

Gender differences during adolescence in the motives for physical exercise, depression, anxiety and stress

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Abstract

Lately, there has been increase of interest in examining the motives of male and female adolescents for taking part in physical activities, as well as examining their depression, anxiety and stress. The objective of this paper was to investigate intergender differences between male and female adolescents concerning the motives for physical exercise, depression, anxiety and stress. The pertinent sample accounted for 332 high-school students of both sexes from Valjevo (164 females and 168 male high school seniors), aged 18.10 ± 0.86. Three measuring instruments were used: Questionnaire for collecting basic data, The Exercise Motivation Inventory 2 („EMI-2“) questionnaire and the Depression anxiety stress scale (DASS – 21). The internal consistency and reliability of the questionnaire and the scale was satisfactory. The given results revealed that there are statistically significant gender differences, as the male adolescents, compared to the female adolescents, more frequently took part in physical activities ($p \leq 0.01$). The important difference between the motives for participating in physical activities between the male and female participants was defined, so the motives: Socializing, Competiti-

on, Enjoyment, Social recognition and Strength and Persistence were more dominant with male adolescents, whereas motives: Appearance, Agility, Maintaining and improving health, and Body mass control were manifested more with female high school seniors. The findings revealed, with the probability of error being 0.05 the statistically significant differences of the depression dimension between the adolescents who rarely or never take part in physical activities and those who take part in physical activities three or more times a week. The results suggest that there are significant differences between male and female participants when it comes to stress variable ($t = -2.47$, $p \leq 0.01$) and anxiety variable ($t = -2.17$, $p \leq 0.05$). Differences on the depression variable are not significant. The findings were discussed within the context of current empirical and theoretical frame.

Keywords physical exercise • sport • adolescents • motives • depression • anxiety • stress

Introduction

The development of technology, more prominent sedentary way of life and insufficient physical activity represent danger to psychosomatic condition of adolescents now, at the start of the XXI century. A great number of students today face various mental disorders (depression, anxiety and stress) which diminish their capacity to express their abilities, creativity and interest in studying. With these problems of the modern age it is extremely significant to define the existence of one of the mentioned psychopathological disorders in order to be able to give suitable help and impro-

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ve the quality of adolescents' lives (Šepić & Kolić-Vehovec, 2017).

Depression is an emotional state which is characterized by low positive affect, dysphoria, hopelessness, disinterest, apathy, negative attitude towards oneself and life in general (Jovanović, Gavrilov-Jerković, Žuljević, & Brdarić, 2014). It is estimated that 10-15% of adolescents have clear symptoms of depressive disorders (Jokić-Begić & Čuržik, 2010). The frequency of depression differs between genders and it is twice as more common among female population (Begić, 2011).

Anxiety represents unpleasant emotional state of dread, fear and concern characterized by somatic symptoms which indicates to overactive autonomic nervous system (Crnković, 2017). Anxiety has recently become very popular in research studies, since it is one of the most common mental disorders. The risk of developing anxiety is 5%, being slightly higher among women (Lenz, Vinković, & Degmečić, 2016).

Stress is common among adolescents (Rukavina & Nikčević-Milković, 2016). In modern psychology, it includes the feelings of tension, fear and dissatisfaction (Cetinić, Gavranić, Hudorović, Tomić, & Validžić, 2014). People are aware of this but are incapable of finding suitable explanation for the source of stress and are not able to face frightening situations and things (Ljubić & Babić, 2017).

Adolescence represents a tremendously sensitive period of development, accompanied with big psychophysical changes – negative affective reactions and difficulties in affectivity, which can generate problems with serious consequences (Randall, Thomas, Whiting, & McGrath, 2017). It is precisely this life period that interests the experts who study mental health of the youth and the changes which occur in the period of late adolescence (Horton, 2011). The evaluation of the unpleasant cognitive and emotional states among adolescents is one of the everyday tasks of the psychologists, in practice as well as in theoretical researches (Novović, 2006).

