

## **GENDER DIFFERENCES IN QUALITY OF LIFE AND PHYSICAL ACTIVITY OF HIGH SCHOOL STUDENTS**

**Jaroslav Broďáni, Natália Kováčová, Monika Czaková**

*Constantine the Philosopher University, Faculty of Education, Department of Physical Education and Sport,  
Slovakia*

**Summary:** This article demonstrates the gender differences between the physical activity (PA), the joy of physical activity (PACES) and quality of life areas of boys and girls from high schools with different sports level and in the different ages. In this survey participated 630 boys and 672 girls from high schools in the age from 16 to 19 years. The quality of life is measured by the SQUALA survey, joy of the movement by the PACES survey, and the level of physical activity per week in hours by PAQ survey. The level of sports performance is defined by levels (occasional, active and registered sportsman). The data are presented by descriptive characteristics (n, M, SD) and the significance of differences and the relations are measure by non-parametric methods (W, rs). Differences in the PA, PACES, SQUALA levels at the group of boys and girls in the different age and sports level are rare. Different load of physical activity relates to sport level. It was not proven that with the increasing sports level, the joy of the physical activity also rises. The interactions between indicators of PA, PACES, and SQUALA in boys and girls in the different age and sports level were proven sporadically with a predominance of negative correlations. In most cases, the positive interactions of PA with PACES and areas of physical well-being was not proven. The higher appearance of positive correlations of PA with areas of SQUALA prevails in 18-years old girls. Boys show the higher number of interactions of PACES with areas of SQUALA. The joy of the movement positively correlates with spiritual well-being in groups of 18-19 years old boys, which perform physical activities in all sports levels. The gender differences between monitored indicators show that the gender factor is very important in this study. The age and sport level factor contributed significantly in the differentiated results of high school boys and girls.

**Key words:** quality of life, joy of the movement, physical activity, age, gender, sports level

## Introduction

Physical activity is an essential part of everyday life. It can be influenced by many factors. Today's so-called "modern age" have on physical activity mainly negative impact (Vaskan et al. 2018). It is important to create conditions for the various physical activities in the preschool age and continuously raise their level by all age categories till adulthood. Quality and level of physical activities cannot be lowered also in Physical Education lessons in high schools (Medeiros et al. 2018). According to Campo-Tenera et al. (2017), physical activity (PA) plays an important role in promoting health well-being in adolescence period of life. According to studies of Palomino-Devia et al. (2018), the relation between the general and mental health and physical function and vitality in adolescents was detected. Higher physical activity raises the quality of life connected with health, PA, and joy of the movement itself (Brod'áni 2012, 2015; Zurita-Ortega et al. 2018).

Except for the PA performed in the Physical Education lessons, most adolescents practice the PA outside of the school institutions as occasional, active or top (registered) sportsmen. These types of physical activities allow them to have more fun and support the social relations between them (González et al. 2016). Some of the authors coincide in their studies of PA that the PA plays one of the most important role in the prevention of public health (Garcia et al. 1998; Anderson et al. 2005; Norris et al. 1992). Regular PA around 3-5 times a week can be beneficial for physical fitness improvement and it can increase the general quality of life (Brod'áni 2016). Nevertheless, according to these authors, adolescence age is a very risky because the biggest decline of overall PA was registered right in this period of life.

Another important factor which differentiates PA is gender. From the viewpoint of gender differences, the authors as Chahín et al. (2011), Hernando et al. (2013), Hutchens et al. (2016), Medina et al. (2018) proven higher sports level in boys than in girls. The reason of this fact can be the high care for body appearance and slightly narcissistic expression to look always good which support self-confidence and this may reduce girls' interest in PA (Norris 1992).

Interactions between these factors have a broader background. The phenomenon of subjective evaluation of the joy of the movement comes to the fore "PACES" which shows a high frequency of interactions between the quality of life areas "SQUALA" more than between the overall volume of "PA". Despite of enough PA per week and high level of PACES, the expected interactions of SQUALA areas in high school students have not been proven. Low

rates of positive interactions indicate the necessity of monitoring this construct also in connection to the gender, different sports level and age.

