. Nowadays, it is desirable for a person to devote a part of their leisure time to motor activity. It has its explanation in the positive impact on

the somatic, social and mental health (Caspersen, 1994; Strawbridge, et al. 2004). Implementation of research results which indicate the positive effects of regular physical effort is highly necessary not only in Poland. Perhaps, this will affect the quality of life of an individual as well as of the whole society (Haskel et al., 1992; Charzewski, 1997; Martinez-Gonzales et al., 2001; Haskell et al., 2007; Biernat & Tomaszewski, 2015).

Developing positive habits of spending leisure time, ways of strength recovery and active recreation requires knowledge of the current level of participation of selected social groups and, in particular, university students, i.e. individuals with a higher level of education, who in the future will contribute to governing the country and making key economic choices and health-related decisions (Eurobarometer, 2010). The purpose of this research was to diagnose physique, physical activity and health behavior of university students from the University of Physical Education and Sport in Biala Podlaska (Poland).

Material and methods

The research included 162 male students from the University of Physical Education and Sport in Biala Podlaska (Poland). Forty-seven study participants (28.1%) were sportsmen (handball, volleyball, basketball, football, MMA, taekwon-do, swimming and athletics). The average age of respondents was ($M=20.27$ years) the subjects were interviewed with the use of IPAQ (Sjöström et al. 2000) and HBUSQ (Litwiniuk, Grants 2010) questionnaires. The students' body height and body weight were assessed. The measurements were conducted according to the principles accepted in anthropometry, using standardized instruments. The procedures of the study were reviewed and accepted by the ethical committee. The results obtained were subjected to a statistical analysis using Statistica 12.0 software.

Results

Physical activity is one of the key elements of a healthy lifestyle. Analysis of the study material indicated that the majority of respondents preferred an active model of spending their leisure time, which may be linked to the area of their studies.

Slightly less than a third of the subjects (28.1%) regularly attended sporting activities organised at various kinds of sports clubs, including Academic Sports Associations, while the remaining 71.3%, of the respondents participated individually in organised recreational activities as well as in physical educational activities (Fig. 1).

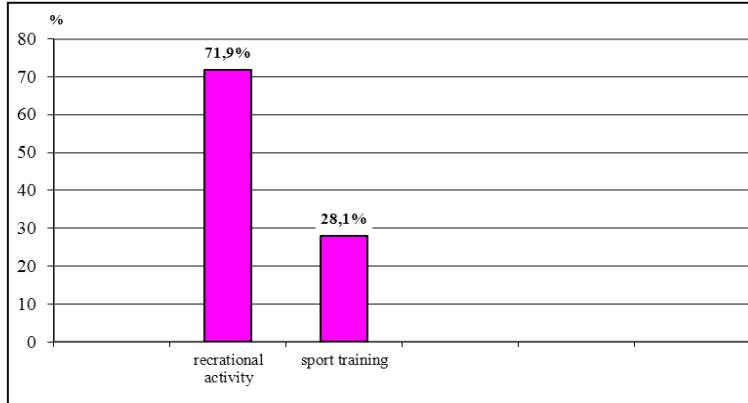


Figure 1. Type of physical activity of respondents (n=162)

There were no significant differences in physical activity associated with intensity. The results of the study showed that most students are characterised by high physical activity (Fig. 2).

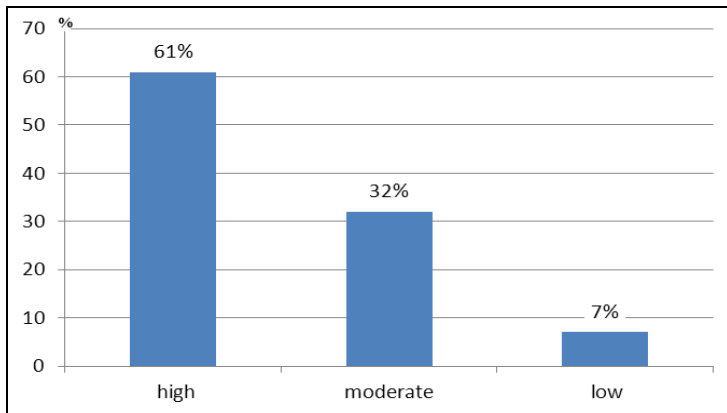


Figure 2. Physical activity percentage summary diagnosed with the use of IPAQ questionnaire taking into account intensity (n=162)

More than half of the respondents participated in sports and recreational activities 5 times a week, while similar percentage of

respondents claimed to have been involved in sports activities either 3 times a week or everyday (Fig. 3).

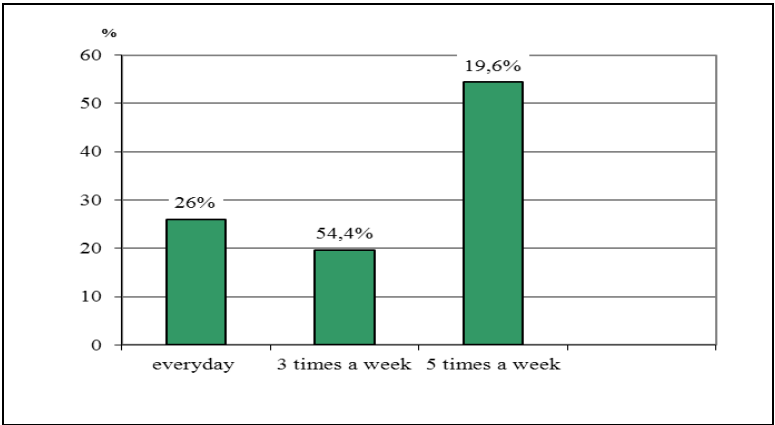


Figure 3. Frequency of sports and recreational activity participation of respondents (n=162)

Adequate nutrition is one of the elements of a healthy lifestyle. Nevertheless, as proved by the research results obtained with the use of Health Behaviour in University Students Questionnaire (HBUSQ), it is only every third student (31.7%) who has meals on a regular basis during the day, while students who do sports have meals twice as often (68.2%).

Table 1

Diet of the student respondents depending on the type of sports and recreational activity (n=162)

| | | Student (n=115) (%) | Student athletes (=47) (%) |
|--|----------------------|------------------------|-------------------------------|
| Regular consuming of meals | | 31,7 | 68,2 |
| Number of meals during a day | Below 3 | 7 | - |
| | Three times per week | 56 | 22 |
| | Five times per week | 37 | 78 |
| Seven day per week consuming fruits and vegetables | | 7 | 36 |
| Limited of sweets | | 6 | 12 |
| Taking extra supplements of diet (complete diet) | | 67 | 100 |
| Salt extra in a meal | | 31 | 29 |

The number of meals remains unsatisfactory as 37% of the students and 60% of student athletes eat 4-5 meals a day, which has a beneficial impact on the prevention of obesity and helps to develop good eating habits. On the other hand, a small number of students, i.e.: 6% of the students and 12% of the student athletes reduce the consumption of sweets. Additionally 31% of the students and 29% of the student athletes add salt to foods. The

level of awareness of both students and student athletes may influence the use of dietary supplements, as meals consumed in student canteens do not ensure a balanced diet adjusted to physical effort during practical and educational courses as well as training.

More than a half of the respondents admitted to consuming alcohol on a weekly basis. Alcohol consumption is more frequent among regular students than student athletes. A weekly consumption of beer concerns 51% of the students and 78% of the student athletes. This is due to the fact that according to some dietary theories, low-alcohol drinks contribute to a quicker recovery after a training session. On the other hand, consumption of spirits, i.e. vodka and alcoholic drinks is less frequent, while champagne or wine are drunk sporadically and the frequency of their consumption among students and student athletes is reversed (Tab. 2).

Table 2

Frequency of alcoholic beverages consumption by students depending on the type of sports and recreational activity (n=162)

| Kind of alcohol | Frequency (%) | | | | | | | | | |
|-----------------|---------------|------------------|---------------|------------------|----------------|------------------|---------|------------------|---------|------------------|
| | Everyday | | In every week | | In every month | | Seldom | | Never | |
| | Student | Student athletes | Student | Student athletes | Student | Student athletes | Student | Student athletes | Student | Student athletes |
| Beer | - | - | 51 | 78 | 41 | 11 | 3 | 1 | 7 | - |
| Wine | - | - | - | - | 6 | 3 | 87 | 96 | 1 | 7 |
| Wodka | - | - | - | - | 37 | 54 | 61 | 46 | 2 | - |
| Champagne | - | - | - | - | - | - | 84 | 99 | 16 | 1 |
| Drinks | - | - | 3 | 7 | 47 | 74 | 46 | 15 | 4 | 4 |

The majority the respondents declared the lack of addiction to smoking, while only 11% of the respondents admitted to smoking on an occasional basis or for social reasons ("social smoking"). Only a few students stated that they smoked but they did it very rarely (Fig. 4).

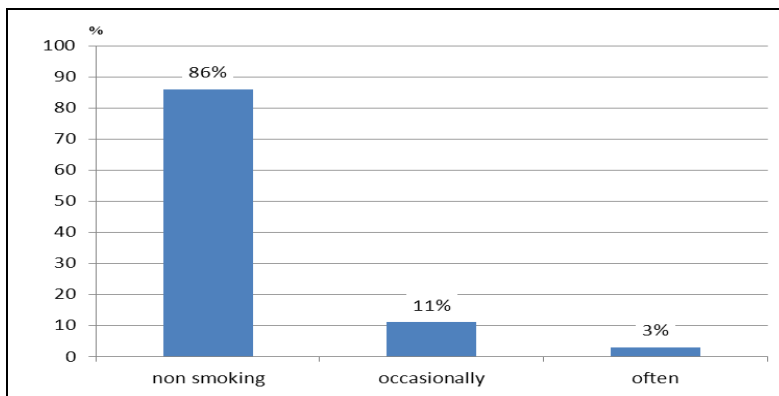


Figure 4. The prevalence of smoking among students (n=162)

It has been reported that competitive athletes sometimes use tobacco and alcohol despite the fact that these substances are harmful to human health. The majority of them have no beneficial effects on sports performance.

Discussion

The present state of knowledge referring to the lifestyle of academic youth does not provide an explanation to numerous matters concerning the way and organisation of leisure time of students, including student athletes. Research on physical activity was conducted with the use of various diagnostic tools. IPAQ questionnaire applied hereinafter enables objective analysis and comparison of different social and vocational groups (Biernat & Stupnicki, 2005; Thomas et al., 2005; Sjöström et al., 2006; Bouchard & Blair, 2007). Similarly to the assessment of health and risk behaviours, unifying the tools would be beneficial (Litwiniuk & Grants, 2010).

This article concerns health behaviours characteristic to a specific vocational group of Physical Education students. Research has shown that students of Physical Education at Polish and other European universities demonstrated a higher level of physical activity in comparison to students in other educational disciplines (Wojtyczek, 2006). This is probably due to the specific nature of this discipline and it stems from the fact of shaping the habits and sports interests in previous years.

A crucial element of a healthy lifestyle is the avoidance of health-risk behaviours. Research has shown that the area of study determines the level of physical activity and health-risk behaviours such as avoidance of smoking, alcohol abuse and avoidance of psychoactive substances. Research results were much different from the ones that were obtained from students of other types of higher education institutions (Mellibruda et al., 2003; Pach et al., 2006; Rzeznicki et al., 2007).

Other authors' research shows that alcohol is most popular among students, followed by tobacco and "cannabis products" such as marijuana and hashish. In the case of smoking, addiction may occur after a few weeks of occasional smoking. It is also important to note that smokers are 4-5 times more at risk of developing alcohol addiction in comparison to non-smokers (Zatorski & Przewoźniak, 1996; Kurpas et al., 2013; Kalupa et al., 2013; Wójtowicz-Chomicz, et al., 2014).

Rational nutrition involves, among others, the number (4-5 times a day) and regularity of consuming meals – breakfast, eaten before going to university classes is conducive to effective learning and training and it ensures better well-being (SCF/CS/NUT/SPORT/5, 2001; WHO Technical Report Geneva, 2007). The review of the literature has shown that breakfast

is the most important element (Walentukiewicz, 2009). Low blood glucose concentration after a long night pause can result in mental or psychological impairments among those who did not have breakfast. The lack of this meal leads to forenoon fatigue and causes reduction of cognitive abilities, especially the ability of recalling (Skibniewska et al. 2007; Markiewicz, et al., 2007). In the case of Physical Education students, rational nutrition is hindered by a great number of practical classes (Maughan, 2000; Zajac et al., 2007).

Conclusions

According to the latest standards of the World Health Organization (WHO) and American College of Sports Medicine (ACSM), all the surveyed students of physical education followed all recommendations regarding healthy physical activity and their level of physical activity was mostly determined by practical classes at university and training. Medium- and high-intensity physical activity constituted the largest part of weekly physical activity and energy expenditure of the students.

Healthy behaviours in the field of nutrition prevailed mainly among students who practised sports. No health-risk behaviours such as alcohol and nicotine abuse or taking psychoactive substances and drugs were observed among the students.

Physical Education students as future teachers, instructors and coaches are well prepared to represent authority and to promote healthy behaviours among school students because during studies they have acquired necessary knowledge and skills which now they can put into practice in school or by conducting sports activities among youth and adults. Previous studies may contribute to an even better diagnosis of lifestyle of students of different faculties in Poland and Europe as a reference material. Research results may contribute to more complementary look at the lifestyle of students and they (results) can provide a basis for organisation of students' leisure and prevention in terms of health-risk behaviours.

Acknowledgements

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ORIGINAL RESEARCH PAPER

**INFLUENCE OF EXCHANGED
NEUROMUSCULAR REGULATION OF
M.GASTROCNEMIUS ON THIS MUSCLE TONE**

**Normunds Vārpa¹, Alvis Paeglītis¹, Zinta Galeja¹, Mati
Paasuke², Jaan Ereline², Helena Gapeyeva², Tatjana Kums²**

¹Latvian Academy of Sport Education

Address: 333 Brīvības Street, Riga, LV – 1006, Latvia

Phone: +37126766214

E-mail: normunds.varpa@lspa.lv

²University of Tartu

Address: 4 Ujula Street, Room 202, 51008 Tartu, Estonia

Phone: + 37 27 376 286

E-mail: Mati.Paasuke@ut.ee

Abstract

On last year's more popular become muscle testing method of applied kinesiology (AK). There is question about what the tester determines with this muscle testing method – maximum voluntary contraction (MVC), force or myoathatical reflex? On science this method is called subjective method. Therefore it is necessary to explain this term “week-tested muscle” and record changes in the body with objective methods. One of the recent articles show that it's significant changes on muscle local blood flow in muscle with normal neuromuscular regulation and exchanged neuromuscular regulation or normal and week-tested muscle. Subcortical level of central nervous system (CNS) coordinates all these systems (muscle local blood flow, motor pattern of active muscle or muscle tone). On literature are articles about normal and exchanged neuromuscular regulation equally about muscle tone, but there is just few interdisciplinary articles. The aim of the study is to compare differences of muscle tone with normal contraction motor pattern and in weak-tested muscle condition on every controlled position. In this experiment participated young healthy women in age 20 – 25. We analyzed myotonometry parameter – frequency (Hz) in 18 gastrocnemius muscles with normal contraction motor pattern and in weak-tested condition obtained irritating the greater omentum in pyloric part of stomach. For tonometry we used Myometer Myoton-3 (Muomeetria Ltd, Estonia). To get results we putted myotonometer on the belly of medial muscle gastrocnemius. Muscles tone was registrated in rest

position, during isometric contraction 60 degree flexion of the knee, then during isometric contraction with 5% of MVC, and then again in rest position for both condition of m.gastrocnemius motor pattern. Results. Analyzing obtained results we didn't found statistically significant changes in muscle tone of every position in both conditions of m.gastrocnemius motor pattern what can be connected with changes of the muscles local blood flow.