Regular and planned aerobic and anaerobic exercise of certain intensity and range normalizes the metabolism of fat and carbs, improves mental state and the functioning of muscular, cardiovascular, respiratory and endocrine system (Vina, Sanchis-Gomar, Martinez-Bello, & Gomez-Cabrera, 2012). The continuous, medium intensity physical activity and exercise lower the level of anxiety, depression and stress (Hadžikadunić, Turković, & Tabaković,

2013). On the other hand, the reduction of physical activity can have many negative effects on psychophysical health of adolescents, for example increased risk of developing coronary diseases, diabetes, some types of cancer, obesity and hypertension (Baumeister et al., 2017). The study by Metthew (2017), proves that there is reduction of anxiety with people who exercise 2 to 4 hours a week. Also, the research by McMahon et al. (2017) shows that the physically active participants had lower scores on the self-evaluation scale of stress than those who were not physically active. In addition, the results of McPhie & Rawana (2015) showed that the people who exercise every day or at least two or three times a week, have lower scores on the depression and stress scales, when compared to those who are less physically active (who exercise once a week, several times or once a month, or do not exercise at all).

The chain of the latest empirical research indicates that the regular and moderate physical activity has significant function in a healthy lifestyle, health improvement and in the prevention of numerous diseases (Chomistek et al., 2015; Wu, Fisher-Hoch, Reninger, & McCormick, 2016; Eli et al., 2016; Parker et al., 2016; Bursnall, 2016; Lang et al., 2016). But even with the exact facts about the importance of physical activity, there is still a great number of individuals who are physically inactive, which affects negatively the quality of their physical and mental health.

In the context of physical activity and exercising, the exerciser exercises for two reasons: 1) to receive external (extrinsic) incentive and prove that he is better than others and 2) external reward, which represents a certain feedback and facilitates the feeling of competence, where the result is increased internal – intrinsic motivation, as this research shows (Cox 2005). Therefore, the basic motives that characterize the motivation for physical exercise are: focus on motoric task, learning new skills, taking joy in exercising, physical practice, tendency towards maintaining good health, enjoying the challenge, excitement and socializing.

In the research done by (Šimunić & Barić, 2011) it was determined that the main motives for exercising, maintaining and improving health are agility and strength. On the one hand, the dominant motives with women are maintaining and improving health, agility and body mass control, which shows their awareness of the importance of exercising, while with the male participants what is prevailing is

strength, health, agility and competition, which brings confidence and increased persistence in exercising. In the study carried out on the sample of women who exercise regularly, it is emphasized that body mass is the less important motive compared to the female amateurs, as the research shows (Vlašić, Barić, Oreb, & Kasović, 2002).

In their study by Hynynen et al. (2016), they stress that in the industrialized countries the increase of physical inactivity is manifested in the period of late adolescence. Furthermore, it is determined that the significant number of behaviors, originated in the period of adolescence, is adopted and it remains distinctive behavioral model even in the later periods of life, as the study shows (Engelberg et al., 2016). Research findings (Owen, Astell-Burt, & Lonsdale, 2013) bring forward the fact that the dominant adolescents' motivation for participating in physical activities is a good physical appearance (extrinsic motivation), instead of the motives concerning health (intrinsic motivation). The study (Sibley & Bergman, 2016) has shown the statistically significant difference in the motives of challenge, competition, social recognition, strength and perseverance and body mass control between male and female adolescents, so that the first four motives are more relevant to male adolescents, and body mass control to female adolescents.

Research results (Abasi, Eslami, Rakhshani, & Shiri, 2016; Morgan, Young, Smith, & Lubans, 2016) indicate that while planning their physical activity during free time, male adolescents manifest the perseverance and confidence in their own success by sticking to the plan of physical activities even when there are certain difficulties and disadvantages (e.g. bad mood), in contrast to female adolescents who need stronger incentives. Besides that, male adolescents with increased energy more often take part in team sports and weightlifting, whereas female adolescents are more active in the activities such as dancing, yoga and aerobic.

