

The interaction of physical activity and the life quality of students in mid and late adolescence

Authors' Contribution:

A - Study Design
B - Data Collection
C - Statistical Analysis
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Abstract

The report presents the internship analysis results between the physical activity during the week and life quality fields in mid and late adolescence of students in different sport level. In the research took part students from secondary schools and universities from Slovakia ($n=308$). The life quality was observed via modified questionnaire SQUALA and the level of the physical activity during the week in hours (PA). The results are presented by descriptive characteristics (n , M , SD) and the statistic importance of differences, relations is rated by non - parametric methods (W , U , r_s) at the levels of importance ($p<0.05$, $p<0.20$; p = level of significant = p -value = 1%, 5%, 10%, 20%). Positive interactions PA with life quality fields were found in mid adolescence. In the group of active athletes in mid adolescence were proved positive interactions with the field of physical well-being ($p<0.10$), field of appearance and possession of things ($p<.01$), by occasional athletes with the spiritual field ($p<0.01$) and the field of education ($p<0.20$). In the group of students in late adolescence was proved a positive interaction PA only with the field of material safety ($p<0.01$). It was repeatedly proved that mid and late adolescence is a very stormy and unstable period of lifetime, mainly when talking about satisfaction with life quality. The importance of life quality plays a great role in the lives of adolescents. It was also pointed out that there are possibilities to influence the fields of life quality via physical activities, but especially the importance of creating sufficient circumstances to enhance the life quality in social environment of adolescents. The contribution was published via the grant resource MŠ SR KEGA 003UKF-4/2016.

Keywords: Physical activity, life quality, interaction, students, adolescence

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INTRODUCTION

Young people in the period of mid and late adolescence have to face many inner and outer changes. Satisfaction with own life is an indicator of well-being of adolescents [1]. Usually it relates to the determinants as health, socioeconomic status, and age, involvement in religious activities, interpersonal relationships, major life events, ethnicity, parenting, social support, orphanage, self-esteem and personal variables [2,3]. Quality of life is defined with reference to the person's satisfaction with the way how he achieves the objectives of determining the direction of his life [4,5]. They are defined by the hierarchy of values to which human effort is directed. Otherwise, if there are short-term or long-term efforts fragmented, they will feel worse, and this will be reflected in the evaluation of quality of life [6,7].

An important dimension that affects the well-being and, therefore, the personal quality of life as a whole, is the physical fitness [8]. Taking part in physical activities leads to a wide range of social, psychological and physical consequences. Participation in regular exercise is associated with a number of positive psychosocial effects such as reduction of depressive symptoms, reducing anxiety, and improve self-esteem, improvement of reaction time and a more positive perception of themselves.

Positive interaction between regular physical activity and areas of life in groups of high school students and college students, who performed regular physical activity 3-5 times a week, show works [9,10,11,12,13,14,15]. Quantity and physical activities polarity interactions with the individual quality of life, however, is closely related to the specificity of groups of adolescents. An important role play factors such as the level of physical activity, type and size of schools, curriculum, gender, social group, etc. For this reason, we try to apply the presented research methods for various targeted groups of adolescents and contribute to the monitoring of the issue of relationship analysis between the level of physical activity and individual quality of life [16,17,18].

In our contribution we focus on high school students and universities in middle and late adolescence. The main objective was to show the interaction between quality of life and different level of physical activity during a week. As one of important factors that should influence the mentioned causality in relation to the results, is also the sports level.

METHODS

Questionnaire survey which was aimed at determining the sport level, the frequency of physical activity during the week, and the quality of life was attended by students of secondary schools and universities in Nitra (n=308). The average age group of students in middle adolescence was M: 16,66 year at SD: 0.474 and students in late adolescence M: 19.44 year at SD: 0.601.

Respondents reported a sporting level according to subjective evaluation. Groups of students with different sport levels in middle adolescence are marked A-C and in late adolescence D-F: A (D): Passive athlete - does not seek physical activity, undergoes the compulsory sports activities at school; B (E): Occasional athlete - seeks physical activity, irregularity during the week, unorganized physical activity; C (F): Active athlete - the regularity of the week, not a member of a sports organization or is a member of sports organization, national level, performance or professional sport.

