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2012 m. lapkričio 29 d. Lietuvos sporto universiteto Senato posėdyje Garbės daktaro vardai suteikti Kopenhagos universiteto prof. **Bengt Saltin** ir buvusiam LKKA Tarybos pirmininkui **Ignui Staškevičiui**.

On November 29, 2012, Professor **Bengt Saltin**, University of Copenhagen, and former Chairman of LAPE Council **Ignas Staškevičius** were conferred the Titles of Doctor Honoris Causa at the Meeting of the Senate of Lithuanian Sports University.



Kopenhagos universiteto prof. **Bengt Saltin**
Professor **Bengt Saltin**, University of Copenhagen



NDX energija valdybos pirmininkas **Ignas Staškevičius**
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2012 m. gruodžio 10 d. Lietuvos sporto universiteto Senato posėdyje Garbės profesoriaus vardas suteiktas buvusiam ilgamečiam LKKA rektoriui prof. habil. dr. **Kęstučiui Miškiniui**.

On December 10, 2012, Professor Dr. Habil. **Kęstutis Miškinis**, former Rector of LAPE, was conferred the Title of Doctor Honoris Causa at the Meeting of the Senate of Lithuanian Sports University.



Žurnalo „Ugdymas. Kūno kultūra. Sportas“ Redaktorių kolegijos narys prof. habil. dr. **Kęstutis Miškinis**

Professor Dr. Habil. **Kęstutis Miškinis**, member of the Editorial Board of the journal “Education. Physical Training. Sport”

2013 m. vasario 13 d. Lietuvos sporto universiteto Senato posėdyje Garbės daktaro vardas suteiktas Erlangeno–Niurnbergo universiteto Sporto mokslo ir sporto instituto direktoriui prof. dr. **Alfred Rutten**.

On February 13, 2013, Professor Dr. **Alfred Rutten**, Director of the Institute of Sport Science and Sport, University of Erlangen–Nuremberg, was conferred the Title of Doctor Honoris Causa at the Meeting of the Senate of Lithuanian Sports University.



Erlangeno–Niurnbergo universiteto Sporto mokslo ir sporto instituto direktorius prof. dr. **Alfred Rutten**

Professor Dr. **Alfred Rutten**, Director of the Institute of Sport Science and Sport, University of Erlangen–Nuremberg

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THE INFLUENCE OF PILATES EXERCISE ON WOMEN'S ANTHROPHOMETRY INDICES, CORE MUSCLE PERFORMANCE AND HEART RATE CHANGES DURING THE SESSION

Vaiva Abramavičiūtė, Kristina Zaičenkovienė, Artūras Sujeta
Lithuanian Sports University, Kaunas, Lithuania

ABSTRACT

Research background and hypothesis. Pilates exercises are used in fitness and in some forms of rehabilitation programs (Di Lorenzo, 2011). Pilates focuses on core body exercise and activation of transversus abdominis muscle (TrA), multifidus and pelvic floor muscles can also be used as an exercise programme controlling body mass and blood pressure. Little is known about the Pilates exercise intensity and heart rate changes during the practice session.

The aim of the current research was to study the impact of Pilates exercise on women's body weight, core muscle performance and to evaluate heart rate changes during the practice session.

Research methods included anthropometry measurements, heart rate and core muscle performance measures.

Research results. In the period of 8-week Pilates training we found that it had a significant impact on women's fat body mass and static core muscle endurance. Slightly decreasing tendency was found in BMI, but there were no statistically different changes between the results at the beginning and after 8-week training period. Measuring HR changes during the Pilates session we found that moderate HR was 98.2 (4.7) beats/min and maximum HR was 131.4 (7.2) beats/min. Maximum HR took approximately 10% and moderate HR – 90% of training period time.

Discussion and conclusions. We found that 8-week Pilates training period had a positive influence on the participants' core muscle performance, fat body mass and minor BMI reduction. As a result, Pilates exercises could be used for the prevention of low back pain and to reduce obesity. Slight HR changes during the session indicate that Pilates exercises may have implications for the rehabilitation of individuals who have high blood pressure and cannot go in for high intensity physical activity.

Keywords: BMI, heart rate, Pilates training, static endurance of core muscles.

INTRODUCTION

Pilates method is a physical fitness system which helps to relax and at the same time sustains the smallest inner body muscles. Most attention is paid to the correct spine position and strengthening inner small body muscles during the practice session (Crews, 2006).

Joseph Pilates recognized that motor functions of the brain controlled the mobility and stability of the body, activating specific muscles in a functional sequence at controlled speeds and emphasizing quality, precision, and control of movement (Gallagher, Kryzanowska, 2000).

Scientific research shows that exercising in Pilates provides higher muscle endurance (especially of inner body muscles), has a positive impact on body composition changes, and shows a tendency to regulate blood pressure (Jago et al., 2006; Rogers, Gibson, 2009), as well as to strengthen and stabilize back and abdominal muscles (Menacho et al., 2010).

Joseph Pilates is credited for labelling the core, or centre, “the powerhouse” (Weinberg, 2008). The general consensus regarding the anatomical boundaries of the “core” is from the pelvic floor

inferiorly to the ribcage superiorly and is consistent with most of the current operative definitions (Akuthota, Nadler, 2004; Faries, Greenwood, 2007; Willardson, 2008). Centring is the focal point of the Pilates method. Abdominal hollowing, or the abdominal drawing-in manoeuvre (Endleman, Critchley, 2008) preferentially recruits TrA, internal oblique, and multifidus muscles (Barnett, Gilleard, 2005; Hides et al., 2006).

Z. Ali and colleagues (2010) investigated Pilates training impact on overweight physically inactive women. Research sample included 15 women, 26 (± 3) years of age. Results showed that Pilates training had a significant impact on the percentage fat body mass; it decreased by 7.3%, fat body mass (kg) decreased by 8.5%. Hip measurement indices decreased by 4.6%. However, total body mass and BMI indices remained unchanged (Ali et al., 2010).

In the 4-week research with 11-year-old young girls, scientists measured heart rate (HR) during the session using Polar HR monitors. Results showed that moderate training activity was 75%, mean HR was 104 beats/min (Jago et al., 2006).

The aim of the current research was to study the impact of Pilates exercise on women's body weight, core muscle performance and to evaluate heart rate changes during the practice session.

RESEARCH METHODS

From 26 women who took 8-week Pilates training session we selected 10 volunteering women

who were included into the research sample. All the other women refused to take part in the research, but they also performed Pilates exercises with the groups. Women took an 8-week Pilates training sessions twice a week for one hour; we measured their body mass, fat body mass, core muscle endurance and observed HR changes during the session at the beginning and after 8-week Pilates training period. Anthropometric characteristics are presented in the Table.

Table. Anthropometric characteristics of the participants

Index	Participants n = 10
Age, years	40.4 (10.5)
Height, cm	167.1 (2.8)
Weight, kg	64 (10.2)

Research methods. At a baseline and after the 8-week training period, participants were weighted using Tanita TBF 300 (USA) scales and their BMI and fat body mass were calculated. The height of the participants was measured using wooden meter ruler.

Heart rate measurements were taken using Polar HR monitors. Resting heart rate was measured after the 10 min relaxation lying on the mat. Heart rate changes were presented by Polar Precision Performance computer programme (Figure 1). We analysed HR changes during the Pilates session. HR target zones were calculated using Karvonen target HR zones formula (Skidmore et al., 2008; Burke, 2002).

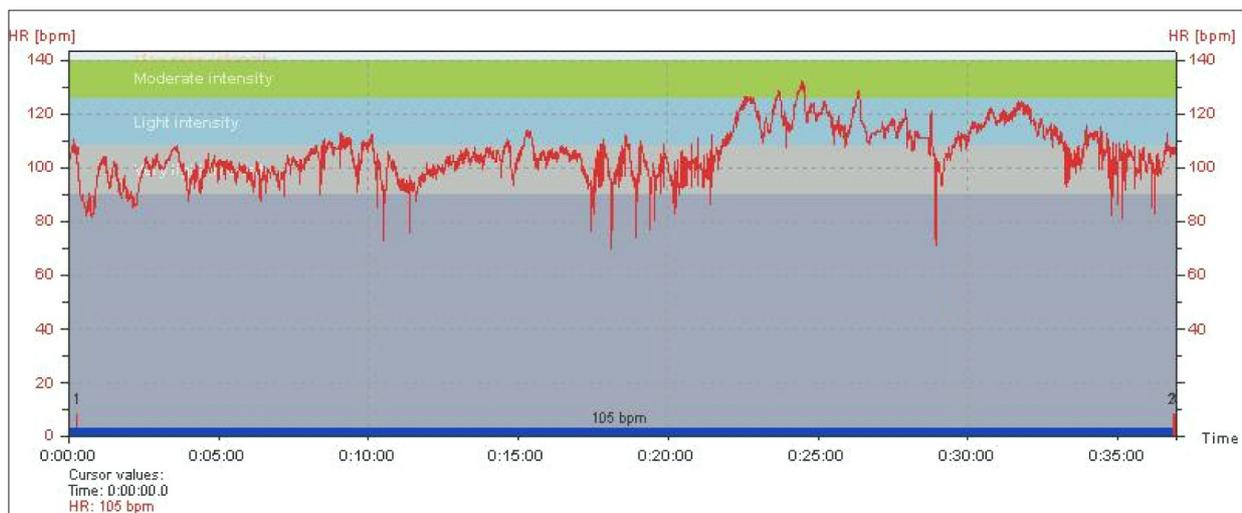


Figure 1. The original curve of one participant heart rate changes during the Pilates session

Static core muscle endurance was measured using Stabilizer™ Pressure Bio-feedback device. Measurements were made performing two exercises: lying on the back with bend legs (first exercise) on the floor and lying on the floor with band raised legs 90° (second exercise). Stabilizer™ Pressure Bio-feedback was put under the participant's back and cuff was set at 40 mm Hg of pressure, and then the exercise was performed attempting to maintain that pressure. We registered the time which the participant maintained unchanged cuff pressure.

Statistical analysis of the research data was carried out using "Polar Precision Performance", "Microsoft Excel" and "Statistica for Windows". The following parameters were calculated: arithmetic mean (\bar{x}), standard deviation (\pm SD), ANOVA single factor analyses and index p for statistical significance. The level of significance was set when $p < 0.05$.

RESEARCH RESULTS

Research results showed that Pilates training had a positive impact on women's BMI. At the beginning it was 23.4 (5.2) and after 8-week training it was 22.8 (4.5). There were no statistically significantly different changes ($p = 0.082$), but we observed slightly decreasing BMI tendency (Figure 2).

Anova showed statistically decreased percentage of body fat mass ($p = 0.003$) compared to the values at the beginning 29.8 (7.4)% and after 8-week Pilates training 28.4 (7.6)%.

Anova showed statistically significantly different changes between core muscle static endurance results during the first exercise at the beginning of Pilates training 16.3 (4) s and after 8-week period 20.8 (3.3) s ($p = 0.003$) (Figure 4).

Statistically significantly different changes ($p = 0.0001$) were also found between core muscle

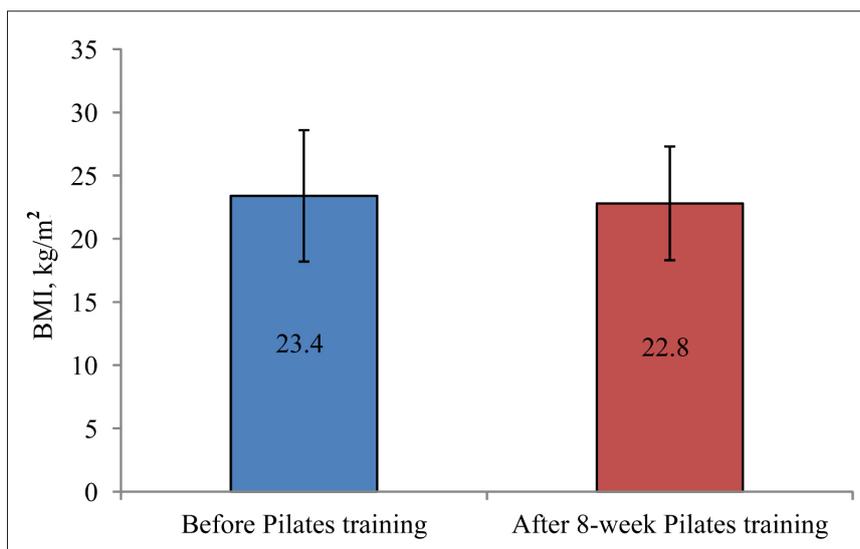


Figure 2. Women's BMI changes before and after 8-week Pilates training period

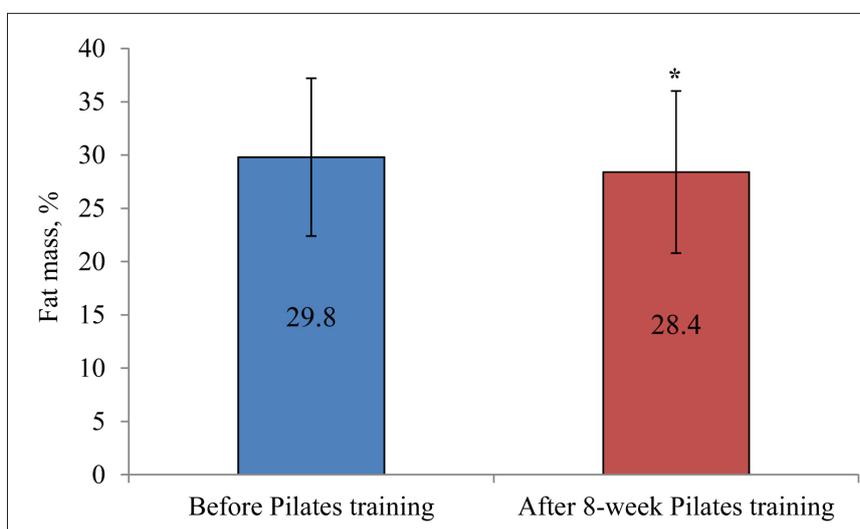


Figure 3. Women's fat body mass before and after 8-week Pilates training period

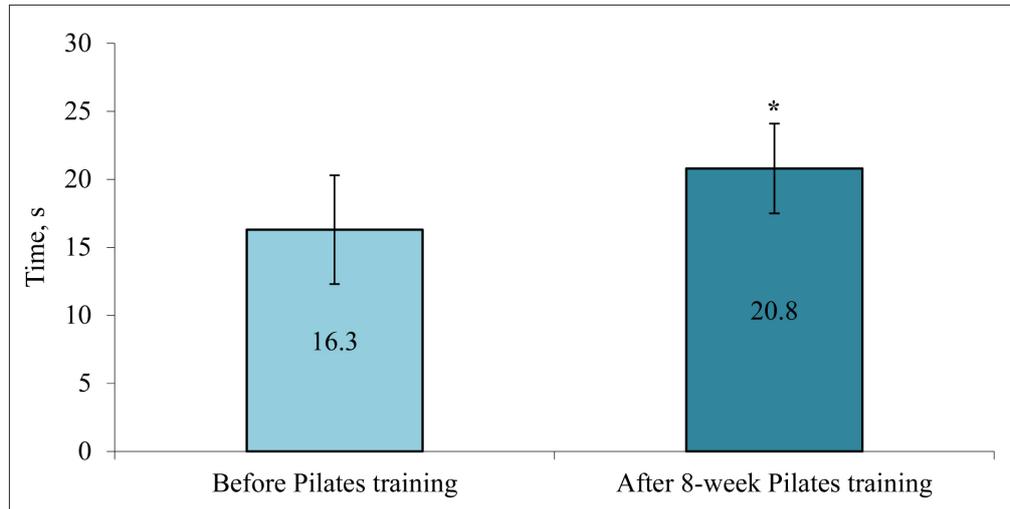
Note. * – statistically significant difference ($p < 0.05$).

static endurance results performing the second exercise. At the beginning the result was 27 (4.2) s and after Pilates training period it improved to 33.8 (2.9) s (Figure 5).

Analysing HR changes during the session we found that women's resting HR was 74.6

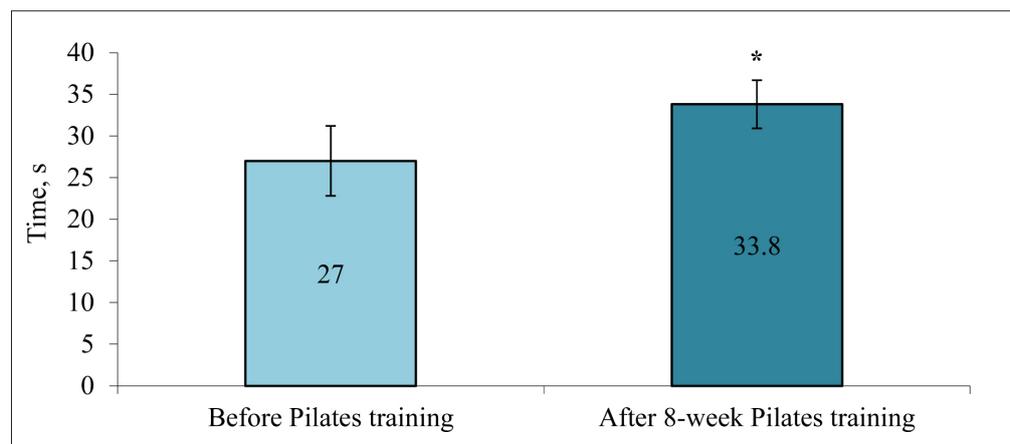
(3.3) beats/min, moderate HR during the session was 98.2 (4.7) beats/min and maximum HR was 131.4 (7.2) beats/min (Figure 6). Maximum HR took about 10% of the training period time, and moderate HR – about 90% of the training period time (Figure 7).

Figure 4. Core muscle static endurance results during the first exercise



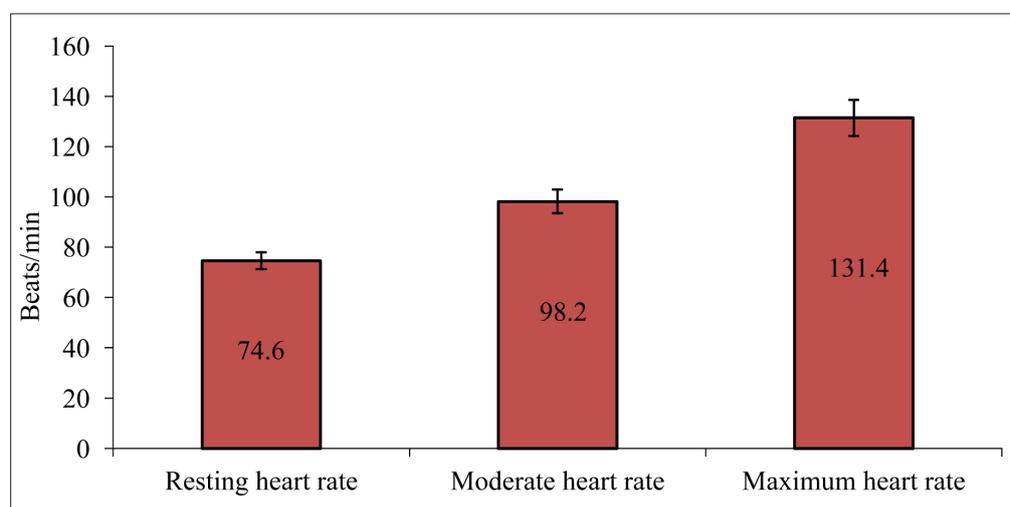
Note. * – statistically significant difference ($p < 0.05$).

Figure 5. Core muscle static endurance results during the second exercise



Note. * – statistically significant difference ($p < 0.05$).

Figure 6. Resting, moderate and maximum heart rate values



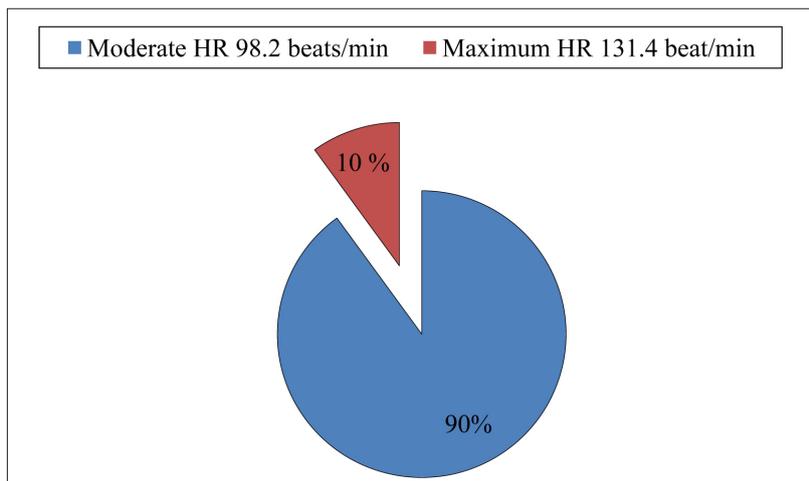


Figure 7. The spread of Heart rate during the session

DISCUSSION

According to numerous scientific studies, Pilates method is an effective physical fitness method (Kloubec, 2010; Dunleavy, 2010). Pilates training helps to reduce obesity (Jago et al., 2006; Sekendiz et al., 2006; Kloubec, 2010). In our research women's fat body mass decreased after 8-week Pilates training period and we also observed a decreasing tendency of BMI. These results mainly coincided with R. Jago and colleagues' (2006) investigations proving that 4-week Pilates training had a significant impact on BMI and improved blood pressure of 11-year-old girls. A randomized trial of 30 girls (10 to 12 years old) were offered free Pilates classes (Jago, 2006). Sixteen girls (intervention group) participated in group mat Pilates classes 5 days per week, 1 hour per session, for a 4-week period. The body mass index (BMI) percentile of these young girls was lowered in this pilot study. There was a 3.1-percentile reduction in the BMI in the treatment group, while the control group increased by 0.8 percentiles.

K. Rogers and A. L. Gibson (2009) found that after 8-week Pilates training period body fat mass decreased by 1.2%. Our research results are similar: fat body mass decreased by 1.47%.

Using real-time ultrasound, I. Endelman and D. J. Critchley (2008) demonstrated that Pilates technique of abdominal hollowing was effective in recruiting the Transversus abdominis (TrA) muscle and the internal obliques. Twenty-six healthy participants with at least 6 months of classical Pilates training were recruited for a repeated measures study to analyse Pilates exercises with or without the abdominal drawing-in manoeuvre (Ultrasound was used to detect activity in the TrA and internal

oblique muscles). Pilates exercises activated the TrA and internal oblique, but they did not function independently (Endleman, Critchley, 2008).

J. Kloubec's (2010) research dealt with 12 weeks of Pilates training for middle aged men and women twice a week for 60 min, which improved abdominal and upper body muscle endurance and also had a positive effect on the improvement of legs muscle flexibility compared to the results of the control group before and after 12-week training period. In our research core muscle static endurance improvements were seen after an 8-week Pilates training period.

L. Herrington and R. Davies (2005) also observed that Pilates exercises improved abdominal muscles endurance and stability of core muscles in girls. J. L. Fonceka with colleagues (2009) found that Pilates exercises were the perfect way for people who felt pain or had problems with the back muscles.

We found that during Pilates training session women's moderate HR was 98.2 (4.7) beats/min and this HR was observed during nearly 90% of session time. Maximum HR was 131.4 (7.2) beats/min and this HR was seen only in about 10% of Pilates training session time. It can be concluded that Pilates exercises perfectly fit for persons with high blood pressure who cannot practice high intensity physical activity. R. Jago et al. (2006) found that moderate HR during Pilates exercises in young girls' group was 104 beats/min. J. M. Schroeder and colleges (2002) also measured HR changes during Pilates session and they found that HR changes during the session were from 86.0 + 14.34 beats/min to 105.8 +15.53 beats/min. It

could be stated that this intensity of exercises was too low for improving heart muscle endurance.

CONCLUSION AND PERSPECTIVES

We found that 8-week Pilates training period had a positive effect on the participants' core

muscle performance, fat body mass and minor BMI reduction. As a result, Pilates exercises could be used for the prevention of low back pain and to reduce obesity. Slight HR changes during the session indicate that Pilates exercises may have implications for the rehabilitation of individuals who have high blood pressure and cannot practice high intensity physical activity.

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PILATES PRATIMŲ POVEIKIS MOTERŲ ANTROPOMETRINIAMS RODIKLIAMS BEI LIEMENS RAUMENŲ IŠTVERMEI IR ŠIRDIES SUSITRAUKIMŲ DAŽNIO KAITAI PRATYBŲ METU

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Pilates pratimai plačiai taikomi sveikatinimo srityje, kaip viena iš reabilitacijos formų (Di Lorenzo, 2011). Pilates programos pagrindinis tikslas yra giliųjų liemens raumenų, tokių kaip skersinis pilvo, dauginis dubens dugno, aktyvavimas. Taip pat šie pratimai gali būti naudojami kaip kūno svorio ir kraujo spaudimo reguliavimo programa. Aptikta nedaug studijų, kurių metu nagrinėta širdies susitraukimų dažnio kaita Pilates pratybų metu.

Tikslas – nustatyti Pilates pratimų poveikį moterų antropometriniams rodikliams, liemens raumenų ištvirmei ir nustatyti širdies susitraukimo dažnio kaitą Pilates pratybų metu.

Metodai: antropometrija (*Tanita TBF 300, JAV*), pulsometrija (*Polar HR*), liemens raumenų ištvirmės nustatymas (*Stabilizer™ Pressure Bio-feedback*), matematinė statistika.

Rezultatai. Po 8 savaičių Pilates pratybų nustatyta, kad jos teigiamai paveikė moterų riebalinę kūno masę ir liemens raumenų statinę ištvirmę. Buvo pastebėta KMI rodiklių mažėjimo tendencija, nors statistiškai reikšmingas rodiklių pokytis nebuvo nustatytas. Stebint širdies susitraukimų dažnio (ŠSD) kaitą pratybų metu nustatyta, kad vidutinis ŠSD buvo 98,2 (4,7) tv./min, maksimalusis – 131,4 (7,2) tv./min. Maksimalusis ŠSD sudaro apie 10% pratybų laiko, vidutinis – 90%.

Aptarimas ir išvados. Pilates pratybos teigiamai veikia moterų liemens raumenų statinę ištvirmę, riebalinę kūno masę bei KMI rodiklio mažėjimą. Įvertinant rezultatus galima būtų teigti, kad Pilates pratybos yra tinkamos nugaros skausmų bei antsvorio prevencijai. Nedideli ŠSD pokyčiai pratybų metu rodo, kad tokio pobūdžio pratybos tinka reabilitacijos metu tiems asmenims, kurie turi padidėjusį kraujo spaudimą ir negali užsiimti jokia kita intensyvia fizine veikla.

Raktažodžiai: širdies susitraukimų dažnis (ŠSD), kūno masės indeksas (KMI), Pilates pratybos, liemens raumenų statinė jėgos ištvirmė.

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SPORTS AND COMBAT SAMBO EXPOSURE AND DIFFERENCES IN STAGE-ACTIVITY

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ABSTRACT

Research background and hypothesis. The sport result is mostly accounted for by the technical and tactic preparation of SAMBO fighters. The establishment of the Sports and Combat SAMBO wrestling contest actions will allow identifying the essential differences between the ways of wrestling.

Research aim was to examine the distribution of actions used by Lithuanian Sport and Combat SAMBO fighters exhibiting different sport skill levels at contests differing in terms of their level.

Research methods. In 2012 we watched 46 Lithuanian higher school Sport SAMBO contest bouts and analysed 50 Lithuanian Sport SAMBO Championship bouts and 43 Combat SAMBO bouts.

Research results. Actions performed at Sport SAMBO were relatively divided into: very important – throws by legs and throws by trunk; important – throws by arms and retention; of minor importance – painful arm locks and painful leg locks. Combat SAMBO wrestling actions were divided into: very important – throws by arms, retention and throws by trunk; important – throws by legs, painful arm locks; of minor importance – painful leg locks.

Discussion and conclusions. In stage-activity, the arsenal of greater mastery SAMBO wrestling moves and combinations is larger, therefore the process of drafting motion management training should be the main objective. Throws performed on stage by Sports and Combat SAMBO wrestling wrestlers have major differences. Sport SAMBO is based on a large variety of throws, in sport SAMBO the throw is attempted by feet or waist, and combat SAMBO wrestling is based on hand throws, throws around the waist, maintenance, leg locks and arm bars.

Keywords: competition stenography, range of actions, effectiveness of actions.

INTRODUCTION

Lithuanian sportspeople have gained remarkable achievements in combat sports at the European and World championships and the Olympic Games. A wide range of wrestling types, the complexity of movement control, a variety of training measures and methods as well as their scientific substantiation is becoming an increasingly urgent problem for the comprehensive development of younger generation and further advancement of sport (Skurvydas, 2008; Skernevičius et al., 2011; Kenney et al., 2012).

Science investigates the range, choice and performance of movements used in wrestling under definite circumstances. Extensive analysis

of the movement control problems is made; however, a single opinion about these issues is still missing (Körding et al., 2007; Latash et al., 2007; Skurvydas, 2008). Wrestling types are numerous, separate types sometimes develop their different branches and events.

SAMBO is a relatively young branch of sport. Since 1972 international SAMBO contests have been organised on a regular basis. Since 2002 SAMBO wrestling has been divided into the sport and combat events. In Lithuania, Sport and Combat SAMBO actions and their application have been widely analysed (Linonis et al., 2004; Štarevičius, Mečkovskis, 2012). However, Lithuanian

researchers usually inquire into the problems of college student sport. Within the wide space of research there are studies showing that the range of actions used by SAMBO fighters differs depending on the level of their skills (Буланцов, Табаков, 2011; Горская, Конондаков, 2012). Studies focusing on the specific features of actions used by Sport and Combat SAMBO fighters differing in terms of their skills are not sufficiently numerous. The technical and tactic preparedness of SAMBO fighters produces the most significant effect on the sport result (Фёдоров, 2008). Teaching how to apply fight actions adequately plays a vital role in the training of wrestlers (Дажалилов, 2010). SAMBO develops intensively; the popularity of this particular branch of sport is growing steadily. Within the world context, SAMBO demands serious attention from sport researchers, however, the number of studies in this area is still insufficient. Without research and data analysis the control of basic training parameters, such as the performance, intensity and volume of actions, becomes complicate. It is impossible to control the process of fighter preparation effectively unless the target research information concerning training and contests is available; this factor vitally affects the training procedure for the purpose of achieving progress in sport (Naglak, 1977; Skernevičius et al., 2011).