Aims In accordance with the defined research problem, the basic aims of this transversal study were: (1) examining the frequency of taking part in physical activities and (2) determining the statistically significant gender difference in two independent samples of both genders regarding their variables – motives for physical exercise and negative emotional states (depression, anxiety and stress). In the context of theoretical findings and formulated aims, two research hypotheses were put forward: it is expected that male adolescents will significantly more often

take part in physical activities, that the participants who more frequently take part in physical activities will achieve significantly lower scores on the depression scale.

Method

Participant sample and procedure. In this section study, the pertinent sample of N=288 is represented by the students of the IV grade of Secondary Commercial and Technical school in Valjevo (164 females or 49.40 % and 168 males or 50.60%). The average age of the participants is 18.10 (SD = 0.86).

The anonymous researches were done in groups, during regular classes, on September 2017. The size of the groups varied from 20 to 30 participants. Average time needed for filling in the questionnaire was approximately 45 minutes. In accordance with the ethical principles of the research, school principals signed a formal consent for the students' participation in the testing. During the research, the adolescents could have quit at any time, without any repercussions (three adolescents quit).

Measures. Questionnaire for collecting basic data. A special basic characteristics questionnaire was made for the requirements of this research, and it included demographic variables (sex, age, high-school type) and the variables which refer to the frequency of physical exercising and other aspects of physical activity. The participants circled the offered categories (never, rarely, less than once a month, 1-2 times a month, 1-2 times a week, 3 to 4 times a week, 5 or more times a week) which apply to them. The original categories were later, for the purpose of getting answers, distributed in marginal groups, where the first three original groups received a common sign 0, and the last two signs 1.

The Exercise Motivation Inventory questionnaire – „EMI-2“. The Croatian version of the instrument (Markland & Ingledew, 1997) was used to evaluate the motives for adolescents' participation in physical activities. The questionnaire contains 54 items which refer to the 14 following motives for exercising: Socializing (e.g. "To spend time with friends."), Appearance (e.g. "Because it helps me look better."), Challenge (e.g. "Because it gives me goals for progress."), Competition (e.g. "Because I like trying to win during physical activities."), Enjoyment (e.g. "Because I take joy in hard work."), Prevention of health problems (e.g. "To avoid illness."), Agility (e.g. "To remain or become more agile."),

Maintaining and improving health (e.g. “To have a healthy body.”), Organism regeneration (e.g. “Because it makes me feel well.”), Peer pressure (e.g. “To fit in.”), Social recognition (e.g. “To prove myself to the others.”), Strength and perseverance (e.g. “To increase my strength and perseverance.”), Stress management (e.g. “It helps me decrease tension.”), and Body mass control (e.g. “To keep my figure.”).

The answers to items are marked on Likert-type scale (from 0 – completely untrue of me, to 5 – completely true of me). Results for each subscale are based on the arithmetic mean of specific items.

The questionnaire has shown satisfactory metric characteristics. The defined coefficients of internal reliability (Cronbach’s alpha) of this research for the subscales were: Socializing ($\alpha=0.90$), Appearance ($\alpha=0.87$), Challenge ($\alpha=0.85$), Competition ($\alpha=0.89$), Enjoyment ($\alpha=0.91$), Prevention of health problems ($\alpha=0.88$), Agility ($\alpha=0.89$), Maintaining and improving health ($\alpha=0.90$), Organism regeneration ($\alpha=0.83$), Social recognition ($\alpha=0.87$), Strength and perseverance ($\alpha=0.92$), Stress management ($\alpha=0.86$), and Body mass control ($\alpha=0.85$). The results are similar to those from the research done on Croatian sample by Šimunić & Barić (2011).