Based on the above facts, in our paper we focus on gender differences between physical activity (PA), joy of physical activity (PACES) and the areas of quality of life (SQUALA) in boys and girls from high schools at different ages and sports level.

## **Aim**

Aim of this work is to reveal the gender differences in the interactions between the physical activity, joy of the movement and subjective evaluation of the quality of life of boys and girls from high school with different age and sports levels.

## **Material and Methods**

The questionnaire survey was focused on finding of the frequency of physical activity in a week, level of sport performance, joy from the physical activity and the quality of life. The survey was attended by 630 boys and 672 girls (16 – 19 years old) from Slovak high schools. Physical activity in the week (PAQ) was determined by the overall hours of physical activity without physical education. Groups with different sports level were defined as follow:

Occasional athletes (A): do not seek physical activity, attend mandatory sports activities at school or at work or seek physical activity, not regular in a week, physical activity is not organized,

Active athletes (B): regular activity in a week, no membership in sport organization,

Registered athletes (C): they are members of sport organizations, national level, international level, top sport level.

For the evaluation of the joy of the movement we used questionnaire PACES – Physical Activity Enjoyment Scale which consist of 16 statements. Respondents express themselves by the 5 points, Likert scale. Total score is obtained by the counting of individual answers. High values represent the joy of the movement and the low value from summary score represents less joy from the physical activity (Heesch et al. 2006).

The questionnaire of quality of life contained several parts from the SQUALA questionnaire (Dragomirecká et al. 2006; Zannotti & Pringuey, 1992; Ocetková 2007; Sýkorová 2008). The questionnaire defines the areas from the subjective point of the view “How are you

satisfied with...”. The areas in questionnaire were assessed by respondents on a 5-point scale. The questionnaire items were evaluated in terms of these spheres:

1. sphere of physical well-being (health, sleep, solution of everyday activities, do not have health problems),
2. sphere of psychosocial well-being (family, personal relationships, intimate relationships, hobbies, safety),
3. sphere of spiritual well-being (justice, freedom, beauty and art, the truth),
4. sphere of material well-being (money, good food),
5. education (to be educated),
6. leisure time (possibility to spend your free time, have enough things for play and fun),
7. appearance and ownership of the things (to look good, to dress nicely, to own nice things).

For the data presentation we used basic descriptive statistics (frequency  $n$ , arithmetical mean  $M$ , standard deviation  $SD$ ). Differences between independent groups were assessed by Kruskal Wallis  $\chi^2$  test for multiple choices. For finding the interaction between criteria “frequency of the physical activity in a week, joy of the physical activity” and “areas of quality of life” we used the Spearman’s correlation coefficient ( $r_s$ ). For the assessment of the statistical significance of differences and relations we used the level of significance  $p < .20$ ;  $p < .10$ ;  $p < .05$  and  $p < .01$ .

## **Results**

Aim of the work was to reveal the gender and age differences in levels and interactions between physical activity, the joy of physical activity and in the subjective evaluation of individual areas of quality of life between 16 to 19 years old boys and girls from high schools. In every age groups, students were divided into other groups according to their sports level as occasional, active or registered sportsmen (tab. 1 – 4).

**Table 1**

*Level of physical activity, joy of the movement and quality of life areas of 16 years old boys and girls with different sports level*

Indicators	Sports performance 16 years boys						Sports performance 16 years girls					
	A Occasional [n=49]		B Active [n=51]		C Registered [n=73]		A Occasional [n=99]		B Active [n=74]		C Registered [n=39]	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Physical activities per week without physical education [h]	2,65	1,71	5,10	2,82	8,86	3,56	2,28	1,74	5,96	2,87	8,64	4,39
Total physical activities per week [h]	4,63	1,78	7,33	2,89	10,95	3,54	4,51	1,90	7,93	2,89	10,95	4,29
Joy of movement	49,78	7,33	49,43	5,80	53,16	6,99	49,93	6,00	53,46	7,05	50,44	4,45
Physical well-being	3,80	,55	3,56	,75	3,74	,50	3,64	,62	3,76	,56	3,85	,57
Psychosocial well-being	3,62	,57	3,71	,54	3,69	,55	3,63	,52	3,67	,55	3,91	,49
Spiritual well-being	2,93	,78	2,95	,74	3,06	,80	2,90	,72	3,16	,68	3,23	,69
Material well-being	3,59	,73	3,61	,80	3,71	,75	3,57	,80	3,60	,86	3,76	,82
Education	4,03	,77	3,67	,75	3,76	,74	3,77	,73	3,84	,74	3,81	,68
Leisure time	3,72	,78	3,84	,77	3,89	,78	3,64	,80	3,81	,80	3,99	,67
Appearance and Property affairs	3,81	,69	3,95	,73	3,80	,80	3,74	,71	3,82	,76	3,99	,63