It is **relevant** to determine and analyse the qualitative and quantitative indicators of technical actions used by SAMBO contestants. This should help to optimise the training process involving SAMBO fighters taking into account the specific features of their contest activities. It is equally important to carry out a comparative analysis of the technical action performance indicators shown at Sport and Combat SAMBO contest bouts. This could help to set up the fighter training landmarks for more purposeful application of actions in the selected discipline.

The following **research problem** emerges: to inquire into and reveal a variety of actions used by Sport and Combat SAMBO fighters differing in terms of their sport skill level.

Research purpose: to examine the distribution of actions used by Lithuanian Sport and Combat SAMBO fighters exhibiting different sport skill levels at contests differing in terms of their level.

Research object: technical actions applied at Sport and Combat SAMBO fighter contests of differing level.

Hypothesis: the dissemination of actions in Sports and Combat SAMBO wrestling contest will allow to identify the essential differences between the ways of wrestling. This will provide a basis for efficient planning and management of Sports and Combat SAMBO wrestling training.

RESEARCH METHODS

In 2012 we watched 46 Lithuanian college student Sport SAMBO bouts; we also examined 50 Lithuanian Sport SAMBO Championship bouts and 43 Combat SAMBO bouts. Efficacious (evaluated by judge) actions were recorded by means of a stenography method (Чумаков, 1976). Classification of SAMBO actions was carried out according to J. Gorskaja, M. Kondakov (2012) methodology. Significance of the data distribution difference was checked by calculating χ -square (χ^2) (Čekanavičius, Murauskas, 2000). We applied the four field (2 x 2) frequency table calculation method (Pukėnas, 2009). For the determination of reliability of data elicited from the separate sample indicators, we applied $p < 0.05$ and $p < 0.01$ criteria. Computation was performed with the help of SPSS package.

RESEARCH RESULTS

Research indicated that the rate of application of technical actions used by contestants and evaluated by judges per bout at college student Sport SAMBO Championship, compared to the one at Lithuanian Championship, amounted to 2.50 and 3.32 respectively (Table 1). Evaluation of activity demonstrated by sportspeople during bouts allows us to assume that Lithuanian SAMBO Championship contestants may be evaluated as sathletes with a higher level of skills. It was found that at the Lithuanian Championship, compared to college student contest, the rate of actions performed and evaluated by judges is larger by approximately 0.82. However, this difference is not reliable ($\chi^2 = 0.27$; $p > 0.05$). The distribution of categories of actions performed at both contests is similar. However, at Lithuanian SAMBO Championship the frequency of throws by arms and throws by legs performed by fighters exceeds the rate demonstrated by the participants of Lithuanian SAMBO college student championship by approximately 2%. Throws by trunk movement or a less complicated over the back throw with

arm clinch are more acceptable at college student contests. Other actions which are evaluated as more complex ones are performed mostly by Lithuanian championship participants. Static actions (painful arm lock and retention) are preferred by Lithuanian Championship contestants; however, painful leg locks are more acceptable at college student contests.

Actions performed at Sport SAMBO Lithuanian contests may be divided relatively into three groups (Table 2): Group 1 (very important actions) – throws by legs (33%) and throws by trunk (30%), these constitute the largest part of efficaciously performed actions (63%); Group 2 (important actions) – throws by arms (14%) and retention (13%); Group 3 (actions of minor importance) – painful arm locks (5%) and painful

leg locks (4%). A particular group consists of actions performed most frequently, of them at least one action is performed efficaciously once per each contest bout on the average (over the back throw from the knee, front or back leg-show throw, over the pelvis throw, throw with both legs clinch). These actions represent the basis of technique in the SAMBO contest activities.

Evaluation of the distribution of Combat SAMBO actions at Lithuanian Championship indicates a higher level of athlete's activity. Each Combat SAMBO contestant average performed on 3.89 actions per bout compared to Sport SAMBO contest indicators, this is a 0.96 increase on judge evaluated action. Yet it must be noted that about 23% of judge evaluated Combat SAMBO bout actions consisted of blow-involving actions

Table 1. Distribution of actions performed and evaluated by judges at Lithuanian higher schools and adults Sport SAMBO contests; reliability of the value differences

No.	Action groups	Actions	Higher schools SAMBO	Lithuanian adults SAMBO	Action difference χ^2 and reliability values
1.	Throws by arms	With both legs clinch (n)	8	12	0.29 (p > 0.05)
		Knocking off (n)	5	9	
		„Windmill“ (n)	2	4	
		In total (n, %)	15 (13)	25 (15)	
2.	Throws by legs	Back leg-show (n)	15	6	0.12 (p > 0.05)
		Front leg-show (n)	5	16	
		Lateral undercut (n)	5	8	
		Inside pickup (n)	4	9	
		Overhead with knee rest (n)	6	10	
		Overhead with foot rest (n)	2	7	
		In total (n, %)	37 (32)	56 (34)	
3.	Throws by trunk	Over the pelvis (n)	8	12	0.00 (p > 0.05)
		Over the back with arm clinch (n)	10	6	
		Drop throw (n)	4	7	
		Over the back from the knee (n)	7	15	
		Spring hip (n)	5	5	
		Undercut while falling (n)	1	5	
		In total (n, %)	35 (30)	50 (30)	
4.	Painful arm lock (n, %)	6 (5)	9 (5)	0.00 (p > 0.05)	
5.	Painful leg lock (n, %)	6 (5)	5 (3)	1.01 (p > 0.05)	
6.	Retention (n, %)	16 (14)	21 (13)	0.07 (p > 0.05)	
Overall (n, %)			115 (100)	166 (100)	

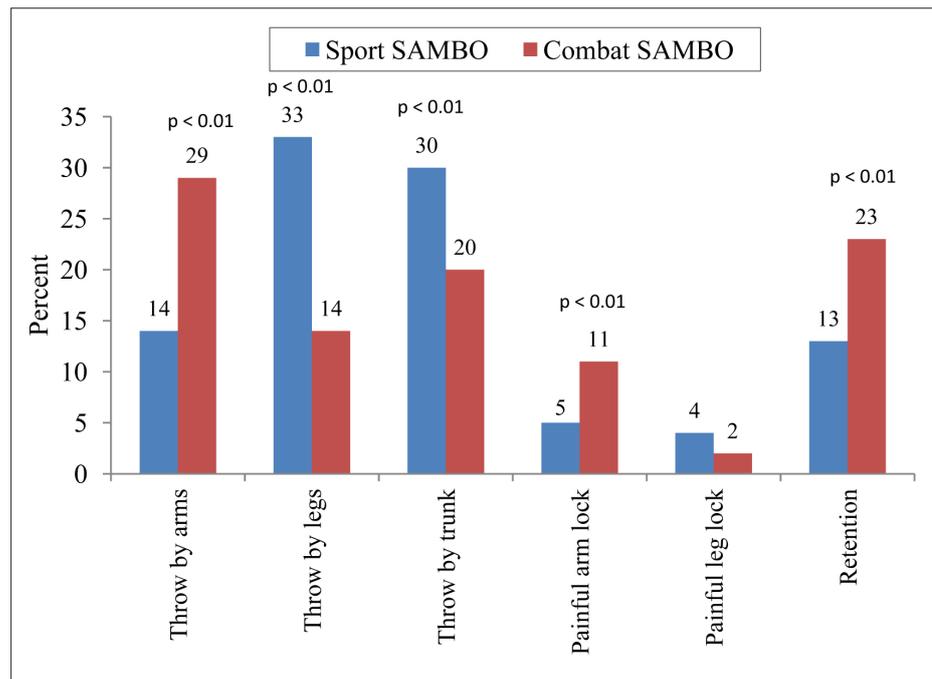
(128 wrestling actions and 29 blow-involving actions were recorded during the bouts). Comparison of the distribution of wrestling actions performed during the observed Combat SAMBO and Sport SAMBO contests showed essential differences in almost all action groups ($p < 0.05$). The difference was not observed only in painful leg locks (Figure 1). Combat SAMBO bouts were distinguished for throws by arms (29%), their performance rate was twice as big as in Sport SAMBO bouts ($\chi^2 = 10.69$; $p < 0.01$) (Table 2) in which a throw with both legs clinch prevailed. Throws by trunk take the second place in throws from the point of view of application in Combat SAMBO bouts – 20% of all performed actions, however the per cent rate of application of these actions is lower by one third in comparison with the one observed at Sport

SAMBO contests ($\chi^2 = 4.03$; $p < 0.01$). A huge difference between Combat and Sport SAMBO bouts is evident in throws by legs ($\chi^2 = 15.81$; $p < 0.01$). In Sport SAMBO bouts these actions are performed twice as frequently. Painful arm locks and retention involving static actions dominate Combat SAMBO bouts in absolute and relative figures ($p < 0.01$). Combat SAMBO wrestling actions, by the frequency of performance in contest activities may be divided into: 1. very important (throws by arms (29%), retention (23%) and throws by trunk (20%)). To these actions take the largest share of efficaciously-performed actions (72%); 2. important (throws by legs (14%), painful arm locks (11%)); 3. of minor importance: painful leg locks (2%).

Table 2. Distribution of actions performed at Lithuanian Sport SAMBO and Combat SAMBO contests; reliability of the value differences

No.	Action groups	Actions	Lithuanian higher schools and adults Sport SAMBO	Lithuanian Combat SAMBO	Sport SAMBO and Combat SAMBO action difference χ^2 and reliability values
1.	Throws by arms	With both legs clinch (n)	20	21	10.69 ($p < 0.01$)
		Knocking off (n)	14	3	
		„Windmill“ (n)	6	1	
		In total (n, %)	40 (14)	26 (29)	
2.	Throws by legs	Back leg-show (n)	21	4	15.81 ($p < 0.01$)
		Front leg-show (n)	21	2	
		Lateral undercut (n)	13	1	
		Inside pickup (n)	13	5	
		Overhead with knee rest (n)	16	1	
		Overhead with foot rest (n)	9	0	
		In total (n, %)	93 (33)	13 (14)	
3.	Throws by trunk	Over the pelvis (n)	20	1	4.03 ($p < 0.01$)
		Over the back with arm clinch (n)	16	1	
		Droptrow (n)	11	1	
		Over the back from the knee (n)	22	3	
		Spring hip (n)	10	12	
		Undercut while falling (n)	6	0	
		In total (n, %)	85 (30)	18 (20)	
4.	Painful arm lock (n, %)	15 (5)	10 (11)	4.61 ($p < 0.01$)	
5.	Painful leg lock (n, %)	11 (4)	2 (2)	1.36 ($p > 0.05$)	
6.	Retention (n, %)	37 (13)	21 (23)	5.63 ($p < 0.01$)	
Overall (n, %)		281 (100)	128 (100)		

Figure. Distribution of the indicators of actions performed at Lithuanian SAMBO contests, in per cent



DISCUSSION

Research showed that contestants performed a bigger number of dynamic actions (throws) at Lithuanian Sport SAMBO higher level contests; the application of static actions (painful locks and retention) did not differ much. S. Dažalilov (2010), S. Fedorov et al. (2012) having examined young SAMBO fighters, found that the fostering of fighters' activity during their training sessions by a variety of methodological measures speeded up the progress in movement control and sports skill. Studies indicated that among the five major factors determining the SAMBO bout result, the most important one was the technique-tactics factor; also important were physical abilities, such as swiftness and equilibrium which form the basis of movement control (Осипов, 2012). Research carried out by other authors revealed that the specific characteristics of SAMBO fighters' technical and tactic training and their bout performance were strongly influenced not only by the weight category indicators but also by the morphological body features; this is especially important to the fighters belonging to heavy weight categories (Горская, Кондаков, 2012).

The data of our research involving Lithuanian SAMBO fighters support the findings by foreign researchers who examined highly skilled fighters

(Буланцов, Табаков, 2011): the control and abundance of movements determine the level of athlete's skill. The level of technical-tactical and specific physical preparedness of fighters as well as the rules of this particular sport event account for the bout contents determining the specific features of training. The combat scope of actions used by fighters is much smaller compared to the total range of mastered actions (Харитонашвили и др., 2007). With the growth of importance and level of a contest, sportspeople increasingly seek to avoid risk and perform only reliable actions able to secure a victory without experiencing a dangerous position (Журавель и др., 2003). Original data elicited by this research through the comparison of the range of actions used by Sport and Combat SAMBO fighters enrich the training research knowledge which may help to improve the training of fighters. It must be stressed that the groups of very important and important factors determined in our research are characterised by diversity and performance-related combinatory chances (chance to go from the performance of one action to another with lightning speed). This information must be taken into account when carrying out the pre-contest training of fighters.

CONCLUSIONS AND PERSPECTIVES

In stage-activity, the arsenal of greater mastery SAMBO wrestling moves and combinations is larger; therefore, the process of drafting movement management training should be the main objective. Sports and Combat SAMBO wrestling wrestlers'

performed throws on stage have major differences. Sport SAMBO is based on a large variety of throws, in sport SAMBO throw is attempted with feet or waist, and combat SAMBO wrestling is based on hand throws, throws around the waist, maintenance, leg locks and arm bars. Sports and Combat SAMBO wrestling training is applied by different steps and combinations highlighting specific areas.

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SPORTINIO IR COMBAT SAMBO TECHNIKOS VEIKSMŲ VARŽYBINĖJE VEIKLOJE SKLAIDA IR SKIRTUMAI

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Trūksta mokslinių tyrimų, kurie atskleistų įvairaus sportinio lygmens imtynininkų sportinio ir Combat SAMBO veiksmų ypatumus. SAMBO imtynininkų techninis, taktinis parengtumas daugiausia turi įtakos sportiniam rezultatui. Svarbu nustatyti SAMBO imtynininkų technikos veiksmų varžybiniame veikloje kokybinius ir kiekybinius rodiklius, atlikti jų analizę. Nustačius įvairaus meistriškumo SAMBO imtynininkų varžybose taikomų veiksmų sklaidą, bus galima veiksmingiau planuoti ir valdyti sportininkų rengimą.

Tikslas – ištirti Lietuvos sportinio ir Combat SAMBO įvairaus meistriškumo sportininkų skirtingo lygmens varžybose taikomų veiksmų sklaidą.

Metodai. 2012 metais stebėjome Lietuvos aukštųjų mokyklų sportinio SAMBO varžybų 46 kovas ir ištyrėme 50 Lietuvos sportinio SAMBO čempionato kovų bei 43 Combat SAMBO kovas.

Rezultatai. Sportinio SAMBO Lietuvos varžybose atliekamus veiksmus sąlygiškai galima suskirstyti į: *labai svarbius* – metimus kojomis ir metimus liemeniu; *svarbius* – metimus rankomis ir išlaikymą; *mažai svarbius* – skausmingus veiksmus rankai ir skausmingus veiksmus kojai. Combat SAMBO imtynių veiksmas skirstomi į: *labai svarbius* – metimus rankomis, išlaikymą ir metimus liemeniu; *svarbius* – metimus kojomis, skausmingus rankai; *mažai svarbius* – skausmingus kojai.

Aptarimas ir išvados. Varžybiniame veikloje didesnio meistriškumo SAMBO imtynininkų judesių ir jų kombinacijų įvairovė yra didesnė, rengimo procese judesių valdymo mokymas turėtų būti labai svarbus. Sportinio ir Combat SAMBO imtynininkų veiksmas varžybų metu turi esminių skirtumų. Sportinio SAMBO pagrindą sudaro metimai kojomis ir metimai liemeniu, o Combat SAMBO – metimai rankomis, išlaikymas ir metimai liemeniu. Rengiant sportinio ir Combat SAMBO imtynininkus taikomi skirtingi veiksmas ir jų kombinacijos.

Raktažodžiai: varžybų stenografija, veiksmų įvairovė, veiksmingumas.

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OPTIMIZATION OF TECHNICAL TRAINING OF ICE-HOCKEY PLAYERS AGED 8–17 YEARS

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ABSTRACT

Research background and hypothesis. Training models in athlete training have already been determined by sport researchers (Hellard et al., 2006). The programme that has been developed and tested by one alternative experiment is targeted to optimize the purposeful technical training for 8–17-year-old ice hockey players.

Research aim was to determine technical training models.

Research methods. A long-term experiment of one alternative was carried out involving subjects from 8 to 18 years in 2000–2010. The programmes for technical training were developed with regard to the time ratio, measures taken and recommendations of foreign experts. Later the programmes have been adjusted to the results obtained. The following tests have been used for evaluation of the skating technique: to evaluate specific skills – forward and backward skating; to evaluate the puck control – manoeuvre skating driving the puck and without the puck.

Research results. Analysis of the results in the initial training period shows that the greatest improvement in the results has been registered in manoeuvre skating driving the puck – 11.6%, and in backward skating – about 8%. A significant improvement in the results of the basic training period has been observed in backward skating – 7% as well as in 30 m standing skating – 6.3%. In the special training period a more marked increase in the results has been registered in backward skating – 5.2% as well as in 30 m standing skating – 3.8%.

Discussion and conclusions. This is due to the lack of special skills and a complex biomechanical structure of the performance of the technical action. Sport performance was influenced by adolescent developmental patterns, and the optimal adjustment of the programme, taking into account the initial and basic training period analysis.

Results of the present research allow us to conclude that 1) Athletes' training programmes, taking into account the recommendations, were effective. 2) The greatest improvement in the results was registered within the 1st and 2nd stages of athletes' training. We believe that this is due to a complex biomechanical structure of the performance of the technical action. After the improvement, the growth of the results slows down. 3) Time ratio for technical training is distributed in the following way: 1st stage – 55–53%, 2nd stage – 50–48% and 3rd stage – 47–44%.

Keywords: technical training, manoeuvre skating, experimental programme, optimization of training, training model.

INTRODUCTION

Athletes' training is a multi-stage process (Weineck, 2004; Платонов, 2004). Athlete's success is mainly determined by genetically-induced potential physical, spiritual, mental and intellectual capacities (Malina et al., 2005) as well as by genetically determined adaptations in response to the applicable training programme (Wolfarth et al., 2005).

No less focused and effective training of young athletes is conditioned by coach's ability to use up-to-date, scientifically based sports training technologies (Skurvydas, 2002; Lyle, 2006; Reilly, 2007). This is especially important for small countries with extremely limited number of talented athletes.

Although the conception about athletes' long-term training periods is often quite different (Kent,

1998), almost all authors distinguish between the initial, deepened, specialised and final periods in the selection of athletes as well as the initial, basic, special sports performance achievement periods (Платонов, 2004). The period encompassing childhood, adolescence and young adult stages is characterized by a favourable reputation for personal development, which leads to growth and development trends (Malina, 1988; Malina et al., 2005). For this reason it is relevant to find gifted and talented children for sports in order to achieve their sports performance goals (Martens, 2004). Otherwise, the most receptive for individual capacity to develop age stages might be lost (Naul et al., 1998). That is why scientifically-based optimal training programmes adequate to the regularities of growth and maturation of young athletes are of great importance, and in particular, those training programmes which are adequate to their individual body functional powers and specific skills (Bar-Or, 2005).

No scientific publications have been found to support optimal technical *training models* in particular periods of the long-term training of ice-hockey players that would lead to optimal *technical fitness models*.

Research hypothesis suggests the programme that has been developed and is targeted to optimize the purposeful technical training of ice hockey

players aged 8–17 years. *Research object* was technical training and fitness models and their interaction of ice-hockey players aged 8–17 years.

Research aim was to determine technical training models as well as technical fitness model characteristics of ice-hockey players aged 8–17 years.

RESEARCH METHODS

The programmes have been designed taking into account recommendations of sport researchers from the Czech Republic, Russia and Sweden (Букатин, Колузганов, 1986; Быстров, 2000; Gustavson et al., 2002).

- A long-term experiment was carried out in 2000–2010. The subjects of the experiment were young athletes aged 8–17 years (training programmes are appended, Tables 1–3).
- Method of theoretical analysis and generalization.
- Testing.
- Mathematical statistics (arithmetic mean, the deviation of the average values of the significance of differences by Student's t-assessment criteria ($n = 17$)).
- Comparative analysis. Dynamics of research results was assessed by P. Siris methodology.

Table 1. Sample of micro-cycle weekly plan in the initial training period of the preparatory stage

Days of the week and content	Purposefulness	Volume and duration, min
<i>Monday</i> <ul style="list-style-type: none"> • Preparatory skating technique improvement drills • Improvement of manoeuvre skating • Playing with tasks 	Aerobic Anaerobic alactic Mixed	20 30 20
<i>Tuesday</i> <ul style="list-style-type: none"> • Preparatory drills of the puck control • Improvement of passing and receiving the puck • Improvement of wrist shot • Playing with tasks 	Aerobic Anaerobic alactic Aerobic Mixed	20 30 20 20
<i>Wednesday</i>	Rest day	
<i>Thursday</i> <ul style="list-style-type: none"> • Preparatory drills of skating technique improvement • Improvement of backward skating technique • Improvement of ability to change direction skating • Playing with tasks 	Aerobic Aerobic Aerobic Mixed	20 30 20 20
<i>Friday</i> <ul style="list-style-type: none"> • Preparatory drills of the puck control technique • Improvement of deceptive motions • Improvement of the puck shooting • Playing with tasks 	Aerobic Anaerobic alactic Aerobic Mixed	20 30 20 20
<i>Saturday</i> Competition in technique actions, relay, agility games	Mixed	60

Table 2. Sample of micro-cycle weekly plan in the basic training period of the preparatory stage

Days of the week and content	Purposefulness	Volume and duration, min
<i>Monday</i> <ul style="list-style-type: none"> Preparatory drills to improve skating technique Improving skating technique in different playing positions Improving skating technique in transition from one mode to another Playing with tasks 	Aerobic Anaerobic alactic Mixed Mixed	20 30 20 20
<i>Tuesday</i> <ul style="list-style-type: none"> Preparatory drills of the puck control Improving driving the puck technique Improving 1x1 technique Training game 	Aerobic Anaerobic alactic Aerobic Mixed	20 20 20 30
<i>Wednesday</i> Rest day		
<i>Thursday</i> <ul style="list-style-type: none"> Preparatory drills to improve skating technique Improving manoeuver skating backwards Improving manoeuver skating backwards of players in different playing positions Training game with tasks 	Aerobic Aerobic Anaerobic alactic Mixed	20 20 20 30
<i>Friday</i> <ul style="list-style-type: none"> Preparatory drills of the puck control Improving deceptive motions and throwing the puck technique Improving throwing the puck technique of offensive and defensive players Training game with tasks 	Aerobic Anaerobic alactic Mixed Mixed	20 20 20 30
<i>Saturday</i> Integrated training	Match	90

Table 3. Sample of micro-cycle weekly plan in the special training period of the preparatory stage

Days of the week and content	Purposefulness	Volume and duration, min
<i>Monday</i> <ul style="list-style-type: none"> Special preparatory drills to improve skating technique Improving various techniques in different positions Improving various skating techniques moving from one skating technique to another Training game 	Aerobic Anaerobic alactic Mixed Mixed	20 20 20 30
<i>Tuesday</i> <ul style="list-style-type: none"> Drills for improving the puck control Improving 1x1 technique Technique improvement by using playing drills Training game with tasks 	Aerobic Anaerobic alactic Mixed Mixed	20 20 20 30
<i>Wednesday</i> Improving individual technique	Day for recovery Aerobic	50
<i>Thursday</i> <ul style="list-style-type: none"> Preparatory drills to improve skating and the puck control Playing drills 2x1; 3x1; 3x2; Training game with tasks 	Aerobic Anaerobic alactic Mixed	20 30 40
<i>Friday</i> <ul style="list-style-type: none"> Preparatory playing drills to improve skating and the puck control Improving technique tactics actions in defence zone Improving technique tactics of completing the attack Training game with tasks 	Aerobic Aerobic alactic Aerobic Mixed	20 20 20 30
<i>Saturday</i> Integrated training	Match	90

Research organization. Changes in the results of the main technical actions performance after the experimental programmes were under investigation. The results were determined by “New Test“.

1. Manoeuvre skating was estimated according to the test recommended by A. Bukatin, V. Koluzganov (1986): standing behind the goal line after the signal subjects had to overcome obstacles moving in a “Snake-like“ manner. The obstacles were located in certain places (Figure 1).
2. Manoeuvre skating driving the puck was estimated using the same test.

3. 20 m standing skating and 20 m standing backward skating.
4. 30 m standing skating.

The table shows that there was a different time ratio for improving skating and driving the puck techniques at different training stages. In the opinion of Russian specialists (Букатин, Колузганов, 1986; Быстров, 2000), 40% of the total practice time should be given to technical training techniques while Swedish professionals allow 50% of the total practice time for technical training techniques (Gustavson, 2002).

Figure 1. Test to assess the skating technique of ice hockey players (manoeuvre skating) (Букатин, Колузганов, 1986)

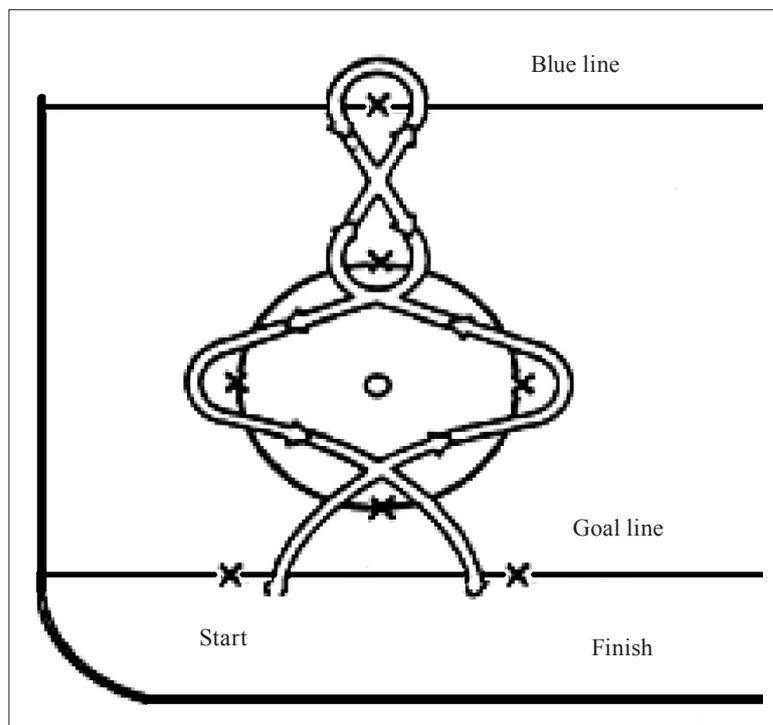


Table 4. Time ratio (%) for skating technique and driving the puck technique at various periods of training

Means of training	Initial training period (8–10 years)			Basic training period (11–13 years)			Special training period (14–17 years)			
Skating technique	43	40	33	26	24	22	17	15	13	10
Driving the puck technique	11	15	20	24	25	26	30	31	32	34
Total, %	54	55	53	50	49	48	47	46	45	44

RESEARCH RESULTS

Initial training period. The greatest changes have been registered in manoeuvre skating test driving the puck within the 2nd and 3rd years of training – 11.6% while improvement of results within the 1st and 2nd years of training was 9.6%. In 20m standing skating and 20m standing backward skating test a more worked improvement was registered in 20m standing backward skating: within the 1st and 2nd as well as within the 2nd and 3rd years of training – 8.0%. The comparison of the results in the 2nd and 3rd years of training has revealed a lower increase of results – 5.5%.

Basic training period (11–13 years). During the research period change in results of technical training was not uniform. There was a marked increase in the improvement of manoeuvre skating test results within the 2nd and 3rd years of training – 9%, and within the 1st and 2nd – 8.4%. The greatest improvement in the results of skating driving the puck has been registered within the 2nd and 3rd years of training – 8.8%, and within the 1st and 2nd years of training – 7.2%.

Special training period (14–17 years). The results of the research best describe a purposeful training of athletes. During the whole period of the research results of technical fitness were not uniform. The most worked improvement has been observed in performing tests of manoeuvre skating and skating driving the puck. The most marked improvement was registered in the results of manoeuvre skating within the 3rd and the 4th years of training – 7.9%. A lower increase in the results of manoeuvre skating test was observed within the 1st and 2nd years of training – 3.5% and within the 2nd and 3rd year of training – 1.7%. The greatest increase in the results of skating driving the puck was registered within the 3rd and the 4th years of training – 6.0%. However, a lower increase in the results was registered between the 1st and 2nd years of training – 3.3%, within the 2nd and 3rd years of training – 1.2%.

An increase in the results has been registered in 20m backward skating and 30m standing skating. The most marked improvement was registered in the results of backward skating within the 1st and 2nd years of training – 5.2%. A lower increase was observed within the 2nd and the 3rd years of training – 3.5%, and within the 3rd and 4th years of training – 3.1%. The greatest increase was registered in the test of 30m skating from a standing start within the 1st and 2nd years

of training – 3.8%. A lower increase in the results was observed within the 2nd and the 3rd years of training – 2.4%; and within the 3rd and 4th years of training – 1.8%.

DISCUSSION

Goal-directed training of athletes is best described by the results of the research (Figures 3 and 4). During the whole period of the research results of technical fitness were divergent. The most worked improvement has been observed in performing tests of manoeuvre skating and skating driving the puck

In the period of initial training manoeuvre skating performance improvement resulted in the absence of specific skills and the applied training methods. Subsequently, the results of performance decreased due to too few numbers of hours given for skating technique training.