Key words: *Normal and weak-tested muscle, muscle tone*

Introduction

From theory of applied kinesiology (AK) (Walther, 2000; Frost, 2002; Rosner, Cuthbert, 2012) it is known that different external or internal influences to the men's body could exchange neuromuscular regulation on the level of organization of motor patterns and observed muscle could become weak-tested or become hypertonic.

From literature it is also known that metabolic activity of muscle cells during static voluntary contraction even in one separate muscle differs. If oxygen consumption rate differs between muscle's motor units, then blood flow through capillaries supplying muscle cells must be regulated according to their metabolic activity (Paeglitis, Kukulis, Eglitis & Galeja, 2014). In the literature from 1970th is described experimentally proved concept of muscle local blood flow redistribution to capillaries feeding active muscle fibers (Paeglitis, 1986; Skards & Paeglitis, 1982; Skards & Paeglitis, 1985; Paeglitis, Kukulis, Eglitis, & Galeja, 2014). These research results showed that parallel with somatic nervous system, which regulates recruitment of muscle motor units, the vegetative nervous system regulates local blood flow redistribution through capillaries feeding active muscle fibers. Incoherent action of these two neural systems leads to inadequate energy supply for active motor units.

Coordination of these two systems takes place in the same regulatory level where motor pattern of active muscle is organised (Solms & Turnball, 2002). These coordination problems were observed in experiment where dynamics of blood flow during static voluntary contraction of leg muscles in two conditions were compared – normal muscles motor pattern organization and in situation when controlled muscles were weak- tested (Gavrona, et al., 2015).

Muscle tone is the normal state of balanced tension in the tissues of the muscle. Coordination of the system takes place in sub cortical level where also motor pattern of active muscle is organized (Solms & Turnball, 2002). If there is motor pattern coordination problems that mean there is

changed muscle local blood flow then this process can be related with changes in muscle tone (Fig.1).

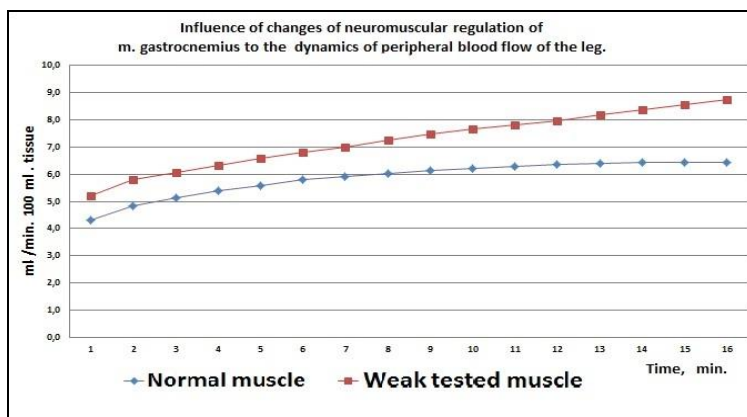


Figure 1. Influence of changes of neuromuscular regulation of *m.gastrocnemius* to the dynamics of peripheral blood flow of the leg (Gavróna, et al., 2015)

From neurophysiology theory it is known if muscle contraction is in tonic condition there will don't be myothatical reflex. When muscle is tested with AK method, muscle get impulse from CNS cortical level, but after approximately 3 seconds must dominate impulse from CNS subcortical level. If muscle still “works” in cortical level there will don't be or will be delayed myothatical reflex. In AK theory it calls “Weak – tested” muscle (Paeglitis & Veseta 2005).

The aim of the study is to compare differences of muscle tone with normal contraction motor pattern and in weak-tested muscle condition on every controlled position.

Material and methods

In this experiment participated young healthy women in age 20 – 25. We analyzed myotonometry parameter – frequency (Hz) in 18 gastrocnemius muscles with normal contraction motor pattern and in weak-tested condition obtained irritating the greater omentum in pyloric part of stomach, because from AK literature it is known that the stomach is the relation with *m.gastrocnemius* (Ramšák & Gerz, 2005). To test condition of *m.gastrocnemius* person was lying on stomach, one leg 60 degree of knee flexion. Subject makes isometric contraction of knee flexion while tester makes provocation (3 seconds knee extension with the same force) (Walther, 2000; Frost, 2002; Rosner & Cuthbert, 2012). If muscle

contraction is in tonic condition there will don't be myothatical reflex (Paeglitis & Veseta 2005) and AK theory calls it “weak – tested muscle”. Experiment was continued for both condition (normal contraction motor pattern and in weak-tested muscle) of *m.gastrocnemius*.

To get tone results we used Myometer Myoton-3 (Muomeetria Ltd, Estonia). The working principle of device is based on dosed impact on muscle belly, after which a muscle as viscous – elastic structure reply with damped oscillation. The muscle elasticity is the ability of the muscle to restore its initial shape after contraction; it is characterized by logarithmic decrement of oscillations amplitude damping. Muscle with high elasticity has lower logarithmic decrement value. Stiffness of muscle characterized the ability of tissue to restore its shape after removing of external force acting on muscle. Myoton 3 has mass of testing end 18 g and it induces oscillation of muscle tissue by a mechanical impact with minimal force (up to 0,4N). The diameter of Myoton 3 testing end was 3mm and stroke time of testing end of device during all measurements was 15 ms (Gapeyeva, et. al., 2012). The area for measurements (on the belly of medial muscle *gastrocnemius*) was identified by manual palpation at muscle contraction. The testing end of myotonometer was placed on previously palpated muscle belly. Points for measurement has been marked by marker symmetrically for muscles of right and left body side. Registering tone characteristics of the observable person was lying on stomach. Muscles tone was registered in rest position (BEFORE 1 and 2), during isometric contraction in 60 degree flexion of the knee (POSITION 1and 3), then during isometric contraction with 5% of MVC (POSITION 2 and 4), and then again in rest position (AFTER 1 and 2) for both condition of *m.gastrocnemius* motor pattern.



Figure 2. Test position 2 and 4

Results

For comparing differences of muscle tone characteristics between two muscle conditions in every controlled position we transposed obtained results in pairs – during normal and during weak-tested conditions accordingly with normal local blood flow regulation and with limited local blood flow.

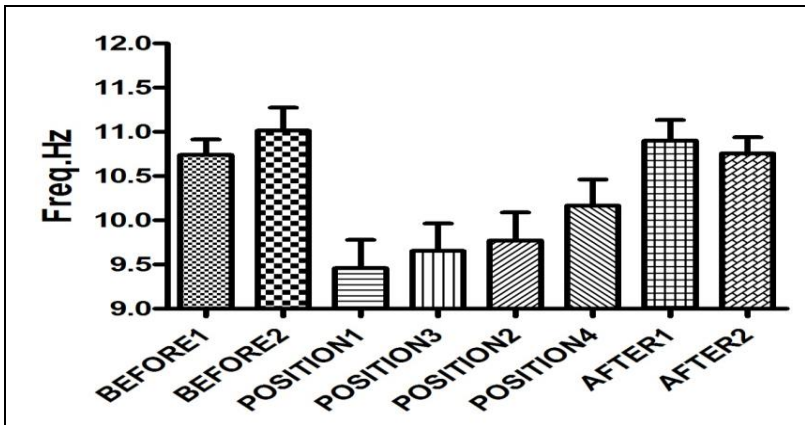


Fig.3. Frequency of muscle tone of *m. Gastrocnemius* in analyzed positions with during normal and weak-tested condition (with and without normal redistribution of local muscles blood flow)

Analyzing obtained results we didn't found statistically significant changes in muscle tone of every position in both conditions of *m.gastrocnemius* motor pattern.

Discussion

From literature it is known that muscle elasticity is the ability of the muscle to restore its initial shape after contraction, it is characterized by logarithmic decrement of oscillations amplitude damping. Muscle with high elasticity has lower logarithmic decrement value. Stiffness of muscle characterized the ability of tissue to restore its shape after removing of external force acting on muscle (Gapeyeva, et.al., 2012). Myotonometer dumping results represents all tissues elasticity. It means, tone includes stiffness results of muscles, blood vessels, etc. This could be point why there are not significant changes on muscle tone on week-tested muscle *gastrocnemius*.

From literature it is known that muscle contraction control could be conscious or unconscious – automatically performed (Solms, Turnbull 2002). From neurophysiology there is information that motor control mainly

is realized involving subcortical levels of CNS – it is unconscious (Shumway-Cook, 1995). In this motor pattern organizing level muscles realize contraction with normal neuromuscular regulation and normal local blood flow redistribution. If muscles contraction control could not be realized in subcortical level of CNS the active muscle shows weak-tested symptoms. If there is exchange neuromuscular regulation, but muscles tractive force is the same, from literature of applied kinesiology we could conclude that this muscles realize contraction in tonic condition – controlled in cortical level (Paeglitis & Veseta 2005), or muscles of synergists must realize the same contraction force (Walther, 2000; Frost, 2002; Rosner & Cuthbert, 2012). This could be another point why there are no significant changes on muscle tone on week-tested muscle *gastrocnemius*.

Local blood flow results of *m.gastrocnemius* with normal and weak – tested muscle is significantly different (Gavrona, et al., 2015), but difference is low on first minutes and test time of myotonometry could be too short what could explain insignificant changes of tissue tone. From obtained results it could be speculated that during myotonometry of weak-tested muscles when motor control realizes through involvement of motor centers of cortical level, test must be done for a long time. And this could be third point why there are no significant changes on muscle tone on week-tested muscle *gastrocnemius*.

Conclusions

There are insignificant differences of muscle tone with normal contraction motor pattern and in weak-tested muscle. Tested normal or exchanged neuromuscular regulation of *m.gastrocnemius* with myotonometer must use several preconditions:

- myotonometer represents various elasticity of tissues;
- synergist muscles can replace agonist muscles contraction force;
- test must be done for a long time.

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REVIEW PAPER

VISUALIZATION EXERCISES IN ALPINE SKIERS TRAINING PROCESS

Katrina Volgemute, Daina Krauksta, Žermēna Vazne

Latvian Academy of Sport Education

Address: 333 Brīvības Street, Riga, LV – 1006, Latvia

Phone: +371 67543410

E-mail: Katrina.Volgemute@lspa.lv

Daina.Krauksta@lspa.lv.

Abstract

Scientists believe that mental training provides positive effect on athletes' success. If the visualization is used in the training process, the athletes level of imagination raises, which improve the ability to monitor their performance in competitions. The study focuses on the role of the imagination in an alpine skier's preparation process, which is one of the aspects of the athletes' psychological preparation that leads to increased results. Developed imagination is able to influence the skiers in several ways: psychologically, emotionally, physically, technically and tactically. The research experimental part is developed and tested in practice whit visualization exercises and tasks. The importance of the experiment is demonstrated and provided as an important part of developing the imagination of skier during preparation process.

Key words: *alpine skiing, psychological training, visualization exercises*

Introduction

The topic of imagery has fascinated many people in sport and physical activity settings for years. It is considered to be one of the most popular performance enhancement techniques or psychological skills because of its versatility in effecting several different outcomes. Whit imagination athletes can improve the ability to concentrate, rise self-esteem, help in case of pain, injury and fatigue. In thoughts, athlete can revive earlier experience, events and feelings that can help them get ready for competitions.

Imagination in sport is the ability to create an image or series of images related to your sport. Visualization or imagination includes all the

sensory use to create or restore some kind of experiences, events and feelings to you mentally for better preparation for competitions. Similarly, imagination is useful to improve the technical performance elements or for error correction (Hanina & Hanin, 2010). Also, many athletes in their minds play pre-competition, competition or after competition plan (Orlick, 1986).

Aim of the study: Based on literary source research and personal experience – develop imagination exercises for alpine skiing athletes.

Materials and Methods

It has been proposed that mental imagery enhances performance by improving key mental factors that heavily influence athletic performance (Callow & Hardy, 2001; Taylor & Wilson, 2005). Mental imagery can improve performance when athletes rehearse general strategies and tactics, specific skills and plays, successful use of positive self-talk, and the overall performance. Furthermore, mental imagery can be used to facilitate effective responses to competitive stress and emotions, and produce feelings of a successful performance and achieving a desired goal (Mortiz, 1996).

One explanation as to why results vary may be the individual differences which can influence the learning and the performance of motor and cognitive skills (Vealey & Greenleaf, 2006). Researchers cannot control for imagery ability, controllability, and past experiences. Imagery ability has two influential factors: (1) how clearly athletes can see an image and how detailed the image appears to them and (2) the athlete's ability to manipulate aspects of the images they wish to change (Vealey & Greenleaf, 2006).

Imagery requires organized, repetitive practice for it to have the desired effect on performance. Research has shown systematic practice effectively increased imagery ability. For effective use of imagination exercises in mental trainings there are necessary conditions:

1. Images must be controllable so that athletes can manipulate images in productive ways to prepare themselves to perform at an optimal level;
2. In addition to controllability, the other essential factor to effectively using imagery in a mental training program is vividness. Vividness can also involve such components as whether the image is in colour, how many senses are involved, and what emotional or physical sensations are experienced when engaging in the imagery (Evans, Jones & Mullen, 2004).

When an athlete is engaged in mental imagery, there are two distinct imaging perspectives in that the athlete can experience the imagined situation, an external or internal perspective. Mahoney and Avenier (1977) defined external imagery perspective as a third person view, where the participant assumes the position of an observer, as if watching a film or

recording of a previous performance. On the contrary, an internal imagery perspective, has been defined as requiring an approximation of the real-life experiences, in which that the participant imagines being inside his/her body, while experiencing the sensations that they may expect to encounter in the actual situation (Mahoney & Avenier, 1977). The first stage in learning novel motor tasks is called the cognitive stage because the learner initially uses verbal and cognitive cues to represent the task, and the dominant sensory system is vision (Fischman & Oxendine, 1993).

Based on the researched literature sources 10 exercises were created to develop imagination for alpine skiers from U16 and Junior age groups:

1. Putting on sport equipment with closed eyes

In this exercise, alpine skiing equipment is required – ski boots, helmets and ski goggles. Athletes with closed eyes, without using vision, have to put on their sports equipment in a way they would normally do in training (Fig. 1). This exercise helps athletes to train the ability to imagine. They should be able to mentally imagine their every move, just the same way as they would with see with open eyes.



Figure 1. Putting on sport equipment with closed eyes

2. Make a system points

Based on the experience acquired during usual competitions and/or training sessions athletes have to find the “key points” which describe that competition and/or training session. “Key points” can be, for example, warm-up, course inspection, inventory preparation, start, skiing, finish, etc. With the help of imagination athletes must explain what takes place traditionally in each specific situation.

3. Initiate the feeling of the movement

Based on the previous exercise “key points” athletes have to explain their emotions and/or feelings in each of the movements (Tab. 1.).