Depression, Anxiety, Stress Scale – DASS-21. That 21-item scale (Lovibond & Lovibond, 1995) is used for the evaluating the current level of unpleasant emotional states – depression, anxiety and stress. The claims are evaluated on a four-point Likert-type scale, where the lowest point means, “It did not apply to me in the least”, and the highest point means, “Almost completely or most of the time applied to me”. The

scale contains three subscales with seven items each: Depression – subscale of low positive affect (e.g. “I had dry mouth.”), Anxiety – the measure of physiological excitement (e.g. “I could not experience any positive emotion.”) and Stress – the measure of non-specific negative affect (e.g. “I was trembling.”). The participants were expressing the degree of agreement with the given items, evaluating how many times in the past week they experienced a negative emotional state described in, for example, the claim “It was hard for me to relax”. The scores on each subscale vary from 0 to 21. Total score of an individual subscale is achieved by adding the evaluations of the contingent items, provided that the higher score marks higher degree of depression, anxiety and stress. The official version of the translated DASS-21 scale was used in this research, and it is available on:

<http://www2.psy.unsw.edu.au/dass/Serbian/Serbian.htm>.

The internal consistency expressed by Cronbach’s alpha coefficients extremely high ($\alpha=0.91$ for the complete sample). For the subscales, the internal consistency is: Depression ($\alpha=0.92$), Anxiety ($\alpha=0.90$) and Stress ($\alpha=0.88$).

Results

With the purpose of examining the statistically significant differences of the motives for participating in physical exercising, as well as the differences in items on the depression, anxiety and stress scale, firstly the frequency of adolescents’ participation in physical exercising is presented in Table 1.

Table 1. Distribution of participants by sex compared to the frequency and percentage of participation in physical exercise

Item	Total		Male adolescents		Female adolescents	
	N	%	N	%	N	%
Never	38	11.47	15	8.92	24	14.63
Rarely	46	13.85	18	10.71	28	17.03
1–3 times a month	53	15.96	28	16.66	24	14.63
1–2 times a week	77	23.19	32	19.04	50	30.48
3–4 times a week	81	24.39	48	28.57	36	21.95
5 or more times a week	37	11.14	27	16.07	8	4.87
Total	332	100.0	168	100.0	164	100.0

The results show that the highest weekly frequency of exercising is 3 to 4 times, and that there

is the smallest number of participants who exercise 5 or more times during a week. Analyzing the

participation of the sexes, it is evident that the biggest number of male adolescents exercise 3 to 4 times a week, whereas female adolescents most often exercise 1 to 2 times a week. The percentage of high school seniors who exercise rarely or never is higher with females than with males.

What is more, in the research conducted using nonparametric rank-sum test, Mann-Whitney U test, the difference of mean value (median) was determined between the two peer groups of participants (Table 2).

Table 2. Gender differences between male and female adolescents in the frequency of in participating physical exercise

Item	Sum of Ranks		U	Z
	Male adolescents	Female adolescents		
How often do you exercise?	17469.00	24726.00	6475.03	-4.79***

Legend: *** – $p < 0.01$

As expected, the results of the two independent samples indicate that there is a statistically significant difference between male and female adolescents in participating in physical activities ($p < 0.01$).

Below, the basic descriptive parameters, arithmetic mean (M), standard deviation (SD), The

Kolmogorov–Smirnov test (K-S), skewness coefficient (Sk) - symmetry indicator of the result distribution curvature and kurtosis coefficient (Ku) – indicator of the homogeneity of the result distribution variance on the “EMI-2” questionnaire subscale (Table 3) are being discussed.