A marked improvement in the results of the puck control can be explained by the fact that this technique is quite complicated, and because of the absence of specific skills, a reasonable number of hours were given for mastering the skill. Improvement in other tests, i. e. 20 skating forward and backward, can be explained by a complex biomechanical structure of technical actions and the successfully selected training methods. The comparison of the results of the athletes under investigation with the analogous research results of Russian and Swedish scientists has revealed the results of our testing to be higher, but the difference was not statistically significant ($p > 0.05$).

In the basic training period time ratio distribution was determined by the training specifics of technical game, recommendations of foreign researchers and programme adjustment for educational monitoring. Significant increase in results was also affected by regularities in adolescent development patterns and correctly selected teaching methodology. It can be seen that higher performance results have been observed in the technical actions with a complex biomechanical structure. Relatively more time has been allocated for them in the training programme. Change of results in athletes' training confirms the correctness of the training methodology. Comparison of testing results of our athletes with the above-mentioned test results obtained by Russian and Swedish researchers allows us to assert that our testing results were higher, but the difference was not statistically significant ($p > 0.05$).

Figure 2. Changes in results of manoeuvre skating and skating driving the puck for ice-hockey players aged 8–17

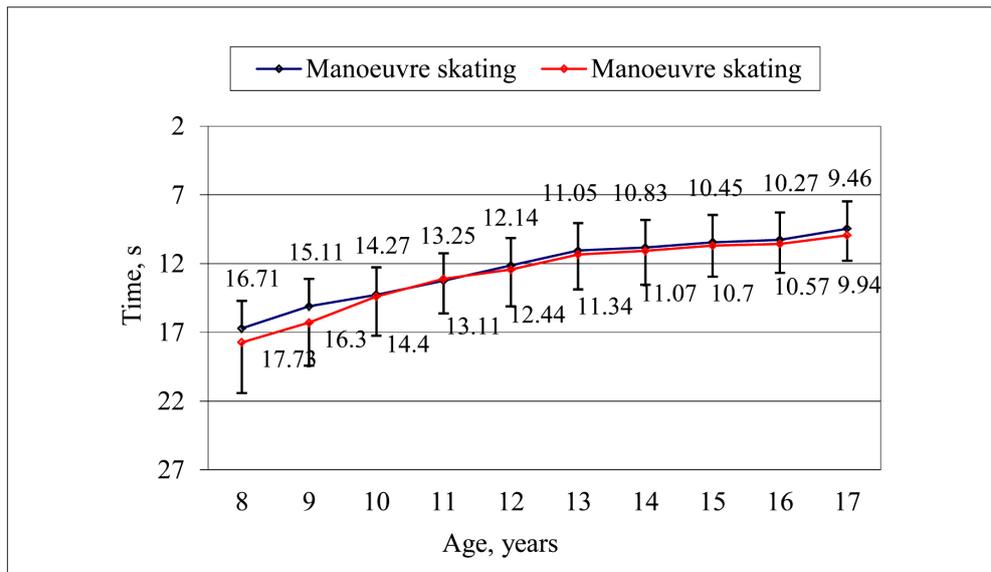
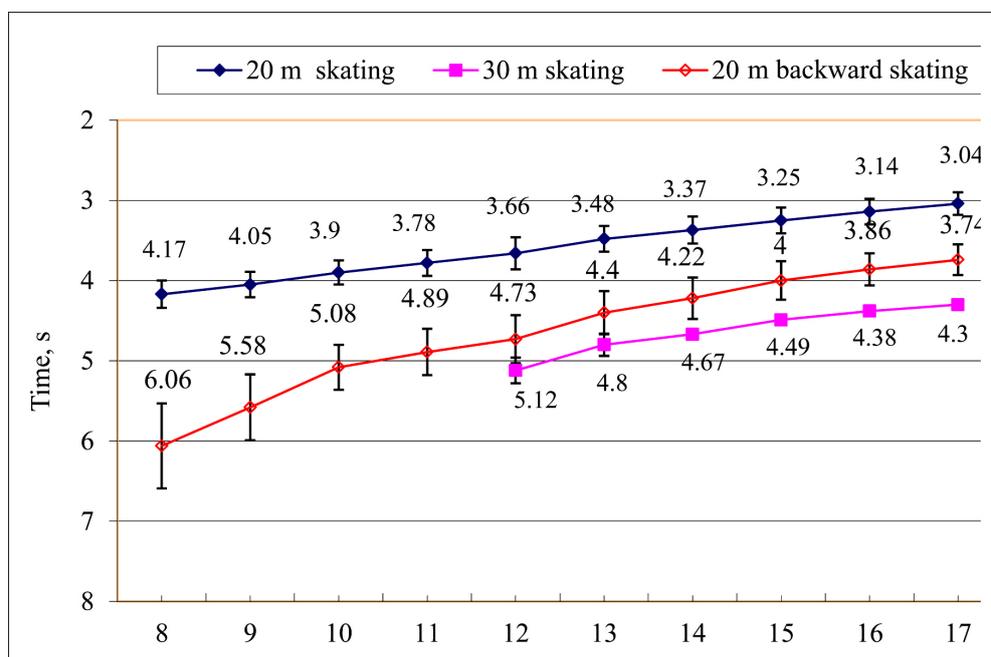


Figure 3. Changes in results of various skating tests for ice-hockey players aged 8–17 years



Special training period. When planning weekly micro-cycles (Monday, Wednesday, Friday), application of technical exercises during the match was emphasized. The ratio of specific measures was increased up to 80%. The amount of technical actions and effectiveness during matches was recorded. The analysis of the results was adjusted to individual players' technical development plans: 2–3 morning training sessions were added to weekly micro-cycles. Correctness of the purposeful athlete training is best characterised by the achieved results.

Comparing the results obtained with the testing results of the Russian and Swedish researchers in

similar studies it has been found that differences in research results were not statistically reliable ($p > 0.05$). We believe that difference in increase and regularity of results in manoeuvre skating without the puck and driving the puck is due to a more complex coordination and biomechanical structure of technical actions. It can also be asserted that improvement of the results was influenced by individual (additional) tasks.

Development and adjustment of the program, based on the recommendations of foreign scientists, helped us to determine the optimal time ratio and the main technical tools to improve technical actions in various stages of development.

CONCLUSIONS AND PERSPECTIVES

1. Sports training technologies are of utmost importance for the final results: selection efficiency, the up-to-date scientific knowledge, methods, tools and innovations used as well as integrity and consistency in all stages of fitness training, a targeted development planning and adjustment taking into account athletes' fitness indices, determination of the ratio for teaching and training measures and the adjustment of the results achieved.

2. Study of ice hockey technical fitness at different training periods has shown that experimental programmes were effective (changes in the results are presented in Figures 3 and 4). A marked increase in the improvement of test results in the *initial training period* has been observed in manoeuvre skating driving the puck – 11.6% as well as in backward skating – 8.0%.

In the *basic training period*, the greatest improvement in the results has been registered in backward skating – 7.0% and 30m standing skating – 6.3%.

In the *specialised training period* the maximum difference in the results has been registered in performing the backward skating test – 5.2% and 30m standing skating test – 3.8%. This was determined by the lack of special skills and a more complex biomechanical structure of technical action performance. Sport performance was influenced by adolescent developmental patterns and adjustment of individual programmes in the initial and basic training stages.

3. Model of time ratio distribution of skating and puck control techniques:

- in the initial training period – 54, 55 and 53% respectively (Figure 2);
- in the basic training period – 50, 49, 48% respectively;
- in the special training period – 47, 46, 45 and 44% respectively.

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8–17 METŲ LEDO RITULININKŲ TECHNINIO RENGIMO OPTIMIZAVIMAS

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Sportininkų rengimo specialistai nustatė orientacinius rengimo modelius, bet kartu iškėlė problemą dėl kartais neprognozuojamai kintamų modelių sąveikos (Hellard et al., 2006). Labai svarbu sportininkų rengimo programose numatyti įvairių rengimo rūšių santykį. Dėl šios priežasties kai kurie tyrėjai rekomenduoja vertinti techninio rengimo programų galutinio rezultato (rungtynių) sąsajas (Bangsbo, 1994; Faigenbaum, Westcott, 2000). Neaptikta mokslo publikacijų, pagrindžiančių ledo ritulininkų daugiamečio rengimo atskirų etapų optimalių techninio rengimo modelių, kurių pagrindu būtų galima sudaryti techninio parengtumo modelius. *Hipotezė:* manome, kad mūsų parengta ir eksperimentu patikrinta programa sudaro prielaidas optimizuoti kryptingą 8–17 metų ledo ritulininkų techninį rengimą.

Tikslas – nustatyti 8–17 metų ledo ritulininkų techninio rengimo modelius.

Metodai. 2000–2010 m. buvo atliktas ilgalaikis vienos alternatyvos eksperimentas. Tiriamųjų amžius – nuo 8 iki 18 metų. Buvo tirtos įvairių techninio rengimo programų ir rezultatų sąsajos. Programos sudarytos atsižvelgiant į techniniam rengimui skirtą laiką, taikytas priemonės ir užsienio specialistų rekomendacijas. Vėliau programos koregavome atsižvelgdami į gautus rezultatus. Naudojome šiuos testus: čiuožimo technikai įvertinti – čiuožimą pirmyn ir atbulomis tiesiąja; specifiniams gebėjimams įvertinti (ritulio valdymo technikai) – manevrinį čiuožimą varant ritulį ir be jo.

Rezultatai buvo analizuojami naudojant matematinės statistikos metodus (aritmetinį vidurkį, jo nuokrypį, vidutinių reikšmių skirtumo reikšmingumas vertintas pagal Stjudento t kriterijų ($n = 17$). Tyrimas atliktas kiekvienu ledo ritulininkų rengimo laikotarpiu.

Rezultatai. Pradinio rengimo etapu (8–10 metų) didžiausias rezultatų prieaugio skirtumas pastebėtas atliekant manevrinio čiuožimo rutulio varymo testą (11,6%) ir čiuožiant atbulomis (8,0%). Bazinio rengimo etapu didžiausias rezultatų prieaugio skirtumas pastebėtas tiriamiesiems čiuožiant atbulomis (7,0%) ir čiuožiant 30 m iš vietos (6,3%). Specialiojo rengimo etapu didžiausias rezultatų prieaugio skirtumas aptiktas ledo ritulininkams čiuožiant atbulomis (5,2%) ir čiuožiant 30 m iš vietos (3,8%). Sportiniams rezultatams įtakos turėjo paauglių organizmo vystymosi dėsningumai ir optimalus programos koregavimas atsižvelgiant į pradinio ir bazinio rengimo etapų rezultatus.

Aptarimas ir išvados. 1. Ilgalaikiu eksperimentu nustatėme, kad sportininkų rengimo programos, parengtos atsižvelgiant į rekomendacijas, yra veiksmingos. 2. Didžiausi rezultatų prieaugiai pastebėti pirmu ir antru sportinio rengimo etapu. Manome, kad taip atsitinka dėl ledo ritulio technikos biomechaninių judesių sudėtingumo, o vėliau, juos patobulinus, rezultatų prieaugis sulėtėja. 3. Laiko santykis, skiriamas techniniam rengimui pagal etapus (modelį), turėtų vidutiniškai būti toks: I etapas – 55–53%, II – 50–48%, III – 47–44%.

Raktažodžiai: techninis rengimas, manevrinis čiuožimas, eksperimentinė programa, rengimo optimizavimas, rengimo modelis.

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PSYCHOSOCIAL PROBLEMS AND PHYSICAL ACTIVITY AT DIFFERENT AGES IN PATIENTS WITH EPILEPSY

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ABSTRACT

Research background and hypothesis. Physical inactivity of patients with epilepsy is associated with the course of the disease, treatment, preconceived attitudes and myths that their physical activity might be dangerous and cause seizures (Steinhoff et al., 1996; Nakken, 2001).

The aim of our research was to examine the links between the psychosocial problems of patients' with epilepsy, their physical activity, self-reported quality of life as well as their connection with patients' age.

Research methods. The participants were 209 patients with epilepsy from three different regions (Šiauliai, Panevėžys and Pasvalys) of Lithuania. The subjects were selected with the help of quantitative closed-type survey – QOLIE-89 and IPAQ international questionnaire. The research findings were compared between two age groups: younger (20–39 years of age) and senior (40–59 years of age) subjects.

Research results. The main psychosocial problems for patients with epilepsy were concerns about possible injuries during the seizures, experience of shame and other social restraint, health problems that might occur as a result of taking antiepileptic drugs for a long period of time, negative effects of antiepileptic drugs and memory impairments. These problems were more common among younger respondents ($p < 0.05$). Physical activity levels in patients with epilepsy were inadequate and different. The main factor that contributed to these differences was patients' age. Younger respondents trained more in their leisure time, while seniors spent more time reading or sleeping ($p = 0.002$). Younger patients lacked knowledge about the most appropriate types of physical activities, senior respondents were inactive were to the disapproval of medical professionals and their health problems ($p = 0.006$). Younger respondents evaluated their lifestyle as good enough more often than seniors.

Discussion and conclusion. Psychosocial problems and physical inactivity of patients with epilepsy were connected with their age. Younger respondents more often than seniors were physically active and their self-reported quality of life was good.

Keywords: age of patients with epilepsy, social problems, physical activity, evaluation of lifestyle.

INTRODUCTION

Epilepsy is a common illness in the world (Bondstrata et al., 2008). Even 5.87 people out of 1000 are diagnosed with active epilepsy which requires medical treatment in Lithuania (SVEIDRA, 2008). Patients with epilepsy commonly experience behavioural, emotional and mood disorders due to psychological difficulties and epilepsy-related social restraints (Herman, Jacoby, 2009). In comparison with the total population, people with epilepsy have more psychological problems the number of which

grows proportionally to the frequency of seizures. O. Devinsky et al. (2005) claim that people with epilepsy have difficulties (experience discomfort), R. Mameniškienė et al. (2002) suggest that more than half of the patients are not inclined to control their disease consciously. Despite the modernisation of the society, there are still wrong concepts and ideas about patients with epilepsy resulting in difficult social environment for the patients (Laccheo et al., 2008). The specialists usually get only the information about treatment,

and psychosocial problems which are experienced by people with epilepsy are forgotten (Webe et al., 2001; Pennell, Thompson, 2009).

Physical inactivity of patients with epilepsy is associated with the course of the disease, treatment, preconceived attitudes and myths that physical activity might be dangerous and cause seizures (Steinhoff et al., 1996; Nakken, 2001). Many people with epilepsy reported general and epilepsy-specific barriers to leisure time physical activity (Kihye Han et al., 2011). Types and frequency of seizures, as well as medication may influence patients' ability to be physically active (Devinsky et al., 1995; Wong, Wirrell, 2006). The evidence shows that patients with good seizure control can participate in both contact and non-contact sports without harmfully affecting seizure frequency (Arida et al., 2008). According to K. O. Nakken (1999), regular and properly chosen physical exercises may reduce seizures for 36% of people with epilepsy. Physical activities may also help to avoid psychosocial problems as they improve health, mood, produce positive changes, relieve depression and anxiety, could be potential candidate for stress reduction in people with epilepsy (Arida et al., 2009). People with epilepsy are aware of the principles of treatment and appropriate patterns of life, however more than half of them are unwilling to accept adequate responsibility for their illness (Devinsky et al., 2007). We have not found reviews about the psychosocial problems of those ill with epilepsy and links between physical activity and lifestyle in connection with their age.

We hypothesize that younger patients with epilepsy demonstrate psychosocial problems associated with disease but sometimes they lack time for physical activity and they evaluate lifestyle as good or excellent. Senior patients with epilepsy have more psychosocial problems associated not only with disease but also with social difficulties, they are physically inactive and evaluate their lifestyle as bad.

The aim of our research was to examine the links between psychosocial problems, physical activity, self-reported quality of lifestyle of patients with epilepsy and their connection with age.

RESEARCH METHODS

Participants. Members from associations of people with epilepsy from three different regions of Lithuania (Šiauliai, Panevėžys and Pasvalys) participated in the research in 2008 and 2009. The

survey was conducted considering the respondents' agreement and permission given by the presidents of the associations. For the final analysis 209 respondents were selected out of the population of 220 participants because 11 respondents did not return their questionnaires.

All respondents aged between 20 and 59 years. The age at the onset of the respondents' epilepsy according to the median differed significantly in the two age groups: 107 persons, 20–39 years old (51 women and 56 men) and 102 persons, 40–59 years old (55 women and 47 men). The differences did not depend on gender of the respondents ($p = 0.25$). The majority of the respondents had university education (29%) or incomplete higher education (67%). The education of the respondents did not depend on gender ($\chi^2 = 2.229$; $df = 6$; $p = 0.897$).

Methods. The main research method employed was a questionnaire survey. Aiming to examine the psychosocial problems of the subjects we used a quantitative closed questionnaire survey QOLIE-89 (Quality of Life in Epilepsy) (Ware, Sherbourne, 1992; Hays et al., 1993). QOLIE-89 contained multi-item measures of emotional problems, social support and worry about seizures, medication effects, memory, pain, health perceptions and self - reported quality of life. The questions from International Physical Activity Questionnaire IPAQ (Ainsworth, Levy, 2004) were inserted to determine in what kind of physical activity the respondents were engaged and how much time they were physically active during the past seven days. Both questionnaires were translated into the Lithuanian language and adapted for the survey in Lithuania.

The patients' with epilepsy answers to certain QOLIE-89 questions were assessed on three-point, four-point and five-point scales: from 1 – extremely interfering, to 5 – not at all interfering.

The frequency of physical activity of patients with epilepsy was assessed using questionnaire answers to the following questions: in what kind of physical activity or sports respondents were engaged in everyday life (at work, at home or in the courtyard, moved from one place to another, lifted light objects, exercised, participated in sports and other physical activity), how often they were physically active (their breathing became intensified) for at least 10 minutes, how much time they devoted to physical activities during the past seven days. If persons had to make moderate effort during physical activity and his/her breathing became intensified, if he/she walked no more

than 10 minutes per day, their physical activity was considered to be of moderate intensity. The respondents were considered physically inactive if they failed to perform these physical activities.

The relation between psychosocial problems of patients' with epilepsy and their physical activity was presented by dividing respondents into two groups: group 1 – patients who self-reported their quality of life as excellent or fairly good, group 2 – patients who self-reported their quality of life as moderate, poor or extremely poor.

Data analysis was conducted using computer program for statistical analysis *SPSS 11.0* (originally, Statistical Package for the Social Sciences). Average assessment reliability was determined according to Student's t test. Aiming at analyzing the independence of two features χ^2 test was applied. The reliability of statistical differences was set at the significance level of $p < 0.05$.

RESEARCH RESULTS

Figure 1 demonstrates that the majority of younger respondents developed epilepsy in early childhood or adolescence, while many older patients were diagnosed with epilepsy at the mature age. The difference was statistically significant ($\chi^2 = 47.772$; $df = 5$; $p = 0.00$) and did not depend

on the gender of the respondents ($\chi^2 = 6.63$; $df = 5$; $p = 0.25$).

Table 1 indicates that illness-related feelings experienced by patients with epilepsy (assessed on a three-point scale) were not always related to their age. The point average shows that the majority of the respondents were extremely or slightly concerned about possible injuries during seizures, embarrassment and other social problems. Younger respondents were more concerned about these problems ($p < 0.05$). The survey also showed that more than half of the respondents of both age groups had concerns about sustained use of medications and their adverse effects ($p > 0.05$). Table 1 shows that anxiety about memory difficulties and social restraints was higher than the median (3.0), i. e. respondents were slightly anxious. Younger respondents were more concerned about these problems than the older ones ($p < 0.05$). The respondents of both age groups gave similar evaluations of the time spent with their family and close friends. Despite all psychosocial problems patients with epilepsy self-reported the quality of life as moderate. Significantly more respondents of the younger age self reported the quality of life worse than their older counterparts.

Table 2 demonstrates that the point average of strenuous exercise restrictions due to health

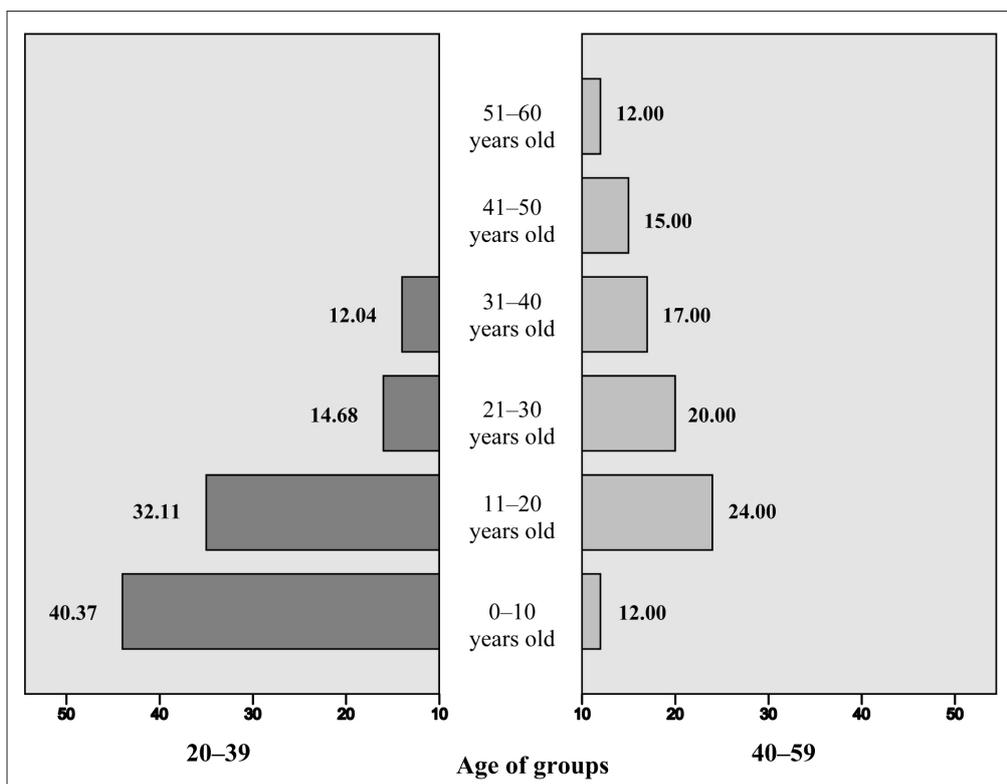


Figure 1. Patients with epilepsy grouped according to the onset of epilepsy (%)

was close to slightly limiting level of physical activity and did not depend on respondents' age. Lifting and carrying shopping bags were only slightly limiting or completely limiting factors among all respondents. During the past seven days respondents participated in physical activities only four times. Walking was also quite limited. The variety of responses revealed that some respondents went for a walk more than six times, others – rarely and for less than ten minutes per day.

Figure 2 shows that younger respondents were jogging, riding a bicycle or roller-skating during their leisure time, while senior patients most often were reading or sleeping ($\chi^2 = 40.27$; $df = 18$; $p = 0.002$).

The reasons for poor physical activity in younger patients with epilepsy (see Figure 3) were lack of information about appropriate physical activities and free time occupations. Senior

patients stated that they were physically inactive due to the lack of information, health problems and disapproval of medical professionals ($\chi^2 = 23.23$; $df = 9$; $p = 0.006$).

The self-reported quality of life in patients with epilepsy pertains to moderately intensive physical activity during the past seven days (Table 3). Among all the respondents who evaluated the quality of their lives as reasonably good, fewer patients were concerned about adverse effects of long term use of medication ($p = 0.038$), while all the rest were engaged in moderately intense physical activity during the past seven days ($p = 0.001$) and spent more quality time with their family and close friends ($p = 0.013$). Moreover, among the respondents who evaluated the quality of their lives as good and poor, the same numbers of patients were concerned about possible injuries during the seizures, embarrassment or social problems and went for

Table 1. Psychosocial problems of people with epilepsy (points)

Items	Values	General	Age groups		Significance of the difference	
		M ± SD	20–39	40–59	t	p
Worries about possible injuries during the seizure		1.83 ± 0.612	1.73 ± 0.60	1.93 ± 0.61	-2.363	0.019
Worries about embarrassment and other social problems due to seizures		2.04 ± 0.634	1.93 ± 0.61	2.15 ± 0.64	-2.486	0.014
Experienced difficulties performing the work or other activities during the past 4 weeks		3.05 ± 0.821	3.03 ± 0.81	3.07 ± 0.83	0.922	0.337
Worries about the adverse effect of long-term use of medications on health		1.64 ± 0.61	1.69 ± 0.56	1.60 ± 0.65	1.005	0.316
Anxiety about memory difficulties (forgetting names of people, places, other information, etc.)		2.93 ± 1.083	2.58 ± 0.99	3.29 ± 1.05	-4.917	0.000
Anxiety about social limitations		3.14 ± 1.01	3.22 ± 0.98	3.06 ± 1.03	1.133	0.258
Time spent with family and friends		2.71 ± 0.971	2.70 ± 1.05	2.73 ± 0.88	-0.239	0.811
Patients' self-reported quality of life		2.94 ± 0.773	2.67 ± 0.70	3.22 ± 0.75	-5.393	0.000

Table 2. Physical activity of people with epilepsy (points)

Items	Values	M ± SD	Age groups		Significance of the difference
			20–39 years	40–59 years	p
Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports		1.66 ± 0.59	1.66 ± 0.54	1.67 ± 0.65	0.874
Lifting and carrying shopping bags		2.46 ± 0.60	2.39 ± 0.62	2.52 ± 0.58	0.125
Intensive physical activities during the past seven days.		4.06 ± 1.68	3.85 ± 1.78	4.26 ± 1.56	0.092
Walked for less than ten minutes per day during the past seven days.		5.22 ± 1.39	5.02 ± 1.47	5.41 ± 1.27	0.047

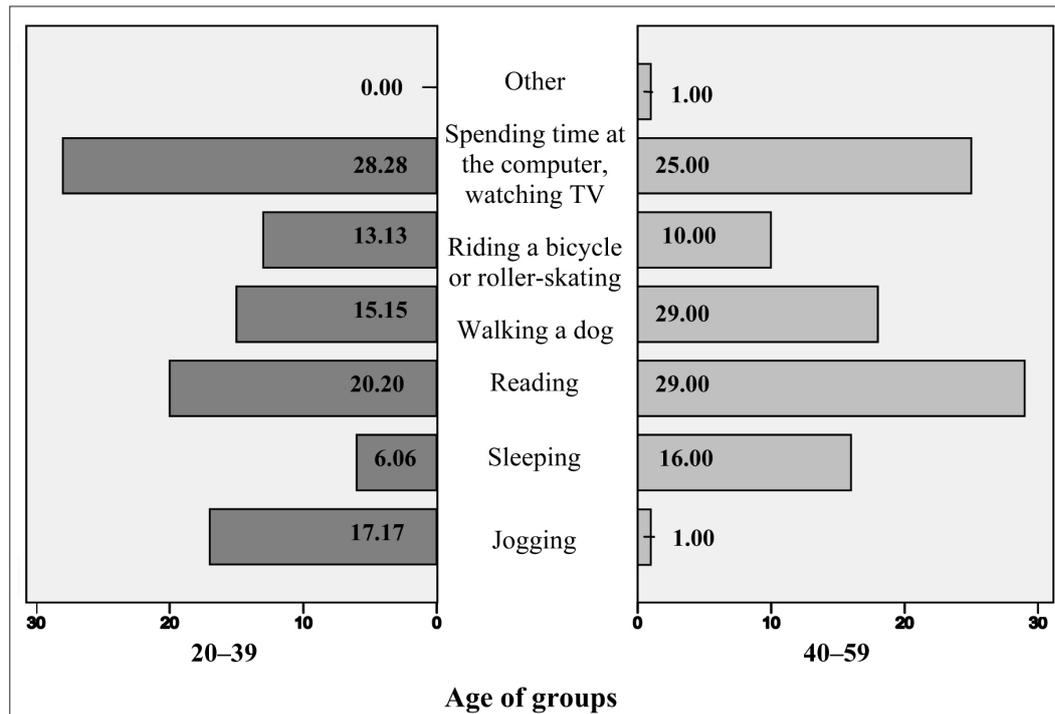


Figure 2. Leisure time physical activities of patients with epilepsy (%)

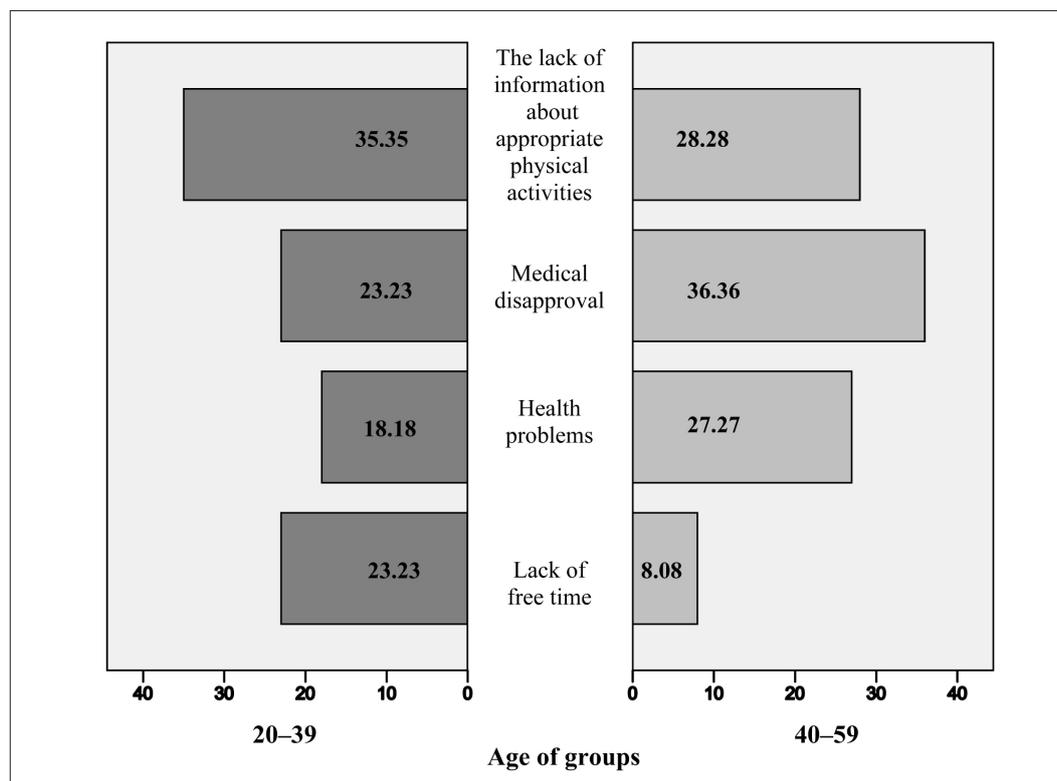


Figure 3. The reasons for physical inactivity in patients with epilepsy (%)

shorter than 10 minutes walks per day during the past seven days ($p > 0.05$). Spearman's correlation analysis revealed that there was a connection between the reasons discouraging physical activity

($r = -0.180$; $p = 0.011$), furthermore, the most common leisure activities were tangential to the evaluation of the quality of life during the past four weeks ($r = 0.153$; $p = 0.031$).