Table 1

Exercise – initiate the feeling of the movement

| <i>Key points</i> | <i>Feeling of the movement</i> |
|--------------------------|--------------------------------|
| 1. Warm-up | Energy, focus |
| 2. Course inspection | Concentrated attention |
| 3. Inventory preparation | Preparedness for start |
| 4. Start | Maximum tension |
| 5. Skiing | Speed, unloading |
| 6. Finish | Safety |

4. Time measurement: Compare between real-mental

After course inspection athletes perform three runs with a timed control. Afterwards, with the help of visualization, athletes take three “mental runs” thought the skiing course, where each “mental run” is also time controlled (Fig. 2).



Figure 2. Mental run performance

The times of the mental training should be matched with the execution times of the real attempt (Tab. 2). The more the real time and mental time match; the better is your mental training of your technique.

Table 2

Real and mental runs results

| Run time | 1. | 2. | 3. | Average time |
|-------------|----|----|----|--------------|
| Real time | | | | |
| Mental time | | | | |

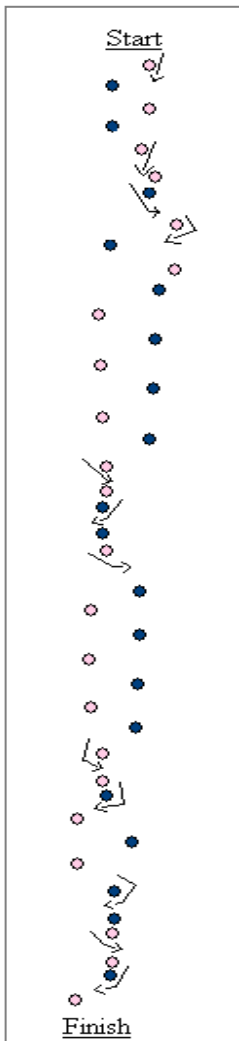
5. Split method: Compare “mental runs”

After course inspection and first skiing run, athletes perform five “mental runs” through the course with time control. All attempts can be also done during training session. In this exercise, it is important that “mental run” times match or at least are very similar to each other. The results are recorded in table and compared (Tab. 3).

Table 3

Mental run results

| Mental run time | 1. | 2. | 3. | 4. | 5. |
|-----------------|----|----|----|----|----|
| | | | | | |



6. Skiing training/race course drawing

In this exercise athletes draw a skiing course gates on a paper right after training or course inspection. While drawing, athletes have to pay attention to course gate numbers, colours, gate combinations and even the external poles (Fig. 4). This exercise helps to develop imagination. For an athlete to be able to draw the most accurate course scheme it is important to involve visualization.

7. Seeing through your “mental eyes”

This exercise has a several steps that athletes have to perform following instructions from the coach: *step one*: athletes stands opposite to their usual training place – skiing slope. Athletes carefully examines training place and then close their eyes. *Step two*: Athletes inhale and exhale calmly and deeply. Afterwards athletes try to intensively visualize previously viewed training place. *Step three*: after instructions from the coach athletes have to open their eyes for 1 second and look at the training place. Then close their eyes immediately. For a short time, they are allowed to concentrate on what they have just seen. *Step four*: athletes while having their eyes closed must describe what they have seen: where are other athletes? What colours did they see? How many obstacles are on the hill? etc. *Step five*: athletes for a brief time (1 sec) open their eyes and close them again.

Figure 4. Skiing course drawing

Afterwards they turn their back on the slope and again describe what they saw to the coach. The coach should ask as much questions as possible about the location and its details.

8. *Make scrip*

The main task of this exercise is to describe all the activities, movements and their performance technique. Athletes have to write down on a paper the exact description of what they do in alpine skiing. Everything has to be written from “I” perspective (for example, “I am standing on the starting line and concentrating on the situation. After that I am...”). This process can take about 30 minutes; athletes have to intensively think about their own activities and sport technique. Also, the writing should be formulated in the present tense and it must be positive (without the word “no”) and as far as possible with more details.

9. *Competitive Situation Imagery*

This exercise must be carried out in written form on prepared worksheets (Fig. 5).

Competitive Situation Imagery

1. Approach a place, through imagery, where you have recently competed or have vivid memories of a competition. Allow yourself to experience the sensations that may accompany a competitive experience for you--that is, if you typically get nervous or psyched up before competitions, allow yourself to feel those emotions.
List some typical emotions or feelings that you experience before competing:

a.

b.

2. Imagine yourself at varying times before competition, making it as real and vivid as possible. If you typically have a pre-competition routine, imagine yourself following the steps of that routine up to the point where you are competing. Remember to use all your senses. Write down in the space below what you typically do before competition:

3. Competition time: imagine yourself in an actual competition situation, doing what you would typically do, with your typical emotional and physical reactions.

At the beginning and throughout competition, **I feel:**

At the beginning and throughout competition, **I think:**

At the beginning and throughout competition, **I see:**

Figure 5. Competitive situation imagery worksheet

10. Imagination checklist

Exercise is carried out in writing. This is an exercise designed to help the athletes to begin integrating their senses into imagination. Athlete is given 10 situations (Tab. 4).

Table 4

Imagery Sensory Checklist

| Situation | Rating |
|--|--------|
| The suit you will wear in practice this afternoon | |
| Tasting a juicy lemon | |
| The sound of your alarm clock | |
| The slope you last trained on | |
| The feel at the end of the course in the finish | |
| Cold and early morning on a slope | |
| The roaring approval of a crowd | |
| Feeling dry mouthed and tired after a workout | |
| The discomfort in your muscles during the last gates of a race | |
| The anticipation and anxiety waiting on a start line | |

With a help of imagination, they have to establish situations in their mind. As athletes create each of the following images in their mind, they have to rate their ability to do so based on this scale: *0 = No Image 1 = Some Image 2 = Clear Image*

Discussion

The developed exercises are approbated by the Latvian U16 and Junior age group alpine skiers in season of 2015-16 and they will continue to use exercises in training, competition and after-competition process during 2016-17 season. In practice, the imagination exercises have produced positive results for alpine skiers. The imagination exercises in training process help athletes to recognize and highlight their strengths and reduce weaknesses. It does not only help to regulate anxiety which athletes are experiencing during the race, but also helps to gain self-confidence, focus and become mentally strong. Athletes can use imagination in setting closer and further goals and to increase motivation of both in daily workouts and further sporting activities.

It is well known that imagination exercises are able to provide a great possible benefit for athletes if the exercises are detailed and including all senses and concentration abilities.

Imagination is as skill, and, just like any other skill, that is used in sport, it will need to be practice and develop. Because imagery is a mental skill, athletes will need to concentrate on creating and controlling images,

which can be tiring at first. For this reason, it is best to begin imagery training by imaging high quality images for short periods of time, and then gradually increasing the time of imagination process. It is important to try to imagine as realistic as possible, by re-creating important details of sport setting (e.g., practice and competition venues) in mind. Including details like the colours or sounds what the athlete sees and hears. Realisation in imagination is the most important visualization exercise and it is important to create the feeling that athlete is really experiencing what they see in their mind.

Conclusions

Were developed 10 imagination developing exercises. Based on practical experience 3 of the exercises (1, 4, 6) are innovative. Other 7 exercises are from methodologies of imagination abilities development by Jumson Lee (2010) – 2, 3, 5, 7, 9 and Emma J. Stodel (2004) – 8, 9. These 7 exercises were modified for alpine skiing sport.

Imagination is a psychological skill that can be trained and developed by including visualization exercises in training process. Like all skills, visualization must be practiced consistently and correctly so it could give a positive effect.

Imagination is used to help athletes to anticipate and solve problems, to prepare for competition, as well as to stage a race or training activity. Imagination trainings can be done individually or in groups and they can be led by sport psychologist or a coach.

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REVIEW PAPER

SPIRITUALITY IN SPORT – A BIBLICAL PERSPECTIVE

Gunita Tālberga, Andra Fernāte

Latvian Academy of Sport Education

Address: 333 Brīvības Street, Rīga, LV-1006, Latvia

Phone: +371 29968833, +371 67543373

E-mail: gunita.talberga@lspa.lv, andra.fernate@lspa.lv

Abstract

Holistic models of personal development include spirituality as an important aspect of every individual to be developed (Chandler et al. 1992; Myers et al. 2008), but comprehension of the term is very broad. Christianity is the largest religion in the world according to data gained in social research based on religious self-identification of people (Pew Research Center, 2010). Christianity is based on God's revelation in Biblical texts. Therefore the purpose of our research was to define 'spirituality' considering the Biblical understanding of words 'spirit' and 'spiritual', and to describe real life examples of Christian sportspeople living their spiritual life. A theological interpretive method of the Bible was used in this research to create the definition of spirituality. To describe spiritual experiences of Christian sportspeople we studied testimonies collected in the book "Power to win: riveting stories of struggle and triumph to inspire you" written by A. D. Ribeiro (2016). God is the ultimate reason of human beings and sport. Through our research we have created the definition of 'spirituality' and we introduce a new term: 'pre-spirituality'. Spiritual sportspeople experience God in their sport. They give credit to God for their physical abilities, talents and success and take part in sport to glorify God. Spiritual sportspeople recognize their need for Jesus in order to live a spiritual life and they find their ultimate joy, meaning and purpose in a loving relationship with God and not in their athletic success.

Key words: *spirituality, pre-spirituality, sport, Biblical perspective, God, Jesus, Holy Spirit*

Introduction

Spirituality is an important part of a personality that needs to be developed (Valbis, 2005). A holistic approach to personality and personal development often puts spirituality at the centre of a personality model (Chandler et al. 1992; Myers et al. 2008). Chandler, Holden and Kolander (1992) suggest that spiritual health should be considered as a component part within each of the interrelated and interactive dimensions of wellness (i.e. social, physical, emotional, intellectual and occupational). Preece and Hess (2009), editors of the journal's "Interface" volume that is named "Sport and Spirituality: An Exercise in Everyday Theology", admit that the intersection between sport and spirituality has attracted unprecedented

academic interest in the first decade of the twenty-first century. However, authors operate with quite different definitions of spirituality (p. 6). So the question arises – is it possible to create one definition of spirituality or spirituality in sport for common use among scholars?

By reading the Bible, scientific papers and other literary sources, we have come to the conclusion that people define spirituality according to various worldviews. Therefore it will never be possible to create one universal definition of spirituality that will be acceptable for people who believe in God and for people who don't believe in God; for people who believe that Jesus is Son of God and for people who don't believe in Him; for people who recognize that Holy Spirit is God and for those who don't think that is true etc. In this paper we search a definition of 'spirituality' according to a Biblical perspective and its application in sport which would correspond to the world view of Christianity. Christianity is ranked as the largest religion in the world according to the religious self-identification of people (Pew Research Center, 2010) and it is the worldview of the authors of this paper.

The word 'spirituality' is an important concept that is used today when we think about the holistic development of sportspeople. But in the Bible we only find the words 'spirit' and 'spiritual'. Hence the purpose of this paper is to offer a definition of 'spirituality' according to the Biblical perspective and to unfold the view of Biblical spirituality in sport.

Material and Methods

A theological interpretive method of the Bible was used to create the definition of spirituality. According to this method, the Bible is viewed as a sacred text whose purpose is to reveal God and His activity in human history. The text is viewed as a testimony that communicates God's truth and therefore must be interpreted with an attitude that God speaks in and through all the Biblical texts (Tate, 2012). Theological studies are based on God's self-revelations and are efforts to make definitive statements about God and His teaching. Studies of theology are based in the belief that God exists, is personal, can be known, and has revealed Himself (ESV Study Bible, 2008, p. 2505). While doing theological interpretations of the Biblical texts by using exegesis and hermeneutics we recognize *sensus plenior* and *the Grand Narrative of the Bible* as well. *Sensus plenior* is "a deeper meaning" of Scripture, intended by God but not necessarily by the author. This meaning could be found in the progressive development of the understanding of revelation. *Sensus plenior* does not preclude the literal, historical meaning of Scripture, but makes room for theological interpretation. *The Grand Narrative of the Bible* is an important assumption about the textual unity – that all parts of the Bible exist in such a close relationship that each part must be understood in terms of the whole, and the whole in terms of the parts (Tate, 2012).

This study method involved reading and understanding the relevant passages in the Bible on the topics 'spirit' and 'spiritual', and summarizing the teaching to create a definition of the word 'spirituality'. Our study was based on using Bible translations in Latvian (1965 revised translation and 2012 translation) and English

Standard Version (ESV) translation (2001). All quotes represented in results are taken from ESV translation unless indicated King James Version (KJV) or Holman Christian Standard Bible (HCSB). We used the free online reference library "Blue Letter Bible" (www.blueletterbible.org) to study the original meanings of the words and to compare various English translations of the Bible. To understand the context and various interpretations of particular verses we used the English Standard Version Study Bible (2008).

To draw out practical implications of spirituality in sport, we explored the collection of testimonies of sportspeople in the book "Power to win: riveting stories of struggle and triumph to inspire you" written by Alex Dias Ribeiro (2016). We studied the testimonies and described real life examples of spiritual sportspeople living their spiritual life. This book was chosen because of its diversity of real life experiences of Christian athletes in stories that include interviews and contain success, struggles, failures and miracles in their Christian walk and in sport.

Spirituality according to the Biblical perspective

The purpose of our study was to create a definition of 'spirituality' according to the Biblical understanding and to unfold the view of Biblical spirituality in sport. First, we will explore the Biblical revelation of God who is Spirit by His nature and the ultimate reason of humanity and sport. Second, we will describe the nature of spiritual people and life experiences of spiritual sportspeople to offer different expressions of spirituality in sport. Finally, we will give a definition of spirituality according to a Biblical perspective and will introduce a new term 'pre-spirituality' that we have created.

From the Bible it is known that God describes Himself "I am" as it is not possible to describe Him fully or explain Him (Ex 3:14). God is above everything. Biblical texts reveal that God is Spirit (John 4:24), therefore it is clear that it will never be possible to explain or define spirituality completely because God and His work are at the centre of spirituality. God's thoughts are higher than human thoughts (Isa 55:9) and it is beyond human ability to describe or comprehend God's works fully. However, God reveals Himself to some degree and people are able to know Him intimately through Jesus, through the Scriptures, through His creation, through His works and through the Holy Spirit (1 Cor 2:10-12). Therefore we think that efforts to define spirituality are not in vain if we approach it with fearful and humble hearts in front of the omnipotent and omniscient Creator.

In the very first sentences that we find in the Bible (Gen 1:1-2) we are introduced to three very important things: God existed before anything else existed, God is the Creator, and God has a nature of Spirit. Hebrew words *Elohim* (God) and *Ruach Elohim* (Spirit of God) are the first names of God that are mentioned in the Bible. Avery (2014) writes that there are around five hundred Biblical names and titles to express various aspects of God's being and *Elohim* is among the three primary ones together with *Yahweh* (LORD) and *Adonai* (Lord). He discovered that the names *El*, *Eloah*, and *Elohim* all point to the majestic supremacy of God who created the cosmos and transcends it. Might and strength is the root meaning of *El* and *Eloah*. It is also associated with fear. People used these two words to talk about

someone who is mightier than they are and therefore have fear of it or find refuge from fear in it. *Elohim* is unique and used only in the Hebrew language, while people have adopted *El* and *Eloah* also in other languages to talk about their gods. The word *Elohim* is unusual because it expresses the mysterious and complex nature of God as it is the noun in plural form, but talks about the One God. This may indicate the supremacy of *Elohim* – that He is God of gods, the only true God (the sole divine being in the universe), as well as the fact that Father, Jesus and the Holy Spirit is one God (Mat 3:16-17, 28:19; 1 John 5:7) – something incomprehensible and mysterious to the human mind. *El ekhad* (One God) is the other specific name of God that expresses compound unity and is used by prophet Malachi (Mal 2:10).