**Table 2**

*Level of physical activity, joy of the movement and quality of life areas of 17 years old boys and girls with different sports level*

Indicators	Sports performance 17 years boys						Sports performance 17 years girls					
	A Occasional [n=77]		B Active [n=42]		C Registered [n=64]		A Occasional [n=86]		B Active [n=64]		C Registered [n=45]	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Physical activities per week without physical education [h]	3,10	2,09	6,60	2,82	8,67	3,79	2,55	2,02	6,39	3,67	10,13	3,73
Total physical activities per week [h]	5,06	2,16	8,86	2,68	10,85	3,93	4,55	1,98	8,59	3,61	12,13	3,53
Joy of movement	49,26	6,41	50,86	6,30	52,44	6,19	49,55	4,95	49,52	4,27	48,98	5,48
Physical well-being	3,66	,62	3,76	,52	3,81	,60	3,77	,69	3,81	,51	3,92	,57
Psychosocial well-being	3,64	,54	3,77	,57	3,80	,53	3,75	,55	3,70	,53	3,84	,44
Spiritual well-being	3,12	,83	3,20	,70	3,29	,70	2,97	,72	2,94	,80	3,14	,76
Material well-being	3,50	,79	3,55	,91	3,70	,79	3,60	,80	3,62	,84	3,52	1,02
Education	3,69	,93	3,75	,81	3,83	,62	3,76	,77	3,68	,77	3,42	,81
Leisure time	3,70	,86	3,82	,77	3,67	,87	3,59	,97	3,80	,90	4,09	,83
Appearance and Property affairs	3,86	,65	3,79	,54	3,89	,71	3,89	,61	4,11	,58	4,07	,63

**Table 3**

*Level of physical activity, joy of the movement and quality of life areas of 18 years old boys and girls with different sports level*

Indicators	Sports performance 18 years boys						Sports performance 18 years girls					
	A Occasional [n=68]		B Active [n=65]		C Registered [n=58]		A Occasional [n=94]		B Active [n=62]		C Registered [n=29]	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Physical activities per week without physical education [h]	2,84	1,96	5,88	3,51	8,59	3,84	2,63	2,11	5,77	3,46	10,17	3,96
Total physical activities per week [h]	4,63	1,99	7,96	3,42	10,55	3,84	4,68	2,26	7,98	3,50	12,21	4,20
Joy of movement	49,22	6,07	54,08	7,33	52,53	6,91	51,71	7,08	49,18	5,27	51,31	4,83
Physical well-being	3,63	,55	3,73	,60	3,77	,59	3,59	,68	3,75	,62	3,80	,74
Psychosocial well-being	3,66	,46	3,62	,56	3,73	,47	3,62	,60	3,55	,47	3,67	,66
Spiritual well-being	3,03	,73	3,44	,81	3,11	,83	3,08	,71	2,95	,66	3,12	,80
Material well-being	3,63	,80	3,50	,94	3,71	,79	3,52	,90	3,61	,68	3,57	,91
Education	3,76	,87	3,65	,90	3,50	,89	3,53	,84	3,70	,75	3,79	,90
Leisure time	3,78	,85	3,72	,91	3,72	,97	3,66	,97	3,81	,85	3,72	,93
Appearance and Property affairs	3,83	,58	3,87	,72	3,83	,77	3,74	,81	3,84	,69	3,89	,75