Table 3. Interrelations of self-reported quality of life, psychosocial problems and physical activity in patients with epilepsy (points)

Items	Values	Self-reported quality of life as excellent or fairly good		Self-reported quality of life as mediocre, poor or very bad		Significance of the difference
		N	M ± SD	N	M	p
Moderately intensive physical activities during the past seven days	60	4.63 ± 1.756	136	3.81 ± 1.594	0.092	
Walking not less than 10 minutes during the past seven days.	62	5.31 ± 1.455	137	5.18 ± 1.361	0.047	
Worries about possible injuries during the seizure	62	1.76 ± 0.534	137	1.86 ± 0.644	0.019	
Worries about embarrassment and other social problems due to seizures	62	1.95 ± 0.612	137	2.08 ± 0.642	0.014	
Worries about the adverse effect on health due to long-term use of medications.	62	1.77 ± 0.584	137	1.58 ± 0.614	0.316	
Time spent with family and friends	62	2.97 ± 1.101	137	2.60 ± 0.887	0.811	

DISCUSSION

According to S. Choi-Kwon et al. (2003) the quality of life among patients with epilepsy depends not only on the type and frequency of seizures, but also on the psychological and emotional state due to social stigmatization. Our research has demonstrated that 40% of younger respondents developed epilepsy during the first ten years of their lives (i. e. epilepsy was innate or childhood epilepsy), 32% of them developed epilepsy at the age of 11–20 (i. e. during adolescence). Hence the majority of 29–49 year-old respondents experienced the effects of epilepsy during their youth; the illness heavily affected not only them, but their families as well. In the senior age group a large number of patients had post-traumatic epilepsy. These respondents encountered the loss of employment, the necessity of retraining, financial difficulties.

Almost every person with epilepsy is concerned about possible injuries during the seizure. It was determined that younger respondents were worried about the injuries more often than the older ones because their social ties were wider, there was an increased probability that qualified medical aid might not be provided. Moreover, younger patients with epilepsy were more concerned about possible embarrassment and discrimination due to seizures, dependence on other people, behavioural changes and memory difficulties. C. Bagley (1972) indicates that just a while ago epilepsy was considered to

be a psychiatric disorder and people still follow myths when judging patients with epilepsy. Most often people who have developed epilepsy at an early age have an exaggerated perception about shame and discrimination, thus they might not be able to overcome more serious problems in the future (Devinsky et al., 2007). Older respondents were less worried about shame and other social problems.

According to the researchers (Kwan, Brodie, 2001; Lee, 2005) appropriate treatment can successfully control and even prevent seizures for most people with epilepsy, important predictors of good outcome are few side effects of therapy. Our research revealed that the majority of the respondents were taking antiepileptic drugs, and some of them experienced side effects. Due to the usage of antiepileptic drugs the respondents of the younger age group experienced difficulties and disturbance at work and were anxious about social limitations. A large number of senior respondents indicated that they were not greatly concerned about their illness and side effects of antiepileptic drugs, however with age their concerns increased. Many other authors agree with this opinion concerning the effects of antiepileptic drugs (Hesdorffer et al., 2011).

Patients with epilepsy very often tend to worry about memory difficulties; they suffer from a more severe cognitive function disorder. It has been scientifically proved that memory difficulties

frequently correlate with the severity of seizures, their frequency, medication used and other factors. Memory problems were also indicated by our respondents and they were related to the respondents' age. Younger respondents were not much concerned about memory difficulties. Increasingly, patients with epilepsy tended to worry about problems related to memory, which was particularly noticeable in the senior group (up to 75%).

A significant indicator, especially among younger respondents, was higher or incomplete higher education. Education received can help improve the quality of life for patients with epilepsy, make them aware of their health condition, ensure better activity and communication, their involvement in social life, opportunities to devote more time for family and relatives. The opinion of other researchers coincides with the fact that education has a great impact on the person's social possibilities (Daoud et al., 2007).

World Health Organization (WHO) recommends that every adult should get at least 30 minutes of physical activity per day. The recommended time should not be divided into shorter than 10-minute periods; however, it has been proved that even very short physical activities have a positive effect on health (Jankauskienė, 2008). Nowadays doctors try to encourage patients with epilepsy to be physically active; nevertheless, people are still physically inactive for fear of inducing seizures or increasing seizure frequency and due to the lack of information. Studies have revealed that physical activity can decrease seizure frequency as well as lead to improved cardiovascular and psychological health in people with epilepsy, especially with the help of physicians' encouragement and recommendations, accurate monitoring of medications, and preparation of family or trainers (Bjorholt, 1990; Howard et al., 2004; Pennell, Thompson, 2009).

The respondents who participated in our research were also quite intolerant to physical

activities. The majority of respondents were physically inactive as they feared to induce seizures, they lacked information about adequate types of physical activities. Despite all the positive effects of physical exercise, patients with epilepsy were still discouraged from participation in physical activities by physicians. On average, our respondents were physically active not daily, but only four times during the last seven days. Patients who were moderately physically active during the last seven days evaluated the quality of their life better than those who were physically inactive.

CONCLUSIONS AND PERSPECTIVES

1. Psychosocial problems and physical inactivity of patients with epilepsy were related to their age.

2. Younger respondents manifested the following psychosocial problems: antiepileptic medication interfering with their work; worries about social limitations; deterioration of memory, fear to experience shame due to seizures. The seniors demonstrated worries about the possibilities to lose their jobs, self-service limitations, social difficulties.

3. Patients with epilepsy were physically inactive. Younger respondents indicated that they lacked knowledge about forms of physical activity appropriate for them; sometimes they lacked time for physical activity. Seniors indicated that they were physically inactive due to health problems and discouragement from their doctors.

4. More physically active patients self-reported their quality of life as good, substantial or excellent. The younger respondents were more numerous among them as well as those patients who worried less about the harmful effect of medicine and spent more time with their friends and close people.

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EPILEPSIJA SERGANČIŪJŲ PSICHOSOCIALINĖS PROBLEMOS IR FIZINIS AKTYVUMAS

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Sergančių epilepsija fizinis pasyvumas susijęs su ligos eiga, gydymu, ligonių požiūriu ir mitais, kad fizinis aktyvumas gali būti pavojingas ir išprovokuoti priepuolius (Steinhoff et al., 1996; Nakken, 2001).

Tikslas – išsiaiškinti sergančiųjų epilepsija psichosocialines problemas, fizinį aktyvumą, savos gyvenimos vertinimą ir pastarųjų sąsajas su ligonių amžiumi.

Metodai. Buvo tiriama 209 trijų Lietuvos rajonų (Šiaulių, Panevėžio ir Pasvalio), susibūrusių į epilepsija sergančiųjų draugijas, nariai. Naudojant kiekybinę QOLJE-89 anketą ir IPAQ tarptautinį klausimyną atlikta anketinė apklausa. Duomenys palyginti tarp jaunesniojo (20–39 metai) ir vyresniojo (40–59 metų) amžiaus apklaustųjų.

Rezultatai. Pagrindinės epilepsija sergančiųjų psichosocialinės problemos buvo nerimas, kad priepuolio metu gali susižaloti, patirti gėdą, rūpestis dėl socialinių apribojimų ar tai, kad ilgą laiką vartojami vaistai gali pakenkti sveikatai, pablogėti atmintis. Šias problemas nurodė daugiau jaunesnių nei vyresnių respondentų ($p < 0,05$). Epilepsija sergančiųjų fizinė veikla buvo menka. Didelis duomenų išsibarstymas rodė, kad epilepsija sergantieji fizinį aktyvumą vertina nevienodai. Dažniausia skirtumą priešastimi buvo sergančiųjų amžius. Jaunesni respondantai laisvalaikiu daugiau bėgioja, važinėja dviračiu ar riedučiais, vyresni – daugiau skaito ar miega ($p = 0,002$). Jaunesni respondantai nurodė, kad stokoja laisvo laiko ir žinių apie jiems tinkamiausią fizinės veiklos formą, vyresni – esą fiziškai neaktyvūs, nes tam nepritaria gydytojas ar to nedaro dėl sveikatos problemų ($p = 0,006$). Savą gyvenimą kaip pakankamai gerą įvertino daugiau jaunesnių apklaustųjų ir mažiau tų, kurie turėjo psichosocialinių problemų ar buvo fiziškai neaktyvūs.

Aptarimas ir išvados. Psichosocialinės problemos, menkas fizinis aktyvumas glaudžiai susijęs su apklaustųjų amžiumi. Fiziškai aktyvesnių ir nurodžiusių geresnę gyvenimo kokybę buvo daugiau jaunesnio nei vyresnio amžiaus respondentų.

Raktažodžiai: nerimas dėl ligos, socialinės problemos, fizinis aktyvumas, savos gyvenimos vertinimas.

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ATTITUDES TOWARDS PHYSICAL ACTIVITY OF STUDENTS DISENGAGED IN SPORTS AT KLAIPĖDA UNIVERSITY

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ABSTRACT

Research background and hypothesis. Students' lifestyle and daily routines change at the moment of entering higher education institutions, their load for mental activity increases, whereas physical activity decreases. It becomes complicated to maintain proper health, necessary levels of physical development, fitness and functional potential (Daledo et al., 2008). The analysis of previously conducted research on physical activity of students at Lithuanian universities showed that motivation to individually engage in sports and be physically active has dropped. Around 40.0% of university students have no stimulus for physical self-improvement and almost do not spend time for exercising (Poteliūnienė et al., 2005). The attitudes of the majority of students towards physical activity are negative – about 92.0% of females and 91.0% of males claim that they do not approve of compulsory physical activities and slightly more than half of females (51.0%) and a lower percentage of males (44.0%) expressed doubt in relation to their intent of being physically active throughout an entire period of studying (Daledo et al., 2008). There is still a gap in research analysing such situation among students of Klaipėda University. There were also no studies found which would analyse the attitudes towards physical activity expressed by students of Klaipėda University. *Hypothesis:* Klaipėda university female students engage in sports less frequently compared to male students.

Research aim was to reveal the attitudes towards physical activity of students disengaged in sport at Klaipėda University.

Research methods. Quantitative research was conducted using the method of questionnaire survey in October of 2011. A probability random sample was comprised of 203 (104 males and 99 females) first year full-time students, disengaged in sports, aged 19–21 years.

Research results show that 70.9% of females and 49.0% of males lack knowledge about physical activity. One third of academic youth do not dedicate a decent share of time for their physical self-improvement, and less than one fifth of students are completely disengaged in sports activities; 30.7% of males and 30.7% of females name a lack of informal physical education clubs which would be free of charge as the main reason for their disengagement in sport-related activities. Supposedly this is the reason why more than two thirds of men and women are absolutely willing to refuse compulsory exercising.

Discussion and conclusions. The results of the conducted research allow concluding that the attitudes towards physical activity expressed by the majority of Klaipėda University students are poor. It has been revealed that the academic community neglects proper development of students' attitudes towards physical activity by deciding to deprive students of sufficient information. Therefore, the results highlighted a lack of such knowledge among students. Drawing on the conducted research results we suggest that application of methodological research materials will create better conditions to develop physical activity and especially physical self-improvement of Klaipėda university students providing more subject-related and methodological knowledge.

Keywords: physical activity, attitude, physical self-improvement.

INTRODUCTION

According to WHO (2010), the Council of Europe and the European Community, the future of the new Europe is a growing

and a maturing person who should be guaranteed a possibility to grow healthy, seek education, develop healthy skills and a sense of responsibility,

which is relevant to Lithuania as well. Such idea is substantiated by the educational institutions of the Republic of Lithuania, one of the tasks of which is to promote spiritual and physical potential of a person, to lay firm foundations of morality and healthy lifestyle, to develop motivation to engage in sports and individual exercising throughout the entire life.

The benefits of sports and physical activity for a young person, their health, development of physical skills are unquestionable. Research literature has proved a positive effect of physical activity on health (Kardelis et al., 2001; Adaškevičienė, 2004). Physical activity is essential not only for the normal growth and cognitive development of a person, which is a very important criterion of physical state and a health, but also for the maturity of the body functional systems, prevention of health issues, development of physical potential, and it can assist in avoiding coronary and vein-related diseases, diabetes, obesity and a tendency for depression (Dencker et al., 2006; Dregval, 2008; Kardelienė, 2009; Trinkūnienė, Emeljanovas, 2009, and others). It was observed that a physically active person was characterised by higher self-esteem, positive health-related behaviour and proper nutrition, absence of addictions and harmful habits (Zaborskis et al., 2005). However, direct and indirect evidence confirming the decrease in physical activity of youth is increasing (Anderssen et al., 2005; Hallal et al., 2006). Motivation of around 40.0% of university students to engage in sport related activities and exercising daily has dropped down (Poteliūnienė et al., 2003, 2005). Attitudes towards vigorous physical activity of the majority students are negative – about 92.0% of females and 91.0% of males do not approve of compulsory physical activities and slightly more than half of females (51.0%) and 44.0% of males express a doubt in relation to their intention of being physically active throughout the entire period of studying (Dadelo et al., 2008).

The aim of the research was to reveal attitudes towards physical activity of Klaipėda University students disengaged in sports.

Research hypothesis – Klaipėda university female students engage in sports less frequently compared to male students.

RESEARCH METHODS

A total number of 203 (females (n = 99) and males (n = 104)) full-time Klaipėda university

students disengaged in sports, aged 19–21 years, having entered the University in 2011 and studying at 7 faculties (Pedagogy, Social Sciences, Marine Engineering, Art, Natural Sciences and Mathematics, Maritime institute, Humanities) participated in the research. The research participants were selected using the random sampling method. The research employed a method of a written questionnaire. The questionnaire was composed of 17 multiple choice questions. The majority of questions were closed, i. e. only one answer was possible from the choices provided. The procedures of the questionnaire survey complied with the principles of anonymity and students' consent to participate in the research. The research was conducted at the beginning of compulsory physical education classes.

Data analysis. The obtained research results were processed using *Statistical Package for Social Sciences SPSS 17.0*. For the interpretation of the reliability level of the obtained statistical data, a Chi-square (χ^2) test was applied (to test hypotheses of non-parametric criteria in respect to distribution of variables in the population, i. e. to verify if the difference between empirical and theoretical distributions is significant according to Pearson's formula), while differences of responses for females and males were rated using Mann-Whitney U test (significance of differences between two independent samples based on rank choices of responses).

RESEARCH RESULTS

Results of the quantitative research revealed that more than half of females (57.6%) and males (56.7%) attended physical education classes at the university because of compulsory attendance. Only a low number of female research participants (22.2%) attended the class with the intention to improve the shape, whereas 21.2% of males claimed they cared to improve their physical potential (Figure 1).

After the analysis of the time spent for individual exercising and sports throughout a week it was established that the majority, i. e. almost one third (28.6% of females and 25.2% of males) of academic youth dedicated only 1–2 hours per week for physical self-improvement, and almost 15.0%, i. e. 7.1% of females and 7.8% of males, were completely disengaged in sports and exercising. Using the non-parametric test of Chi-square (χ^2) it was identified that males more often than females

engaged in sports and exercising for 5-6 hours and more males and females often engaged in individual sports for 7 hours per week ($\chi^2 = 7.353$; $p = 0.007$) (Figure 2).

Analysing the causes which determine reluctance to engage in individual sports and exercising, it was identified that a similar number of males (30.7%) and females (31.1%) named a lack of free informal physical education clubs as the principal reason for the disengagement in sports. The remaining number of females (26.2%) mentioned being lazy to engage in sports and 27.7% of males claimed having insufficient amount of time to engage in independent sport-related activities (Figure 3). There were no statistically significant differences identified in respect to gender to the question provided.

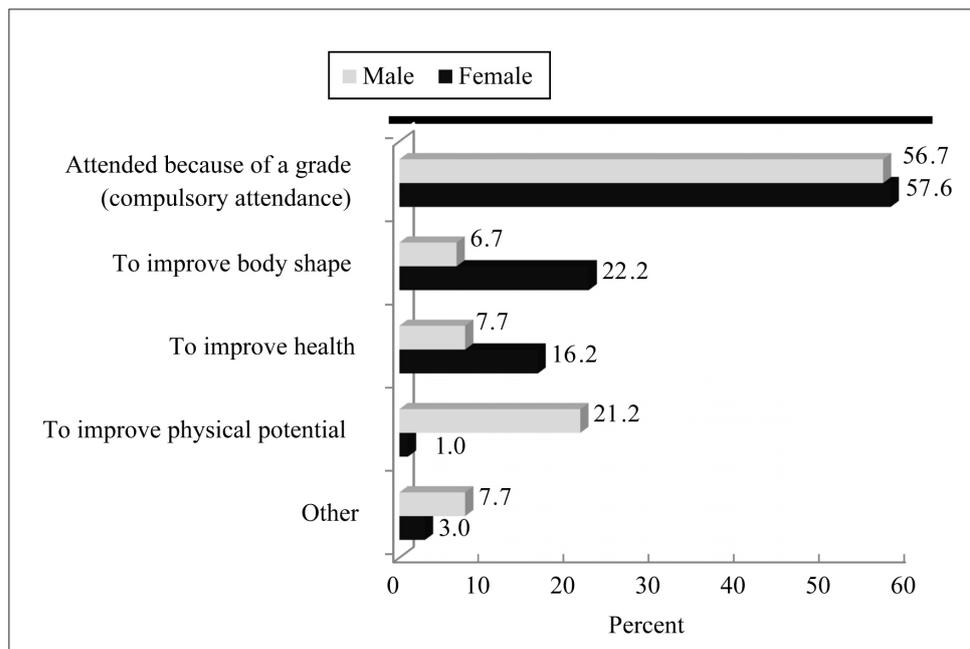
It was revealed that significantly more than two thirds (79.8% of females and 65.4% of males) of respondents claimed willing to have no compulsory physical education classes and expressed their wish to choose sport-related activities on voluntary basis, and only a minority of students would approve of the compulsory physical education classes – 12.1% of females and twice as many males – 25.9%, which conditioned a statistically significant difference between the genders – it is possible to presume that men are willing to engage in sports more

often compared to women ($\chi^2 = 6.527$; $p = 0.040$) (Figure 4).

Knowledge, skills, competencies and motivation are an integral part of positive and targeted physical activity. There is no doubt that properly delivered knowledge allows shaping positive attitudes towards physical activity, i. e. it can motivate young adults to engage in sports more actively and be more physically active. Obtained research data revealed that a greater majority of females (70.9%) compared to males (49.0%) did not have adequate information in relation to physical activity ($\chi^2 = 12.007$; $p = 0.001$), and only a minority of students claimed having sufficient amount of information (6.1% of males and 2.9% of females) (Figure 5).

It was identified that the academic community neglected a proper formation of students' attitudes towards physical activity by deciding to deprive students of sufficient amount of information. Only 16.5% of males and 15.2% of females believed that information about physical activity was provided by the academic staff, even though the majority, i. e. almost one third of males and females, most of the time received information from mass media (Figure 6). There were no statistically significant differences identified in respect to gender to the question provided.

Figure 1. Main reasons for attending physical education classes at the university



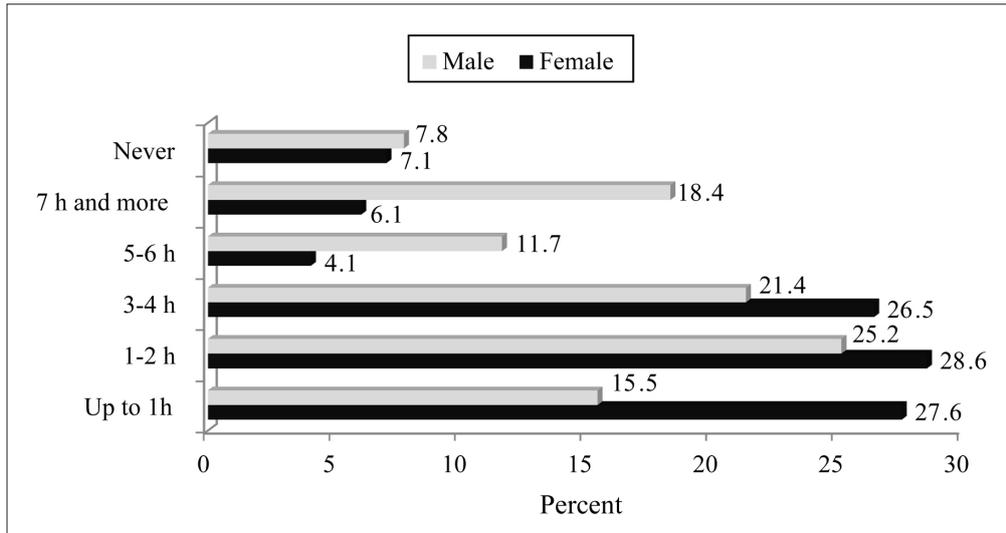


Figure 2. Time (hours per week) spent by students for individual exercising and playing sports

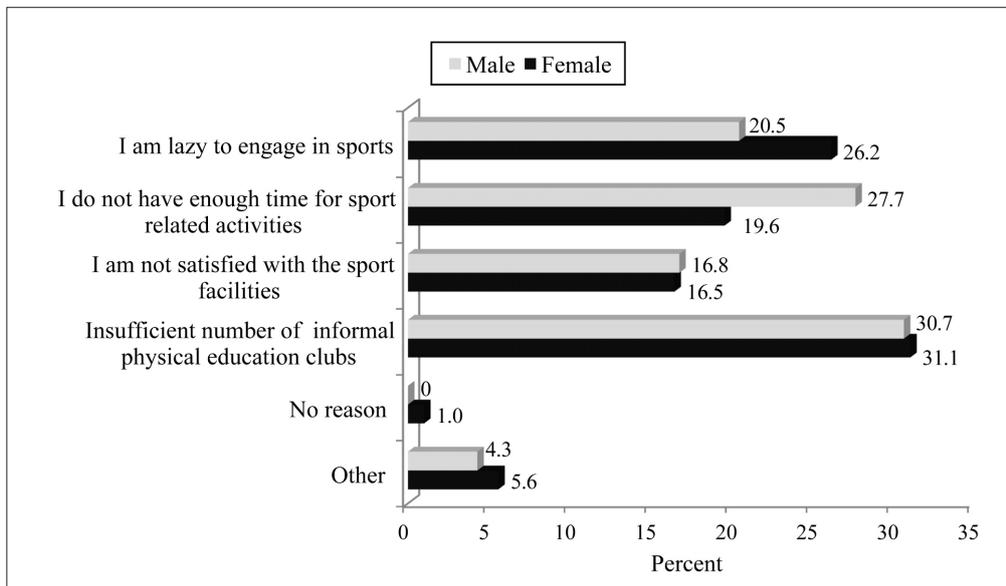


Figure 3. Main reasons for student inactivity

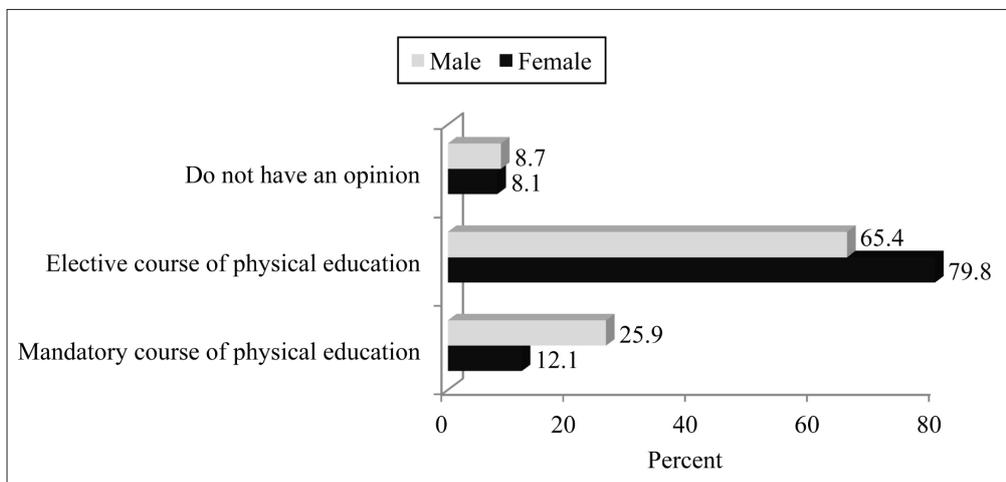


Figure 4. Students' opinions related to the status of physical education classes

Figure 5. Students' knowledge about physical activity

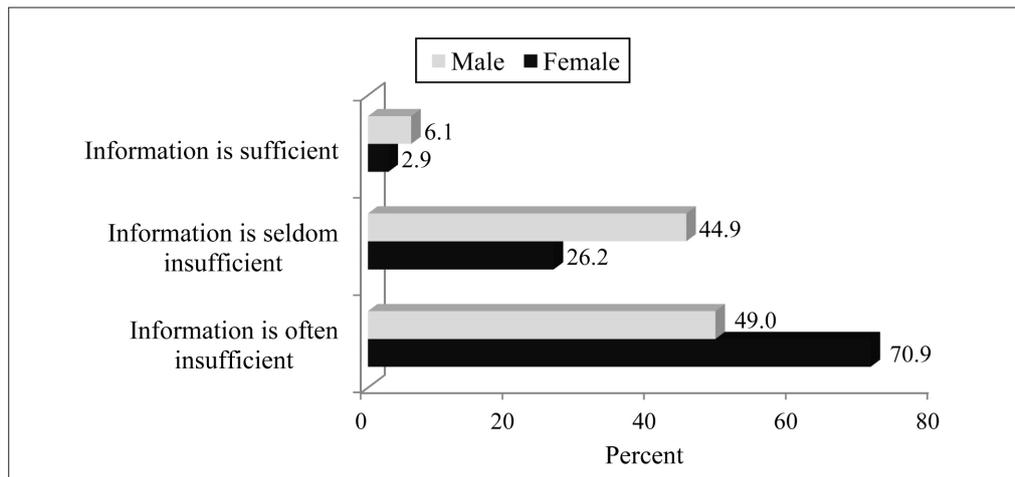
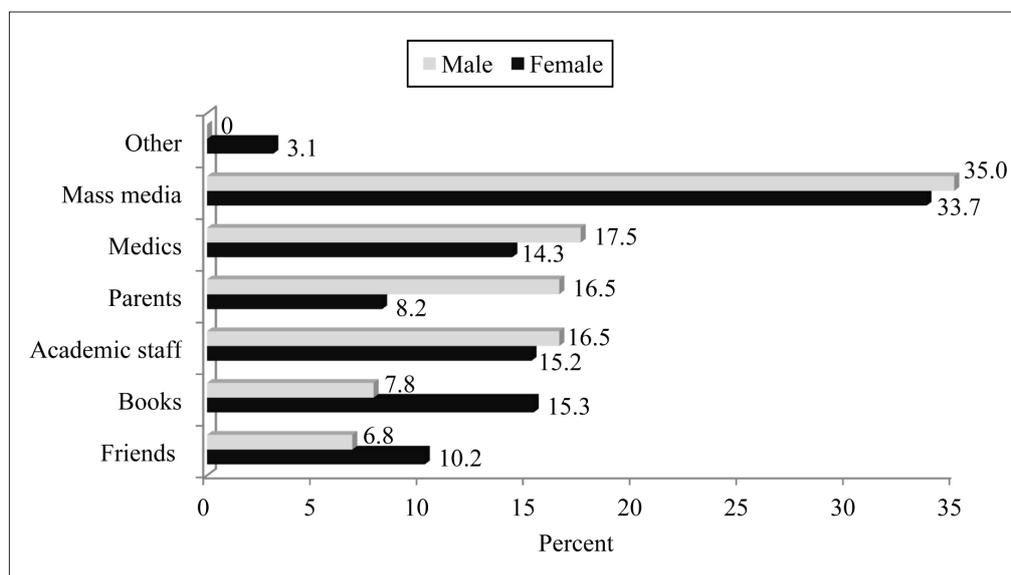


Figure 6. Sources of information providing knowledge about physical activity to students



DISCUSSION

Scientific research confirms that sport-related activities greatly influence not only the improvement of physical health (Grinienė, 2006), but also the development of psychosocial health (Nieman, 2002; Vainienė, Kardelis, 2008), therefore, the significance of the increase in physical activity at universities does not decline; however, attitudes of academic youth towards sport-related activities become less motivated, which means that attitudes of students towards active physical engagement is poor (Proškuvienė et al., 1999; Poteliūnienė, 2005; Dadelo et al., 2008). In their research S. Dadelo et al. (2008) have concluded that almost half of men and slightly more than half of women were not sure whether they were willing to be physically active

throughout the entire period of their studies. A similar situation was observed among students of Klaipėda University. It was observed that about one third of students (males and females) spent insufficient number of hours for physical self-improvement, whereas less than one fifth were completely disengaged in sports and exercising, even though WHO (2010) issued recommendations to young adults to daily attend sport-related activities of an average intensity for no less than 60 minutes. Results reveal that students involved in the research mentioned a lack of informal physical education clubs, lack of determination and free time as the principal reasons for their inactivity. Possibly these are the reasons why significantly more than

two thirds of Klaipėda university students (males and females) completely disapprove of compulsory physical education classes. A similar situation was observed among students of other universities. The vast majority (92.0% of females and 91.0% of males) of students at Vilnius Gediminas Technical University also expressed their wish of having physical education courses as electives, which reveals a tendentious increase in physical inactivity among students.