Avery acknowledges that classifying God's names according to Father, Jesus and Holy Spirit would produce tedious repetitions. Through the study of the Bible, we observed that the Spirit is one of those unifying attributes to name the one and only God and we summarized our findings in the Table 1. The original Hebrew and Greek in transliterated form are taken from the Bible study sources (interlinear) in the Blue Letter Bible.

Table 1

Names of God that include the word Spirit

| English | Hebrew | Greek | Bible reference |
|--------------------------|---|--------------------|--|
| the Spirit of God | ruwach Elohim, ruwach El, ruwach 'elowahh | pneuma theos | Gen 1:2; Job 27:3; Job 33:4; Mat 3:16; Rom 8:9 |
| the Spirit of the LORD | ruwach Yahweh | pneuma kyrios | Isa 11:2, 61:1; Luke 4:18;2 Co 3:17-18 |
| the Spirit | ruwach | pneuma | Mat 4:1, Mark 1:10,12 |
| the Spirit of Father | - | pneuma patēr | Mat 10:20 |
| the Spirit of Son | - | pneuma huios | Gal 4:6 |
| the Spirit of Christ | - | pneuma Christos | Rom 8:9, 1 Pet 1:11 |
| the Holy Spirit | ruwach qodesh | hagios pneuma | Ps 51:11; Isa 63:11; Mat 1:18; Mark 3:29; Act 7:55 |
| the Spirit of glory | - | pneuma doxa | 1 Pet 4:14 |
| the Spirit of wisdom | ruwach chokmah | pneuma sophia | Exo 28:3; Isa 11:2; Eph 1:17 |
| the Spirit of truth | - | pneuma alētheia | John 15:26, 16:13;1 John 4:6 |
| the Spirit of revelation | - | pneuma apokalypsis | Eph 1:17 |

John writes that "God is Spirit" (John 4:24) which shows us that the Spirit is not something that belongs to God (as could be considered through the preposition 'of' being used in the names of God in English), but the Spirit is the nature of God, His essence, that is who He is. Whereas, spirit of man is something that belongs to man and it is given to humans from God who is the Spirit (Ecc 12:7). The Hebrew word *ruwach* used in the Old Testament and the Greek *pneuma* used in the New Testament are never referred to as a depersonalized force although it refers also to movement of air, wind, breath or breeze (Pierce, BLB, 2016). The Spirit is something intangible, immaterial, incorporeal, invisible and yet possible to feel, hear and experience. "The wind (*pneuma*) blows where it wishes, and you hear its sound, but you do not know where it comes from or where it goes" (John 3:8) - this is the

nature of the Spirit of God who has no beginning and no end and who existed before anything else and there won't be anyone after Him (Ps 90:2; Isa 43:10; Rev 22:3). All things were made by Him, and nothing was created except through Him (John 1:1-3). All other spirits in the universe were created or given by the Spirit of God.

We find in the Bible that God has created immaterial spirits or spiritual beings that are named angels (messengers of God) to minister to Him (Heb 1:14). While in Genesis 2:7 it describes that God formed man (Heb: '*adam*') from the dust of the ground (Heb: '*adamah*') and breathed (Heb: '*naphach*') into his nostrils the breath of life (Heb: '*něshamah*'), and so the man became a living being or soul (Heb. '*nephesh*'). Biblical texts reveal that *nephesh* is in the blood (Lev 17:11, 14; Deut 12:23) and this word is often used when authors talk about the living being as a whole. *Nephesh* (soul) is the life that leaves the body when it dies (Gen 35:18, Job 11:20, Jer 15:9), as well as *něshamah/ruwach* (spirit) leaves the body when the living being dies or in other words breathes out one's last (1 Kings 17:17, Ps 146:4, Ecc 12:7, Luke 23:46, Acts 7:59). So we see that God has created spirit, soul (Isa 57:16, Heb 4:12) and physical body of each human. Physical body is created from the dust and is the physical bearer of soul and spirit that is immaterial and eternal (Isa 26:19; Dan 12:2). On this earth, the Creator provides life to humans through breathing and through the circulation of blood in the body. There are many actions that humans can do with their body voluntary to control and rule over it, but the ultimate control over the blood circulatory system and the respiratory system to make body work and to ensure life is not in the hands of the individual. As we see it, the only reason of the existence of human beings is the will of loving God and therefore it is written that God is not served by human hands as if He needed anything, rather He himself gives everyone life and breath and everything else – for in Him we live, and move, and have our being (Acts 17:25, 28). God created everything to reveal His glory (Ps 19:1) and humans are the masterpiece of God's creation because they are created in God's image (Gen 1:27). God created humans and gave them His breath of life (spirit), trust and the honour to be His co-workers and care for His creation (Gen 1:26, 28, Ps 8:5-9).

Biblical spirituality in sport

Now, if we think of sport, we see that God is the ultimate reason of the existence of sport as well. Today, we most often think of sport as physical activity to improve physical and mental well-being, form social relationships or to obtain results in competitions (according to the European Sports Charter, 1992), but in the 14th century, the word 'sport' was introduced as a short version of 'disport', the noun that originally meant 'amusement, recreation'. Only starting from the mid 19th century people use the word 'sport' with the view of 'athletic contests' (Ayto, 2005). The Creator is the Lord of joy (Rom 14:17; Phil 4:4; Gal 5:22). If we are careful observers, we see play everywhere in God's creation – sunshine plays in the water, wind plays with leaves, animals play and humans play. God wants animals and people to play because play brings joy (Ps 104:26; Isa 11:8; Zech 8:5). God has created people in His image (Gen 1:27) and from God's creation, humans have the widest variety of play - music and dance, games (board games, field games and

computer games), theatre etc. We see God's creative character reflected in the diversity of sports that people have invented. God created humans with various body compositions and different talents to move, to play and glorify Him in various ways. Playing activities enhances motor and sensory skills and social behaviours. Play is a learning process for both animals and humans. God's loving character has intended learning processes of humans and animals to be enjoyable.

There is nothing on the Earth apart from the Creator who is awesome and magnificent in His love, creativity, beauty, wisdom, holiness, justice. He is more than words can describe and express. There is no one like Him and there is no God besides Him (2 Sam 7:22; Ps 40:5; Ps 86:8, Isa 46:9). This is the reason why He is the only one who deserves worship through words and deeds from all of His creation (Ex 20:1-6; Ps 19; John 4:23; Luke 4:8; Rom 12:1-2). It means that every word that sportspeople (coaches, athletes, judges etc.) use on and off the court should be pleasant to God and glorify Him (Ps 19:14). Every action on the field or off the field should reflect God, His goodness, love, grace, kindness, creativity etc. because humans were made in God's image. Unfortunately, very often we don't see it. Instead there is anger, injustice, abuse, swearwords, and selfishness.

Through the Grand Narrative of the Bible (Creation, Fall, Redemption, Restoration) we see that in the beginning everything was created good. Spiritual warfare between God and evil began when angels (God's created spiritual beings) and Satan (their leader) rebelled against their Creator (Isa 14:12-15; Eze 28:15, 17; Jude 1:6; 2 Pet 2:4). Human beings got involved in this warfare (Gen 3; Mat 13:38-39; Eph 6:11-12; Rev 12:7-17). Pride, arrogance and selfishness is the root of the disobedience to God and it was planted into the hearts of humans by Satan (Mat 13:24-30). Humans chose disobedience to God and His will (Gen 2:16-17, 3:6) that resulted in broken relationships between God and His people (Gen 23-24) and broken relationships amongst people (Gen 3:12, 4:8 etc). All descendants of Adam and Eve are born with corrupted hearts that are deceitful and desperately wicked (Gen 6:5; Ps 14:1-3, 51:5, 53:1-3; Jer 17:9; Mark 7:20-23; Rom 3:10-19). Therefore, we can observe evil in sport. Instead of loving and serving each other, people often hate each other. Instead of forgiveness, people keep bitterness in their hearts etc. Since people are born self-centred, most often sport is also self-centred. Sport is used to earn acceptance, self-value, meaning and purpose. People long to be loved, but often confuse love with acknowledgement and appreciation. Despite all the success, athletes can feel void in their hearts. Footballer Cesar Sampaio describes his experience as follows, "While you're playing good football and live up to the expectations, you're well treated. But, when you fail, the thing is different and painful" (Ribeiro, 2016, p. 64). There are many ways people strive to be successful and accepted through sport - beautiful appearance and strong body, obeying the coach, wealth etc. Victory in contest and the champion's title is the most common strive for success, and for many, that is what sport is all about. Governments of countries use the medal count to show power over other countries. This often leads to pursuing victory at any cost which results in ongoing doping scandals around

Olympics and other sport events. People try to solve these issues through education but amount of issues shows us that the problem needs a deeper solution.

Biblical texts reveal that only God can provide the ultimate, eternal solution to the problem of a corrupted heart. God gives people the opportunity to receive a new heart and a new spirit. This means they can experience God's unconditional love and inner peace (Rom 5:1-5), and can truly love God and love each other on and off the sport field (Mat 22:37-40), and live a life according to God's will and His laws (Ez 36:26-28, Heb 8:10). Father, Son and Holy Spirit are one God, the Creator and the Spirit who works to redeem and restore His creation. Christ as Spirit dwells in the human heart through faith (Rom 8:9-10, Eph 3:17) and that is a birth of a new creation (John 3:1-8; 2 Cor 5:17; 1 Pet 1:23) who is now called a spiritual person (1 Cor 2:15). Paul writes that the person who is joined to the Lord is one spirit with Him (1 Cor 6:17). Spiritual people are those who have received God's Spirit, who search the depth of God, who understand and accept the things that are freely given by the Spirit of God and learn the spiritual truths (1 Cor 2:10-15). Spiritual truth is the wisdom of God - the laws and causal links that are formed by the Creator (Rom 7:14). To know spiritual truth is to know will of God and to act according to that (Rom 12:1-2; Col 1:9-10).

The apostle Paul explains that even when Jesus Christ dwells in the human being, the body of the spiritual human is perishable and dies because of sin, but the Spirit gives life to the spiritual person because of righteousness (Rom 8:10). It was God's Spirit who raised Jesus from the dead and the same Spirit shall raise the body of the human God's Spirit dwells in (Acts 2:24; Rom 8:11). The natural body (*psychicos*) which is made of dust of the earth is perishable, but the spiritual body (*pneumatikos*) given by God to those who are born from above in Spirit (Jn 3:3,6) will be imperishable (1 Cor 15:53-54). Hence, Paul urges people to train primarily for godliness because godliness holds promise for the present life and also for the life to come whereas the physical body is perishable (1 Tim 4:7-8). However, Paul point out that care of the physical body can also glorify God because it is a temple of Holy Spirit (1 Cor 6:19-20). Some manuscripts have additions to the verse of 1 Cor 6:20 that express the holistic thought as follows: "For you were bought at a price; therefore glorify God in your body and in your spirit, which are God's" (1 Cor 6:20, KJV, HCSB). People should glorify God with both spirit and body. Exercising the body is good and acceptable thing. The problem starts when physical perfection and success is idolized. People wholeheartedly work towards the perfection of the body and it overtakes their time and effort of exercising for godliness. The other extreme is investing only in the development of the spiritual dimension and denying God's created human body, abusing it in direct way or by not taking care of it.

God sends His Holy Spirit into every human's heart that truly trusts Jesus (John 7:39, 15:26, 16:7, Gal 4:6) which enables human beings to live according to God's will. Yet human beings every day have to make choices to submit to God's Spirit and His guidance (Rom 8:14, Eph 5:18, James 4:6-17). The surrender to Christ and His Spirit transforms a person's heart, life and behaviour (2 Co 5:17, Gal 5:22, Col 1:9-14) – that is a process of restoration. Although true trust in Jesus is

held in the heart, it is visible in the words and deeds (Isa 28:16, Rom 10:9-11, Mat 7:21, Luke 6:46-49) of a person. Jesus said, "For the tree is known by its fruit" (Mat 12:33). Footballer Zé Sérgio testifies that when he was born from the Spirit, he realized that his time on Earth is passing towards eternity with God and what happens here is so transitory. He became less vulnerable to the unfavourable circumstances in his career, "I used to be a short-tempered player. Everybody knew I could go mad for nothing. Today, as I am growing in the faith, I am becoming less short-tempered." (Ribeiro, 2016, p. 37). The surfer Bitá describes changes after his encounter with Jesus as follows, "As if by magic, Jesus set me free from drugs and got right my messy life, giving me so much joy that today, nearly twelve years on, I live only to follow, love and worship this Jesus. I went on surfing even better. My surfboards bearing the lettering *Jesus Saves*." (Ribeiro, 2016, p. 52).

As we observe, spiritual people naturally and freely give credit to God for their success instead of boasting and emphasizing how good they are. In the Biblical texts, we see that God's people rejoiced in their Creator and admitted that physical abilities or skills that they had came from the Lord (Hab 3:19, Ps 144:1). King David gave credit to God for his victories since his young age (1 Sam 17:34-37, 46-47). David inquired about God and asked Him for wisdom and guidance in his battles (1 Sam 23:1-13). We find that athletes who follow Jesus also give credit to God for their success. Footballer Cesar Sampaio says, "I invited Christ into my life, accepting Him as my Savior. The transformation happened right away, and God honored my decision in a practical form: in the next match, I was chosen as the best player on the pitch, won many prizes and I was sure that He had given me all that" (Ribeiro, 2016, p. 65). Karateka Ciça Maia confirms this with "In 1992, I went to the World Championship certain that talent and glory are not ours, but God's. I changed my attitude and started fighting for God. [...] I became a lot more competent and courageous as an athlete." (Ribeiro, 2016, p. 47). Basketball player Luiz Felipe recalls, "Into the court I went full of the Holy Spirit, and played superb basketball. We won the game. I scored more than anyone else and left the court with a medal on my chest. Above all, I left convinced that the medal was on Jesus' chest [...]" (Ribeiro, 2016, p. 42-43). This doesn't mean that spiritual athletes are not training hard. Two-Time Brazilian surfing champion Jojó de Olivença says "God bless, but He doesn't surf. If I don't work, it won't be easy to be a champion at all. So I spend time training hard. My surfing exists because of my spiritual life" (Ribeiro, 2016, p. 30).

The Biblical texts are clear on the fact that a relationship and fellowship with God can be renewed only by trusting in Jesus as only His blood cleanses humans from their disobedience and tears down the barriers to open free access to God for everyone who trusts in Him (John 6:47-64, Heb 7:25, 9:22, 10:19-23; 1 John 1:7). Jesus says, "I am the way, and the truth, and the life. No one comes to the Father except through me" (John 14:6). People who trust in Jesus and accept God's forgiveness and love are free from all condemnation (John 15:5-6, Rom 8:1-2, Heb 10:29-31). This is called spiritual or Christ-centred life.

Sport as a mirror of the spiritual battle

Through Paul's letters to the people in Corinth, Rome and Galatia, we learned that there are three types of people – natural, spiritual and carnal. Bill Bright has created a helpful visual illustration to see the difference between these three (Fig. 1).