**Table 4**

*Level of physical activity, joy of the movement and quality of life areas of 19 years old boys and girls with different sports level*

Indicators	Sports performance 19 years boys						Sports performance 19 years girls					
	A Occasional [n=28]		B Active [n=34]		C Registered [n=21]		A Occasional [n=59]		B Active [n=19]		C Registered [n=2]	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Physical activities per week without physical education [h]	2,36	2,06	5,56	3,52	9,62	3,89	3,10	1,74	5,00	2,60	11,00	1,41
Total physical activities per week [h]	4,18	2,11	7,24	3,59	11,90	3,86	4,75	2,03	6,89	2,96	14,00	,00
Joy of movement	50,50	8,60	52,18	6,10	54,10	5,51	51,86	7,63	53,47	7,61	59,00	9,90
Physical well-being	3,69	,45	3,76	,76	3,54	,64	3,83	,63	3,85	,79	4,40	,85
Psychosocial well-being	3,71	,44	3,69	,59	3,74	,56	3,82	,47	3,87	,56	3,70	,42
Spiritual well-being	3,13	,76	3,16	,76	3,32	,91	3,33	,77	3,61	,74	4,13	,18
Material well-being	3,63	,85	3,72	,87	3,71	,77	3,56	,72	3,63	,91	4,50	,71
Education	3,98	,63	3,84	,76	3,71	,99	3,98	,80	4,11	,70	2,75	1,77
Leisure time	3,75	,78	3,68	,82	3,83	,84	3,86	,75	4,08	,73	5,00	,00
Appearance and Property affairs	3,75	,59	4,19	,51	4,02	,70	3,88	,62	3,98	,79	4,33	,94

Comparing boys and girls in the individual age groups with different sports level (tab. 1 – 5) it can be stated that statistically significant differences in the monitored indicators are rare. Differences in physical activity ( $\chi^2 = 3.72$ ;  $p < .05$ ) were monitored only between the groups of registered 17 years old boys ( $M = 10,85$ ,  $SD = 3,93$ ) and 17 years old girls ( $M = 12.13$ ,  $SD = 3.53$ ) while in the girls group was monitored lowered level of joy of physical activities ( $\chi^2 = 7.1$ ;  $p < .01$ ). The lower level of joy of the physical activity ( $\chi^2 = 14.03$ ;  $p < .01$ ) we monitored also in the group of 18 years old girls but at the same level of physical activity as 18-year-old boys. The exact opposite was manifested between the groups of 16 years old active sportsman with the same level of PA, where girls ( $M = 53.46$ ;  $SD = 7.05$ ) performed physical activities with the higher joy as boys ( $M = 49.43$ ;  $SD = 5.80$ ). Statistically significant differences between the genders in the subjective evaluation of the quality of life are also very rare (tab. 5). There are no logical connections and common signs concerning gender, age, and sports level. For this reason, we do not evaluate them further.

**Table 5**

*Comparison of the level of PA, joy of PA and quality of life between boys and girls with different sports level*

Indicators	Sports performance											
	16 years			17 years			18 years			19 years		
	Occasional	Active	Registered	Occasional	Active	Registered	Occasional	Active	Registered	Occasional	Active	Registered
Physical activities per week without physical education [h]	2,42	3,24	,17	3,29	,99	<b>4,08*</b>	3,29	,01	3,20	3,06	,04	,30
Total physical activities per week [h]	,30	1,63	,01	3,05	1,21	<b>3,72*</b>	3,05	,00	3,15	1,43	,05	,98
Joy of movement	,30	<b>7,23**</b>	2,88	,00	,21	<b>7,1**</b>	,00	<b>14,03**</b>	,00	,52	,15	,97
Physical well-being	1,82	1,19	1,35	1,53	,43	,80	1,53	,20	,13	1,19	,32	1,89
Psychosocial well-being	,02	1,62	3,31	2,42	,88	,21	2,42	,05	,08	,92	,42	,05
Spiritual well-being	,19	2,37	1,06	,95	3,45	1,29	,95	<b>12,81**</b>	,05	1,36	3,67	2,03
Material well-being	,00	,00	,49	,90	,28	,84	,90	,04	,27	,40	,24	1,84
Education	<b>5,91*</b>	2,22	,01	,12	,42	<b>7,65**</b>	,12	,09	2,25	,19	1,65	1,01
Leisure time	,45	,00	,32	,48	,01	<b>7,5**</b>	,48	,42	,00	,67	2,39	<b>4,01*</b>
Appearance and Property affairs	,25	,74	,94	,06	<b>10,38**</b>	1,49	,06	,06	,31	,53	,74	,31