Table 3. Descriptive parameters of the motives for physical exercising

Subscale	Total	Male adolescents	Female adolescents	Sk	Ku	K-S
	M±SD	M±SD	M±SD			
Socializing	2.31±1.38	2.81±1.29	2.05±1.46	0.17	0.65	0.805
Appearance	3.63±2.01	3.32±1.12	4.02±1.20	-1.03	0.29	1.079
Challenge	3.05±1.27	3.54±1.22	2.96±1.32	-0.62	0.32	0.768
Competition	2.17±1.46	2.90±1.54	1.73±1.29	0.58	-0.40	1.280
Enjoyment	3.26±1.28	3.83±1.18	3.35±1.42	-0.70	-0.71	0.877
Prevention of health problems	3.58±1.33	2.92±1.35	3.42±1.31	-0.71	-0.29	0.886
Agility	3.40±1.12	3.36±1.22	4.08±1.07	-1.22	-0.17	0.159
Maintaining and improving health	4.25±1.07	4.02±1.11	4.15±1.08	-1.29	0.29	0.802
Organism regeneration	4.19±1.05	4.10±1.05	4.12±1.01	2.58	1.89	1.075
Peer pressure	0.92±1.17	0.09±0.83	0.56±0.93	0.77	1.12	0.748
Social recognition	1.56±1.22	2.03±1.35	1.23±1.12	-1.13	8.87	1.281
Strength and perseverance	3.72±1.20	3.94±1.06	3.92±1.23	-0.82	-0.20	0.878
Stress management	3.36±1.52	3.42±1.20	3.35±1.25	-0.47	0.83	0.833
Body mass control	2.95±1.50	2.73±1.42	2.96±1.50	-0.46	0.18	0.156

Data from Kolmogorov-Smirnov test show that the result distribution of the questionnaires does not deviate statistically significantly from the normal

(Gaussian) distribution, which points to the appropriateness of the measuring instrument.

Reviewing the table, we can notice that the participants believe that the most important motives for the participation in physical activities are Maintaining and improving health and Organism regeneration, while the importance of the motive of Peer pressure is minimal. On the one hand, the response analysis on the level of individual items has shown that the male adolescents consider Strength and perseverance and Organism regeneration most important incentives for participation in physical activity, whereas they give Peer pressure minimal importance. On the other hand, female adolescents

believe that the most important motive for participation in physical activity is Maintaining and improving health, Agility and Organism regeneration, whereas they too give the motive of Peer pressure minimal importance.

With the goal of examining the difference of participation in physical activity between male and female adolescents on the depression, anxiety and stress scales, arithmetic mean (M), standard deviation (SD) and parametric Student's t-test for independent samples were measured (Table 4).

Table 4. Gender differences between arithmetic mean of male and female adolescents on the DASS-21 scale

Item	Male adolescents	Female adolescents	t
	M±SD	M±SD	
Stress	4.92±4.47	5.86±4.56	-2.47**
Anxiety	2.81±3.27	3.48±3.30	-2.17*
Depression	4.03±4.35	4.53±4.64	-1.43

Legend: * – $p < 0.01$; ** – $p < 0.05$

The measured quantitative data show that, in regard to sex, there is a statistically significant intergroup difference in self-assessment of the items on the depression, anxiety and stress scale with male and female participants who, to a different degree, participate in sport activities. Going over the measurements of the DASS-21 questionnaire, regarding the sex, it can be observed that the female participants achieved higher score on the stress ($M=5.86±4.56$), anxiety ($M=3.48±3.30$) and depression ($M=4.52±4.35$) variables. Using Student's t-test, it can be noted that the differences of arithmetic means between male and female adolescents are statistically significant when it comes to stress ($t=2.63$, $p < 0.01$) and anxiety ($t=-2.17$, $p < 0.05$) variables, whereas with the numerical variable of depression, the distribution between sexes is not statistically significant.

With the intention of examining the differences of the items of the DASS-21 scale with adolescents who take part in physical exercising, the results of the standard parametric Student's t-tests for independent samples in Table 5 indicate that there is a statistically significant difference between arithmetic means in the depression dimension with adolescents who stated that they rarely or never participate in physical activities and those who stated that they exercise three or more times a week. This finding represents the probability higher than 95% that the statistical difference, regardless of the scope, is not accidental. On the contrary, significant difference between two samples regarding the categorical stress and anxiety variables is not determined, which indicates that the variables 'do not help' explain the variations, that is, that such difference probably does not exist with adolescents).