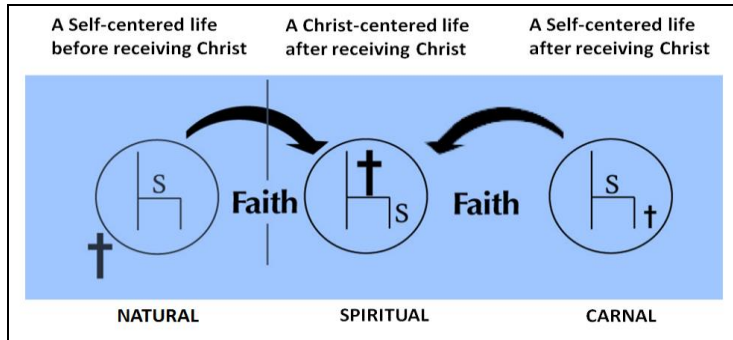


Figure 1. Three types of people – three kinds of lifestyles (Bright, 2001)

Paul distinguishes between those who live according to the flesh and those who live according to the Spirit. He says that to be carnally minded (to live according to the flesh) is death because the carnal mind is at enmity against God, but to be spiritually minded is life and peace (Rom 8:5-6). Internal, constant joy and peace characterize a life in the Spirit that reflects the life in the Kingdom of God (Rom 14:17).

Bible commentators explain that God and believers each have a role in sanctification: by the power of Spirit, believers must take an active role in battling sinful habits. (ESV Study Bible, 2008, p. 2170). By reading Paul's letter to Romans, we become aware of the constant battle between the sinful nature ("deeds of the body" in Greek) and the Spirit of God (Rom 7:15, 24), and we see that Jesus Christ ensures victory in this battle. Jesus Christ has delivered believers once for all (Rom 4:2-25; 5:2, 9) and He is the one who will deliver them (Rom 7:24-25) day by day (ESV Study Bible, 2008, p. 2169).

Paul describes that the deeds of the flesh are: sexual immorality, impurity, sensuality, idolatry, sorcery, enmity, strife, jealousy, fits of anger, rivalries, dissensions, divisions, drunkenness, orgies, and the like. He warns that those who do such things will not inherit the kingdom of God. (Gal 5:19-21). We can see these things mirrored in the world of sport. For example, there is much false spirituality and sorcery provided by Satan and evil spirits to ensure success. Football player Mauro Madureira tells, "While training, I broke my arm. I was told that someone out of envy was doing a 'work' against me, and I should protect myself as soon as possible, and I head for a spiritualist centre [...]. As experienced and famous players used to do the same thing, I followed suit. At first, the accuracy of prophecies, the protection and the promises of much success fascinated me. [...] I started going to different spiritualist centers. [...] My fear of displeasing bad spirits and guides

reached a point in which my posture on the pitch didn't depend on my talent and effort anymore, but the guides' actions and reactions" (Ribeiro, 2016, p. 76). In some ways, sport is a world of body cult and therefore to fall into sexual immorality, impurity and sensuality is a likely risk. Football player Márcio Araújo in the interview that was published in Placar Magazine in 1985 shared, "Today sexual relationships are messed up. Women are losing their modesty, in just half an hour after getting to know a man; they have sex with him without knowing his name and forget all that the next day. I am against abortion, divorce, and I think the structure of society is the family. Just follow what is in the Bible" (Ribeiro, 2016, p. 99). Players who are left sitting on the bench has to deal with disappointment and not to be jealous to their teammates. Silas Pereira, former professional Brazilian football player in the interview in 1990 said, "When coach Telê put me on the bench and Careca on the pitch, the press lashed out at me saying "and now, Silas, what will you do?" My answer was that I wanted to be there to serve God, at the National Squad on the pitch, on the bench and wherever" (Ribeiro, 2016, p. 24).

Paul encourages the followers of Jesus: "Walk by the Spirit, and you will not gratify the desires of the flesh." (Galat 5:16). Walking by the Spirit is a daily journey of total surrender to God and His love. James gives a clue to the victory over flesh and temptations of the devil with the following advice: "Draw near to God, and He will draw near to you. Cleanse your hands, you sinners, and purify your hearts, you double-minded!" (James 4:8). Ezekiel writes that the renewed heart is one heart (Heb. *leb echad*) - it is heart that is undivided and fully devoted to God (Eze 11:19). Indifference is disgusting to God (Rev 3:16,19). Spiritual life requires total surrender to God and therefore there are only two options for humans: submit to the living God and to be obedient to him by the power of Spirit or not, there is no middle way. Speaking in sport terms – there are no other teams than God's team and Satan's team. If we are not with God, we are against Him (1 John 3:8-10). If we are in God's team, He becomes our coach and we choose to submit to His game plan every day and every moment of our lives. God loves people and He constantly calls them to repent and turn from all their transgressions (Eze 14:6, 18:30; Hos 14:1-2; Mat 4:17; Mar 1:15; Luke 13:1-5; Act 2:38, 3:19, Rev 2:5, 16, 3:3). Jesus says: "Be perfect, therefore, as your heavenly Father is perfect" (Mat 5:48, HCSB). Peter reminds the words of God cited from Lev 11:44-45: "Be holy, because I am holy" (1 Pet 1:16, HCSB).

A life in the Spirit is based on love

Personal consecration is a response of love to God's gracious and loving initiative. Since fellowship with God is based on love, God gives people freedom to choose Him or not, to remain with Him in constant and continuous love relationship or not (John 14:21, 15:10; Rom 5:8, 8:35-39; 1 Cor 13; Eph 3:14-19, 4:15-16; 1 John 2:5, 4:7-19, 5:1; Rev 2:4-5).

Daniel Dias, the Brazilian Paralympic swimmer, says that after the 2008 Games in Beijing where he experienced great success he had turned away from God for some time. "I was thinking that I was making all this happen by my own merits and I forgot also that without God, none of this would have happened. I was

gradually moving away from intimacy with Him," says Dias. He admits that while medals and fame continued to come, his spirit dried up in the midst of an existential desert and he had no joy in his life. He took a Bible in his bag, but God's words were far from his heart because he didn't read it anymore. He chose to repent, to come back to God and receive His forgiveness between 2010 and 2011 because he understood the love of God. He says, "My luck is that, although I was far from God because I wanted to, he never ceased to be by my side." (Ribeiro, 2016, p. 166-167).

"Already" and "not yet" aspects of spirituality

God is above any time limitations but his spiritual people live in the tension between "already" and "not yet" aspects. "Already" means that Jesus Christ has paid the full price of sins and humans are saved by faith in God's grace with nothing to add to the sacrifice of Jesus (John 19:30; Heb 7:27). The ultimate victory over the sin and death already belongs to Jesus because the Son of God is the only human who has lived entire life in absolute obedience to God, including His death on the cross and resurrection (John 8:28-29, Phil 2:8). Through His righteousness and obedience, humans are made righteous and get life (Rom 5:18-19). The "not yet" aspect uncovers the reality that spiritual people live in a carnal body in a world (1 John 2:15-17) that is ruled by devil (John 14:30). Hence, they are subjected to internal and external temptations daily (Rom 6:12; James 1:13-15; Luke 22:31-32; 1 Pet 5:8-9). Each spiritual person must be watchful to keep the faith and not to fall by turning away from the ways of Christ (Mat 24:42-51, 26:41; Mark 14:38; 1 Cor 10:12; Gal 6:1; 1 Pet 5:8).

Chilean goalkeeper Rojas took part in a scam during the 1990 World Cup qualifying match in Brazil. Rojas had hidden in his gloves a scalpel blade and injured himself with hope that match will be called off. When sports authorities discovered the sham, Chile was banned for two World Cups and Rojas was banned from football forever. Even when punished, Rojas went on denying the sham and his guilt until he broke under the burden of it. Rojas acknowledges, "I lived hell on earth up to the day I resolved not to cover my sin, and confessed to God, to my family, and to the whole world my dishonesty. I was forgiven by God and by my family [...]." After Rojas had confessed and experienced forgiveness by God who took burden off his back, he still has been dealing with consequences of his sin. The wife of Roja says, "Roberto really didn't think about the consequences at all. Ever since he was on the reserve bench in São Paulo, he got restless. He forgot that God is in control and knows everything and wanted to do in His own way" (Ribeiro, 2016, p. 60-61).

The sinful nature of people tends to make scenarios and plans for one's life forgetting about God. James writes that instead of boasting in our plans we should say "if the Lord wills, we will live and do this or that" (James 4:13-15). Athletes often have their hopes, dreams and plans for their career. When things don't come out as planned or expected the natural answer of the sinful nature is disappointment and anger, the spiritual answer that is based on God's word (Isa 55:9; Rom 8:28), is surrender to God and trust in Him at all times – even when bad things happen. Alex Dias Ribeiro, former racing driver, shares his own experiences and emotions after

the fail of his Formula 1 dream, "... getting out of the car that morning, I was stepping into a very different reality from what I had desired for my life and my career. I wanted to be world champion, but I was abandoning my world, not as a champion, but as a loser [...]." He says that only the immense strength of God whom he always trusted held together his emotional wreck in the darkest moment of his life (Ribeiro, 2016, p. 89-90). Stories of other athletes involve unfulfilled hopes such as being called up for the National Squad or a certain team, the rejection or bad attitude from a coach or teammates, lashing out by press or fans. Dealing with injuries and learning to trust God in the circumstances of obscurity is the common topic of several stories. Footballer Bismarck shares that after a serious leg injury, he questioned God, "Why?", but he admits that during nine months of recovery he learned that the love and friendship of Jesus was not only something written on paper, but very real (Ribeiro, 2016, p. 108 - 109). Thirty year old football player Leba lost his leg after his motorcycle was hit by a drunk driver. Finding himself in the situation with one leg, no money, unable to exercise his profession, and a wife and three children to sustain, he was confident in God, "The strength that comes from God gives me the certainty that He is in absolute control of the situation. My spirituality became stronger from this accident because I realized that my destiny is in His hands" (Ribeiro, 2016, p. 119 - 120).

Spirituality as an endurance race of life

Biblical texts use athletic metaphors of running to depict the truth that eternal victory requires sacrifices and perseverance (1 Cor 9:24-25; Heb 12:1-2). Jesus admits that following Him, obedience to God and His laws requires certain sacrifices (Matt 10:17-38, Matt 19:21, Luke 14:26-33, John 15:20). Therefore there are people who don't follow to the end (John 6:66, Rev. 2:4-5). Only those are victorious, who stay in His love, overcome struggles by the power of the Holy Spirit (Rom. 8:13) and do His will unto death (Matt. 10:22; Rev. 2:10). They will be rewarded (Rev. 2:7, 11, 17; 2:26-28; 3:5, 12, 21). However, it may be easy to misinterpret these metaphors, thinking that it is a human's effort which wins the victory in spiritual race and not God's grace and love. Therefore we would like to give a helpful illustration that the race of faith is like the race of the team Hoyt. Dick Hoyt runs together with his son Rick in competitions by pushing him in the wheelchair as Rick was born a spastic quadriplegic. Dick also bikes and swims together with Rick in triathlon competitions. They cross the finish line together. Dick is devoted to take his son to these competitions because he loves his child. If Rick didn't want to sit in the chair or the boat or to be carried on father's hands, if he didn't want to endure the hot sun or the rain, to experience the painful bumps on the road, he wouldn't gain the victory together with his dad. Likewise eternal victory to receive the crown of life requires sacrifice and effort from both - God and people. Jesus experienced abjection, scorn, pain and death on the cross in order to give eternal life to humans. Humans, who have chosen to follow Jesus and obey the will of God, experience abjection and scorn from those who don't have the Spirit, who don't want to live according to the laws of the Creator (Jude 1:18-19). Footballers Silas and Jorginho share how their teammates have made fun of them because of

their belief in Jesus (Ribeiro, 2016, p. 24, 33). An objection from the world is a kind of test of true spirituality that Jesus confirms with words, "If you were of the world, the world would love you as its own; but because you are not of the world, but I chose you out of the world, therefore the world hates you." (John 15:19). Apostle Peter encourages: "If you are insulted for the name of Christ, you are blessed, because the Spirit of glory and of God rests upon you" (1 Peter 4:14).

And yet the toughest struggles to live a spiritual life are not caused by other humans but by one's own sinful nature and passions that hinders from doing God's will (1 Peter 4:1-2). Growing in trust in Christ is a process and we see parallels that may be drawn to compare it with muscle training. Giving up one's ego and one's own will to God may be very painful because it requires overcoming self-resistance to God. However, the more a person trains the easier it becomes. In the beginning of the spiritual journey, people learn to submit their will and plans to God after disappointments in life, after failures of their own plans and dreams because there is hope in God. The closer people come to God, the more they trust Him and ask to show His will before any plans are made so that they may follow Him (John 10:3).

Authors of Biblical texts talk about people who are young in their faith, like infants in Christ, and about those who are more experienced or mature in their walk with Christ (1 Cor 3:1; Heb 5:12-14). It shows that God doesn't expect a life in faith without any mistakes. When a spiritual toddler falls down, God helps him to get up and learning to walk in Spirit continues. However, proper spiritual growth should reach maturity in the course of time by constant practice (Heb 5:14). In the physical world we see that adults fall, especially under difficult circumstances (fatigue, slippery surface, tripping etc.) and it is the same in spiritual world. Paul urges no one to be arrogant, "Therefore let anyone who thinks that he stands take heed lest he fall" (1 Cor 10:12). Getting up after each fall and continuing to exercise in the race of faith is essential. The parables in Luke 15 reflect the heart of Heavenly Father – He is the one who reaches out and helps to stand up after the fall. A.D. Ribeiro explains that Ayrton Senna was a spiritual new born when the press, opponents, officials, fans, Christians, atheists and agnostics began to require from him the lifestyle of a saint. "Startled, he flinched, but never failed to give the message about the things of God," says Ribeiro. He admits that without good Scriptural guidance and support of brothers of strong faith, Ayrton Senna lived a self-centred and not God focused Christian life (Ribeiro, 2016, p. 133).

In order to live spiritual life, to win and not to fall, Paul gives instructions to take up the whole armour of God to resist the schemes of the devil (Eph 6:10-20). Paul encourages to pray to God at all times in the Spirit (Eph 6:18). It means seeking an intimate presence with God to live according to His will in all areas of life (relationships, athletic career, health, finances, future etc.) at all times. Praying to God in the Spirit is a way of surrender. Spiritual people pray to God truly with their heart and mind willing, "Your kingdom come, your will be done, on earth as it is in heaven" (Mat 6:10; Luke 22:42). Testimonies of athletes in the book "Power to Win" (Ribeiro, 2016) reveal prayer as an important part of the life of a spiritual sportsperson. Athletes have prayed to confess and to give their life to Christ. They

have prayed to win spiritual battles and attacks from the devil. They have prayed prayers of renunciation of occult forces. They have prayed for team unity and integration. They have interceded for coaches. They have prayed for those who get injured and for those who seek God. They have prayed God for good skill in sport and wisdom on the field to give God honour. They have prayed to win if it was His will and they have prayed that whoever wins would glorify God. They have knelt down to give thanks to God. They have prayed to get a place in a team and they have prayed during times of pressure. In dangerous situations they have prayed to God to save their life. Sportspeople have also experienced the power of prayer when other people intercede.