Even though it is believed that academic community is interested in motivating the development of students' spiritual and physical potential, research revealed that very little was done in teaching students to exercise individually by providing theoretical knowledge and developing special skills. Such knowledge should assist in comprehending educational, activating and health enhancing functions of a sport (Blauzdys, Vilkas, 2007). Results revealed that only a very small percentage of academics provided information about physical activity, therefore a majority of students, i. e. almost one third of males and females, receive the necessary information from the mass media most of the time.

CONCLUSIONS AND PERSPECTIVES

Even 70.9% of females and 49.0% of males expressed a lack of information related to physical activity. One third of academic youth spend insufficient number of hours for physical self-improvement, whereas less than one fifth of students are completely inactive. The main reason conditioning students' disengagement is a lack of informal physical education clubs, lack of willpower and free time. It is likely that due to such reasons, significantly more than two thirds of males and females completely disapprove of compulsory physical education classes. It has been revealed that academic community neglects proper development of students' attitudes towards physical activity by not giving students sufficient information. Drawing on the obtained results of the conducted research and applying methodological research materials would create better conditions to develop physical activity and especially physical self-improvement for Klaipėda university students, ensuring more subject related and methodological knowledge.

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KLAIPĖDOS UNIVERSITETO NESPORTUOJANČIŲ STUDENTŲ POŽIŪRIS Į FIZINĮ AKTYVUMĄ

Artūras Janauskas

Klaipėdos universitetas, Klaipėda, Lietuva

SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Studentams įstojus į aukštąsias mokyklas, pasikeičia jų gyvenimo būdas, dienvakė, didėja protinės veiklos krūvis, sumažėja judamoji veikla. Išlaikyti gerą sveikatos lygį, reikiama fizinį išsivystymą, parengtumą ir funkcinį pajėgumą darosi sudėtinga (Daledo ir kt., 2008). Tyrimais įrodyta, kad Lietuvos aukštųjų mokyklų studentų motyvacija sportuoti, savarankiškai mankštintis sumažėjo. Apie 40,0% aukštųjų mokyklų studentų neturi pagrindo fizinei saviugdai ir fiziniams pratimams beveik neskiria laiko (Poteliūnienė ir kt., 2005). Daugumos studentų požiūris į aktyvią fizinę veiklą neigiamas – apie 92,0% merginų ir 91,0% vaikinių nenori privalomų sportinės veiklos pratybų ir daugiau nei pusė merginų (51,0%) bei šiek tiek mažiau vaikinių (44,0%) abejoja, ar nori būti fiziškai aktyvūs visą studijų laikotarpį (Dadelo, Tamošauskas, 2008). Kyla klausimas, kokia gi situacija tarp Klaipėdos universiteto studentų? Ji nėra atskleista. Neaptikta ir Klaipėdos universiteto studentų požiūrio į fizinį aktyvumą tyrimų. *Hipotezė* – Klaipėdos universiteto merginos sportuoja mažiau nei vaikinai.

Tikslas – išsiaiškinti Klaipėdos universiteto nesportuojančių studentų požiūrį į fizinį aktyvumą.

Metodai. Kiekybinio tyrimo metu pasitelkiant anketinės apklausos metodą atlikta apklausa, kuri vyko 2011 metų spalio mėnesį. Tyrimo tikimybinę atsitiktinę imtį sudarė 203 (104 vaikinai ir 99 merginos) I kurso nuolatinišė studijose besimokantys nesportuojantys studentai, kurių daugumos amžius (97,5%) 19–21 m.

Rezultatai. 70,9% merginų ir 49,0% vaikinių trūksta žinių apie fizinį aktyvumą. Trečdalis akademinio jaunimo fizinei saviugdai skiria nepakankamai laiko, o mažiau nei penktadalis visiškai nesimankština ir nesportuoja. 30,7% vaikinių ir 30,7% merginų pagrindine nespirtavimo priežastimi laiko nemokamų neformaliojo fizinio ugdymo būrelių trūkumą. Gal dėl to gerokai daugiau nei du trečdaliai vaikinių ir merginų visiškai nenori privalomų kūno kultūros pratybų.

Aptarimas ir išvados. Daugumos Klaipėdos universiteto studentų požiūris į fizinį aktyvumą – menkas. Paaikškėjo, kad akademinė bendruomenė, nesuteikdama pakankamai žinių, menkai formuoja studentų požiūrį į fizinį aktyvumą. Taigi rezultatai parodė didelę šių studentų žinių stoką. Naudojant tyrimo rezultatų duomenis ir taikant mokslinę metodinę medžiagą, bus sudaromos geros sąlygos plėtoti Klaipėdos universiteto studentų fizinį aktyvumą, ypač jų fizinę saviugdą, ir teikti daugiau dalykinių ir metodinių žinių.

Raktažodžiai: fizinis aktyvumas, požiūris, fizinė saviugda.

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MIRROR VISUAL FEEDBACK IMPACT ON ABDUCTOR POLLICIS BREVIS MUSCLE ELECTRICAL ACTIVITY IN THE STROKE AFFECTED ARM

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ABSTRACT

Research background and hypothesis. Stroke is recognized as one of the major causes of morbidity, mortality and long-term disability around the world (Laver et al., 2012). Mirror visual feedback is one of the newest areas of research that shows the potential application in neurorehabilitation (Kang et al., 2012). We hypothesize that abductor pollicis brevis muscle activity in the stroke affected arm will be higher when the movements are performed with non-affected hand visual mirror feedback.

Research aim was to identify mirror visual feedback impact on abductor pollicis brevis muscle electrical activity in the stroke affected arm.

Research methods. Post-stroke subjects ($n = 12$) performed bimanual thumb opposition under three conditions: without mirror visual feedback, with non-affected and affected arm reflection in the mirror. Electrical activity of abductor pollicis brevis muscle was recorded simultaneously.

Research results. There was a significantly higher ($p < 0.05$) muscle activity amplitude when thumb opposition was performed with visual feedback of non-affected hand compared to task without mirror visual feedback. No muscle activity amplitude difference was observed when thumb opposition was performed looking at affected hand mirror visual feedback compared to task without mirror visual feedback. Motor unit firing rate did not differ between tasks.

Discussion and conclusions. I. Nojima and co-authors (2012) have identified that mirror visual feedback activates motor cortex. Additionally, our study shows that even during one-time movement with observation of non-affected hand in the mirror shows higher muscle electrical activity in the affected hand.

Keywords: mirror neurones, thumb opposition, bimanual movement.

INTRODUCTION

Stroke is recognized as one of the major causes of morbidity, mortality and long-term disability around the world. It is often irregular and varies from 100 to 300 cases for 100000 persons per year. Stroke occurs in one million people per year in Europe (Laver et al., 2012).

Stroke usually impairs motor function which disrupts the activities of daily living. It is known that 87% of upper limb motor damage occurs in acute stroke period (Yun et al., 2011). In addition,

more than 50% patients suffer long-term upper limb impairments because they avoid using their affected arm after conventional therapy (Kang et al., 2012). Moreover, the thumb opposition is the most difficult and important movement of thumb in daily activities (Delagi et al., 2011). Thumb opposition, thereby grasp mechanism, is very disturbed due to abductor pollicis brevis muscle paralysis (Delagi et al., 2011).

Mirror visual feedback is one of the newest areas of research that shows the potential

application in neurorehabilitation (Kang et al., 2012). Neuropsychological studies have observed that mirror causes conflict between vision and proprioception. It is interesting to note that vision information dominates (Holmes et al., 2004; Ro et al., 2004). The systematic review showed that mirror therapy improves hand function and activities of daily living (Thieme et al., 2013). Previous studies have suggested that visual mirror feedback increases primary motor cortex activity of the stationary hand (Garry et al., 2005; Shinoura et al., 2008; Tominaga et al., 2009) where mirror neurons exist (Dushanova, Donoghue, 2010).

J. H. Cauraugh and J. J. Summers (2005) note the importance of planning and executing bilateral movements post-stroke. It can facilitate cortical neural plasticity by these mechanisms: motor cortex disinhibition that allows increased use of the spared pathways of the damaged hemisphere, increased recruitment of the ipsilateral pathways from the contralesional or contralateral hemisphere to supplement the damaged crossed corticospinal pathways, and upregulation of descending premotorneuron commands onto propriospinal neurons (Cauraugh, Summers, 2005).

In our study we simultaneously used mirror visual feedback and bilateral movement performance, and tried to increase motor cortex excitability which results in increased muscle activation (Furukawa et al., 2012). We hypothesize that abductor pollicis brevis muscle activity in the stroke affected arm will be higher when the bilateral movements are performed with non-affected hand visual mirror feedback compared to movements without it.

One study showed that mirror visual feedback affects stationary non-dominant hand muscle activity in healthy subjects while they observe dominant hand reflection in the mirror (Furukawa et al., 2012). We failed to find any evidence that shows the single-mirror visual feedback effect in stroke affected arm muscle electrical activity. Our research aim was to identify mirror visual feedback impact on abductor pollicis brevis muscle electrical activity in the stroke affected arm.

RESEARCH METHODS

Participants. Twelve women (age – 65.51 (4.46)) with right-hemisphere stroke (28.34 (3.67) days after the first stroke symptoms) participated in the study. All participants were right-handed,

according to the Edinburgh Handedness Inventory (Oldfield, 1971).

The inclusion criteria of this study include: first-ever stroke, subacute post-stroke stage within 8 weeks after onset, muscle strength in the affected hand overcome gravity (score > 3 on the Lovett scale) (Cuthbert, Goodheart, 2007), no serious cognitive deficits (score > 20 on the Mini Mental-State Exam) (Folstein et al., 1975), and no spasticity at any joint of the upper limb (score of < 1 on the Modified Ashworth Scale) (Bohannon, Smith, 1987).

The subjects were familiarized with the study objectives, methods, procedures and possible inconveniences. Research was carried out in accordance with the principles of the Declaration of Helsinki, concerning ethics of the experimentation with humans. All subjects gave informed consent prior to participation.

Motor tasks performance. All subjects had to perform thumb opposition with each finger movement under three different conditions (Table). During tasks subjects were asked to supinate their forearms. During tasks which used mirrors subjects' hands were 10 cm apart from mirror, and without mirror hands were 25 cm apart from each other. Tasks priority was chosen randomly. Mirror wall (38 cm x 33 cm) (Figure 1) was used to perform tasks with visual mirror feedback. One minute break between tasks was done in order to avoid fatigue (Naik, 2012).



Figure 1. Mirror wall (38 cm x 33 cm)

Measurements of muscle electrical activity. Bipolar Ag-AgCl surface electrodes were used for surface electromyogram (sEMG) recordings (silver bar electrodes, diameter 10 mm, centre-to-centre distance 20 mm) of abductor pollicis

Table. Tasks performed by subjects

Tasks	Conditions	Repetitions (times)	Rest between the repetitions
Thumb opposition with non-affected hand reflection (NAHR)	Non-affected hand reflection in the mirror	3	No rest
Thumb opposition with affected hand reflection (AHR)	Affected hand reflection in the mirror	3	No rest
Thumb opposition without mirror reflection (WR)	No mirror	3	No rest

brevis muscle belly oriented parallel to the length of fibres in the affected hand (Biometrics Ltd, Gwent, UK). The skin at the electrode site was cleaned with alcohol wipes. The ground electrode was positioned on the wrist of non-affected hand. sEMG signals were recorded by amplifiers with signal measurement using a filter bandwidth of 20–460 Hz. The analogue signal was sampled and converted to digital form at sampling frequency of 1 kHz. The EMG signal was telemetered to a receiver that contained a differential amplifier with an input impedance of 10 M Ω , input noise level was less than 5 μ V and the common mode rejection ratio was higher than 96 dB. sEMG signals were synchronously recorded during pollicis opposition movements in all conditions. We analysed the root mean square and mean power frequency to assess muscle activity amplitude and motor unit firing rate, respectively.

Mathematical statistics. The research data were processed using Microsoft Excel 2010 program mathematical statistical analysis. The data are reported as mean values and standard deviations (SD). Changes were evaluated using Student's (t) test ($p < 0.05$ level of significance).

RESEARCH RESULTS

Figure 2 shows affected hand abductor pollicis brevis muscle electrical activity amplitude under three different conditions: non-affected hand mirror visual feedback (0.35 (0.09) mV), affected hand mirror visual feedback (0.32 (0.09) mV) and task without mirror visual feedback (0.30 (0.09) mV). There was no significant abductor pollicis brevis muscle electrical activity amplitude difference between the non-affected and affected hand mirror visual feedback conditions. There was a significantly higher ($p < 0.05$) amplitude when subjects observed the non-affected hand reflection in the mirror compared to task without mirror visual feedback, whereas there was no significant difference in amplitude when affected hand reflection was observed in the mirror compared to task without mirror visual feedback.

There was no significant difference in muscle motor unit firing rate of the abductor pollicis brevis muscle between the non-affected hand reflection (145.97 (17.63) Hz), affected hand reflection (149.47 (17.73) Hz), and task without mirror visual feedback (145.84 (11.74) Hz) (Figure 3).

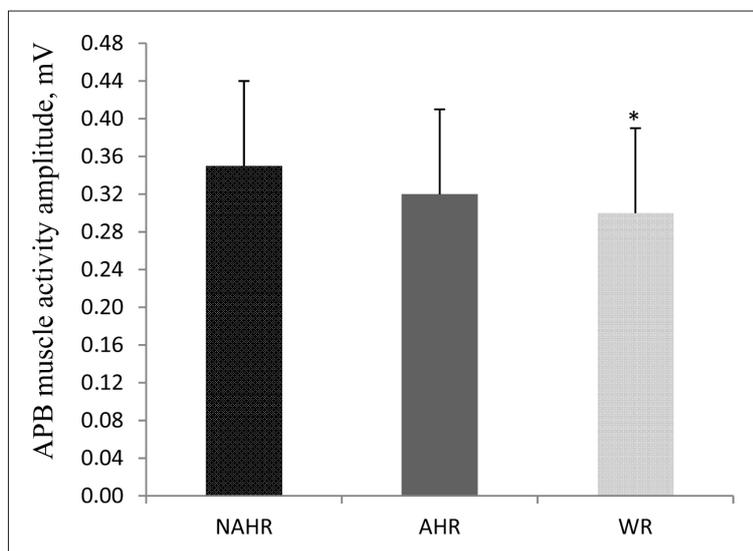
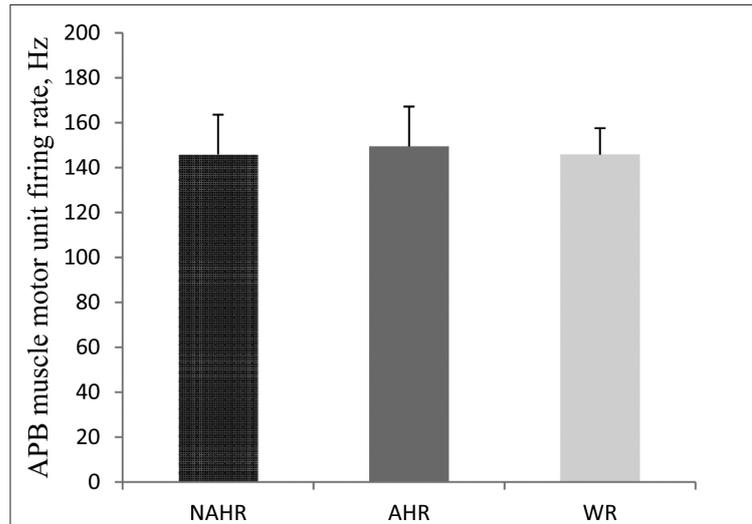


Figure 2. Stroke affected hand abductor pollicis brevis (APB) muscle electrical activity amplitude during observation of thumb opposition of the non-affected hand reflection (NAHR), affected hand reflection (AHR) and task without reflection (WR) in the mirror

Note. * – statistically significant difference ($p < 0.05$) between NAHR and WR tasks.

Figure 3. Stroke affected hand abductor pollicis brevis (APB) muscle motor unit firing rate during observation of thumb opposition of the non-affected hand reflection (NAHR), affected hand reflection (AHR) and performing thumb opposition without reflection (WR) in the mirror



DISCUSSION

Obtained results confirmed our hypothesis that abductor pollicis brevis muscle activity in the stroke affected arm would be higher when bimanual movements were performed with healthy hand visual mirror feedback compared to observation of affected-hand and movements without mirror.

K. Furukawa and co-authors (2012) showed that mirror visual feedback increased stationary non-dominant hand muscle activity in healthy subjects while they observed dominant hand movement reflection in the mirror. Our study showed that observation of the healthy hand in the mirror increased muscle electrical activity amplitude, whereas affected hand observation did not show any differences compared to movements without mirror. Several mechanisms have been suggested to explain how mirror therapy works. E. L. Altschuler and co-authors (1999) explain that the mirror reflection of the healthy moving arm, which looks like the affected arm moving correctly, substitutes the often decreased or void proprioceptive input, thus helping recruit the premotor cortex and improve motor rehabilitation through close interaction with the premotor cortex. I. Nojima and co-authors (2012), M. I. Garry and co-authors (2005) performed transcranial magnetic stimulation during mirror illusion in healthy subjects and showed increased excitability of the primary motor cortex (M1) of the hand behind the mirror. In addition, J. Liepert and co-authors (2001) reported that the primary motor cortex was excited by hand movements and thus the ipsilateral M1 excitability is known to increase contraction strength as voluntary

unilateral arm/hand movements induced excitability changes in both the contralateral and ipsilateral M1.

X. Hu and co-authors (2012) observed reduced firing rates evident in the paretic muscle compared with the contralateral muscle of stroke subjects. However, the motor unit firing rate did not differ between different conditions. L. A. C. Kallenber and H. J. Hermens (2008) discusses that motor unit firing rates reflects CNS input solely. Possible explanations is that opposition movement is influenced not only by CNS, but also by peripheral muscle properties (Kallenber, Hermens, 2008), which can be seen on increased muscle activation amplitude.

Based on the obtained results and the completed research (Yavuzer et al., 2008; Michielsen et al., 2011; Yun et al., 2011) we indicate the importance of mirror visual feedback adjustment for stroke patients when the movement is performed bimanually, observing the healthy hand movements in the mirror.

CONCLUSIONS AND PERSPECTIVES

Our research aim was to identify healthy hand mirror visual feedback impact on abductor pollicis brevis muscle electrical activity in the stroke affected arm. The main findings of our study are:

1. Muscle electrical activity amplitude of affected hand with non-affected hand mirror visual feedback was higher compared to movements without mirror visual feedback;

2. Muscle electrical activity amplitude of the affected hand with its mirror visual feedback did not differ compared to movements without mirror visual feedback;

3. The rate of motor unit firing remained unchanged during all three conditions.

Subsequent studies should clarify the one-time mirror feedback effect on different types of exercises. Additionally, it is important to reveal if subjects at different stroke stages have different responses to mirror feedback.

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VEIDRODINIO GRĮŽTAMOJO RYŠIO POVEIKIS PATYRUSIŲJŲ GALVOS SMEGENŲ INSULTĄ PAŽEISTOS RANKOS TRUMPOJO ATITRAUKIAMOJO NYKŠČIO RAUMENS ELEKTRINIAM AKTYVUMUI

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Galvos smegenų insultas yra pripažintas kaip viena iš pagrindinių sergamumo, mirtingumo ir ilgalaikės negalios priežasčių visame pasaulyje (Laver et al., 2012). Veidrodinis grįžtamasis ryšys yra viena iš naujausių tyrimų sričių, kuri taikoma neuroreabilitacijos metu (Kang et al., 2012). Manytume, kad dėl insulto pažeistos rankos trumpojo atitraukiamojo nykščio raumens elektrinis aktyvumas yra didesnis atliekant judesius veidrodinio grįžtamojo ryšio principu nei be jo.

Tikslas – nustatyti veidrodinio grįžtamojo ryšio poveikį patyrusiųjų galvos smegenų insultą pažeistos rankos trumpojo atitraukiamojo nykščio raumens aktyvumui.

Metodai. Asmenys, patyrę galvos smegenų insultą ($n = 12$), atliko abiejų rankų nykščiu priešpastatymo judesį esant trims skirtingoms sąlygoms: judesiai atliekami be veidrodinio grįžtamojo ryšio, judesiai atliekami stebint sveikosios ir pažeistosios rankos atvaizdą veidrodyje. Užduočių metu buvo registruojamas trumpojo atitraukiamojo nykščio raumens elektrinis aktyvumas.

Rezultatai. Stebint sveikos rankos atspindį veidrodyje nustatyta reikšmingai didesnė ($p < 0,05$) raumens elektrinio aktyvumo amplitudė, lyginant su rodikliais judesių, atliekamų be veidrodžio. Stebint pakenktos rankos atspindį veidrodyje, amplitudė reikšmingai nesiskyrė nuo judesių, atliekamų be veidrodžio. Trumpojo atitraukiamojo nykščio raumens motorinių vienetų impulsavimo dažnumas atliekant skirtingas užduotis nesiskyrė.

Aptarimas ir išvados. I. Nojoma ir bendraautorai (2012) teigia, kad veidrodinis grįžtamasis ryšys aktyvuoja motorinę žievę. Mūsų tyrimas parodė, kad netgi vienkartinis judesys stebint sveikos rankos atspindį veidrodyje padidina pažeistos rankos trumpojo atitraukiamojo nykščio raumens elektrinį aktyvumą.

Raktažodžiai: veidrodiniai neuronai, nykščio priešpastatymas, judesys abiem rankomis.

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WHAT IS “TOLERANCE” AND “TOLERANCE EDUCATION”? PHILOSOPHICAL PERSPECTIVES

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ABSTRACT

Research background. The notion of tolerance is used in various contexts, but nevertheless it remains ambiguous. The very fact that educators, politicians, and philosophers again and again face questions about the meaning of value term “tolerance”, stresses the vivid necessity of continuous attempts to elucidate the notion of tolerance at the theoretical level.

Research aim was to provide relevant arguments for the thesis that tolerance is a context dependent notion and therefore the claims about tolerance “in general” are ambiguous, uninformative, and non-instructive.

Research method. Our research methodology was philosophical reflection involving conceptual analysis and the application of the outcomes to education sciences.

Research results. If we are to understand and define the concept of tolerance, we need a broader understanding of what is good and what is bad, understanding of what behaviour is expected from us under certain cultural circumstances.

Discussion and conclusions. 1. In religious context, tolerance is a respectful attitude towards beliefs and practices of others – attitude which, in fact, can be grounded either by dogmatism or by scepticism. 2. In political context, emphasis is laid not on what others believe or think, but on what people do. 3. There is one common feature of tolerance conceptions which take shape in inter-religious discourse and in politics: it is believed that it is quite easy to understand the motives of actions performed by “others”; such understanding (“empathy”) is the main condition for tolerance. 4. In ethics and education, tolerance is the measurement (or objective assessment) of our beliefs keeping in mind possibilities of their alternatives. In this respect, tolerance is the realization of human rational nature.

Keywords: tolerance, tolerance education, autonomy, ethics, rationality.

INTRODUCTION

The notion of tolerance is used in various contexts; nevertheless, its meaning is short of clearance and distinctness. Can we be sure that in different contexts this concept does not differ in its meaning? How does tolerance as a *political value* relate to the notion of tolerance in the discourse of education sciences? Contemporary discourses on tolerance disclose an amazing paradox: tolerance is one of the most important democratic values, and, as far as we can see, the future and the very existence of Western civilizations depends on our being tolerant or intolerant with others, those who are different from us (in respect to nationality,

religion, political ideology, etc.); this is true, but it is very difficult to state or understand what toleration *really* is (cf. King, 1997). What should be tolerated, and why? What does educator really need to do if his/her purpose is tolerance education? Obviously, tolerance is not a skill or competence completely alike those students usually gain through effective education (i.e. skills of writing, reading, debating, or painting, singing, etc.). Of course, tolerance is related to the system of values and ethical education, but, on the other hand, having firm values is not identical with being tolerant; in other words, firm belief in truth of certain religious or moral claims

often leads to religious or moral fundamentalism. If tolerance is a kind of moral decision (letting others be), then another issue is relevant: is it acceptable to tolerate immoral actions? And what about so-called “Zero tolerance policies” which are accepted in some U.S. schools? Does Zero tolerance, to immoral actions contribute positively to the moral development of students? (This issue is thoroughly discussed by P. Daniels, 2008.) The very fact that educators, politicians, and philosophers again and again face such questions stresses a vivid necessity of continuous attempts to elucidate the notion of tolerance at the theoretical level.

So, the main question is: how are we to understand the word “tolerance”? Our answer is: it depends on the context. The thesis statement of our paper is: tolerance is a context dependent notion, and therefore claims about tolerance “in general” are ambiguous, uninformative, and *non-instructive* (especially in the case of educational discourse). To put it otherwise, the notion of tolerance itself does not ensure any clear criterion for assessing our actions (and the ones of others). The aim of the paper was to provide relevant arguments for this thesis. The first implication of this thesis significant for educational sciences is the claim that in the area of practical affairs (i. e. educational *praxis*) “absolute tolerance” or “unconditional tolerance” reveals itself as a defective idea – defective in the sense that scepticism and indifference (or other extremities – dogmatism and fundamentalism) emerge as a socially desirable stance.

Theoretical discussions on tolerance usually centre on some classical texts: for instance, John Locke’s “Letter Concerning Toleration” (2010); J. S. Mill’s treatise “On Liberty” (2002). In Lithuania R. Plečkaitis’ monograph *Tolerance* (1998) remains the fundamental philosophical work on the topic. Among philosophical works in English, we should mention B. Williams’s article “Toleration: An Impossible Virtue?” (1996), P. King’s comprehensive study “Toleration” (1997), P. Zagorin’s “How the Idea of Religious Toleration Came to the West” (2003), F. Rainer’s informative paper “Toleration” (2012).

RESEARCH METHODS

Our research methodology was philosophical reflection, involving conceptual analysis and the application of the outcomes to education sciences.

RESEARCH RESULTS

Tolerance and matters of religion. The idea of diversity or variety pervades the claims which are meant to convey the notion or concept of tolerance (Plečkaitis, 1998). People differ among themselves, but not all differences are easily acceptable – we know this from the lessons of the history and from our everyday experience. Differences of religion are something people usually find intolerable (Williams, 1996). We tend to treat our own religion (i. e. certain system of beliefs and specific practices) as *the best* way to realize internal starvation for the transcendence (which is natural for human being, *homo religiosus*). But there are, as we believe it, *bad* ways to actualize this specifically human feature. For instance, Muslims believe that Islam grants the best way to be religious and other alternatives are bad (or, at least, not as good as the way shown by Mahomet).

In the matters of religion we have clearly drawn distinction between orthodoxy and heresy and namely this distinction shows differences of religious beliefs and practices in dark colours. If some claim about transcendence is justified and true, then it must be justified and true in some *universal* way. If there is ultimate reality and truth which is named by “God” (in singular or plural), it is evident that there should be one objective representation of this reality and truth (i. e. orthodoxy, “true/right/straight belief” in ancient Greek), and, all specific and subjective interpretations of transcendence should be treated with caution. In this context, “heretical” or “heterodox” beliefs and practices are said to be tolerated in one specific sense: “heterodoxy” reveals itself as dangerous fault, but it is necessary to convert proponents of faulty beliefs and practices in some civilized, legal manner (although Augustine justifies the use of force in teaching “right doctrine” (King, 1997; Rainer, 2012).

Historically, the concept of tolerance emerges from the clash of religions (Catholicism, Protestantism, Islam) in post-medieval Europe. In his treatise *De Pace Fidei* Nicolas de Cusa (1401–1464 A. D.) proposes a powerful idea that only superficial look reveals stark contrasts of different religions and, of course, deeper intellectual inquiry is needed to notice conceptual elements common to all of them. There is one religion in various rites, one essentially *Christian* dogma in various appearances (Rainer, 2012). In this case, toleration

is concentration on affinities without due respect to differences. "Other" or "different" has no value of its own.

In Erasmus of Rotterdam's (1466–1536 A. D.) preaches religious tolerance on the grounds that forced conversion of infidels is totally ineffective. "That, which is forced, cannot be sincere, and that which is not voluntary cannot please Christ" (Olin, 1979, p. 90). Of course, it does not mean that differences should be treated positively. Erasmus finds specific strategy to finish continuous strife among major religions: first of all, it is recommended to put emphasis not on human belief (i. e. what is declared), but on human conscience. This strategy rests on silent assumption (taken from medieval theology) that human soul is Christian in nature. As conscience speaks in terms of Christian doctrine, according to Erasmus, there is no need to extend formal authority of the Church: "The sum and substance of our religion is peace and concord. This can hardly remain the case, unless we define as few matters as possible and leave each individual's judgment free in many questions" (Olin, 1979, p. 100).

Eventually Christian humanists have to acknowledge that it is impossible to blur dogmatic contrasts at the theoretical-theological level. It is clearly understood that Church has a political power and unquestioned right to use it (Plečkaitis, 1998; Zagorin, 2003; Kaplan, 2007), and at this point contexts of religious discourse, ethics and politics evidently overlap. In the case of Christian Church, "will to truth" is identical with "will to power" (using Nietzsche's terms), and it, of course, cannot be content with merely formal obligation.

J. Locke links up religious tolerance with autonomy of moral agent in his famous *Letter Concerning Tolerance*: the truth "is not taught by laws, nor has she any need of force to produce her entrance into the minds of men" (Locke, 2010, p. 31; cf. Spinoza, 2008). As J. Waldron (1991) rightly noticed, Locke's conception of tolerance rests on naïve and false epistemological assumption that religious beliefs cannot be imposed from outside, i. e. that religion is not a proper object for manipulations.