A modified questionnaire for students according the authors [6, 19, 20, 21] contained selected items from SQUALA. SQUALA entries were evaluated in terms of areas:

1. Physical well - being (health, sleep, handle everyday activities, not having problems);
2. Psycho - social well - being (family, relationships, intimate relations, hobbies, safety);
3. Spiritual well - being (justice, freedom, beauty, art, truth);
4. Material well - being (money, good food);

5. Education (to be educated, attend school);
6. Free time (possibilities to spend free time, have enough items for entertainment);
7. Appearance and possession of things (look good, wear nice things, own things I like);
8. Orientation to the future (have children in the future, job I will enjoy).

The questionnaire defines the area of objective site, "How important is it for you" and the second from the subjective side "How satisfied are you with" Both items assessed the respondents on a 5-point scale depending on what the meaning of her life placed, or how important it has been for them in their life (1. Completely unimportant, 2. A bit important, 3. Moderate important 4. Very important 5. Completely important), and (1. Very dissatisfied, 2. Dissatisfied, 3. Something in between, 4. Happy, 5. Very satisfied).

When processing data, we used the basic descriptive statistics (frequency n , diameter M , standard deviation SD). Differences between importance and satisfaction in the quality of life for dependent groups, were assessed by Wilcoxon's z test, and differences between independent groups were assessed by the Mann-Whitney U test. When calculating the interaction between the variables "refer to being physically active during the week and the area of the quality of life", we used the Spearman's correlation coefficient (r_s).

For the assessment of the statistical significance we used the level of significance $p < 0.05$ and relations $p < 0.20$. The data were handled in programmes MS Excel a SPSS.

RESULTS

Physical activity of students of secondary schools and colleges is differentiated due to the period of adolescence, sporting level, total physical activity, or physical activity outside the school physical education (tab. 1, 2, 4).

Statistically significant differences ($p < 0.01$) were demonstrated between the groups of students in middle and late adolescence mentioning the various sporting level (tab. 2). We register the differences also when comparing the overall level of physical activity per week (tab. 4). Students in middle adolescence, indicating passive and occasional sporting level, reach higher levels of total physical activity per week than students in late adolescence ($p < 0.01$).

Students in middle and late adolescence, indicating an active sporting level have reached the same level of physical activity (tab. 4). The same level of physical activity undertaken outside the school attendance was noted also between the groups with the same sporting level (tab. 4). Students in middle and late adolescence mentioning passive and occasional sporting level participated in physical activities in diameter A: 3.45 hours <> D: 2.10 hours a week and B: 4.96 hours <> E: 3.45 hours a week. High frequency of physical activity a week was demonstrated by the group of adolescents who place a sporting level of active athletes C: 9.18 hours <> F: 8.57 hours a week, which results from the requirements placed on the sporting level.

Overall, we found out that high school students in middle adolescence achieve higher levels of physical activities such as university students in the late adolescence. A significant role plays the physical activity undertaken during compulsory education by increasing the overall volume of physical activity in a week. Hourly amount of physical activity undertaken outside schooling is the same in both groups of adolescents at various sporting level. Overall is however the levels of leisure-time physical activities among students who place passive and occasional sporting level very low, as confirmed by today's society-wide trend of inactivity

Table 1. Descriptive characteristics of age, physical activity and life quality by students in mid and late adolescence with different sport.