Paul suggests to use the word of God because it is the sword of the Spirit (Eph 6:17; Heb 4:12). God's word is living because God's Spirit talks through His words (John 6:63). Bible commentators explain that the flesh (i.e. human nature including emotions, will, and intellect) is completely incapable to produce genuine spiritual life for this can only be done by the Spirit. The words that Jesus speaks are spirit and life and they do their work in the unseen spiritual realm and awaken a genuine spiritual life (ESV Study Bible, 2008, p. 2036). Jesus Himself is the living word (John 1:1-14), therefore trusting in God's Word is trusting Jesus. Ribeiro says that F1 racer Ayrton Senna came across the verse, "And the Lord said unto me, Behold, I have put My words in thy mouth" (Jer 1:9, KJV) and he started to feel uncontrollable urge to talk with others openly about his spiritual experience with God (p. 133). Athletes have experienced the active work of the God's Word in the process of redemption. For example, the surfer Bitá says that he read in the New Testament "I tell you the truth, no-one can see the kingdom of God unless he is born again" (John 3:3) and he couldn't stop thinking of it. Later on, when he was on a beach, God spoke straight to his heart and showed that to be born again is to die to a sinful life and restart everything again (p. 52). Football player Batista tells that in one of the daily meetings with other players he shared about Noah's Ark, Sodom and Gomorrah and about the salvation that is in Jesus Christ. Two players asked him to talk more about it. One of them was Romário, who went to bed that night thinking about the subject and on the next day said, "That's it. A Boat is about to depart, and I have to be on it." He had understood that only Jesus guarantees the salvation (p. 57). We see that spiritual athletes practically receive strength, guidance and encouragement from God's word. Several athletes have shared how God, through His word from Joshua 1:8-9, encouraged them and gave strength on the sports field when they felt weak or discouraged or unsure of their abilities (p. 48, 56, 72). Football player Jorginho says that the Brazilian team had many defeats during the Pre-Olympic tournament in Bolivia in 1987 and pressure on the team was mounting. As he felt weak, he asked for a word from God. Then he came across the passage of David and Goliath in the Bible, something that he had never read before. He was encouraged and shared the story with other teammates. After the match the coach of the team quoted a text in which Paul says, "For when I am weak, then I am strong!" and finished saying, "I am sure God has something good for us!" The team became champions of the Pre-Olympic Football Tournament and qualified for 1988

Olympics. They aimed for gold in Olympics, but got silver. Jorginho says that God's word about the incorruptible crown from 1 Corinthians 9:24 was comforting indeed during the difficult moments after they had lost the final match (p. 33-34).

The closer people come to the Holy God, the brighter they realize how narrow the road to enter the Kingdom of God is (Matt 7:14). The goalkeeper João Leite reflects on his own life, "Sometimes, I look at who I am, and don't recognize myself! I was insecure, suspicious, superstitious, vulnerable, fearful and a liar. In spite of seeming to be a good person before the eyes of society, I was so far from God's standards" (Ribeiro, 2016, p. 73). Spiritual people desire to live according to God's will, but one of the challenges of spiritual athletes is to understand the boundaries of a devoted game and aggression in sport as the boundaries are not very clearly defined. Defender Jatobá says that he is still competitive on the football field, but without malice in his heart. Footballer Silas admits that some coaches used to say that he was a bit too "friendly" and didn't play hard with the opponents (Ribeiro, 2016, p. 24, 96).

Summary

Summing up the results we would like to propose our definition for the word 'spirituality' and introduce with the new term 'pre-spirituality'. Our purpose of this study was to define 'spirituality', but during the process of research we realized that there is a need for a word to describe presence of God's spirit (the breath of life) in each human. We decided to call this state 'pre-spirituality'.

Linguistically the noun 'spirituality' is formed from the adjective 'spiritual' which in Biblical sense basically means 'God centred' or 'God focused' referring to the root 'Spirit' that is God's nature and one of His names. Whatever noun would follow, the word 'spiritual' would determine whether this thing/person/event comes from the Spirit of God or is oriented towards Spirit of God. Any way, it is all about God because He is the beginning and the end of everything (Rev 21:6). For example, if we think of a spiritual song – it comes from God because it is inspired by God's Spirit and it goes to God because its purpose is to worship Him. If we think of spiritual people – they come from God because they are created by Him, they are born from the Spirit and they are oriented towards Him to live life with Him. 'Spirituality' means a state or condition of being spiritual. State is 'way of standing, condition, position' and condition is 'situation, mode of being' (Ayto, 2005). So we could say that spirituality is a mode of life that is God centred. To live a God centred life means to put Him in front of anything else – myself, others, circumstances etc. – He, His will and His plans are at the centre of everything.

However, we would like to suggest a more specific definition of spirituality that could be beneficial for practical application and would emphasize the essential role of Jesus and the Holy Spirit in the result and process of spirituality. To sum up the results of the Bible study, we drew a visual picture in a form of stylized orienteering map where you can see the definition of spirituality written (Figure 2). The Kingdom of God is represented on the right side as buildings on an impassable cliff. Originally, people were created very good to be representatives of God's Kingdom, but humans chose to turn away from God. Hence, the sole access to God

now is through God Himself who came on the Earth and lived in human body – Jesus Christ. Each person is born in a stage of pre-spirituality because the spirit of God (breath of life) exists in each living human. Every person has knowledge of God deep in their hearts (Ecc 3:11; Rom 1:19-21) and the traffic label with a turning back road sign on the map shows that each person has a choice to turn back to God through Jesus. Prophet Isaiah said: "Therefore the Lord himself will give you a sign. Behold, the virgin shall conceive and bear a son, and shall call his name Immanuel (which means God is with us)" (Isa 7:14).



Figure 2. Depiction of spirituality and pre-spirituality on stylized orienteering map

The move from pre-spirituality to spirituality occurs when a person says "YES" to Christ and trusts Him that He is a way back to God (John 5:24). If there are "yes-es" to Jesus in everyday life decisions – it is following Jesus (Heb 12:1-3). Personal surrender to God, who is Love, is a response of a human's love to God's gracious and loving initiative. In a loving relationship with God through Jesus, humans are transformed in the image of Christ (Pro 3:12; Rom 8:28-29; Heb 12:6-7). It is all done by the power of Holy Spirit (Luke 4:14; Rom 8:13-14). The definition of spirituality that we offer contains all four components mentioned above – trust in Jesus, following Jesus, love and the power of Holy Spirit. Trust in Jesus Christ and His words is key to receiving the Holy Spirit and a continuous trust in Him is key to live one's life under the power and guidance of the Holy Spirit. If we use the metaphor from the sport of orienteering – the Bible (God's Word) is the map in our lives to know God's will and to be obedient to Him. The Holy Spirit is the compass to orientate the map in the correct way because it is possible to use the name "Jesus", but walk the opposite direction – away from the Kingdom of God and not towards it (Mat 7:21-23). Practical applications of spirituality in sport are mentioned in the Conclusion section.

Discussion

In our study, we have explored Biblical texts to offer a definition of 'spirituality'. We have also come up with a new term 'pre-spirituality' that we offer to point out the presence of God's breath (spirit) in the human body that gives each human a deep inner knowledge of the Creator and a desire after Him. Although the idea that spirituality exists (at least potentially) in all persons is found (Ronkainen et al. 2013), we haven't encountered the term 'pre-spirituality' in other studies. Hence, to the knowledge of the authors this is the first time the term 'pre-spirituality' is being used.

Our study gives support to the study of McClendon (2012) who suggests drawing lines between three degrees of spirituality – general spirituality, Christian spirituality and Biblical spirituality. According to his study, Biblical spirituality – the narrowest use of spirituality – gives the clearest understanding of the word to guide people back to the original meaning of the word "spirituality" (Spirit – filled life). He recounts that the earliest record of the Latin word *spiritualite* was dated AD 410 and it was used by an anonymous author urging his audience to live in greater conformity to the Spirit. McClendon admits that in the course of history, due to various reasons, the word started to lose its distinction. The definition of spirituality that we propose through our research extends the definition of Kleinig (2008) "Christian spirituality is following Jesus" and is created to be more specific than such definitions as "living life under the impulse of the Spirit" or "living life in collaboration with Spirit" (Fee, 2010). Benner (2015), just like we do, expresses the idea of spirituality as a process of transformation. According to Benner, the fact that spiritual people are already in God means that the nature of the spiritual journey becomes more of awakening than accomplishment, and more of spiritual awareness than spiritual achievement. He emphasizes the importance of love in Christian spirituality, pointing out that Christian spirituality starts with God's love and God's love is the source of transformational process where humans become fully and deeply human by learning to surrender to God in love.

We agree to the words formulated by L. S. Cunningham (2010), "There is something almost intractable about pinning down exactly what the word spirituality means". Therefore the authors of this study don't claim to have the only correct definition of spirituality. We think that the truth about God and spirituality can be expressed in different ways and words. However, we are convinced that definitions of spirituality which exclude God or reference to His work in formation of spirituality don't reveal the essence and fullness of the word, but only some degree of it. We think that the comprehension of spirituality and the willingness to include God in the definition of spirituality or not will always depend on the heart attitude – whether the heart is seeking to honour the Creator or not.

Hess (2009) has observed that there is a distinct genre of relevant writing on sport and spirituality that lies largely outside the theological discourse, focusing on the socio-cultural dimensions of sport (p. 16). We see our research as a valuable attempt to contribute to the discussion concerning the existing gap. Although some might argue that too much of the content in this study has been devoted to study the

Biblical view on spirituality in general, we have seen it as a very important prerequisite to explore the specific expressions of spirituality in sport. We think it is similar to the situation in sport ethics, where there are no specific ethical values that are characteristic to the field of sport only. Sport ethics is formed of the universal and everlasting human values that are adapted to fit the characteristic situations of the sports world (Kuzņecova, 2003, p. 61). Carmody (1983) writes that holistic spirituality is "connective" and extends the ties from the love of God "to all the significant dimensions of our lives", and we see that this includes the dimension of sport life as well. Conn (1993) speaks of spirituality as an experience that includes all the complexity and richness of each person's historical and cultural location as well as the particularities of gender, race, class, psychological development and the unique operation of divine grace within human personality. In our study we have seen that each human has a personal, individual experience with God in his or her unique life situation. However it was possible to draw out some common trends that reflect spirituality of sportspeople.

We think that the experiences of Christian athletes described in the book of A.D. Ribeiro (2016) were appropriate for initial research of spirituality in sport. However, there are also limitations – all testimonies in the book are from Brazilian athletes or athletes who had athletic career in Brazil. Therefore further work is planned to expand the study and explore spiritual experiences of Christian athletes from a diversity of countries.

Future work should focus on creating theological views on competitiveness in sport and exploring Biblical aspects on the boundaries of a devoted game of spiritual athletes and aggression in sport. Although some studies on the theology of competition exist already, we agree to Smith, Johnson and Hiller (2004) that the topic of studying God's view on competition is far too complicated for human mind and it is not possible to make authoritative statements. Hence, we see that human discussion on the spiritual foundation of competition helps to reveal its multifaceted nature.

Conclusion

According to a Biblical perspective, spirituality cannot be separated from the triune God (*Elohim – Father, Son and Holy Spirit*) who is the Creator of everything and whose Spirit is His nature. God has created immaterial spiritual beings that are named angels and He has created humans with their physical body from dust. Humans are created in the image of God and God's spirit or 'the breath of life' within humans makes them alive.

God is the ultimate reason of sport because He has created human beings with playful nature. Play is intended to bring joy and a joyful learning experience whilst also giving glory to God. God's creative character is reflected in the diversity of human body compositions, body movements and diversity of sports that people have invented.

In the beginning, everything was created good, but spiritual warfare between God and evil began when angels rebelled against their Creator. Satan involved

human beings in this warfare as they also chose to be disobedient to their Creator. Sin (human disobedience to God) has broken the fellowship between God and humanity. Therefore each human's heart is corrupt. Evil in sport reflects the evil that is in human hearts.

God is giving the opportunity to each human to receive a new heart and new spirit through faith in Jesus Christ. Spiritual people are those who have received Holy Spirit in their hearts. Natural people are those who refuse to trust Jesus and therefore don't have Holy Spirit. Carnal people are those who have trusted Jesus and have received the Holy Spirit, but who don't surrender to the Spirit of Christ on a day to day basis. Spiritual people are able to truly experience God's unconditional love and deep inner peace that comes from intimate relationship with Him. Only people with Holy Spirit within can truly love God and love each other on and off the sport field. Spiritual people live according to God's will and His laws.

Spirituality according to a Biblical perspective is trusting in Jesus Christ and following Him in love by the power of the Holy Spirit. Pre-spirituality is a spirited condition of each living human being that is provided by the presence of God's breath (spirit) in the body and gives deep inner knowledge of the Creator and craving after Him. All people are born in a stage of pre-spirituality.

Regarding sport, the Bible as a historical document shows that people have found the unique language of athletics useful and relevant to communicate spiritual truths with those who may be concerned (1 Cor 9:24-27; Phil 3:12-14; 1 Tim 4:7-8; 2 Tim 2:5; Heb 12:1-2).

By exploring testimonies of Christian sportspersons we have found that spiritual sportspersons:

- recognize their need for Jesus to live a spiritual life
- give credit to God for their physical abilities, talents and success
- practice sport to glorify God
- find their ultimate joy, meaning and purpose in a loving relationship with God and not in their athletic success
- have trusted their lives to Jesus, but admit that they continue to grow in their faith
- experience that God has been positively changing their character and life which is reflected on the sports field and their athletic career
- communicate to others that salvation is in Jesus
- experience tension to surrender to God's Spirit and sometimes are disobedient to God in their decisions or actions and begin to live a carnal life
- deal with consequences of their sin
- feel and experience God's presence on the sports field
- surrender to God's love also in difficult circumstances (e.g., injury, disappointment)
- are not jealous for their teammates for taking their place in the game and leaving them on the bench
- have experienced miraculous deliverance from addictions

- experience that God's Word is living and personal in their lives on and off the field
- pray to God and experience the power of prayer on and off the field
- are still competitive in their sports, but do compete without malice in their heart
- experience that other people make fun of them because they believe in Jesus.

We see spirituality as a result and a continuous process simultaneously ("already" and "not yet") because Jesus has made his followers righteous in the eyes of God, but on a daily basis they are subjected to internal and external temptations to be disobedient to God on and off the sport field. "Not yet" aspect causes spiritual people to become carnal people and it gives opportunity for carnal people to become spiritual again. For sporting celebrities walk with Christ can be more challenging than it is for other sportspeople because of constant pressure that is created by other people.