Ideals of the political power limitations and individual autonomy (in the matters of religion) paradoxically lead to opposite and quite uncomfortable conclusions. The first is that the vast diversity of heterodox beliefs only strengthens orthodox dogma (dogmatic conclusion, as in the

case of Nicolas de Cusa). For instance, J. J. Russo (1997) claims the authority of one "civic religion" which should be professed by all citizens. The second is that there cannot be objective truth in matters of religion, that "God" is an empty concept (sceptical conclusion).

Constitution of the Republic of Lithuania (1992) states: "Freedom of a human being to profess and spread his/her religion or belief may not be limited otherwise than by law and only when this is necessary to guarantee the security of society, the public order, the health and morals of the people as well as other basic rights and freedoms of the person" (Article 26). It is the declaration of tolerance in political terms (in this case, authority of the state surpasses authority of the Church). In postmodern era to say that there are many ways to transcendence and we should not single out one and the only way as privileged, first of all, means that religious beliefs and practices do not play the same role as in the former societies. What we have here is not a triumph of religious tolerance, but the triumph of "common sense" and materialistic-pragmatic world-view.

Tolerance in the sphere of politics. In politics differences often lead to social conflicts. We believe that democratic organization and government of the society is the best way for us to be "social animals" (remember the sentence of Aristotle that a human being is *zoon politikon*). However, some ways of social life are inappropriate (e. g. North Korea of today or Pol Pot's regime in Cambodia). So, what does it mean to tolerate different views or positions in political discourse?

First of all, in politics the concept of tolerance is a device of "impersonal rhetoric" (rhetoric in which "We", not "I", is subject of announced decisions and declared beliefs). It is the means to impose authority to social groups which are labelled as "minorities" (Žižek, 2009). So-called "minority" gain toleration in exchange of due respect to so-called "majority", in exchange of their passiveness. In such contexts "toleration" is a spurious coin. "Majority" demonstrates good will and absolute power, "minority", in turn, remains loyal and accepts "inferior position"; in fact, it is a process of polarization, not social consolidation. In this light we can better understand Goethe's known dictum: "Tolerance should be a temporary attitude only: it must lead to recognition. To tolerate means to insult" (the quote is taken from F. Rainer, 2012).

On the other hand, when “minorities” call for “toleration”, it can be understood as a claim for privileges. H. Marcuse labels it as “partisan tolerance” and claims: “The tolerance which enlarged the range and content of freedom was always partisan – intolerant toward the protagonists of the repressive status quo. The issue was only the degree and extent of intolerance” (Marcuse, 1965, p. 85). According to H. Marcuse, if the ideal of political tolerance (maximal freedom for minorities) is fully realized, then we will face social catastrophe – “intolerance toward prevailing policies, attitudes, opinions, and the extension of tolerance to policies, attitudes, and opinions which are outlawed or suppressed” (Marcuse, 1965, p. 81). In democratic state “majorities” exercise incontestable political power in different levels and to different extent, but it is unthinkable to give equal power to “minorities” – it would pervert the very idea of democracy.

S. Žižek (2009) stresses another important aspect: anyway, tolerance is a product of the Western political thought, and as such it tends to advocate and export the Western standards of thinking and living. For instance, in the international conference J. Fernandez-Lasquetty, member of Hispania Parliament, states that such decisions as prohibition of death penalty are “universal and omnipresent values”, and “if we do not believe that such values should be esteemed by all people, then in approximate future they will be torn out from ourselves” (Fernandez-Lasquetty, 2008, p. 78–79). Of course, there is no reference to the codex of Sharia (adopted in Muslim countries) where death penalty is completely justified. In political and geopolitical contexts, *idealization of the West* pervades claims about tolerance.

As we have seen, notion of tolerance is primarily interweaved into the system of other more or less abstract concepts – “state”, “justice”, “autonomy” or “freedom”, etc. Declarations of political tolerance presuppose specific conception of the state which can be traced back to Thomas Hobbes. According to him, emergence of the state is a matter of consensus or “social contract”; the *bellum omnium contra omnes* or pre-civilized existence of human beings is totally inconvenient state even for satisfying primitive and egoistic demands, therefore in the dawn of history people decided to restrict their power to do what they pleased on behalf of one sovereign authority (Hobbes, 2003). So, political tolerance is understood as the only

alternative of the open social conflict. John Rawls seemingly treats toleration as a pattern (described as “overlapping consensus” and “reasonable pluralism”) in which individuals and groups should interact; supposedly this pattern works in different social contexts (Rawls, 1995).

Social contract theory supports the ideal of human autonomy – ideal vigorously defended by J. S. Mill, “prophet” of liberalism. He produces powerful arguments for autonomy and implicitly for tolerance. First of all, he stresses that each individual has a natural right to pursue what he thinks to be a good for him; in other words, the state cannot prohibit “experiments of living”. The state cannot know better than the individual what things are good or bad for him/her. We should demarcate a sphere of purely private matters, a sphere where results of actions concern only the agent himself. On the other hand, according to J. S. Mill, we should demarcate a sphere of public affairs in which actions directly concern not only the agent, but also his social environment (Mill, 2002; cf. Spinoza, 2008). These attempts to draw borders of individual autonomy “from outside” (“from impersonal perspective”) ignore an important point: our actions (alongside with our words) are open to interpretation, and certain actions can be treated by authorities as indirect danger for public interests. It is especially relevant if a state, as J. S. Mill believes, is a means to produce maximum happiness for its citizens.

In contrast to the conception of religious tolerance, the emphasis lays not on what others *believe* or *think*, but on what other people *do*. On the other hand, in this case “the relation of tolerance is no longer vertical but horizontal: the subjects are at the same time the objects of toleration” (Rainer, 2012). We can quite easily tolerate ideas, but it is difficult to tolerate actions (especially these which aim at us). For instance, it is easy to tolerate the basic ideas of communism, but most of us are reluctant to tolerate any active attempts to materialize them.

Tolerance in ethics and education. Ethics is, in the first place, a system of orienteers which enable to lift up human behaviour to the level of *cultural* life. In other words, ethics is a line of demarcation between natural and cultural existence. Bad deeds are unacceptable either for individual or society. But moral norms are relevant to our decisions and actions only in case they are being treated as objective and universal (Williams, 2004). The

ethical claims cannot be normative or regulative without being unconditionally true.

In various conceptions of tolerance, first of all, we need a broader understanding of what is good and what is bad, understanding of what behaviour is expected from us under certain cultural circumstances. The concept of tolerance is not vacuous, if and only if basic moral categories can be sufficiently defined, and, of course, such definition must be in accordance with our actions and motives. We cannot conceive the notion of tolerance in such seemingly primitive or "unreflective" manner in which we understand our evaluative terms (e. g. "fair", "honest", "virtuous", etc.) (cf. Spinoza, 2008). Consequentially, if there are no objective ethical truths, then there is no objective basis for tolerance.

Not only is the concept of tolerance founded on certain ethical commitments. Of course, such notions as "autonomy", "conscience", "justice", etc. are ethical categories in nature. J. S. Mill claims that the state is "the aggregate of individuals" and describes how such "aggregate" work, metaphorically speaking, which principles of "political mechanics" are relevant here (Mill, 2002). His claims about autonomy stresses quite a trivial fact: citizens are elements or "gearwheels" of political mechanism, and there is no need to change them if they work properly. In contrast to J. S. Mill, I. Kant more explicitly describes inner structure of such elements, principles of "moral mechanics". He defines enlightenment (certain cultural phenomena) as "the human being's emergence from his self-incurred minority" and emphasizes objective value of moral decisions which were made "without direction from another" (Kant, 1996, p. 17). In social contract theory of the state, namely "external criteria" of human behaviour ("conditional imperatives", as I. Kant puts it) plays a central role; authorities should encourage (by means of education and moralization) to make or change individual decisions according to socially established standards of human behaviour (Mill, 2002). In fact, different versions of social contract theory are quite content with moral conformism. But, according I. Kant, adequate ethical theory cannot dispense with certain "internal criteria" ("unconditional imperative") of moral decisions (Kant, 1996). Decisions and actions have moral value not because of social context, but as expressions of free will. Of course, state and society can manipulate individual through his feelings,

emotions, inclinations etc., but I. Kant excludes these empirical aspects from his conception of autonomy in which true-self is not material substance subjected to causality and the laws of nature (Kant, 1996).

Declaration of Principles on Tolerance (1995) states: "Education is the most effective means of preventing intolerance. The first step in tolerance education is to teach people what their shared rights and freedoms are so that they may be respected and to promote the will to protect those of others" (Article 4.1). In the sphere of education, realization of tolerance needs a certain ethical background: first of all, students and teachers should recognize one another as moral equals; they should share understanding that human coexistence is interaction of absolutely free (in non-empirical sense) individuals (cf. Heyd, 2003).

Tolerance rests on the rational part of human nature. To be tolerant is to understand things in a certain way. Tolerance is the measurement of our beliefs keeping in mind possibilities of their alternatives. Is it so vital to me to defend such and such belief? What is so special about this particular belief? What about this "being mine" which we predicate to beliefs and opinions? Is it a relevant epistemological characteristic (especially in educational processes)? A tolerant person is the one who tends to test his/her opinions rationally in the encounter with opposite views. So "tolerance" is the word to mark individual's intellectual and moral maturity. Therefore, the question about the essence of tolerance (about tolerance "in general") should be abandoned in favour of the question about rational support (or basis) of our ideals, opinions and beliefs. According to K. R. Popper, the notion of tolerance implies that "faith in reason is not only a faith in our own reason, but also—and even more—in that of others"; tolerance presupposes ability to learn "from criticism as well as from own and other people's mistakes and that one can learn in this sense if one takes others and their arguments seriously. Rationalism is, therefore, bound up with the idea that the other fellow has a right to be heard and to defend his/her arguments" (Popper, 1971 b, p. 238). Tolerance relates not to our first-order (emotional, spontaneous) reactions towards behaviour and attitudes of others, but to reflective evaluation of such reactions – evaluation based on abstract principles.

There are significant changes in the meaning when we speak about tolerant society (in political

context) and tolerant individual (in ethical context). For example, society, which we call educated, encompasses the majority of educated people and the minority of the ones without education; predicate “tolerant” works analogously with the subject “society” or another group-term. But when we say that certain individual is honest or tolerant we do not treat him as a person who can ever demonstrate opposite characteristics (dishonesty or intolerance). That is how moral predicates function in our everyday language.

DISCUSSION

Even discerning contexts in which the concept of tolerance is used, we face serious problems with it. B. Williams even speaks about the impossibility of tolerance: “The difficulty with toleration is that it seems to be at once necessary and impossible. It is necessary where different groups have conflicting beliefs – moral, political, or religious – and realize that there is no alternative to their living together, that is to say, no alternative except armed conflict, which will not resolve their disagreements and will impose continuous suffering. These are the circumstances in which toleration is necessary. Yet in the same circumstances it may well seem impossible” (Williams, 1996, p. 18).

There is one common feature for the tolerance conceptions which take shape in inter-religious discourse, in politics, and ethics: it is believed that it is quite easy to understand the motives of actions performed by “others”, by “those who are different from us”; such understanding (“empathy”) is the main condition for tolerance. Can we tolerate what is totally unknowable, “irrational” from our point of view? Of course, a patient can tolerate the painful operations of a surgeon because he/she is sure that the surgeon’s motives are good (i. e. to heal the patient). But the same person can meet a stranger with a knife under completely different circumstances where it is difficult to understand the purposes and motives of the “other”; natural reaction in such situations is fear and active attempts to avoid or eliminate the danger. Therefore it looks so difficult to tolerate customs and behaviour of “uncivilized” or “primitive” communities and we tend to convert them to our system of beliefs.

So, tolerance appears to be justified only “within the boundaries of mere reason” (using I. Kant’s language). The very term “limits of

toleration” *prima facie* looks like contradiction, although K. Popper’s argumentation clearly shows that theoretical discourse cannot dispense with this notion: “Unlimited tolerance must lead to the disappearance of tolerance. If we extend unlimited tolerance even to those who are intolerant, if we are not prepared to defend a tolerant society against the onslaught of the intolerant, then the tolerant will be destroyed, and tolerance with them” (Popper, 1971 a, p. 265). What is intolerance? First of all, intolerance discloses itself when the citizen avoids discussion on motives and principles of their actions. But, on the other hand, some kinds of arguments and explanations are not allowed in a *rational* discussion: for instance, explanation of certain action by saying “Scripture compels me to do so” will be ridiculed, even if the agent itself sincerely believes it. By the rejection of opponent’s arguments as irrational or irrelevant we can easily accuse him/her of being intolerant in his/her words or actions.

These aspects are significant either discussing the thesis “no toleration of the intolerant” or dealing with so-called “paradox of the tolerant racist”. If an individual subsumes other people to “inferior races”, but refrains from brutal actions, there is a temptation to call him tolerant. In such cases, *prima facie* we have all essential elements of tolerance: the individual holds negative conviction towards the “other”; the individual has a power (physical or political) to oust the “other” from his/her neighbourhood; the individual consciously refrains from open discrimination (e. g. for financial reasons) (King, 1997; Plečkaitis, 1998). Can we claim, that in the case of “the tolerant racist” morally inadmissible attitude became moral virtue of tolerance? Racist holds certain prejudices which cannot be justified on *rational* grounds (Horton, 1996). But if standards of rationality are socially adjustable (as post-modern philosophers belief), then the question of *immoral tolerance* is open.

CONCLUSIONS AND PERSPECTIVES

1. In religious context, tolerance is a respectful attitude towards beliefs and practices of others – attitude which, in fact, can be grounded either in dogmatism (“one religion in various rites”) or in scepticism (“extraordinary claims require extraordinary evidence”).

2. In political context, emphasis lays not on what others believe or think, but on what people do.

3. There is one common feature of tolerance conceptions which take shape in inter-religious discourse and in politics: it is believed that it is quite easy to understand motives of actions performed by "others", by "those who are different

from us"; such understanding ("empathy") is the main condition for tolerance.

4. In ethics and education, tolerance is the measurement (or objective assessment) of our beliefs keeping in mind possibilities of their alternatives. In this respect, tolerance is the realization of human rational nature.

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KAS YRA TOLERANCIJA IR TOLERANCIJOS UGDYMAS? FILOSOFINĖS PERSPEKTYVOS

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Tolerancijos sąvoka vartojama įvairiuose kontekstuose, tačiau lieka neaiški. Pats faktas, kad pedagogai, politikai ir filosofai kaskart susiduria su klausimu apie vertybinio termino *tolerancija* reikšmę, pabrėžia tęstinių pastangų būtinybę nušviesti tolerancijos sąvoką teoriniu lygmeniu.

Tikslas – pateikti relevantiškus argumentus tezės, kad tolerancija yra priklausoma nuo konteksto. Todėl teiginiai apie toleranciją apskritai dviprasmiški ir neinformatyvūs.

Metodai. Tyrimo metodas yra filosofinė refleksija, apimanti sąvokų analizę ir gautų rezultatų taikymą edukologijos srityje.

Rezultatai. Jei norime suprasti ir apibrėžti tolerancijos sąvoką, reikalingas platesnis supratimas, kas yra gera ir kas bloga, kokio elgesio yra tikimasi iš mūsų tam tikroje kultūrinėje aplinkoje.

Aptarimas ir išvados. 1. Religijos srityje tolerancija suprantama kaip pagarbus požiūris į kitų įsitikinimus ir praktiškumas, kuris gali būti grindžiamas tiek dogmatizmu, tiek skepticizmu. 2. Politikos srityje tolerancijos sąvoka reiškia ne tai, ką kiti mano ar tiki, bet tai, ką jie daro (kaip elgiasi). 3. Tolerancijos sampratos, susiformavusios religinėje ir politinėje aplinkoje, turi vieną bendrą bruožą: manoma, kad galima gana lengvai suprasti kitų žmonių veiksmų motyvus. Toks supratimas yra pagrindinė tolerancijos sąlyga. 4. Etikos ir ugdymo srityje tolerancija yra savo pačių įsitikinimų objektyvus įvertinimas atsižvelgiant į alternatyvų galimybes. Šiuo požiūriu tolerancija yra žmogaus racionalios prigimties realizavimas.

Raktažodžiai: tolerancija, tolerancijos ugdymas, autonomija, etika, racionalumas.

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RESEARCH IN CONSUMER PREFERENCES SELECTING THE SERVICES OF WELLNESS-FITNESS CENTRES IN KAUNAS

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ABSTRACT

Research background and hypothesis. Competition among wellness-fitness centre companies is quite high. Each company which provides services to sport, in order to effectively carry out its activities, must take into account not only the political, economic, social, cultural, technological environment to follow current and potential competitors and their actions, but also consumer needs and priorities in selecting services. In addition, wellness-fitness centre managers must know the key criteria of consumer choice, especially when preparing strategic marketing plans for future company activities. *Hypothesis* – the most important keys of consumers selecting fitness centres services are geographic location, the quality of services and price.

Research aim was to determine consumer preferences in selecting fitness and wellness services at the largest health centres in Kaunas.

Research methods. The methods of quantitative questionnaire survey and observation were used, as well as the comparison of the conducted research findings with Euro barometer (2009), “Rait” (2007), KTU representatives investigating the customers in “Impuls” sports and entertainment parks (2009), Lithuanian Union of Sports Federations (LSFS) in 2010.

The questionnaire survey was conducted in March-April of 2011. A random probability sampling method was used with visitors ($n = 170$) from four largest wellness-fitness centres in Kaunas and the e-version of the questionnaire was uploaded into the social network profiles of wellness-fitness centres. The data were analysed and processed using statistical package for social sciences (SPSS 17.0 version).

Research results. Results of the present research allow concluding that respondents’ opinions concerning the following service assessment of wellness-fitness centres in Kaunas were *very scattered* and *very unequal* (standard deviation of the motivator assessment > 1). However, only one provided service coincided. It was the service of sauna and sauna area (standard deviation of the motivator assessment = $0.996 < 1$). The research hypothesis was proved partially.

Discussion and conclusions. Having executed the research it was determined that there were *very versatile consumer priorities* in selecting the service provided by wellness-fitness centres in Kaunas and it was impossible to distinguish predominant ones proving that wellness-fitness centres had to focus on the personalized service packages and modern information technologies for the customer relationship management.

Keywords: consuming sports services, companies of sports services, package of services.

INTRODUCTION

Over the past few years there have been many changes in sports service sector including: developments of technologies, growth of participation in sports activities. Competition among wellness-fitness centre companies is quite high. Each company which provides services to sport in order to effectively carry out its activities must take into account not only the political, economic, social, cultural, technological environment to follow current and

potential competitors and their actions, but also consumer needs and priorities in selecting services. In addition, wellness-fitness centre managers must know the key criteria of consumer choice, especially when preparing strategic marketing plans for future company activities.

Searching for the answer to the main problem of article – what are the key criteria for consumers when they select services of wellness-fitness centres – is the aim of this scientific research. Some authors (Ryan, Deci, 2000; Arocas et al., 2005) analysed the issues concerning sports customers and their reasons for exercise. Consumer needs for sports were also analysed by W. Castellani et al. (2003), C. M. Frederick and C. S. Morrison (1996). Internal consumers' motivations are studied in the work by R. Oman and E. McAuley (1993).

Advantages of acquisition parameters in sports business were studied by G. T. Trail, J. D. James (2001), M. J. A. Berry and G. S. Linoff, (2004). Attitudinal issues in sports enterprises were investigated by M. J. A. Berry and G. S. Linoff (2004), sport consumer loyalty – by J. Lombardo (2005), S. Howard (2010) and others. J. Cooley (2004) analysed the service issues in sports service companies.

Internal consumers' physical exercise motivations were researched by R. Oman and E. McAuley (1993). Advantage obtainment parameters in sports companies were investigated by P. Chelladurai (2001), M. J. A. Berry and G. S. Linoff (2004). Approach building problems in sports companies were researched by M. J. A. Berry and G. S. Linoff, (2004), sport consumers' loyalty by J. Lombardo, (2005), E. C. Schwarz and J. D. Hunter (2008), G. T. Trail, J. D. James (2001) and others.

No empiric research concerning consumers' priorities selecting a sports club was found, although, there are some links to already executed research, e. g. under Euro barometer (2009) there was research about consumers' approach towards sport among the residents of the EU countries; however, Estonia was highlighted most among the Baltic States. Another study was carried out by the research agency "Rait" (2007) investigating the reasons for Lithuanian population not going in for sports. Another study carried out by KTU representatives investigated the customers in "Impuls" sports and entertainment parks (2009). It revealed the consumer behaviours related to sport club selection frequency and marketing measure which condition arising problems.

One more study was carried out under the order of Lithuanian Union of Sports Federations (LSFS) in 2010, where sport club employees and their competences providing sports services were researched. Thus, the research problem of this article concerns the sector providing sports services at the empirical level. Up to now it has not received adequate attention. In the sports sector it is important to store information concerning the present and potential consumers, their purchasing and consumption habits selecting the companies providing sports services.

Research object is current potential sport consumers' priorities of the services in wellness-fitness centres in Kaunas.

Research aim was to identify the most significant consumers' priorities in selecting the services provided by wellness-fitness centres in Kaunas.

Research objectives were as following:

1. Identify selection motivators for wellness-fitness centres;
2. Assess the significance of the provided services according to the consumers' approach in wellness – fitness centres.

Hypothesis: geographical place, the quality and price of the provided services are the most significant priorities for the consumers selecting the services provided by wellness-fitness centres.

RESEARCH METHODS

We chose the quantitative questionnaire survey method for the research of the empirical research problem. The research was carried in March-April, 2011, intervieweing the visitors from the largest wellness-fitness centres in Kaunas "Ažuolynas", "Linija", "Impuls", "Hermis" and the e-version of the questionnaire was uploaded into the social network profiles of wellness-fitness centres (www.facebook.com). According to the executives of wellness-fitness centres, there was no possibility to identify a precise number of persons going in for sports, as in the data bases there were more than 20000 people who had been going in for sports for the last 15 years, their memberships were still active and they were currently going in for sports, but it was necessary to check every consumer's membership separately. According to J. Vveinhardt (2007), (2006), in the descriptive research it is needed to survey not fewer than 150–200 people in order to gain reliable outcomes.

Research sample. The scope of the research sample was 170: current and potential consumers of wellness-fitness centres. Table 1 reports presented demographical and socio-economics characteristics of the investigated respondents.

The respondents were surveyed at different time of the day so that it could be possible to identify the needs of different subjects. The data were analysed and processed with a statistical package for social sciences (*SPSS 17.0* version).

Table 1. Demographic and socio-economic characteristics of respondents

Demographic attributes	Socio-economic characteristics	Frequency	Ratio, %
Gender	Man	70	41
	Woman	100	59
	Total:	170	100
Age	>= 18	5	3
	19–25	68	40
	26–35	58	34
	36–45	24	14
	46–55	10	6
	56 and more	5	3
	Total:	170	100
Income	>= 500 Lt	15	9
	501–1000 Lt	19	11
	1001–1500 Lt	41	24
	1501–2500 Lt	46	27
	2501–4000 Lt	32	19
	4001 Lt and more	17	10
	Total:	170	100
Family status	Single	83	49
	Married	49	29
	Living unmarried	23	14
	Divorced	10	6
	Married (living separately)	3	2
	Widow(er)	0	0
	Total:	170	100
Education	Unfinished basic	3	2
	Primary	2	1
	Unfinished secondary	5	3
	Professional without the secondary	0	0
	Secondary	10	6
	Professional with the secondary	5	4
	Unfinished College	6	4
	College	15	9
	Unfinished university	17	10
	University degree	107	62
Total:	170	100	
Status	Pupil	6	4
	Student	32	19
	Employee	112	64
	Unemployed	3	2
	Other	17	9
	Total:	170	100

RESEARCH RESULTS

Analysing the priorities given by the consumers to the selection of wellness-fitness centres, we researched selection motivators for a sports club and the significance of the provided services according to the consumers' approach.

Selection motivators and their enhancement related to a wellness-fitness centre in Kaunas. The data about selection motivators to attend wellness-fitness centres in Kaunas are given in Figure 1. Key motivators when consumers were selecting a wellness-fitness centre proved to be the following: quality services (26%), convenient geographical place (24%) and affordable price (22%). Qualified trainers (12%) and diversity of services (10%) had quite a great impact, too. Less meaningful in the consumers' selection of a place for sports were the prestige of a wellness-fitness centre (4%), provided additional services (6%) and neighbours' approach (4%).

The deeper data analysis in the selection motivators of a sports club according to the strength has shown (see Table 2) that respondents' opinions were very *united* in the strength assessment of the

following motivators in wellness-fitness centres (standard deviation of the motivator assessment < 1): service diversity, service quality, price, trainers' and other employees' qualification and professionalism, trainers' and other employees' friendly communication with a visitor and a convenient geographical place.

The respondents' opinions varied only in the assessment of actions and special offer motivators (standard deviation of the motivator assessment $1.060 > 1$).

The significance of the services provided by the wellness-fitness centres in Kaunas according to the consumers' approach. Figure 2 provides data concerning the significance of the provided services for the consumers of wellness-fitness centres in Kaunas. The obtained research data show that the most significant services for respondents were as follows: swimming pool and water area, sauna and sauna area, parking lot, Jacuzzi, and cloakroom for outdoor clothing. The least significance for consumers was the rent of equipment as well as workouts for children and pregnant women.

Figure 1. Distribution of the motivators influencing consumers' selection of a wellness-fitness centre in Kaunas

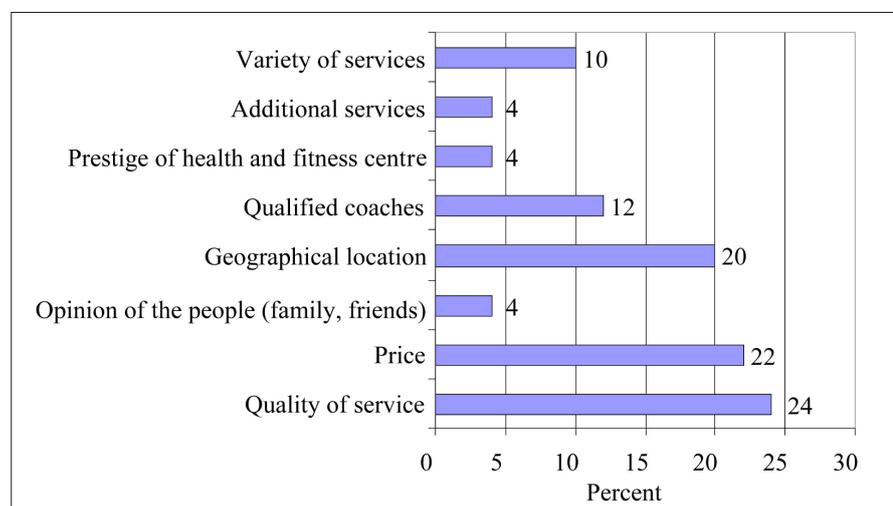


Table 2. The motivator strength for consumers selecting a wellness-fitness centre in Kaunas

Statistical indicators	Variety of services	Quality of services	Price	Promotions & special offers	Qualified coaches	Staff friendly communication with customers	Geographical location
N	Valid 170	170	170	170	170	170	170
Mean	1.66	1.38	1.59	2.19	1.75	1.65	1.79
Std. Deviation	0.785	0.626	0.796	1.06	0.922	0.765	0.929
Variance	0.617	0.391	0.634	1.124	0.85	0.585	0.863

However, after having carried out a deeper significance analysis of the assessment related to the provided services (see Table 3), it was noticed that the respondents' opinions were very unequal (standard deviation of the motivator assessment >1).

However, only one provided service coincided. It was a service of sauna and sauna area (standard deviation of the motivator assessment = 0.996 < 1). The respondents' opinions concerning the following service assessment of wellness-fitness centres in Kaunas were very scattered.

Services	Mean*	Std. Deviation**	Variance
Swimming pool and water area	1.84	1.075	1.156
Sauna, sauna area	1.88	0.996	0.992
Parking lot	2.05	1.059	1.122
Children' room	3.42	1.308	1.712
Massage cabinet	2.84	1.295	1.677
Solarium	3.05	1.279	1.636
Workouts for children	3.49	1.251	1.565
Workouts for pregnant women	3.39	1.316	1.731
Shop of equipment	3.56	1.211	1.466
Jacuzzi	2.26	1.229	1.509
Cloakroom outdoor clothing	2.33	1.191	1.417
Cafe	2.66	1.26	1.587
Pool workouts	2.64	1.185	1.405
Equipment rent	3.28	1.217	1.482
Outdoor sports	2.84	1.293	1.673
VIP zone	3.27	1.3	1.69

Table 3. Significance assessment of consumers' service in wellness-fitness centres in Kaunas

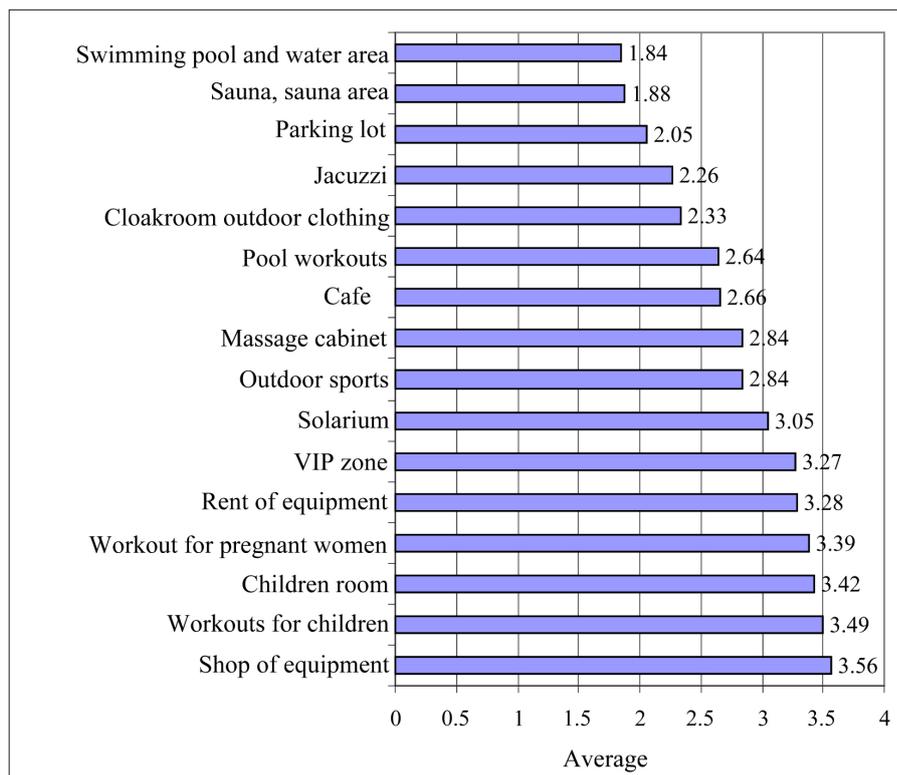


Figure 2. Significance assessment of the services provided by the wellness-fitness centres in Kaunas

Note. * – mean – reveals average significance assessment of every aspect; ** – Std. Deviation – standard deviation. The smaller it was, the more unanimously respondents assessed the factor.