	Middle adolescence						Late adolescence					
	A Passive [n=20]		B Occasional [n=49]		C Active [n=62]		D Passive [n=21]		E Occasional [n=89]		F Active [n=67]	
Indicators	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Year	15.60	.50	15.73	.45	15.63	.49	19.33	.80	19.54	.54	19.34	.59
Physical activity in a week without school physical education [h]	1.65	1.18	3.08	1.50	7.24	3.77	1.90	1.18	3.30	1.79	7.45	3.21
Physical activity in a week [h]	3.45	1.32	4.96	1.63	9.18	3.67	2.10	1.00	3.45	1.80	8.57	3.90
How important for you ...												
Physical well-being	4.63	.28	4.42	.41	4.38	.43	4.52	.30	4.36	.41	4.63	.36
Psychosocial well-being	3.98	.41	3.95	.47	3.86	.41	3.80	.33	3.91	.35	4.34	.46
Spiritual well-being	4.43	.54	4.40	.42	4.04	.43	4.27	.36	4.14	.46	4.47	.57
Material well-being	4.08	.69	4.00	.66	3.81	.63	3.90	.49	3.62	.59	4.26	.62
Education	4.23	.77	4.20	.65	3.90	.68	4.57	.51	4.01	.51	4.17	.70
Leisure time	4.40	.53	4.13	.60	4.14	.60	4.14	.48	3.88	.47	4.33	.53
Appearance and Property affairs	3.97	1.13	4.12	.83	3.56	.86	3.84	.62	3.43	.83	4.00	.75
Focusing on the future	4.18	.86	4.35	.79	4.25	.79	4.07	.75	4.25	.59	4.42	.86
How are you satisfied ...												
Physical well-being	3.71	.38	3.71	.66	3.94	.57	3.36	.31	3.74	.37	3.92	.65
Psychosocial well-being	3.94	.57	3.80	.60	3.68	.38	3.67	.24	3.85	.36	3.88	.49
Spiritual well-being	3.04	.58	2.97	.67	2.88	.53	3.01	.37	3.04	.58	3.23	.78
Material well-being	3.53	.68	3.72	.60	3.68	.77	3.38	.38	3.47	.50	3.43	1.00
Education	4.00	.81	4.13	.68	3.69	.71	4.17	.37	4.05	.57	3.65	1.04
Leisure time	4.08	.57	3.95	.69	3.71	.41	4.05	.47	3.78	.56	3.56	.93
Appearance and Property affairs	3.65	.59	3.94	.78	4.19	.54	3.74	.44	3.69	.54	4.33	.65

Table 2. Comparing age. physical activity and life quality of students with different sport level in mid and late adolescence (Mann Whitney U-test $p < 0.01^{**}$; $p < 0.05^{*}$).

	Middle adolescence						Late adolescence					
	A <> B		B <> C		A <> C		D <> E		E <> F		D <> F	
Indicators	U	p	U	p	U	p	U	p	U	p	U	p
Year	424.0	.273	1358.5	.240	602.0	.817	831.0	.370	2470.0	.038	678.5	.786
Physical activity in a week without school physical education [h]	233.0	.001**	500.0	.000**	62.5	.000**	499.0	.001*	711.5	.000**	52.0	.000**
Physical activity in a week [h]	244.0	.001**	464.5	.000**	53.0	.000**	520.0	.001**	690.0	.00**	56.0	.00**
How important for you ...												
Physical well-being	341.0	.045*	1444.5	.654	387.0	.010**	735.0	.123	1826.0	.00**	529.5	.082
Psychosocial well-being	444.5	.545	1374.0	.388	479.5	.127	696.0	.067	1272.5	.00**	230.5	.00**
Spiritual well-being	441.0	.511	871.5	.00**	324.5	.001**	785.5	.248	1841.5	.00**	455.0	.013*
Material well-being	454.5	.628	1277.0	.140	483.0	.129	658.0	.029*	1428.0	.00**	482.0	.024*
Education	469.5	.779	1059.5	.004**	461.5	.077	417.5	.00**	2417.5	.036*	471.0	.019*
Leisure time	368.5	.097	1470.0	.764	482.0	.123	621.0	.011*	1613.5	.00**	570.5	.174
Appearance and Property affairs	473.5	.823	970.5	.001**	470.5	.103	621.5	.016*	1693.0	.00**	570.5	.186
Focusing on the future	429.5	.400	1385.5	.408	595.0	.780	817.0	.351	2211.5	.004**	482.5	.022*
How are you satisfied ...												
Physical well-being	459.5	.683	1143.5	.024*	396.0	.015*	400.5	.00**	2263.0	.009**	312.0	.00**
Psychosocial well-being	414.0	.313	1267.5	.134	388.5	.012*	650.0	.029*	2783.0	.475	497.0	.042*
Spiritual well-being	479.5	.888	1348.5	.306	543.5	.402	851.0	.515	2713.5	.331	605.0	.330
Material well-being	381.5	.138	1452.0	.683	531.0	.326	867.5	.588	2891.0	.739	642.0	.540
Education	439.0	.481	969.0	.001**	473.5	.099	784.5	.225	2230.0	.006**	477.0	.024*
Leisure time	446.0	.547	1138.5	.017*	389.0	.008**	631.5	.015*	2613.0	.176	468.5	.019*
Appearance and Property affairs	369.5	.107	1275.0	.141	319.0	.001**	880.0	.671	1380.0	.00**	331.0	.00**

Table 3. Comparing the areas of life quality from the point of importance and satisfaction (Wilcoxon test z-test $p < .01^{**}$; $p < .05^*$).