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REVIEW PAPER

ASSESSMENT OF IMPACT OF THE COMPUTER WORK STATION ON THE RISK OF MUSCULOSKELETAL SYSTEM DISEASES IN BANKING SECTOR EMPLOYEES

Wioletta Łubkowska¹, Mirosława Szark-Eckardt², Adrian Juszczyk³,
Magdalena Zajac⁴, Marta Stępień-Słodkowska¹, Bożena Mroczek⁵
Pandya Chinmay⁶

¹University of Szczecin, Poland

²Kazimierz Wielki University in Bydgoszcz, Poland

³Independent Public Team of Plants of Health care in Lipsko, Poland

⁴Institute of Psychology, Faculty of Pedagogy and Psychology Kazimierz Wielki
University in Bydgoszcz, Poland

⁵Pomeranian Medical Universities in Szczecin, Poland

⁶Dev Sanskriti Universities, India

Corresponding author:

Department of Physical Education and Health Promotion
University of Szczecin

Address: 40B Piastów Street, 71 – 065 Szczecin, Poland

Phone: + 48 91 444 27 49/ -79

E-mail: wioletta.lubkowska@usz.edu.pl

Abstract

Diseases of the musculoskeletal system have a significant impact on the presence of an increasingly large group of employees on the labor market, on their mobility and efficiency. This study was aimed at assessing the impact of computer work stations on the risk of musculoskeletal system diseases (MSDs) in banking sector employees. Material and methods: Subject group consisted of 71 banking sector employees who worked in front of the computer for more than 7 hours per day. Purposive sampling was used, in accordance with the non-probability sampling technique. Author's own survey was used. Results: Pain in the lumbar spine (90.63%; $\chi^2=3.94$; $df=1$; $p=0.047$) and discomfort in the hand area (10.2%; $\chi^2=4.89$; $df=1$; $p=0.02$) were statistically more common in banking sector employees in small towns. In those locations, computer work stations were less frequently equipped with a footstool and wrist pads (25.0%; $\chi^2=30.84$; $df=1$; $p=0.0001$), office equipment was more commonly situated in a way which did not require change of body position (78.13%; $\chi^2=5.89$; $df=1$; $p=0.02$), and employees worked with a twisted torso

(59.38%; $\chi^2=8.28$; $df=1$; $p=0.004$). Banking sector employees in larger cities participated in ergonomics trainings more often (89.74%; $\chi^2=33.51$; $df=1$; $p=0.0001$); they also displayed deeper knowledge of ergonomics (87.18%; $\chi^2=4.68$; $df=1$; $p=0.03$). Lack of desk with adjustable height was accompanied significantly more often (24.14%) by wrist pain ($\chi^2=3.9086$; $df=1$; $p=0.04$). Similarly, twisted position of the torso while sitting down was related to frequent incidence of numb legs (37.93%), compared to proportion of those sitting down in a non-forced position (9.52%; $\chi^2=8.04$; $df=1$; $p=0.004$). Conclusions: Correct ergonomics of the computer work station help prevent diseases of the musculoskeletal system. Trainings for employees, prevention programs and promoting healthy work habits are key factors in reducing the incidence of musculoskeletal symptoms.

Key words: *musculoskeletal system, work station, computer, banking, ergonomics, health risk*

Introduction

In recent years the computer has become a wide-spread work tool. Technological advances and software development resulted in introducing computers in new fields which so far had been computer-free. There has been an increase of computer work stations not only in offices, but also in corporate finance departments, as well as in the banking, insurance, IT, accounting, commerce, and science sectors. More and more people from various market sectors spend long work hours in front of computers. Meanwhile, the Polish Labor Code states that working for more than 4 hours per day in front of a computer constitutes ‘particularly arduous working conditions’ (Minister of Labor and Social Policy, 1998). This classification is well-grounded: ignoring negative aspects of working with a computer leads to significant health consequences for the workers.

Kowalska and Bugajska (2009) carried out an analysis of office work and identified negative health consequences in persons working in front of computers. Among the most commonly reported problems were: musculoskeletal system disorders (MSDs), peripheral nervous system diseases, as well as eye diseases and psychosocial stress.

Bendíková (2014) proved that sedentary position translates into long-term immobilized spine, which results in a spinal overload, causing increased pressure of vertebrae, as well as static load on torso and back muscles. This leads to incorrect spine curvature, which in turn results in pain and degenerative changes. According to research conducted in 27 EU member states, as many as 22% of employees face musculoskeletal system disorders.

MSDs significantly impact mobility and efficiency of employees in many various sectors. It affects both individuals and teams, lowering productivity and quality of work, and – consequently – financial results and competitiveness advantage of enterprises. Results show that in 2010 MSDs and carpal tunnel syndrome caused 26 million days of absence from work (Zheltoukhova, Bevan & Reich, 2011). These numbers justify an urgent need to treat MSDs as one of top priorities of national health care in the coming years (Raciborski, Władysiuk, Bebrysz, & Samoliński, 2013; Malińska, 2013). This problem will increase not only due to lack of healthy practices and low health awareness of employees, but also due to aging of Polish employees, who – with time – will experience natural morphological, metabolic and operational changes in their skeletal muscles (with various intensity in men and women) (Bartuzi, 2012). To complete this worrying panorama, one should also add high BMI (Bugajska, Jędryka-Góral, Gasik, & Żołnierczyk-Zreda, 2011), life style deprived of physical activity (Bendíková, Šmída, & Rozim, 2014; Nowak, 2011), smoking, alcohol and diseases such as diabetes, hypothyroidism and rheumatoid arthritis (Bugajska, Jędryka-Góral, Gasik R, & Żołnierczyk-Zreda, 2011).

For sedentary work, it is absolutely vital to provide an ergonomic work station, proper organization of work and to familiarize employees with arduous conditions of work, their consequences and methods of preventing them. Proper attention must be paid to providing adequately equipped work stations: tables or desks with appropriate measurements, chairs, footstools, wrist rests or document holders. Elements of the computer work station must be also ergonomically placed, while employee should take breaks to reduce the static load (Mieszkowska, Bugajska, & Wolska, 2008; Tokarski, 2011). Among other factors that trigger disorders of the musculoskeletal system, categorized as psychosocial factors, are: working under pressure, low satisfaction from work and insufficient social support. Stańczak et al. (2014) stated that working at computer stations in the banking sector is particularly stressful compared to other sectors, and requires further research into related health problems (Stańczak, Mościcka-Teske, & Merecz-Kot, 2014).

Research objectives and questions. The aim of the study was to assess the impact of computer work station ergonomics on the incidence of musculoskeletal system pain among banking sector employees.

The study aimed to answer the following question:

1. How often do MSDs affect banking sector employees working in front of computers in various-sized cities and towns?
2. Do ergonomic work stations and trainings result in reduced MSDs?

3. Which socio-demographic, health and ergonomic factors in this study are related to the incidence of musculoskeletal system pain?

Material and methods

The study was conducted in various branches of the same bank in the “Zachodniopomorskie” and “Mazowieckie” Voivodships in large cities and small towns. The study encompassed 71 employees working in front of computers. Subjects were selected by non-probability sampling. There were 71 employees in the subject group; 83.1% of them were women and 16.9% were men. Number of working hours in front of the computer exceeded 7 hours daily. Participation in the study was voluntary. Subjects were aged 25 – 60. Average age was 39 years ($SD \pm 6.42$). Majority of subjects (64.79%) were university-educated. None of subjects had vocational education. Subjects worked in their roles from 1 to 30+ years. Subjects were divided into 5 groups, based on years of work in their current role and years of work in the bank. The largest groups were computer operators working in their role up to 4 years. Characteristics of the subjects are presented in Tab.1.

Table 1

Sociodemographic characteristics of the respondents

| Demographic variable | Respondents (N=71) | |
|---|--------------------|-------|
| | n | % |
| Sex | | |
| women | 59 | 83.10 |
| men | 12 | 16.90 |
| Education | | |
| secondary | 13 | 18.31 |
| bachelor's degree | 12 | 16.90 |
| master's degree | 46 | 64.79 |
| Work experience in the position [years] | | |
| ≤ 4 | 47 | 66.20 |
| > 4 ≤ 10 | 8 | 11.27 |
| > 10 ≤ 20 | 7 | 9.86 |
| > 20 ≤ 30 | 5 | 7.04 |
| > 30 | 4 | 5.63 |
| Work experience in the bank [years] | | |
| ≤ 4 | 43 | 60.56 |
| > 4 ≤ 10 | 6 | 8.45 |
| > 10 ≤ 20 | 9 | 12.68 |
| > 20 ≤ 30 | 6 | 8.45 |
| > 30 | 7 | 9.86 |

The study was conducted in two stages. In stage I, interviews with bank directors were conducted. Stage II included a printed 2-part survey

based on author's questionnaire. Part I included questions related to descriptive data, such as socioeconomic and demographic aspects, as well as role and work experience. Part II included questions related to MSDs, self-assessment of one's health and computer work station ergonomics. Bank employees completed anonymous surveys. These were placed in individual envelopes, which were then put into collective envelopes.

Surveys were analyzed statistically with Statistica 10.0. Distribution of responses and significance of differences was identified with Chi-squared test. Statistically significant result were those with $p < 0.05$. Relations between pain and risk factor incidence were described with agglomerative analysis, using non-standard Euclidean distance.

Results

Subjects were divided into two groups based on their work location. Group A included computer operators working in bank branches in a large city, while group B – in town branches.

Subjects most commonly reported lumbar spine pain – 80.28%. Other common issues were cervical spine pain (77.46%) and back pain (30.99%). Leg numbness was identified in 21.00% of subjects, while every fifth employee reported hand or wrist pain (Tab. 2).

Table 2

Diseases of the musculoskeletal system in computer users in the banking sector

| Incidence of musculoskeletal system symptoms | Group A (N=39) | | Group B (N=32) | | Total (N=71) | | Chi ² Pearson | p |
|--|----------------|-------|----------------|-------|--------------|-------|--------------------------|-------|
| | n | % | n | % | n | % | | |
| back pain | 11 | 28.21 | 11 | 34.38 | 22 | 30.99 | 0.313 | 0.58 |
| cervical spine pain/ neck stiffness | 29 | 74.36 | 26 | 81.25 | 55 | 77.46 | 0.479 | 0.49 |
| lumbar spine pain | 28 | 71.79 | 29 | 90.63 | 57 | 80.28 | 3.937 | 0.04* |
| pain/stiffness in the hand or wrist area | 4 | 10.25 | 10 | 3.12 | 14 | 19.72 | 4.894 | 0.02* |
| leg numbness | 6 | 15.38 | 9 | 28.12 | 15 | 21.12 | 1.712 | 0.19 |

* $p < 0.05$

SMDs had greater incidence among computer operators working in the bank office in a small town than those working in a large city. Statistical significance was observed in terms of MSDs related to lumbar spine pain and hand pain. Other differences were not statistically significant. When asked about dangerous physical factors that influence their MSDs, every 1 in 4 subject confirmed their existence. Proportion of confirmations was

higher among small town branches (31.25%), as compared to 20.51% in large city branches (Tab. 3).

Table 3

Assessment of work conditions and basic requirements in terms of equipment of the computer work station

| Question | Group A (N=39) | | Group B (N=32) | | Total (N=71) | | Chi ² Pearson | p |
|---|-------------------|--------|-------------------|-------|-----------------|-------|-----------------------------|----------|
| | n | % | n | % | n | % | | |
| Incidence of risky physical factors leading to musculoskeletal symptoms | 8 | 20.51 | 10 | 31.25 | 18 | 25.35 | 1.07 | 0.301 |
| Assessment of one's workstation in terms of ergonomics | 31 | 79.49 | 18 | 56.25 | 49 | 69.01 | 2.531 | 0.111 |
| Presence of footstool and wrist pads | 35 | 89.74 | 8 | 25.00 | 43 | 60.56 | 30.848 | 0.0001** |
| Adjustable desk height | 7 | 17.95 | 6 | 18.75 | 13 | 18.30 | 0.007 | 0.931 |
| Screen position of the desk leading to glare effect | 7 | 17.95 | 6 | 18.75 | 13 | 18.30 | 0.007 | 0.931 |
| Twisted torso while sitting down | 10 | 25.64 | 19 | 59.38 | 29 | 40.84 | 8.278 | 0.004** |
| Presence of chair/armchair with regulated height, depth and armrests | 39 | 100.00 | 30 | 93.75 | 69 | 97.18 | 2.508 | 0.115 |
| Location/distance from the office equipment without change in body position | 22 | 56.41 | 25 | 78.13 | 47 | 66.27 | 5.8991 | 0.0151* |

* p<0.05; ** p<0.01

The observed differences were not statistically significant. Large city branch employees were more positive about ergonomics of their work stations (79.49%), whereas 56.25% of small town employees believed their work place was ergonomic. There were statistically significant differences in terms of work station equipment in footstools and wrist rests (p=0.0001), position of office equipment which does not require change of body position (p=0.015) and working while sitting with twisted torso (p=0.004).

One of the elements that shape awareness of impact of the work conditions on health is employees' knowledge about ergonomics of computer work stations. Ergonomics encompasses requirements for computer chairs, tables, computer screen and keyboard placements, as well as additional equipment, such as document holders, foot stools and wrist rests. Such knowledge is gained by employees during 'ergonomics at work'

trainings and potentially they can use it in practice to modify their work conditions, which was analyzed herein (Tab. 4).

Table 4

Preventive activities aimed at work-related musculoskeletal symptoms

| Question | Group A (N=39) | | Group B (N=32) | | Total (N=71) | | chi2 | p |
|---|-------------------|-------|-------------------|-------|-----------------|-------|--------|----------|
| | n | % | n | % | n | % | | |
| A meeting about work ergonomics at computer work stations | 35 | 89.74 | 7 | 21.87 | 42 | 59.15 | 33.509 | 0.0001** |
| Knowledge about ergonomics at computer work stations | 34 | 87.18 | 21 | 65.63 | 55 | 77.41 | 4.678 | 0.031* |
| Effective and comfortable rest during break at work | 16 | 41.03 | 9 | 28.13 | 25 | 35.21 | 1.282 | 0.257 |

* $p < 0.05$; ** $p < 0.01$

Questions answered by the subjects were related to participation in trainings and assessment of their knowledge on ergonomics and active breaks at work. Over half of subjects (59.15%) participated in ergonomics trainings. There were statistically significant differences between large cities and small towns (89.74% vs 21.87%). Banking sector employees in larger cities displayed deeper knowledge of ergonomics. These differences were statistically significant, similarly to participation in ergonomics trainings. Although over 40% of employees from Group A engaged in effective rest during breaks at work, in Group B the proportion was only slightly lower – 28.13% (Tab. 5).

Table 5

Participation in physical activity and BMI of respondents

| Question | Group A (N=39) | | Group B (N=32) | | Total (N=71) | | chi ² | p |
|---|-------------------|-------|-------------------|-------|-----------------|-------|------------------|---------|
| | n | % | n | % | n | % | | |
| Physical activity in respondents' free time | 32 | 82.05 | 16 | 50.00 | 48 | 67.60 | 8.2451 | 0.004** |
| BMI [body mass in kg/(height in m) ²] | | | | | | | | |
| underweight | 1 | 2.56 | 0 | 0.00 | 1 | 1.41 | 4.9887 | 0.172 |
| normal body weight | 29 | 74.36 | 17 | 53.13 | 46 | 64.79 | | |
| overweight | 6 | 15.38 | 10 | 31.25 | 16 | 22.54 | | |
| obesity | 3 | 7.69 | 5 | 15.62 | 8 | 11.26 | | |

* $p < 0.05$; ** $p < 0.01$

One of conditions of good state of the musculoskeletal system is maintaining correct body posture and physical activity. The obtained results were analyzed in terms of physical activity and BMI. It was found that

82.05% of computer operators from Group A reported physical activity in their free time, while in Group B it was 50.00% of subjects. The difference between groups was statistically significant. Group A had better BMI than Group B. More computer operators from large cities had corrected BMI and there were fewer overweight and obese subjects in that group.

The study was aimed at answering the following questions: Do ergonomic work stations and trainings result in reduced MSDs? Based on work station ergonomics assessment (ergonomic vs non-ergonomic), an analysis of incidence of diseases among bank employees was conducted (Tab. 6).