DISCUSSION

After having carried out quantitative research it can be claimed that the consumers in wellness-fitness centres according to demographic indexes are very versatile as both men and women go in for sports similarly: from a young one to an old one. However, according to the age groups, consumers vary from 19 to 35 years. There are also small numbers of schoolchildren and pensioners, so we might presume that in order to attract the following population, greater attention should be paid to it. According to socio-economic factors, it was found that most consumers of wellness-fitness centres in Kaunas were employed, educated and intelligent people, who had their own aims and needs in life. Besides, wellness-fitness centres are attended by people possessing different income and belonging to different social layers. Most consumers spend about one hundred LTL on sports monthly. However, the distribution of the spent income depends on the sports time, chosen membership, attendance frequency and gained discounts; thus, in order to ensure the efficiency of activity, it is important to design service packages complying with consumers' possibilities and wishes.

Selection motivators of wellness-fitness centres among consumers. The obtained outcomes of the priorities made by the consumers in wellness-fitness centres in Kaunas for the selection of a sports club, it was identified that there were three key motivators and they were related to the marketing means, i. e. price, product/service and geographical place. However, it should be noted that the geographical position is a strategic decision of marketing and it has to be taken into consideration before the establishment of clubs. This is also suggested by the research data carried out in Impuls (KTU representatives investigating the customers in "Impuls" sports and entertainment parks (2009)): the price, product/service and geographical position are important for sports and fitness consumers. However, the in-depth analysis by KTU (2009) does not show the consumer choices of services. It is not clear whether the distinguished criteria like price, product/service and geographical place are predominant. The deeper analysis showed that consumers unanimously excluded the motivators, such as service quality, geographical position and price. Such motivators as actions and special offers are not strong in order to influence consumers' selection. Special offers and actions affect various

consumers differently, thus promotional actions have to be adapted to consumer's individual needs.

The significance of the services provided by wellness-fitness centres in Kaunas according to the consumers' approach. The consumers' opinions concerning the provided services revealed that swimming pool and water area, sauna and sauna area, parking lot, Jacuzzi, and cloakroom for outdoor clothing were significant. However, the deeper analysis showed that the choices of those services were scattered among consumers. The most significant priority selecting a sports club was sauna and different services. It means that sports clubs have to provide personalized service packages for consumers and those have to include a sauna, and other services have to be included according to individual needs. The following assessment enables the claim that the consumers' distribution assessing various service differs a lot, thus the employees of wellness-fitness centres have to design service packages for consumers of wellness-fitness centre and it requires more information concerning each consumer and his/her needs.

The consumers' selection priorities concerning the services provided by wellness-fitness centres in Kaunas depends on three motivators: sauna and various services which also depend on sport consumer's habits, needs and motivation. In this service sector, the service package has to be developed taking into consideration consumer's individual lifestyle habits and needs. Designing a service package for a consumer it is important to identify and select such services which comply with different consumers' needs as the importance of the provided services differs for individual consumer.

CONCLUSION AND PERSPECTIVES

There are very different consumer priorities for selecting the services provided by wellness-fitness centres in Kaunas. This proves that wellness-fitness centres have to focus on the personalized service packages and modern information technologies for the relationship management with consumers. The further research perspectives would be related to the application of information technologies in wellness-fitness centres in Kaunas storing data about consumers and designing personalized service packages for them.

The research hypothesis was proved partially. The key motivators selecting wellness-fitness centres in Kaunas were the following: geographical position, service quality and price. However, a deeper research analysis has revealed that the price of wellness-fitness centres has to be adapted to individual consumers and there have to be designed different value service packages in order to attract and maintain consumers and ensure the employment of organizations.

Wellness-fitness centres in Kaunas have to remain innovative and foresee possible

personalized service packages for consumers in future. Consumers are demanding and searching for new experience, thus in order to satisfy their needs there is a necessity to personalize the package of the provided services.

In order to design and secure good consumers' management system in companies, information technologies have to be installed to store data concerning every consumer's needs for sport. That would enable organizations to design individual service packages for consumers.

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VARTOTOJŲ PRIORITETAI RENKANTIS KAUNO SVEIKATINGUMO CENTRŲ TEIKIAMAS PASLAUGAS

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Kiekviena sporto paslaugas teikianti įmonė, norėdama sėkmingai vykdyti savo veiklą, turi atsižvelgti ne tik į politinę, ekonominę, socialinę, kultūrinę, technologinę aplinką, įvertinti esamus ir galimus konkurentus bei jų veiksmus, bet ir vartotojų poreikius, prioritetus renkantis paslaugas. Sveikatingumo centrų vadovams, sudarant strateginius rinkodaros planus, svarbu žinoti, kurie kriterijai renkantis sveikatingumo centrų paslaugas vartotojams yra pagrindiniai. Empirinio tyrimo apie vartotojų prioritetus renkantis sporto klubą nepavyko rasti, nors sąsajų yra su jau atliktais. Pavyzdžiui, Eurobarometras (2009) tyrė vartotojų požiūrį į sportą tarp ES šalių gyventojų, tačiau jame iš Pabaltijo šalių labiau akcentuojama Estija. „Rait“ tyrimo agentūra (2007) tyrė Lietuvos gyventojų nespportavimo priežastis. Kitas tyrimas atliktas apklausus KTU „Impuls“ sporto ir pramogų parkų klientus (2009) ir bandant išsiaiškinti vartotojų sporto klubų pasirinkimo dažnumą ir veiklos priemones, lemiančias šį pasirinkimą. Straipsnyje keliama mokslinė *hipotezė*: vartotojams renkantis sveikatingumo centrų teikiamas paslaugas svarbiausia yra geografinė vieta, teikiamų paslaugų kokybė ir kaina.

Tikslas – nustatyti vartotojų prioritetus renkantis sporto ir sveikatingumo paslaugas didžiuosiuose Kauno sveikatingumo centruose.

Metodai. Tyrimo metu taikyti tokie metodai: pirminis – kiekybinis, anketinės apklausos; antrinis – atliktų tyrimų apžvalgos ir palyginimo.

Rezultatai. Vartotojų prioritetai renkantis Kauno sveikatingumo centrų teikiamas paslaugas labai įvairūs ir nėra įmanoma išskirti vyraujančių.

Aptarimas ir išvada. Sporto ir sveikatingumo centrai turi orientuotis į asmeninius paslaugų paketus. Čia jiems pagelbėti galėtų ryšių su klientais valdymo šiuolaikinės informacinės technologijos.

Raktažodžiai: sporto paslaugų vartojimas, sporto paslaugas teikiančios įmonės, paslaugų paketas.

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RELATIONSHIP BETWEEN SELF-CONFIDENCE AND BULLYING AMONG ATHLETES AND NON-ATHLETES ADOLESCENTS

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ABSTRACT

Research background and hypothesis. Research shows that significant numbers of children at school become victims of aggression which manifests as bullying or harassment (Zaborskis, Vareikienė, 2008). Bullying at school is associated with many long-term harmful physical, mental and social consequences for all involved in this process: for aggressors, victims and those who are forced to watch bullying (Širvinskienė et al., 2008).

In Lithuania, the number of children who are bullied and children who bully is far greater than in other European countries: approximately a third of 11–15 year-old Lithuanian schoolchildren become frequent victims of bullying (Zaborskis et al., 2005). Bullying is defined as conscious threatening harassment or physical actions against a child who is unable to defend himself/herself repeatedly by one child or a group of children (Širvinskienė et al., 2008). This phenomenon involves a wide range of behaviours – from physical attacks to nicknaming and verbal abuse, from ignorance to frightening looks, from individual attacks to group actions or anonymous messages (Zaborskis, Vareikienė, 2008).

Research aim was to determine the relationship between self-confidence and bullying among Kaunas City athletes and non-athletes adolescents. *The object of the research* was the relationship between self-confidence and bullying of adolescents.

Research methods. The research was conducted from September, 2011 to December, 2011. It included schoolchildren from four schools in Kaunas city. The organization of the survey complied with the principles of respondents' informed consent and voluntary participation. Before completing the questionnaire, the respondents were fully aware of the aims of the research and performance instructions.

Research results. It was found that the most commonly used forms of bullying were nicknaming, spread of rumours and intimidation. Bullying usually took place in classrooms and school hallways. Most often the respondents experienced bullying from their peers; however, they often bullied their peers themselves.

Discussion and conclusions. The higher the level of self-confidence, the less bullying manifested in respect of both genders. Schoolchildren who did not go in for sports and demonstrated high levels of self-confidence were bullied less often. The higher the level of self-confidence of boys and girls, the less frequent bullying occurred.

Keywords: violence, inner psychological personality derivatives, sports, school.

INTRODUCTION

Bullying is a form of emotional and psychological coercion. Research carried out in various countries shows that long-term emotional violence at school leads to negative traces in personality development and impairment of physical and mental health. It has been found that bullying can cause a variety of somatic complaints (Zaborskis, Vareikienė, 2008); also, bullying damages physical and mental health, causing many psychosocial and psychosomatic problems, may lead to future mental health problems (Širvinskienė et al., 2008). Children who are bullied experience more anxiety, are less safe, have lower self-esteem, are lonely and more prone to depression

(Širvinskienė et al., 2008); there is an increased possibility of suicidal behaviour in such children (Van der Wal et al., 2003).

It is believed that a pupil is being bullied when another pupil or a group of pupils insult him/her or play on him/her evil pranks. Nevertheless, bullying is not just this. Even repeated teasing and doing things which are in particular disliked by a pupil are considered to be bullying. However, the case where two equally strong pupils are fighting one another is not treated as bullying (Zaborskis et al., 2005).

Recently, the popularity of cyber bullying has extremely increased. Bullies publish victim's personal data online and it becomes available to everyone. Information spread in cyberspace causes a serious threat to the privacy of the victims. Information can be forwarded to thousands of recipients in a matter of seconds and this cannot be controlled. Using text messages, message attacks can be performed, when a group of children sends thousands of different kinds of unpleasant text messages to the victim's mobile phone or other electronic means of communication (Qing Li, 2006).

Since 1992, Lithuania has participated in the WHO research programme *Health Behaviour in School-Aged Children* – HBSC. This research also analyses the issue of bullying. A. Zaborskis and J. Makari (2001) published data on high prevalence of bullying among Lithuanian schoolchildren. Unfortunately, there is no more detailed research on the issue of bullying in Lithuania (Zaborskis, Vareikienė, 2008).

In this research it was assumed that adolescents demonstrating high levels of self-confidence were less often bullied and less often bullied others than the respondents with lower levels of self-confidence. At the same time, there is the relationship between high levels of self-confidence and bullying of athletes adolescents – they are neither bullied nor bully others.

Thus, the aim of the research was to determine the relationship between self-confidence and bullying of athletes and non-athletes adolescents.

The object of the research was the relationship between self-confidence and bullying.

RESEARCH METHODS

The respondents were given Shostrom's personal orientation inventory (adjusted), which consisted of 22 items that could be considered five-choice: *always, very often, often, sometimes, never*

(Lester, Lloyd, 1997). The respondents had to select a single answer. Also, the questionnaire was prepared on the basis of the British City of York *Bullying Questionnaire for Students* (procedures for questionnaire adaptation are described in the article by I. Tilindienė et al. (2010), which consisted of 32 questions. Each question had from 2 to 10 answer options. The respondents could select one or more answers.

Research sample and organization. The survey was conducted in 2011, using randomized convenient sampling, which involved 417 adolescents (12–16 years old) who went in for sports and not (147 adolescents went in for sports and 270 did not, 219 girls and 198 boys) and who were selected from four Kaunas city schools, having agreed with the management of the relevant schools. Questionnaires were completed prior to school hours or practice, the respondents were not allowed to take the questionnaires home.

Adolescents who went in for sports were considered to be schoolchildren that at least twice a week were engaged in sports activities in sports schools or sports clubs, went in for sports for at least one year and took part in sports competitions.

Statistical analysis. To calculate research results, *SPSS 13.0 for Windows* computer programme was used. To estimate statistically significant differences between the groups of the respondents (bullying and self-esteem) ($p < 0.05$), χ^2 (chi-squared critical value) was calculated. The strength of the relationship between bullying and self-esteem were evaluated by the Gamma coefficient.

RESEARCH RESULTS

The obtained results showed that the most commonly used forms bullying were nicknaming (59%), spread of rumours (13%) and intimidation (6%) (Figure 1). Schoolchildren were most often bullied in classrooms (41%) and school hallways (37%) (Figure 2). The respondents indicated that most often they experienced bullying from their peers (67%); however, they themselves bullied their peers (66%). The research showed that the more higher the level of self-confidence, the rarer bullying occurred in respect of both genders ($p < 0.05$) (Figures 3, 4). The research suggests that the schoolchildren who did not go in for sports and demonstrated high level of self-confidence were bullied less often ($p < 0.05$) (Figure 5). The higher

the level of self-confidence of both boys and girls, the less frequent bullying was observed ($p < 0.05$) (Figure 6).

The research could not determine whether gender, sports and the level of self-esteem had influence on incurred and initiated bullying ($p > 0.05$).

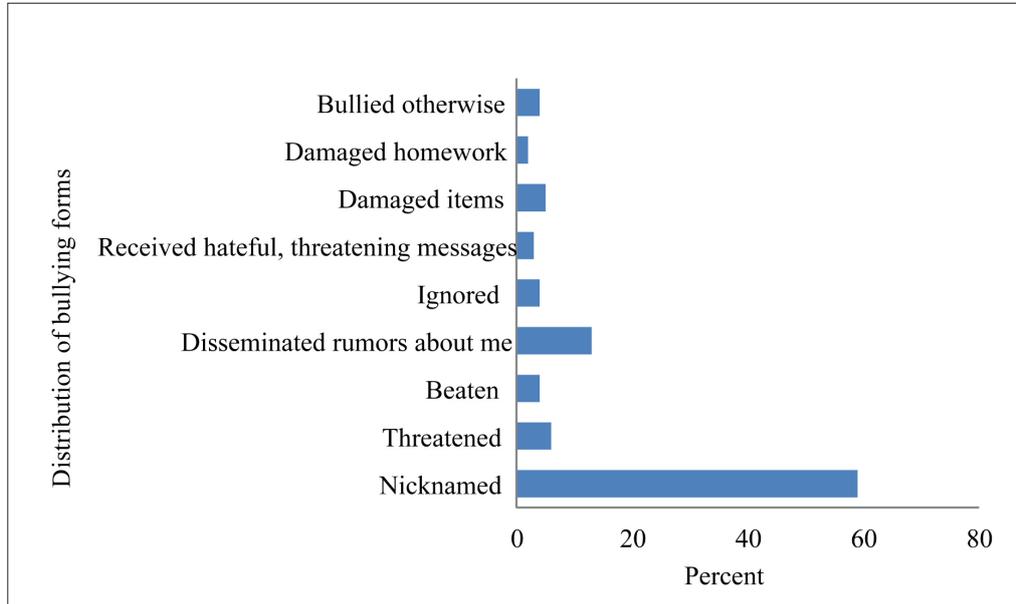


Figure 1. Percentage distribution of respondents' answers to the question "How are you bullied at school?"

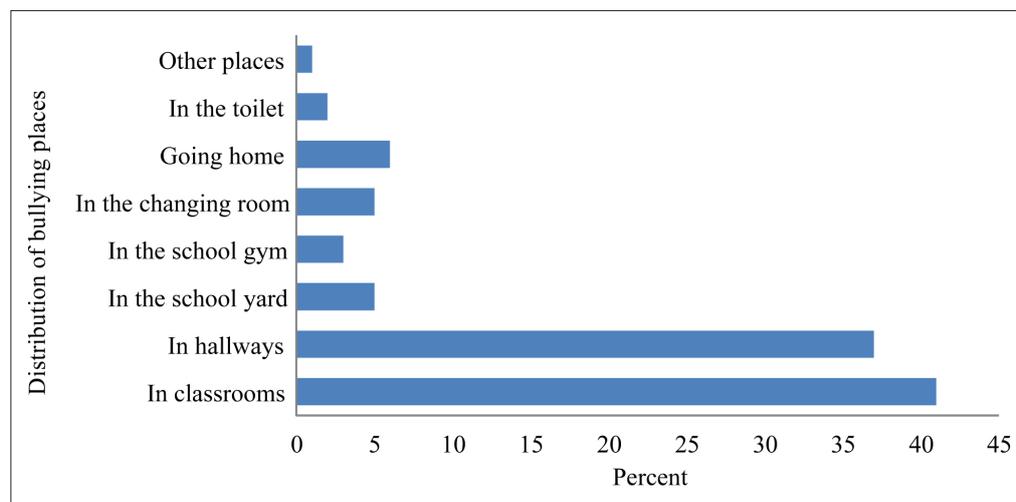


Figure 2. Percentage distribution of respondents' answers to the question "Where were you bullied in school?"

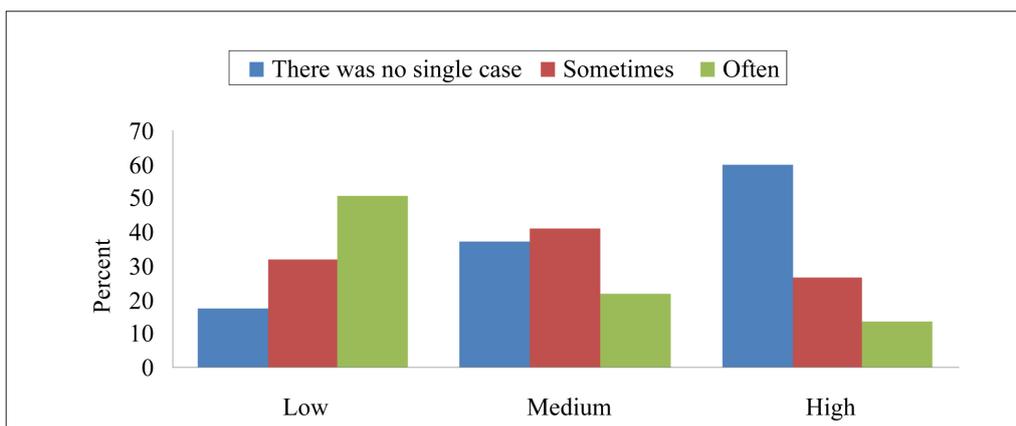
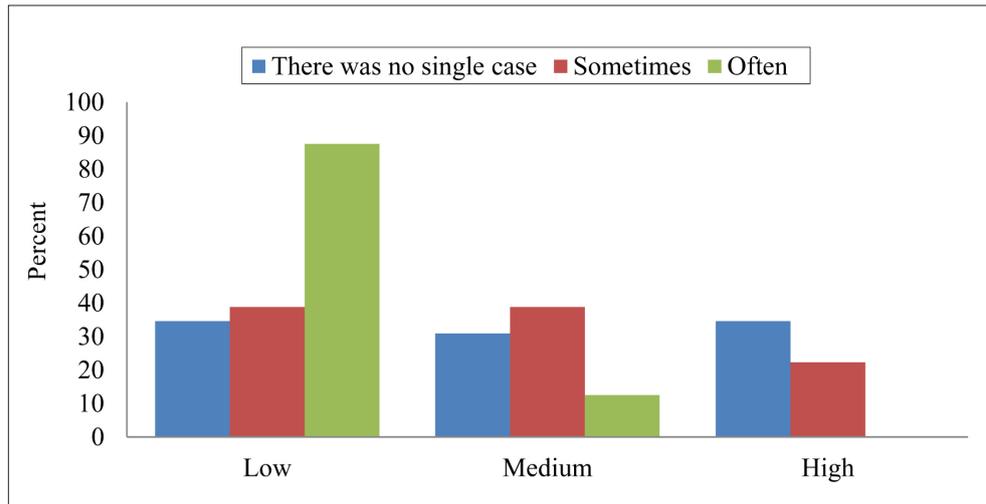


Figure 3. Percentage distribution of self-confidence level by incurred bullying and gender (female)

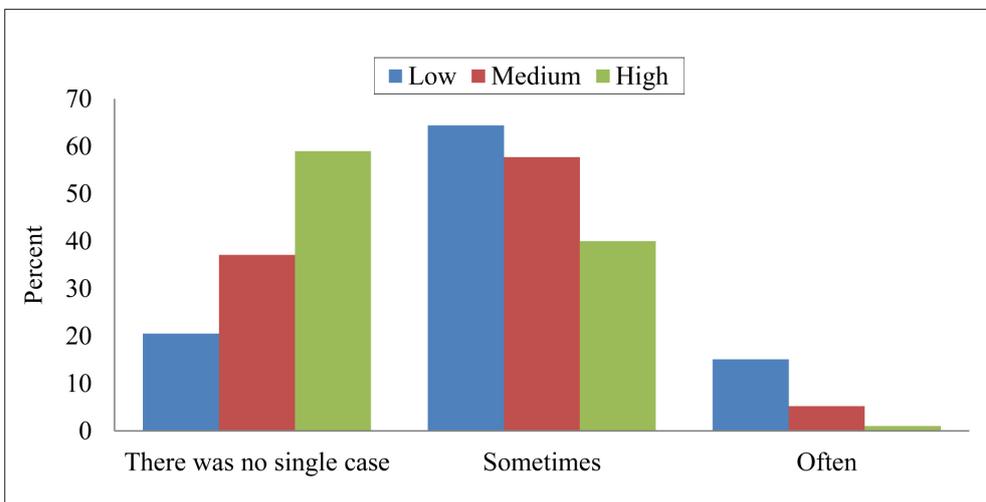
Note. $\chi^2 (2) = 15.781$; $p < 0.05$.

Figure 4. Percentage distribution of self-confidence level by incurred bullying and gender (male)



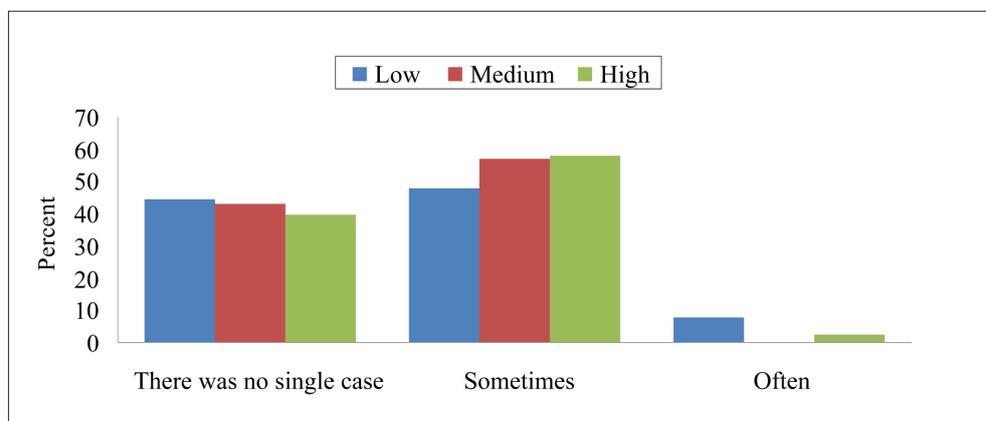
Note. $\chi^2 (2) = 11.999$; $p < 0.05$.

Figure 5. Percentage distribution of incurred bullying for untrained respondents according to the level of self-confidence



Note. $\chi^2 (2) = 34.768$; $p < 0.05$.

Figure 6. Percentage distribution of incurred bullying for athletes respondents according to the level of self-confidence



Note. $\chi^2 (2) = 4.731$; $p > 0.05$.

DISCUSSION

Research (Due et al., 2005) shows that among 28 European and North American countries Lithuanian boys are bullied most frequently (41.4%), and Swedish girls – the least frequently (6.3%). Such a large number of pupils involved in bullying (56.5%) have a great negative influence on learning, education and quality of life as well as well-being (Jankauskienė et al., 2008). All bullying participants are more likely to face behavioural problems: hyperactivity, communication and other disorders (Wolke et al., 2000). There is also the opposite opinion on this matter claiming that hyperactivity is not a consequence, but a reason that may lead a pupil to get involved in bullying (Nordhagen et al., 2005). Other factors are also relevant: excessive anxiety, alcohol and tobacco consumption (Peleg-Oren et al., 2012).

The most predominant form of bullying is verbal bullying (Valeckienė, 2005). The comparison of the data of the survey performed shows that verbal bullying is more frequent than bullying of physical nature. M. E. Lemstra's (2012) research results have striking similarities to previously discussed facts: the most common form of bullying is verbal, not physical, but, in addition to this, there are two more forms of bullying distinguished – social and electronic, cyber bullying (Patchin, 2011). This proves that bullying is not only relevant, but also a constantly evolving problem among pupils. Foreign experience is similar: every other pupil is a bully, who uses verbal bullying, nearly one in three – physical, and one in ten – cyber bullying (Peleg-Olen et al., 2012).

The results of the performed research show that male representatives predominate in bullying initiation in respect of self-confidence (Figures 7, 8), although boys are more likely to inform adults that they have incurred bullying than girls (Fleming et al., 2009). Boys of all ages are more likely to bully others than girls. However, other research claims that only boys of 2–12 years of age are most frequently distinguished as bullies. M. E. Lemstra (2012) identifies the masculine gender as a risk factor in terms of bullying. Other factors are as follows: difficulties and unresolved problems in the family of the pupil. In this case, Finland also has striking similarities: boys are nearly three times more likely to get involved in bullying than girls. Being bullies more often than girls, boys more often themselves become objects of bullying and aggressive victims of bullying as they mostly interact with peers and apply extreme and easy-to-observe forms of bullying – physical bullying (Nordhagen et al., 2005). Girls usually use more passive forms – verbal bullying as they try to stay unnoticed, look for opportunities to remain unobserved (Olweus, 1993). This has been confirmed by our research results as well.

The obtained results show that the most frequent places for bullying in schools are classrooms and hallways. It can be assumed that the approach of teachers of the investigated schools expresses indifference in respect of bullying among schoolchildren – teachers do not carefully observe pupils' communication and behaviour with each other during breaks and lessons. This may affect the aggressor's arrogance to start bullying in public places without fear of resistance, penalty or

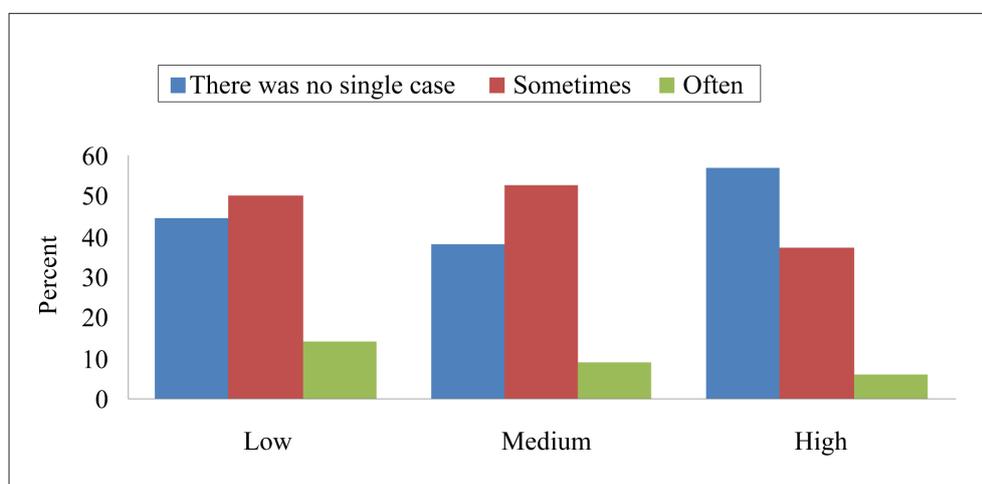


Figure 7. Percentage distribution of self-confidence levels by initiating bullying and gender (male)

Note. $\chi^2(2) = 3.219$; $p > 0.05$.

Figure 8. Percentage distribution of self-assessment level by initiating bullying and gender (male)



Note. $\chi^2(2) = 1.753$; $p > 0.05$.

disciplinary sanctions. To prove this assumption, it is necessary to carry out additional research. F. Bayraktar (2012) confirmed the importance of the approach of school teachers and their influence on bullying; according to the researcher, this is one of the factors that have the greatest importance in shaping psychological climate at school and influencing the frequency of bullying. Returning to the discussion of the most common places of bullying, other authors (Valeckienė, 2005) express the opposite position – they assert that aggressors avoid public places where they can be easily seen, receive a negative reaction or forced to take responsibility for their actions. They indicate that bullies choose remote places that are least visible to adults. Bullies often prefer the adjacent, more remote areas that belong to school outdoor territories; they avoid indoor educational institution spaces (Lemstra et al., 2012).

The results show that those who are bullied often become bullies themselves. Such cases are aggressive victims of bullying. J. Gilligan (Gilligan, 2002), R. Povilaitis and J. Valiukevičiūtė (2006) indicate that those pupils most frequently use the same methods of bullying that they are experiencing themselves. Since these adolescents have suffered a lot of humiliation in childhood from parents, peers, they are highly susceptible to shame. Thus, in case of any threat to survive the same most humiliating feeling, or feeling the vengeance of past grievances, they express their anger on the most innocent and unrelated children. D. Wolke (2000) argues that the distribution of roles and positions in the phenomenon of bullying is very uneven. Only 4.3% of respondents are bullies-aggressors, 10% – aggressive victims of bullying, the remaining majority – passive victims. The results of the research performed in Lithuania

(Jankauskienė et al., 2008) indicate that there are more aggressors (16.3%) than victims (12.7%).