Indicators	Middle adolescence						Late adolescence					
	A		B		C		D		E		F	
	z	p	z	p	z	p	z	p	z	p	z	p
Physical well-being	3.979	.00**	5.255	.00**	5.466	.00**	4.040	.00**	7.013	.00**	6.084	.00**
Psychosocial well-being	.364	.716	1.737	.082	3.093	.02**	2.194	.03*	1.505	.132	5.032	.00**
Spiritual well-being	3.931	.00**	6.025	.00**	6.687	.00**	4.060	.00**	7.887	.00**	6.998	.00**
Material well-being	2.330	.02*	2.319	.02*	1.484	.138	3.025	.00**	1.839	.066	4.307	.00**
Education	1.534	.125	0.831	.406	2.517	.012*	3.019	.00**	0.422	.673	2.896	.00**
Leisure time	2.292	.022*	1.287	.198	4.103	.00**	0.988	.323	1.503	.133	4.260	.00**
Appearance and Property affairs	1.180	.238	1.160	.246	5.353	.00**	0.287	.774	1.943	.052	2.748	.00**

Quality of life in adolescents with different sports levels has certain common features (tab. 1,2, 3). All groups attach greater importance to be satisfied with the physical and spiritual well-being. Similar by active athletes outweighs the importance of satisfaction with the quality of life. As the only one group of adolescents, they report higher satisfaction with appearance and property matters. All groups of adolescents attach the greatest importance to physical well being. Important role is attributed by adolescents to orientation for the future. They are least satisfied with the field of spirituality (justice, freedom, beauty, art, truth).

Congruention between the importance and satisfaction was observed by the groups of passive and occasional athletes in the field of education, appearance and possession of things ($p=sn$). The most differences between the groups of adolescents with the same sport level are found by occasional and active athletes (tab. 4). Students in mid adolescents attach higher importance to spiritual and material well - being, education, free time, appearance, possession of things or they present higher satisfaction with material well - being, appearance and things possession than students in late adolescence.

Reverse view on life quality from the point of importance and satisfaction have the groups of active athletes. Higher importance is presented by active athletes in late adolescence to fields such as physical, mental, spiritual and material well - being, education, appearance and possession of things. Higher satisfaction than importance is presented by active athletes in late adolescence to psycho - social and spiritual field.

Correlation analysis of total physical activity per week and subjective assessment of satisfaction in various areas of quality of life highlighted the differentiated interactions by adolescents with different sport levels (tab. 5). The most frequent interaction between physical activity and quality of life among students who reported active sports level, let us say by students who are passive athletes in late adolescence. In most cases outweigh the negative over the positive interactions.

The positive interaction of physical activity with the quality of life is found sporadically. Most of them are located in middle adolescence. In the group of active athletes in middle adolescence have been shown positive interactions with the areas of physical well-being (r_s : 0.226; $p < 0.10$), appearance and things possession (r_s : 0.353; $p < 0.01$), at occasional athletes with the spiritual well - being (r_s : 0.391; $p < 0.01$) and education (r_s : 0.217; $p < 0.20$). In the group of late adolescence students was shown a positive interaction PA only with the field of material well - being (r_s : 0.326; $p < 0.01$).

Table 4. Comparing students in mid and late adolescence with the same sport (Mann Whitney U-test $p < 0.01^{**}$; $p < 0.05^*$)