Notes: Kruskal Wallis Test  $p < 0.01$ \*\*;  $p < 0.05$ \*; without\* statistically insignificant difference

**Table 6**

*Comparison of PA, joy of PA and quality of life of boys and girls with different sports level (Occasional vs. Active vs. Registered)*

Indicators	Sports performance boys				Sports performance girls			
	16 years	17 years	18 years	19 years	16 years	17 years	18 years	19 years
	$\chi^2$	$\chi^2$	$\chi^2$	$\chi^2$	$\chi^2$	$\chi^2$	$\chi^2$	$\chi^2$
Physical activities per week without physical education [h]	<b>85,68**</b>	<b>84,41**</b>	<b>75,09**</b>	<b>37,03**</b>	<b>107,56**</b>	<b>100,14**</b>	<b>80,91**</b>	<b>13,06**</b>
Total physical activities per week [h]	<b>86,92**</b>	<b>89,39**</b>	<b>80,73**</b>	<b>38,45**</b>	<b>100,51**</b>	<b>104,20**</b>	<b>80,46**</b>	<b>12,59**</b>
Joy of movement	<b>10,57**</b>	<b>8,29*</b>	<b>17,77**</b>	4,13	<b>12,91**</b>	,59	4,60	2,20
Physical well-being	2,57	2,35	2,32	2,51	3,15	1,40	3,69	1,40
Psychosocial well-being	1,21	4,93	2,62	,15	<b>7,74*</b>	2,55	1,67	,15
Spiritual well-being	1,56	2,14	<b>9,51**</b>	1,13	<b>7,24*</b>	2,04	1,66	4,37
Material well-being	,53	3,23	1,11	,29	2,19	,17	,24	2,84
Education	<b>9,18**</b>	,28	3,17	,56	,76	<b>6,99*</b>	3,62	2,31
Leisure time	1,02	,50	,09	,52	5,72	<b>10,39**</b>	,84	5,14
Appearance and Property affairs	1,13	1,67	,47	<b>8,23*</b>	3,53	<b>6,72*</b>	1,27	1,04

Notes: Kruskal Wallis Test  $p < 0.01^{**}$ ;  $p < 0.05^{*}$ ; without\* statistically insignificant difference

Different amount of physical activity without the PE lessons and the whole amount of physical activities per week ( $p < .01$ ) of boys and girls divided to groups according to the sports level closely relates to increasing sports level (tab. 6).

We found differences in the joy of PA between groups of 16 – 18 years old boys with different sports level and in 16 years old girls. The same level of joy of PA was monitored between the groups of 17 – 19 years old girls with different sports level and in 19 years old boys. It was not been confirmed that with the increasing sports level of 16 to 19 years old girls and boys, the joy of PA grows too (tab. 1 – 4).

Higher frequency of significant differences in the subjective evaluation of quality of life areas between the groups with different sports level was monitored in 16 years old girls in the psychosocial well-being ( $\chi^2 = 7.74$ ;  $p < .05$ ) and spiritual well being ( $\chi^2 = 7.24$ ;  $p < .05$ ) and in 17 years old girls in the evaluated areas of education ( $\chi^2 = 6.99$ ;  $p < .05$ ), leisure time ( $\chi^2 = 10.39$ ;  $p < .01$ ) and in the evaluated areas of appearance and property affairs ( $\chi^2 = 6.72$ ;  $p < .05$ ). Other differences in the subjective evaluation of the quality of life areas are also very rare.