The results showed that the adolescents that go in for sports and show high levels of self-confidence are bullied less often, as it is claimed in foreign research (Seehra et al., 2011). Schoolchildren very often demonstrate aggression out of fear and lack of self-confidence because they do not respect themselves and thereby hope to earn it. Aggressiveness reduces inner fears and adolescents use it for increasing self-realization and self-esteem (Christie-Mizell, 2003). Also, there is some other research that represents the opposite opinion – aggressors had high self-esteem; however, it should be noted that the results of such research had been influenced by bullies' high level of depressive symptoms and other psychological issues. A number of risk factors that may influence becoming a victim of bullying were also indicated (Jankauskienė et al., 2008). It included low self-esteem as well as form, gender (male respondents more often became victims of bullying), tobacco and alcohol consumption, mockery of child's appearance by his/her parents, etc.

The research data show that the increase in the level of self-confidence leads to less frequent bullying in respect of both genders. R. Povilaitis and J. Valiukevičiūtė (2006) have found that adolescents having higher levels of self-esteem are less frequently involved in bullying – they know other ways that help to act positively and to foster their self-esteem. Children who feel valued and loved do not have to prove this to themselves or to others, so it is much less likely that they will engage/get engaged in bullying.

Our research data failed to show that sports activities had any impact on bullying and being bullied. The research performed by R. Jankauskienė

et al. (2008) also showed that participation in sports activities had no influence on the involvement in the phenomenon of bullying; however, more victims of bullying were among those respondents that did not go in for sports than among those who did. The greater part of bullies-aggressors was found among those adolescents that were not engaged in sports activities than those who were.

CONCLUSIONS AND PERSPECTIVES

It was found that the most commonly used forms of bullying were nicknaming, spread of rumours and intimidation. Bullying usually takes place in school classrooms and hallways. Most often the respondents experienced bullying from

their peers; however, they themselves often bully their peers. The higher the level of self-confidence, the rarer the bullying in respect of both genders was observed. Schoolchildren who do not go in for sports and show high level of self-confidence are bullied less often. The higher the level of self-confidence of both boys and girls, the less frequent bullying occurs.

Thus, the first assumption suggesting that adolescents with high self-esteem and self-confidence level are less likely to experience bullying and to become bullies themselves than the respondents with low self-esteem was confirmed partially. The second assumption that adolescents' engagement in sports activities and their levels of self-confidence and self-esteem are related to bullying was not confirmed.

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KAUNO MIESTO SPORTUOJANČIŲ IR NESPORTUOJANČIŲ PAAUGLIŲ PASITIKĖJIMO SAVIMI IR PATYČIŲ SĄSAJA

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Nemaža dalis vaikų mokyklose tampa agresijos, pasireiškiančios patyčiomis arba priekabiavimu, aukomis (Zaborskis, Vareikienė, 2008). Patyčios mokykloje susijusios su daugeliu ilgalaikių žalingų fizinių, psichinių ir socialinių veiksnių visiems jose dalyvaujantiems: ir skriaudėjams, ir aukoms, ir stebintiems patyčias (cit. iš Širvinskienė ir kt., 2008). Patyčias patiriančių ir iš kitų besityčiojančių moksleivių dažnis Lietuvos mokyklose yra didesnis nei kitose Europos šalyse: dažnų patyčių aukomis Lietuvoje tampa vidutiniškai kas trečias 11–15 metų moksleivis (Zaborskis ir kt., 2005). Patyčios apibrėžiamos kaip sąmoningas vieno vaiko ar grupės nuolat kartojamas gąsdinantis priekabiavimas ar fiziniai veiksmai prieš vaiką, kuris nepajėgus apsiginti (cit. iš Širvinskienė ir kt., 2008). Šis reiškinys apima platų elgesio spektrą – nuo fizinių išpuolių iki pravardžių, žodinių užgauliojimų, nuo ignoravimo iki gąsdinamų žvilgsnių, nuo individualių išpuolių iki grupinių veiksmų ar anonimių žinučių (Zaborskis, Vareikienė, 2008).

Tikslas – nustatyti Kauno miesto sportuojančių ir nespportuojančių paauglių pasitikėjimo savimi ir patyčių sąsają. Tyrimo objektas – paauglių pasitikėjimo savimi ir patyčių sąsaja.

Metodai. Tyrimas atliktas 2011 m. rugsėjo–gruodžio mėn. Apklausti keturių Kauno miesto mokyklų moksleiviai. Apklausa atlikta po pamokų, susitarus su mokyklos vadovybe ir mokytojais. Buvo tirti keturi šimtai septyniolika, 12–16 m. paauglių. Iš jų 219 merginų ir 198 vaikinai. Moksleiviai pildydami anketas vidutiniškai užtrukdavo 20–25 minutes. Organizuojant apklausą buvo laikomasi tiriamųjų informavimo ir savanoriškumo principų. Prieš vykdant apklausą, tiriamieji buvo išsamiai supažindinti su jos tikslais, atlikimo instrukcijomis.

Rezultatai. Dažniausiai naudojamos patyčių formos yra pravardžiavimas, paskalų skleidimas bei gąsdinimas. Dažniausiai yra tyčiojamosi mokyklų klasėse bei koridoriuose. Dažniausiai respondentai patiria savo bendraamžių patyčias, tačiau iš bendraamžių ir patys tyčiojasi.

Aptarimas ir išvados. Augant pasitikėjimo savimi lygiui, patiriamos patyčios abiejų lyčių atžvilgiu retėja. Iš nespportuojančiųjų ir didelio pasitikėjimo savimi paauglių tyčiojamosi rečiau. Kuo merginų ir vaikinų pasitikėjimo savimi lygis aukštesnis, tuo patiriamos patyčios retesnės.

Raktažodžiai: smurtas, vidiniai psichologiniai asmenybės dariniai, sportas, mokykla.

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NEUROLAW: IS THE DIALOGUE BETWEEN NEUROSCIENCE AND LAW INEVITABLE?

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ABSTRACT

Research background and hypothesis. Today, more and more discussions arise about the effect of a new science – postmodern, of complex dynamic systems – on the science of law. The law science is encouraged to be open both internally and externally with other sciences. The new science encourages other sciences to seek for dialogue, connection and integration; one example of this is neurolaw. Neurolaw is an association of neuroscience and law science aiming at a clearer understanding and coming closer to the truth than it was before, using the achievements of neuroscience. This is a new association which causes much debate. How can it help the law? Is this just a temporary fashion? These are topical issues for the law science to move towards perfection, and for the neuroscience to be adaptable and very important to other sciences.

Research aim. A conceptual overview of the essence of neuroscience and neurolaw, answering the question about how neuroscience can help the law, and if the dialogue between them is inevitable or just a temporary fashion.

Research methods. Systematic and logical analysis of the relationship between neuroscience and law.

Discussion and conclusions. Neurolaw is an inevitable dialogue between law and neuroscience. This is the integration of the two sciences in order to get a clearer understanding of complex legal issues when we deal with people's destinies, and most important, to answer what is true in a particular case. We cannot say that this is just a temporary fashion, more scientific research is carried out and with the help of this dialogue more cases can achieve the equitable solution. On the other hand, various studies related to the judicial decision-making are important to neurolaw, as they look into how decisions are made, what influences them, etc. Conceptualizing this integration as well as the importance and the scope of the dialogue between these sciences, we can say that law science will inevitably face major changes in this area. The future of this inevitable integration depends on how scientists will be able to communicate and achieve the fairest goals for us.

Keywords: integration, changes, the new science.

INTRODUCTION

Worldwide, scientists are increasingly talking about the influence of postmodernism (new, postmodern science of complex dynamic systems) on law (for example, Milovanovic, 1998; Holz, 2006; Jones, 2008; Patterson, 2008;). The new science “does not divide” the sciences into parts, science is increasingly becoming integral. One of the examples of scientific integrity, when different scientists try to communicate, is the dialogue between neuroscience and law science. This integration has various names – neurolaw, neurojurisprudence, sometimes it is simply called

law and neuroscience. In this article, we will use the name of neurolaw talking about the integrated “product” of law and neuroscience. More and more western scientists talk about the dialogue between neuroscience and law (for example, Greene, Cohen, 2004; Aronson, 2010; Jones, Shen, 2012). How is neuroscience important to law and how can it help law? Is this integration inevitable? Can it be just a temporary fashion? These are topical issues because the occurring changes affect the law, and neuroscience becomes more important in various fields. Although neurolaw is a brand new “product”, and almost nobody talks about it

Lithuania, this article aims to at least conceptually cover the manifestations this new dialogue. Aiming at “opening” and perfection, expanding the limits of their knowledge, Lithuanian law science needs to know what neurolaw is and how it alters the knowledge of the science of law. Only following this path and understanding the most fundamental basics, without prejudice to innovation, legal scholars in Lithuania could take what is best to understand the importance of neurolaw research. It is very important for Lithuanian jurisprudence to be “stronger” in determining truth and justice.

The aim of this article was a conceptual overview of the essence of neuroscience and neurolaw, answering the question about how neuroscience can help the law, and if the dialogue between them is inevitable or just a temporary fashion.

RESEARCH METHODS

These methods were used to achieve the research aims: systematic and logical analysis of the relationship between neuroscience and law.

RESEARCH RESULTS AND DISCUSSION

Neuroscience: What is it? Methods, devices and their main characteristics. US Society for Neuroscience defined neuroscience as a science seeking to know human thinking, emotions and behaviour. Carrying out research neuroscientists usually try to describe the human brain and tell us what their normal functions are; determine how the nervous system develops and changes over a person’s life; look for ways to prevent or cure a number of neurological and psychiatric disorders. Neuroscience in literature is often called in the plural form – Neurosciences. T. M. Spranger (2012) identifies a wide range of research and methods from a variety of areas: biology, medicine, chemistry, physics, psychology, mathematics, computer science, engineering, philosophy, and finally, but certainly not last – the law, which are related to neuroscience. In 1969 the Neuroscience Organization included 500 members, nowadays there are more than 40000 of them. This shows the strong growth of this science. As S. K. Ericson (2011) suggests, life is about the brain. It should be noted that neuroscience is a very broad and rapidly developing science.

What are the main methods and techniques in neuroscience? How can we imagine the brain and explore it? Brain imaging methods and techniques can be divided into two parts (Fantini et al., 2001): functional imaging which typically determines physiological functions; and structural imaging which seeks to identify anatomical information. Functional imaging typically involves: single-photon emission computed tomography (SPECT), positron emission tomography (PET), functional magnetic resonance imaging (fMRI). Electroencephalography (EEG), magneto encephalography (MEG) and electrical impedance tomography (EIT) can also be termed as functional imaging techniques. Structural imaging is usually classified as X-radiation (X-ray), computed tomography (CT), magnetic resonance imaging (MRI) and ultrasound (US).

We will briefly discuss each of them. Using single-photon emission computed tomography (SPECT) provides intravenous radio-based 2D and 3D imaging. The unit provides information on the concentration of radio nuclides in the human body. Positron Emission tomography (PET) can help to monitor cerebral blood flow and tissue metabolism, observing how rapidly radioactive isotopes are absorbed or removed (Webster, 1992). Using functional magnetic resonance imaging (fMRI) we can assess changes in cerebral blood flow and oxygen level, which represents localized changes in the brain induced by the sensory, motor or cognitive tasks. When neurons are active, they use more oxygen and blood quickly focuses in the core part of the brain (Webb, 2003). It should be noted that fMRI is the most advanced method in brain imaging. fMRI well serves as lie detecting judicial process by examining psychopaths, aggressive crimes, and so on. Namely fMRI is most commonly used in the field of law. As T. M. Spranger (2012) suggests, with the help of Electroencephalograph (EEG) brain activity is recorded by measuring the voltage fluctuations caused by ion flow. Neurons are provoked; the electrode gets a small electric strength (power wires are connected to the scalp) at short frequencies within 20–40 minutes. The data is recorded on paper or on a computer screen. With regard to the law, the EEG can usually be used as a lie detector. Magneto encephalography (MEG) is the imaging of magnetic fields induced by the brain activity. The touch-sensitive helmet with 64–304 sensors is placed on the volunteer (Paetau, 2002). Electrical impedance tomography (EIT) is

a technique in which electrodes are attached to the human scalp, so the brain is exposed to different frequency electrical currents causing seizure activity (Tharyan, Adams, 2005).

X-radiation (X-ray) is the X-ray method which carries the basic information and leads to radiographic imaging with X-ray photons passing through the human body (Webb, 2000). Computed tomography (CT) is also based on the properties of X-ray imaging technique that generates cross-sectional brain imaging in 2D and 3D format (Webb, 2000). Magnetic resonance imaging (MRI) provides detailed 2D and 3D atomic structure of brain images using a magnet and radio wave features. Ultrasound (U.S.) is a technique in which sound waves are used in the brain ultrasound, and then the sound waves are sent to the head to get the representation (Webb, 2003).

We tried to structure the main methods and devices which are successfully applied in neuroscience. It is hard to choose the best or the worst ones, in each case the investigators try to select the methods which will be best for them for more accurate knowledge.

Neurolaw – what is it? How can neuroscience help the law? In short, neurolaw (also sometimes referred to neurojurisprudence) is the integration of neuroscience and law, and it is a combined science. This is a science which has been increasingly gaining acceptance in recent years (Aronson, 2010; Goodenough, Tucker, 2010). This is an excellent example of an interdisciplinary science. Great interest in neurolaw science is based on the sharp and high-tech development of neuroscience; fast “inclusion” of neuroscience among scientists; the increasing number of neuroscience research questions that relate to law science (Jones, Shen, 2012). Neuroscience and law scientists are increasingly joining forces, for example, MacArthur Foundation Law and Neuroscience Project, the Gruter Institute for Law and Behavioral Research, the Society for Evolutionary Analysis in Law (SEAL). O. Jones (Cookson, 2010) argues that neuroscience is a constantly rapidly growing science. Law is behind and it will inevitably fall behind. A very important question is how much is it behind, and what will be the consequences. O. Jones identifies six ways in which neuroscience changes and shapes law. First, third-party solutions, researchers typically seek to understand how decisions are made, as it is known, what is bad, what is to be convicted, and

so on. Second, determination of lies, which is very important in law, a lie can be determined using neuroscience methods, particularly fMRI. Third, mental state: usually in a criminal case a question arises what was the mental state of a suspect in a crime, neuroscience may also help to answer this question. Fourth, memory: usually in witnesses’ cases, this issue is very important, as far as their memory can capture certain facts. For example, in the cases it is usually necessary for someone to recognize somebody, so neuroscience knowledge can help to tell us how human memory is able to memorize the faces. Fifth, the teenage brain: neuroscience methods can also determine how the brain during adolescence may react to certain stimuli which will lead to certain behavior, and so on. Sixth, the appeal as the basis of the brain: this is often relevant when considering the death penalty issue. Usually neuroscience analyzes how the brain works during the crime and how it changes. So, these are a few possible areas where neuroscience actually helps law.

Neurolaw is gaining great momentum in the US, but the integrity of the law and neuroscience is increasingly grabbing attention of scientists in other countries, such as Australia, South America, Canada, Finland, Germany, Austria, Japan, Greece, Italy and others (Spranger, 2012). In this article, more attention will be focused on the US ongoing research, their experience in the US because the greatest manifestation of this integration can be observed in this country. Modern science does not have the “walls”, it does not want to be limited, and so what is happening in the US is important to Lithuania. We could guess that after a short time new technologies will come to Lithuania and neuroscience will have a significant impact on the knowledge and the law science. This is of course a matter of time, scientists’ preparation, quality equipment and so on, and only time will show when it will inevitably be dealt with in Lithuania.

When did the dialogue start? The beginning of the dialogue between law and neuroscience can be considered the 1990 s (Goodenough, Tucker, 2010). According to the authors, this science includes the following areas of interest: methods of investigation of pain, memory and truth-telling; evidence of the problems of applying neuroscience knowledge; free will, responsibility, problems of moral judgments and punishments; problems of juvenile offenders; various addiction issues; mental health; influence; emotions and neuro-economy of decision-making

and cooperation. As we can see, the dialogue is completely new, but it is rapidly evolving.

In 2006–2009, the number of cases, where achievements of neuroscience were used, almost doubled in the US. Since 2000 the number of law research papers on the theme of “neuroscience” has increased four times, and in 2008 and 2009 more than 200 research papers published in US mentioned keywords “neuroscience”. So it is becoming increasingly interesting to law scientists. More and more neurolaw lectures appear at universities, for example in Vanderbilt University, the University of Colorado, Georgetown University, Mercer University, the University of San Diego, Temple University, Tulane University, Yale University (Jones, Shen, 2012).

When was a neuroscience method used for the first time dealing with a case in court? Only in 2010 fMRI was used for the first time to detect a lie in the US court case (*United States v. Semru*, 2010). The obtained data was used as evidence. As we can see, even though the dialogue is rapid, but quite recently the courts started using neuroscience techniques to get results as evidence. Earlier (*Graham v. Florida*, 2010), neuroscience research findings were in the case for the first time and were quoted during the case. Differences between juvenile and adult brain were quoted and treated as evidence. It should be noted that neuroscience is very important for judges’ decisions, for example (*State v. Nelson*, 2010), the judge saw the offender’s brain and did not give the death penalty. Generally speaking, there are other kinds (not just criminal) of cases in which neuroscience plays a key role, such as the examination of the contractual relationship (*Van Middlesworth v. Century Bank and Trust Co*, 2000); clarifying whether a person has truly lost his ability to work (*Boyd v. Bert Bell/Pete Rozelle NFL Players Retirement Plan*, 2005). Returning to criminal law cases, it can be noted that neuroscience methods or research are of great importance to solve a wide range of issues in criminal cases, such as addressing the issue of punishment reduction (*Oregon v. Kinkel*, 2002), addressing the question of guilt (*People v. Goldstein*, 2004).

It should be noted that in terms of the dialogue between neuroscience and law, relationship between moral and law is of great importance. The moral aspect in law is particularly important. It is extremely complex. It is very important how moral decision-making influences juridical decisions. The answer to this makes scientists search for the right answers in neuroscience (for example,

Greene et al., 2001). Neuroscience generally deals with moral dilemmas, selecting a wide range of scenarios, observing human brain activity, for example “Trolley problem” (Thomson, 1985): you need to imagine that you are a traffic regulator, clicking through the rails and you send them where it is necessary. Suddenly you see a train pelting at a high speed with no brakes. You notice five workers with headphones standing on one track, you can see that the train will soon hit the workers, but you can still do something – direct the train to other tracks where one of the workers stands and who also does not see and cannot hear the train. That is the moral dilemma scenario. Typically, most people reply that they would save the five workers.

It must be borne in mind that not all scientists are positive about the dialogue between law and neuroscience. Usually scientists look carefully to the alliance of law and neuroscience, but still, as S. J. Morse (2011) notes, it is possible to distinguish four situations in which neuroscience can still help: (1) provide evidence that law regulations based on the “folk” psychology are incorrect; (2) provide data that show the characteristics of a new or reformed law doctrine; (3) provide evidence that will help to make decisions in the case; (4) provide data that will help you more efficiently make decisions, particularly in criminal cases.

J. D. Greene and J. D. Cohen (2004) also agree that there is usually a variety of reactions to the dialogue of neuroscience and law. Some argue that an understanding of human behavior will lead to transformational effect of law; others argue that neuroscience will complement the existing law doctrine with new information. According to J. D. Greene and J. D. Cohen, neuroscience may lead to the transforming effect of law despite the fact that the existing law doctrine can apply the knowledge of neuroscience. On the other hand, looking critically, they argue that neuroscience is unlikely to say something to law which would challenge well-established matters. But they agree that neuroscience will change law, transforming people’s moral intuitions about free will and responsibility.

Neuroscience and the law – is it inevitable integration, or maybe just a fashion? Is neurolaw indeed an inevitable “product” of integration? Or is it a temporary fashion? With the emergence of new movements, new approaches, remarkable changes, we do not need to dismiss them immediately, but we also do not need to accept them immediately as the best thing in history. Although we cannot claim

to the best answer, but we will continue trying to find arguments, whether it is in fact an inevitable and significant step forward?

S. K. Ericson (2011) believes that neuroscience cannot offer anything new to criminal doctrine. Some authors believe that attributing human behavior to brain activity causes more conceptual confusion than it is an empirical “coverage” (Pardo, Patterson, 2011). S. J. Morse (2011) argues that a few years ago the dialogue between law and neuroscience was actually viewed more suspiciously, but today there are few people who have doubts about the importance of such a dialogue. This has been confirmed by B. Garland (2004) who argues that the necessary and growing association of law and neuroscience is obvious. Representatives of both the law and neuroscience must find more and more ways to communicate. Neuroscience methods are very important to law. However, it should be noted that both the law and neuroscience researchers are cautious about the application of neuroscience knowledge. For the benefit of both sides, science must be presented, used and discussed. In short, the fact that there is no clear future cannot be the reason to delay the dialogue.

With the exchange and advancement of science, technologies, law science is more likely to benefit from the achievements of other sciences, and even better – the other sciences establish a dialogue that would answer many questions in the area of law. O. R. Goodenough and M. Tucker (2010) claim that solid foundation has been laid for this interdisciplinary science for the future: articles and books are written and published, various research centers are established for the representatives of law and neuroscience, various studies are conducted and neurolaw is increasingly taught to students at universities. It is important to note that this interdisciplinary science might not say anything new about the human brain in general, but in law science it will be important knowledge and huge innovations because it is the integration of the two sciences for the sake of cognition of law matters. O. W. Jones and F. X. Shen (2012) argue that US judges are increasingly taught the basics of neurolaw (special courses are developed), and legislators also receive reports on the latest neuroscience achievements. Thus, judges, lawyers, legislators, legal scholars, and all the people are becoming increasingly interested in neuroscience and its knowledge outcomes.

Is this integration really inevitable? It can be said loud and clear, yes. It is inevitable because

we believe that neuroscience advances are too important and applicable in law science. Probably it might be argued that it is impossible to move away from more profound knowledge, so law scientists and neuroscientists find more ways to build bridges. Although at a first glance it may seem that for neuroscientists it not so important to carry out studies that are relevant only to law scientists, but we should agree that this integration is important for both sides, since neuroscientists do not know the law aspects as well as law academic representatives, so that is why the studies with particularly sensitive social groups, for example, criminals are interesting and important for neuroscience in order to maximize understanding of the different social groups of people. Scientists of both areas are working towards a common goal – a greater understanding of human thought, emotions and behaviours. Neuroscientists have a lot of knowledge that the law scientists could take over, but the best way is when they conduct joint research raising common questions and discussions. We believe that it is really necessary. Of course, we can guess that this will cause dramatic changes in law. Neurolaw is a new and still rapidly evolving science, the major achievements and progress value as well as the reforms of which will be seen in the future. So far, it is most focused on addressing the problems of criminal law and the judicial process. If it evolves and develops, it will be a great achievement in the interdisciplinary science – finding a way to communicate in two different sciences. S. K. Erickson (2011) is right saying, that the impact of neuroscience on law will be inevitable and dramatic.

CONCLUSIONS AND PERSPECTIVES

Neuroscience is a broad and rapidly developing science of human thinking, emotions and behaviours. Neurolaw is the association of neuroscience and law where scientists seek knowledge using neuroscience techniques. Neuroscience techniques allow seeking for more accurate knowledge of a variety of processes, which is especially important to law, for example, examining pain, memory and truth-telling; problems of evidence; problems of free will, responsibility, moral judgments and punishments; problems of juvenile offenders; different inclination issues; mental health; influences; emotions and neuro economy of decision-making and cooperation.

Neurolaw is an inevitable dialogue between law and neuroscience. This integration of the two sciences seeks a clearer understanding of complex legal issues when addressing people's fates, and most importantly, answering what is true in a particular case. We cannot say that this is just a temporary fashion, more research is carried out, and with this dialogue more equitable solutions can be made in legal cases. On the other hand, various studies are important to neurolaw as they are related to the judicial decision-making, how decisions are made, what influences them, and so on. Conceptualizing this integration as well as the importance and the scope of the dialogue between these sciences, we can say that law science will inevitably face major changes in this area. The future of this inevitable integration depends on how scientists will be able to communicate and achieve the fairest goals for us.

We believe that the dialogue between neuroscience and law will be also inevitable in

Lithuania. In order to open up to new knowledge, to be an integral part of other sciences and to develop, Lithuanian law science will inevitably have to consider the pros and cons of this dialogue and to understand the importance of neurolaw research. Legal scholars should be aware that legal science itself does not respond to a wide range of important issues facing both law theory and law practice, such as whether the offender is actually guilty, how the decision is made by the judge, etc. These questions will be addressed by the dialogue between neuroscience and law. We realize that this is a big challenge for the Lithuanian legal practice and theory, and neuroscientists in Lithuania know that they should look for ways to communicate, for suitable instruments and prepare for joint research. Time will tell whether Lithuanian legal science and neuroscience will find ways to communicate. This will lead to enormous changes in the Lithuanian justice system: a key to get closer to the truth and justice, which are very important to each of us.

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NEUROTEISĖ: NEUROMOKSLO IR TEISĖS NEIŠVENGIAMAS DIALOGAS?

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Šiandien vis daugiau kalbama apie naujojo postmoderniojo sudėtingųjų dinaminųjų sistemų mokslo poveikį teisei. Teisės mokslas yra skatinamas būti atviru su kitais mokslais, ieškoti dialogo, jungtis, integruotis. Vienas iš tokių pavyzdžių – neuroteisė. Neuroteisė – tai neuromokslo ir teisės mokslo susivienijimas siekiant aiškesnio pažinimo, didesnio priartėjimo prie tiesos nei anksčiau tai buvo daroma naudojantis neuromokslo pasiekimais. Tai naujas ir daug diskusijų keliantis susivienijimas. Kuo jis gali padėti teisei? Ar tai tik laikina mada? Tai aktualūs klausimai siekiant, kad teisės mokslas judėtų tobulėjimo linkme, o neuromokslas būtų pritaikomas ir labai svarbus kitiems mokslams.

Tikslas – konceptualiai apžvelgti, kas yra neuromokslas ir kas neuroteisė. Atsakyti į klausimą, kuo neuromokslas padeda teisei ir ar šis dialogas tarp jų yra neišvengiamybė, gal tik laikina mada?

Metodai. Sisteminė ir loginė neuromokslo bei teisės santykio analizė.

Aptarimas ir išvados. Neuroteisė yra neišvengiamas dialogas tarp teisės ir neuromokslo. Tai dviejų mokslų integracija siekiant aiškesnio sudėtingų teisinių klausimų pažinimo, kai sprendžiami žmonių likimai, o svarbiausia – norint atsakyti, kas yra konkrečios bylos tiesa. Negalima teigti, kad tai tik laikina mada. Atsiranda vis daugiau tyrimų, mokslininkų, kurie šiuo dialogu daugelyje bylų padeda rasti teisingiausią sprendimą. Antra vertus, neuroteisei svarbūs įvairūs tyrimai, kurie susiję ir su teisėjo sprendimo priėmimu, t. y. kaip priimami sprendimai, kas juos veikia ir pan. Suvokiant šios integracijos, dialogo tarp dviejų mokslų svarbą ir mastą galima teigti, kad teisės mokslas neišvengiamai susidurs su dideliais pokyčiais. O šios neišvengiamos integracijos ateitis priklausys nuo to, kaip mokslininkai gebės vis geriau susikalbėti ir siekti pačių teisingiausių tikslų.

Raktažodžiai: integracija, pokyčiai, naujasis mokslas.

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Examples of the correct format are as follows

Bergman, P. G. (1993). Relativity. In *The New Encyclopedia Britannica* (Vol. 26, pp. 501–508). Chicago: Encyclopedia Britannica.

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Nuoširdžiai sveikiname!

Congratulations!



Lietuvos sporto universiteto doktorantą **Audrių Sniečkų**, 2013 m. gegužės 14 d. Lietuvos sporto universitete apgynusį biomedicinos mokslų (biologijos) daktaro disertaciją tema „Raumenų pažaidos priklausomumas nuo krūvio išdėstymo strategijos, sportininkų specializacijos ir genotipo“. Mokslinis vadovas doc. dr. Sigitas Kamandulis.
Mokslinė konsultantė doc. dr. Dalia Mickevičienė.

We congratulate **Audrius Sniečkus**, the student of doctoral studies at the Lithuanian Sports University, to have defended his thesis “Muscle damage dependence on training load progression strategy, sports specialization and genotype” (Biomedical Sciences, Biology) at the Lithuanian Sports University on May 14, 2013.
Scientific advisor Assoc. Prof. Dr. Sigitas Kamandulis.
Scientific consultant Assoc. Prof. Dr. Dalia Mickevičienė.



Lietuvos sporto universiteto doktorantę **Editą Maciulevičienę**, 2013 m. gegužės 17 d. Lietuvos sporto universitete apgynusią socialinių mokslų (edukologijos, fizinio lavinimo, judesių mokymo ir sporto) daktaro disertaciją tema „Kauno m. vidutinio amžiaus gyventojų pozicijos kaita dėl fizinio aktyvumo laisvalaikiu“. Mokslinis vadovas prof. habil. dr. Kęstutis Kardelis.
Mokslinė konsultantė prof. habil. dr. Stanislava Domarkienė.

We congratulate **Edita Maciulevičienė**, the student of doctoral studies at the Lithuanian Sports University, to have defended her thesis “Changes in the position of Kaunas city middle-aged population regarding their leisure time physical activity” (Social Sciences, Education, Physical Education, Motor Learning, Sport) at the Lithuanian Sports University on May 17, 2013.
Scientific advisor Prof. Dr. Habil. Kęstutis Kardelis.
Scientific consultant Prof. Dr. Habil. Stanislava Domarkienė.