Table 6

Diseases of the musculoskeletal system in computer users in the banking sector
versus work station ergonomics

| Type of musculoskeletal system symptoms | Work station ergonomics | | | | | | Chi² Pearson | p |
|--|-------------------------|-------|----------------------|-------|--------------|-------|--------------|--------|
| | Ergonomic (N=22) | | Non-ergonomic (N=49) | | Total (N=71) | | | |
| | n | % | n | % | n | % | | |
| back pain | 7 | 31.82 | 15 | 30.61 | 22 | 30.99 | 0.0103 | 0.919 |
| cervical spine pain/ neck stiffness | 16 | 72.73 | 39 | 79.59 | 55 | 77.46 | 0.4098 | 0.522 |
| lumbar spine pain | 18 | 81.82 | 39 | 79.59 | 57 | 80.28 | 0.0475 | 0.827 |
| pain/stiffness in the hand or wrist area | 5 | 22.73 | 9 | 18.37 | 14 | 19.72 | 0.1823 | 0.669 |
| leg numbness | 2 | 9.09 | 13 | 26.53 | 15 | 21.13 | 2.7712 | 0.096+ |

+ statistical significance at the level of $p < 0.1$

The presented data did not give grounds to believe that workplace ergonomics assessment made by employees correlated with incidence of pain disorders of the motor system. It was also determined that there were no statistically significant differences in declarations of pain incidence made by subjects – only leg numbness was significant in terms of statistical trend. Paradoxically, this problem was faced more often by employees who assessed their work station ergonomics positively.

Due to the subjectivity of employees' assessments, the researcher also checked whether an objective factor – work station equipment – was related to pain incidence. It was found that lack of desk with adjustable height correlated with significantly more frequent wrist problems (24.14%). Employees with adjustable desks did not suffer from this problem; statistically significant difference ($\text{Chi}^2=3.908$; $\text{df}=1$; $p=0.048$). Similarly, twisted torso while sitting correlated with leg numbness (37.93%), compared to 9.52% among those working in natural positions. Difference in

response distribution was statistically significant ($\chi^2=8.038$; $df=1$; $p=0.004$).

The study was aimed at determining which of the analyzed factors were related to pain problems. To illustrate it, a description with Euclidean distances was conducted, as presented in Figure 1.

Preliminary analysis excluded the size of the city – distance of this variable from pain problems was the greatest and prevented clear presentation of the data. Based on the Euclidean distances of physical distances between variables placed in a multidimensional space, it may be stated that back, wrist and leg pain were mostly related to body position at work and access to individually adjustable desk; less significance was observed in terms of dangerous factors at work and preventive function of effective breaks at work. Cervical and lumbar spine pain, being a separate group of problems, correlated with full adjustment of chair at work and knowledge on ergonomics. Such elements as comprehensive and ergonomic equipment were closely related to ergonomics trainings. However, their correlation with pain problems was weak (Fig. 1).

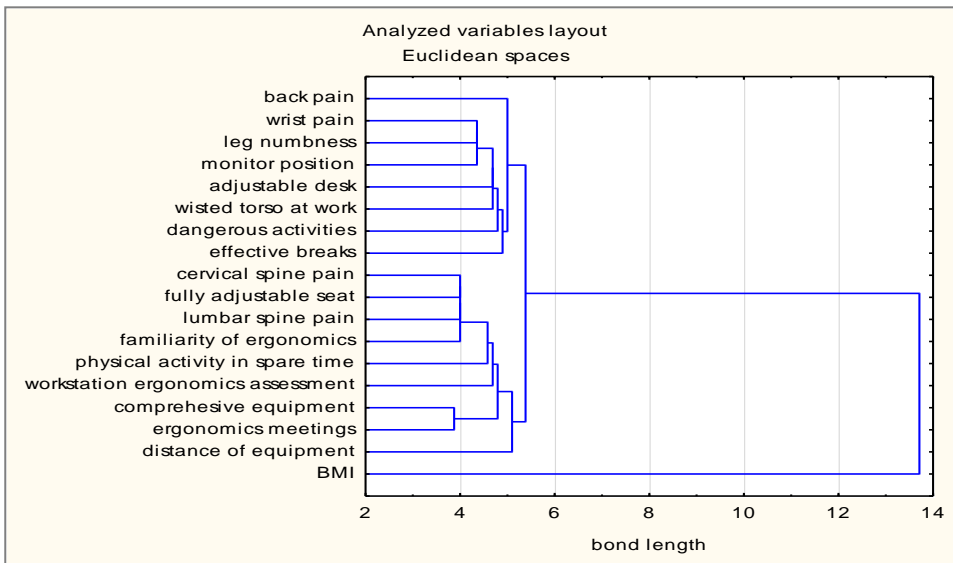


Figure 1. Relations between pain incidence and risk factors

Discussion

Research results presented in this paper indicate that over 80% of subjects faced lumbar spine pain. Cervical spine pain was experienced by 77% of subjects, back pain was reported by 31%, leg numbness – by 21%, while hand and wrist pain – by less than 20%. Reporting rate of

musculoskeletal system pain by the employees is relatively high, although computer operators still don't report their problems to a satisfactory extent. Preventive exam results of computer operators from Poznań, Poland (n=198) in the last 20 years showed a minimal reporting rate of motor system pain related to working in front of LCD monitors. In 1992 – 1996 it amounted to 60%, in 2010 – 2011 only 5%, while in 2012-2014 – 7.7% (Romankow, 2015).

Such low numbers contradict global research results, which suggest that pain among computer operators is common. Sillanpaa et al. showed that 63% of the analyzed computer operators reported neck pain, while 16% suffered from hand pain (Sillanpaa, Huikko, Nyberg, Kivi, Laippala, & Uitti, 2003). German employees (n=1065) suffered from neck pain (55% of subjects), hand and wrist pain (21%) (Klussmann, Gebhardt, Liebers, & Rieger, 2008). Study on Swedish call center operators who worked in front of computers (n=1183) showed that 75% of subjects reported musculoskeletal system pain (Norman, Floderus, Hagman, Toomingas, & Tornqvist, 2008). Research conducted in the UK (n=869) proved that 34% of subjects reported neck pain, while 35% – wrist joint pain (Devereux, Vlachonikolis & Buckle, 2002). Cross-sectional study of high- and low-level knowledge workers who worked in front of computers (n=6191) showed that 45.7% and 56% (respectively) experienced pain and numbness of neck (Korpinen, Pääkkönen & Gobba, 2012).

Results obtained in author's own study suggested that proper work conditions as well as correct position of computer work station elements are available to employees in large city branches, rather than in small towns. Worryingly, only 25% of computer work stations in the small town branch met the requirements for ergonomic work station, i.e. footstools and wrist rests. Placement of work station elements and employee's adjusting themselves to the station by working in twisted position was also very troubling. Incidence of MSDs was significantly higher among small town employees than those from large cities. The study revealed significant differences in terms of computer work station equipment between city/town branches. In small towns, bank offices occupied old buildings which were adapted to suit bank's needs many years before. Meanwhile, in the large city branches, the employees had much greater comfort of work. They had better opportunities to equip their work stations, the rooms tended to be newer and in many cases buildings had been adapted from scratch. It was confirmed by study results, which showed statistically significant differences in existence of dangerous physical factors that influence bank employees' MSDs. Most common mistakes in small town branches were: lack of footstools and wrist

rests, and the most common complaints were related to twisted torso position.

The study clearly indicates that uncomfortable conditions may be reduced and even eliminated by providing ergonomic work stations and proper work environment (Tint, Traumann, Pille, Tuulik-Leisi, & Tuulik, 2012). Bugajska et al. (2011), basing on Washington State Department of Labour & Industries materials, presented periods of various activities in unnatural body positions; by exceeding these times, employees expose themselves to moderate or high risk of overload disorders. Among physical risk factors was keyboard usage: used for 4 hours daily, it constitutes a moderate risk, while used for more than 7 hours per day – a high risk.

Bartuzi et al.'s study results were also interesting. They analyzed computer operators (n=53) and found that MSDs stem inter alia from insufficient awareness of computer ergonomics among employees (Bartuzi & Kamińska, 2010). It was further confirmed by results of study reported in this paper, which indicated that employees with lower awareness of ergonomics and sources of pain experienced pain statistically more often. On the other hand, employees who rested effectively during breaks at work declared statistically lower incidence of leg numbness. It was also related to distance between office equipment without the need to change body position. These observations were confirmed by many papers on importance of breaks at work (Mahmud, Kenny, & Heard, 2011; Rehman, Khan, Khan, & Surti, 2014) and stretching exercises (Mahmud, Fatimah-Bahari, & Zainudin, 2014).

Study results also confirmed beneficial effect of physical activity on reducing musculoskeletal pain incidence. Individuals taking physical exercise in their free time tended to have corrected BMI – these were mostly large city employees. Employers in large cities have opportunity to use appropriate infrastructure, hire gyms or provide fitness / swimming passes.

Conclusions

The presented results give grounds to the following conclusions:

Proper ergonomics of computer work stations helps prevent musculoskeletal pain.

In terms of musculoskeletal pain prevention at work, healthy life style, physical activity in free time and correct BMI play a significant role.

Trainings and prevention programs to raise awareness of employees and promote health work habits play a crucial role in reducing incidence of MSDs.

Education activities should be supported and an appropriate incentive (procedure) system needs to be implemented in order to develop

more effective methods of reducing the risk of chronic musculoskeletal pain among computer operators in the banking sector.

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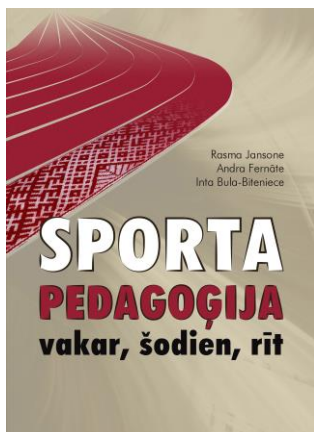
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SHORT COMMUNICATION

Review of the book

“Pedagogy of physical education yesterday, today and tomorrow”



Authors: Rasma Jansone, Ineta Bula-Biteniece, Andra Fernāte, Inese Bautre, Inese Pontaga, Ineta Māra Rubana, Juris Grants, Aivars Kaupužs, Uldis Grāvītis
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The Monograph is absolutely relevant and necessary not just in the Latvian context, but for the sports community in the neighbouring countries as well. The Part one “Theoretical aspects of physical education” has strong theoretical significance and Part two “Implementation of pedagogy of physical education and successful practice” – strong practical impact. It is commendable that the monograph has a strong scientific background – scientific recommendations from various institution, research articles and other works have been used in it. At present, there are many books and scientific publications on Physical Education, Physical Activity, Physical Fitness, Sport etc. However, Physical Education, Sports and Community Development (even Health Care) need this kind of monograph which covers a broad range of this area. The monograph consists of two parts and the information and issues in both of them are highly relevant, but I would like to especially single out:

In the first part:

- Guidelines for the implementation of the process of physical education pedagogy;
- Importance of physical activity in health maintenance and improvement;
- Values of education within the context of physical education pedagogy (in the current context of globalization it is of key importance that physical education involved fostering universal values, tolerance, social development, etc. as highlighted in Eurydice Report 2013, UNESCO).

In the second part:

- Teacher's tools in conducting a meaningful and purposeful learning process in physical education pedagogy;
- Motor skills, acquirements, physical characteristics and biomotoric abilities;
- Physical education content and innovations in it in the aspect of different ages;
- Health promoting physical activity for seniors. The material represents a conceptually in-depth and methodologically demanding study that satisfies all of the criteria for Monograph. The Monograph is relevant to professional and practical needs. In conclusion, I recommend publishing the Monograph.

Arunas Emeljanova, PhD, Assoc. Professor
Department of Health, Physical and Social Education,
Dean, Faculty of Sport Education.
Lithuanian Sports University.

This anthology dedicated to the 95th anniversary celebrations of The Latvian Academy of Sport Education (LASE) reflects dominating value systems and favourable societal developments where sport and sport science are specifically recognized. A drive for quality and the impact of a changing world focusing the unique individual are dominating influents all through the document. Many questions are raised and fully dealt with. In particular the scientific reciprocity of theory versus practice in all programs and scientific activities as well as student and teacher needs. My congratulations to LASE and to all contributors of this book.

Rolf Carlson, PhD
Professor emeritus
Swedish School of Sport and Health Sciences (GIH)
Stockholm, Sweden

CURRENT NEWS



Latvian Academy of Sport Education

10th Baltic Scientific Conference
Multiplicity of Sports Science in Practice
April 26 - 28, 2017, Riga, Latvia

The official language of the Conferences for oral and poster presentations is English. The information are placed on the websites:

<http://www.balticsportsciencesociety.com/> or www.lspa.lv

LASE 9th PhD and Master Student Scientific Conference
„Individual for Society and Society for Individual”
March 23, 2017 Riga, Latvia

LASE 69th Student Scientific Conference
June 7, 2017, Riga, Latvia

The official languages of the Conferences for oral and poster presentations are Latvian and English. The information is placed on the website: www.lspa.lv



OSRESS 2017

Outdoor Sports and Recreation Education Summer School 2017

September 8 – 14, 2017, Madona, Latvia

Organizers: Latvian Academy of Sport Education with Latvian Association of Outdoor Education and Recreation in collaboration, Jozef Pilsudski University of Physical Education in Warsaw, Faculty of PE in Biala Podlaska, Poland State College of Computer Science and Business Administration in Lomza, Poland, Swedish School of Sport and Health Science, Sweden and University of Malaga, Spain.



We congratulate Aleksandra Čuprika, PhD student at the Latvian Academy of Sport Education, who has defended her thesis “PROMOTION OF PHYSICAL CAPITAL IN FITNESS” (Sport Science) at the Latvian Academy of Sport Education on November 24, 2016. Supervisor: Dr.paed., prof. Andra Fernāte.

The Doctoral Thesis has been developed by ESF support within the project “Support for Sport Science” Nr. 2009/0155/1DP/1.1.2.1.2/09/IPIA/VIAA/010 work program „Human resources and employment” 1.1.2.1.2. Sub activity ”Support to Implementation of Doctoral Study Programme”

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GUIDELINES FOR CONTRIBUTORS

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Title page should contain: title of the paper, first and last names of authors with affiliation, first and last name of corresponding authors with postal address, telephone, fax and e-mail.

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Body text should be sectioned into: Introduction, Material and Methods, Results, Discussion, Conclusions, Acknowledgements (If necessary) and References. In articles of others types, the text should follow in a logical sequence and headings of its particular sections should reflect issues discussed therein.

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References – following instructions for Authors on References (APA style).

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Following artificial text shows different types of in-text citation:

Claessens (2010) found evidence that attention will be given to multi-compartment models, such as the 3-water, 3-mineral and 4-compartment models, to assess percentage of body fat.

However, Raslanas, Petkus and Griškonis (2010) noted that Aerobic physical load of low intensity got 35.1 % of total trainings time. Research on physical loading also focused on identifying the basis of many years' research of physical activity (Bytniewski et al. 2010). According to Ezerskis (2010), "... heavy physical loads had the undulating character depending on the dynamics of workloads..." (p. 71) yet girls are more ascertained that the Track & Field training helps to develop courage.

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A complete reference should give the reader enough information to find the relevant article. If the article/book has DOI number, the author should include it in the references. And most importantly, complete and correct references may allow automatic creation of active links by the MetaPress technology that we use for making the electronic version of our Journal. Active reference linking is regarded as the greatest benefit of electronic publishing and it adds a lot of value to your publication.

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made and the author approves their article for publication, payment of the publication charge must be received before the article will be published online.

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Inta Bula-Biteniece

E-mail: inta.bula-biteniece@lspa.lv

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