Results of correlation analysis show in 16, 17, 18 and 19 years old boys and girls with different sports level (tab. 7 and 8) differentiated interactions between the overall physical activity, joy of movement and areas of quality of life.

**Table 7**

*Correlation of joy of movement to the areas of quality of life of 16 – 17 years old boys and girls with different sports level*

		Joy of movement	Physical well-being	Psychosocial well-being	Spiritual well-being	Material well-being	Education	Leisure time	Appearance and Property affairs	
		r <sub>s</sub>	r <sub>s</sub>	r <sub>s</sub>	r <sub>s</sub>	r <sub>s</sub>	r <sub>s</sub>	r <sub>s</sub>	r <sub>s</sub>	
Boys	16 years	Occasional	-,079	,012	,001	<b>-0,222*</b>	<b>0,301***</b>	<b>0,201*</b>	-,026	-,109
		Active	,132	,078	<b>0,183*</b>	,180	,066	<b>-0,189*</b>	,025	-,062
		Registered	-,002	-,029	-,029	<b>-0,292***</b>	,067	<b>-0,209**</b>	,072	,065
	17 years	Occasional	-,104	<b>0,206**</b>	,133	,058	,001	,120	-,022	,031
		Active	-,050	<b>0,207*</b>	,013	,000	,070	,000	<b>-0,280**</b>	-,034
		Registered	,130	-,068	-,010	,086	<b>-0,184*</b>	-,119	<b>-0,219**</b>	,034
	18 years	Occasional	-,041	-,016	,105	-,030	,108	-,023	-,027	,003
		Active	,057	-,124	,025	,085	,157	-,078	<b>0,237**</b>	,026
		Registered	,169	-,064	-,041	,030	-,017	-,127	,144	,101
	19 years	Occasional	-,118	,247	,080	-,023	,233	<b>-0,339**</b>	,003	<b>0,351**</b>
		Active	-,217	,001	-,090	-,188	-,006	-,008	-,070	,045
		Registered	<b>-0,314*</b>	,098	,282	-,099	,016	,269	-,109	,015
Girls	16 years	Occasional	<b>0,200***</b>	-,058	,057	,038	-,128	-,066	-,065	,037
		Active	,092	-,025	<b>-0,176*</b>	,006	-,021	-,127	-,046	-,015
		Registered	,112	-,017	-,039	<b>0,317***</b>	-,012	-,050	<b>-0,424****</b>	-,149
	17 years	Occasional	-,009	,045	<b>-0,162*</b>	-,047	-,105	,009	-,075	-,134
		Active	,029	-,109	-,003	-,006	,034	-,093	,039	,131
		Registered	-,163	,070	,177	-,181	-,078	-,175	-,092	,050
	18 years	Occasional	,060	,040	,079	,074	<b>0,165*</b>	<b>0,133*</b>	<b>0,143*</b>	<b>0,202**</b>
		Active	-,039	,090	,014	-,021	<b>0,276***</b>	,158	<b>0,183*</b>	-,027
		Registered	-,045	,193	-,124	-,052	,079	,119	,173	,078
	19 years	Occasional	<b>0,322***</b>	,099	,080	,106	<b>0,200*</b>	-,013	,016	,040
		Active	-,129	,215	,154	-,090	,074	,072	-,043	,251

Notes:  $r_s$  – Spearman correlation coefficient  $p < 0.20^*$ ,  $p < 0.10^{**}$ ,  $p < 0.05^{***}$ ,  $p < 0.01^{****}$

Higher positive or negative interactions are found in the correlation between the joy of movement with areas of quality of life (tab. 7). 16 - 17 years old boys in the groups with different sports level showed higher interactions of the joy of movement with areas of quality of life than girls (CH16-19 = 28 < > D16-19 = 18). The joy of the physical activity or joy of the movement positively relates to the spiritual well-being of 18 and 19 years old boys and girls in every sports level. In younger boys in the age of 16 and 17, we monitored positive correlations only in groups of active sportsmen (CH16  $r_s = .215$ ,  $p < .20$ ), and registered sportsmen (CH16  $r_s = .261$ ,  $p < .05$ ; CH17  $r_s = .211$ ,  $p < .10$ ). Positive interactions of the joy of movement were found among 18 and 19 years old boys with the area of education. In the other significant interactions prevailed mainly the negative ones.