Indicators	Passive A<>D		Occasional B<>E		Active C<>F			
	U	p-value	U	p-value	U	p-value		
Year	0.0	.000	0.0	.000	0.0	.000		
Physical activity in a week without school physical education [h]	178.0	.372	2069.5	.614	2010.5	.752		
Physical activity in a week [h]	86.5	.001**	1112.0	.000**	1902.5	.408		
How important for you ...	Physical well-being	157.0	.153	2000.0	.417	1289.5	.000**	
	Psychosocial well-being	136.5	.054	2012.0	.451	896.0	.000**	
	Spiritual well-being	150.5	.110	1485.0	.002**	1075.0	.000**	
	Material well-being	174.5	.320	1483.5	.001**	1297.0	.000**	
	Education	158.5	.159	1579.5	.005**	1607.0	.022*	
	Leisure time	156.0	.138	1639.0	.011*	1755.5	.116	
	Appearance and Property affairs	186.0	.524	1235.0	.000**	1467.5	.004**	
	Focusing on the future	187.5	.544	1875.5	.157	1709.0	.068	
	How are you satisfied ...	Physical well-being	100.0	.004**	2040.5	.528	2051.0	.902
		Psychosocial well-being	113.5	.011*	2150.5	.893	1582.0	.019*
Spiritual well-being		203.0	.851	2165.5	.946	1604.5	.024*	
Material well-being		195.0	.679	1564.0	.004**	1798.0	.182	
Education		186.0	.494	1882.0	.164	2032.0	.829	
Leisure time		209.5	.989	1796.0	.076	1889.5	.361	
Appearance and Property affairs		184.5	.496	1689.0	.027*	1742.5	.107	

Table 5. Correlations frequency of physical activity in week [h] and the individual quality of life among students in middle and late adolescence with different levels of sports (Spearman's rank correlation coefficient r_s ; $p < 0.20^*$; $p < 0.10^{**}$; $p < 0.05^{***}$; $p < 0.01^{****}$)

		Middle adolescence			Late adolescence			
		A	B	C	D	E	F	
		Passive	Occasional	Active	Passive	Occasional	Active	
How are you satisfied ...	Physical well-being	r_s	-.008	.096	0.226**	-.258	.087	-0.283***
		p value	.972	.512	.077	.260	.420	.020
	Psychosocial well-being	r_s	-.053	.178	.045	-0.803****	.098	-0.265***
		p value	.825	.221	.728	.000	.359	.030
	Spiritual well-being	r_s	-.185	0.391****	-0.304***	-0.675****	-.023	-0.392****
		p value	.434	.005	.016	.001	.830	.001
	Material well-being	r_s	-.280	.070	.031	-0.694****	0.326****	-0.458****
		p value	.232	.633	.808	.000	.002	.000
	Education	r_s	-.216	0.217*	-0.294***	-.207	-.013	-0.690****
		p value	.360	.134	.020	.367	.903	.000
	Leisure time	r_s	-0.503***	-.088	-0.191*	-0.373**	-0.312****	-0.598****
		p value	.024	.546	.136	.096	.003	.000
	Appearance and Property affairs	r_s	-0.363*	-.030	0.353****	.087	.109	-.020
		p value	.115	.838	.005	.709	.311	.875

DISCUSSION

A hierarchy of objectives of adolescents aged 15-24 years points to the priority of good work (37%). graduation (36%). starting a family (25%). money (12%). own apartment (10%). satisfaction with life (6%). business (5%) and health (4%). The research demonstrates the positive effect of physical activity on subjective well-being [22,23,24,25,26,27]. The joy of physical activity increases together with the sporting level, it means that the lowest average values were reached by passive and the highest by active athletes and competitive athletes [28, 29]. We also dealt with questions: What is the level of physical activity per week and the quality of life of students in middle and late adolescence? What are the differences in particular life quality fields from the point of importance and satisfaction?

In consideration of previous research [9,10,11,12,14,15,19] our results have again confirmed negative impact of very low or very high physical activity during the week with particular fields of life quality of students in mid or late adolescence, Physical activities provided occasionally from 3-5 hours per week show positive interactions with life quality, even only in a small amount,

CONCLUSIONS

Faced results have claimed the outputs from previous research from the area of relations analysis between physical activities and life quality of adolescence students. Repeatedly was shown that mid and late adolescence is a very stormy and unstable life period which is manifested by dissatisfaction with life quality. The negative effect of very low or very high physical activity was claimed within different areas of life quality of students in mid and late adolescence. In our case too high activity on the active level or registered athletes did not enhance the frequency of positive interaction with the life quality, We see the demonstration in demanding high school and college learning, specification of observed sample or the range and frequency of physical activities made out of studying,

Also the interaction between occasional physical activity and life quality of adolescents was claimed. We can demonstrate the possibilities which influence particular parts of life qualities via physical activities but mainly the importance of creating optimal conditions for increasing the life quality of adolescents in their own social environment.

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