By the analysis of the interaction between the overall physical activity per week with the indicators of the joy of movement and the quality of life areas of boys and girls with different age and sports level, we did not find as many correlations as with the joy of the movement (tab. 8).



**Table 8**

*Correlation of physical activity to the joy of movement and areas of quality of life of 16 – 19 years old boys and girls with different sports level*

		Physical well-being	Psychosocial well-being	Spiritual well-being	Material well-being	Education	Leisure time	Appearance and Property affairs
		$r_s$	$r_s$	$r_s$	$r_s$	$r_s$	$r_s$	$r_s$
Boys	Occasional	-,148	-,095	,079	,018	-,123	-,083	,104
	16 years Active	,011	,117	0,215*	,088	-,074	-,043	-,018
	Registered	-0,217**	-0,331****	0,261***	-0,295***	,062	-0,250***	-0,517****
	Occasional	,023	,008	,112	-,095	,135	-,065	-,026
	17 years Active	-0,334***	-0,264**	-,169	,022	-,088	-0,203*	-,195
	Registered	-0,236**	-,114	0,211**	-,079	,009	-0,237**	-,108
	Occasional	,054	-,055	0,218**	,149	0,266***	-0,158*	-,075
	18 years Active	-,112	-,049	0,402****	,120	-,009	0,264***	,023
	Registered	-,007	-,145	0,420****	-,098	0,343****	,099	-,049
	Occasional	-,018	-,041	0,454***	-0,322**	0,253*	-,210	-,148
	19 years Active	,023	-,075	0,256*	0,228*	-,197	-,186	-0,278*
	Registronan	-,032	,104	0,425**	-,211	-,074	-,209	-0,401**
Girls	Occasional	-,032	-,010	,111	,110	-,090	,069	0,150*
	16 years Active	-,023	-0,198**	,143	,124	-0,301****	-0,249***	-0,259**
	Registered	,155	,098	,157	,026	,061	-,045	-,116
	Occasional	,053	,113	,123	,145	0,180**	-,018	-,028
	17 years Active	-,082	-,043	,093	,051	-,073	-,059	-,075
	Registered	-,057	-,183	,176	,083	,111	,190	-,118
	Occasional	,036	-,011	0,519****	0,142*	,063	,098	-,005
	18 years Active	-0,283***	-,120	-0,340****	-0,247**	-,090	-0,221**	-0,196*
	Registered	-,242	-,185	-,188	,039	-,044	-0,25*	-0,397***
	Occasional	-,092	-0,28***	0,198*	,027	-,087	-,132	,015
	19 years Active	-,214	-,264	0,371*	-,275	,096	,184	,075

Notes:  $r_s$  – Spearman correlation coefficient  $p < 0.20^*$ ,  $p < 0.10^{**}$ ,  $p < 0.05^{***}$ ,  $p < 0.01^{****}$

In most cases, the positive interaction between the overall physical activity per week with the joy of movement and areas of the physical well-being of high school students has not been proven. Higher frequency of interactions with areas of quality of life was monitored only in 16- and 17-years old boys, where the negative correlations prevailed. Physical activity positively correlated with the physical well-being only in 17 years old boys from a group of occasional sportsmen ( $r_s = .206$ ,  $p < .10$ ) and active sportsmen ( $r_s = .207$ ,  $p < .20$ ).

Higher frequency of the interaction of physical activity with the indicators of the joy of movement and quality of life was demonstrated in 16- and 18-years old girls. In the group of 18 years old occasional sports girls, the physical activity showed positive correlations with the material well-being ( $r_s = .165$ ,  $p < .20$ ), leisure time ( $r_s = .143$ ,  $p < .20$ ), education ( $r_s = .165$ ,  $p < .20$ ), appearance and property ( $r_s = .202$ ,  $p < .10$ ) and in the 18 years old active sports girls with the material well-being ( $r_s = .276$ ,  $p < .05$ ) and with the leisure time ( $r_s = .183$ ,  $p < .20$ ). The positive correlation of physical activity with the joy of movement was measured in occasional sports girls in the age of 16 ( $r_s = .200$ ,  $p < .05$ ) and 19 years ( $r_s = .322$ ,  $p < .05$ ).

## Discussion

Aim of this work was to demonstrate the gender and age differences on the level of interaction between the physical activity, joy of movement and in the subjective evaluation of areas of quality of life of 16 to 19 years old boys and girls from high schools. The regular physical activity during the adolescence period is very important (Verhulst 1989). One of the main features of leisure time activity is the joy of the movement. This attribute contributes to the long-termed persistence of person in physical activity (Šutka 2013; Broďáni 2014, 2015, 2016, 2018). In our monitoring, based on the comparison of the nationwide researches, was proven that in addition to the factor of sport level, gender, type of high school or region, the age also affects the monitored parameters (Broďáni 2012). Effect of the age factor and its influence to the quality of life and physical activity was demonstrated in the whole period of adolescents (Gill 1994; Yarmak et al. 2017). The positive effect of physical activity on disease prevention and life satisfaction also confirm Maciel (2014) and Massida (2015).

According to the age, the high school students with the different sports level have reached rare statistically significant differences. Important differences were monitored in the groups of registered 17 years old boys and girls. Here and in the group of active 18 years old sportsmen, girls showed lower level of joy of PA. The exact opposite occurred in the group of 16 years old active sportsmen, where at the same physical activity girls showed more joy of PA as boys.

Between the groups of high school students with different sports level we found differences in the joy from physical activity in 16 – 18 years old boys and 16 years old girls. In 17 – 19 years old girls and 19 years old boys was the joy of the PA at the same level. The increasing joy from the PA by the increasing sports level has not been confirmed. Between these groups we monitored in the 16 years old girls the significant differences in the psychosocial and spiritual well-being and among the 17 years old girls in the areas of leisure time, appearance and property affairs.

By correlation of joy of PA and areas of quality of life, the higher number of interactions prevailed between the 16 – 19 years old boys with different sports level. In the 18 – 19 years old boys and girls in each sports level, the relation between the spiritual area with the joy of movement was monitored. Positive correlations were found in the group of 16 – 17 years old active and registered boys. In the group of 18 – 19 years old boys, there were interactions of the joy of PA and the areas of education. In the most cases of interactions between the overall

PA per week, the joy of PA and areas of quality of life of high school students divided to the groups according to the gender, age, and sports level, the positive interactions were not proved or proved in minimum.

These rare interactions are the evidence of the previous researches, that the influence of the physical activities realized regularly, organized, with joy, happiness and fun had a positive impact to the quality of life of high school students (Martins et al. 2015). Another examples of the positive impact of PA on joy and quality of life comparing the external and internal activities are found in Moghaddaszadeh (2016) and Thompson-coon (2011).

## **Conclusion**

Differences in the level of physical activity per week, joy of movement, subjective evaluation of the quality of life areas of boys and girls in different age and sports level are rare. The different volume of physical activity is related to the increasing sports level. It has not been confirmed that as sport levels increase, the joy of physical activity also increases. The interactions between the indicators of physical activity per week, the joy of movement, subjective evaluation of the quality of life areas of boys and girls with different age and sports level was proven very sporadically with mainly negative correlations. In most cases, the positive interaction of PA with PACES and areas of physical well-being has not been confirmed. Higher occurrence of positive correlation of physical activity with the areas of quality of life prevailed among 18 years old girls. Boys showed a higher number of interactions of the joy of movement with the areas of quality of life. The joy of the movement positively correlated with spiritual well-being in groups of 18 – 19 years old boys who perform physical activities at all sports level. Gender differences between monitored indicators demonstrate that the gender factor is very important in the case of this study. The factor of age and sports level had an important impact on the differentiated result of high school students. Low frequency and importance of the interactions of physical activities with the areas of quality of life point to the need for the future monitoring of this element in the life of high school students. The questions is, which other factors can determine these relations. One of them can be a deeper selection of the files based on the level of joy of the movement.

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