Table 5. The differences in self-assessment in the dimensions of DASS-21 questionnaire with adolescents who, to a different degree, participate in physical exercise

“How often do you exercise or take part in sport?” extreme groups	Rarely or never	Three or more times a week	t
	M±SD	M±SD	
Stress	6.03±4.58	5.12±4.23	1.37
Anxiety	2.96±3.61	2.17±3.28	1.05
Depression	4.68±4.54	3.01±3.63	2.27*

On the other hand, the results of the parametric Student’s t test presented in Table 6 bring forward, with the significance of the risk lower than 5%, the fact that there is no statistically significant difference between arithmetic means in the categorical variables

of the items of DASS-21 questionnaire with adolescents who, to a different degree, participate in physical exercise. This points to the fact that the differences are accidental, not systematic).

Table 6. The differences in self-assessment in the dimensions of Depression, Anxiety, Stress Scale (DASS-21) questionnaire with adolescents who, to a different degree, participate in physical exercise

‘How often do you exercise?’	Never	Three or more times a week	t
	M±SD	M±SD	
Stress	6.82±4.54	6.23±4.86	0.75
Anxiety	3.96±3.38	3.34±3.12	0.43
Depression	5.03±4.85	4.36±4.47	0.56

Discussion

As expected, the results of the applied analyses have shown that the motive for maintaining and improving health is typical, for which male and female adolescents partake in physical activity. Also, as anticipated, it proved that, compared to female adolescents, male adolescents spend most of their free time participating in physical activities. Furthermore, in the male subsample, it is noted that they participate in physical activity mostly 3-4 times a week, and in the female sample that number is 1-2 times a week.

Many researches have dealt with examining physical activities and motives for participating in them. The research done by Engelberg et al. (2016) and Vasankari & Hankonen (2016) as well as determined that, while planning physical activities, male adolescents express more perseverance, belief in their own success and need less incentives than female adolescents do for participating in physical

activities. The results of the research done by Williams & Yeo (2016) have shown that the psychological factors of self-regulation and self-motivation are dominant predictors for partaking in physical activities. It seems likely, that for our sample of male adolescents as well, that was the crucial factor for being more persistent in physical activity than female adolescents. It is important to pay attention to gender differences while creating specific physical activity regimens, that is, to adjust them to female adolescents.

In this research, male adolescents self-assessed that endurance, revitalization, enjoyment and stress management are the most important motives for participating in physical activity. However, with female adolescent from our sample, motives of stress, enjoyment, strength and endurance are less emphasized, while the motives of maintaining and improving health, agility, revitalization and appearance are dominant. In their research Meyer et

al. (2016) put forward the fact that, for participating in physical activities, the motive of enjoyment is more dominant with male than with female adolescents.

The descriptive data of this study also point to the relevant differences between the arithmetic means of the motive of competition, where male adolescents express higher estimates than female adolescents. Furthermore, the motivation for participating in physical activities is slightly higher with male than with female participants, which is in accordance with their higher results in the frequency of physical exercising. It is interesting that, with both sexes, the external motives such as: peer pressure, social recognition and competition take last place, whereas the motives: body mass control, physical appearance, stress and maintaining and improving health are more present with female than with male adolescents.

In the research done by Sebire et al. (2016), it has been established that, during exercising, male adolescent is statistically more motivated by enjoyment than female adolescents are, whereas female adolescents are statistically more motivated by agility and body mass control. Examining gender differences in the motivation for participating in physical activities, Morgan et al. (2016) also confirm that when it comes to physical activity, female participants are more emotionally incited by body mass control, physical appearance, stress management, competition and maintaining and improving health, and male participants are motivated by socializing, social recognition and ego-oriented factors of strength and perseverance. Our research has confirmed the finding that female more than male adolescents is generally concerned with their physical appearance and care for their bodies.

Regular physical activity of female participants causes weight loss, better body perception and more confidence, which will further motivate them to persevere in physical activity, as it is stated in the study carried out by Kwok-Kei and associates (2016). This finding corresponds to the results of our research, where female adolescents are, for the purpose of body mass control, statistically more motivated to participate in physical activity than male adolescents are. Besides, the motive of physical

appearance, that is the motive of strength and perseverance, is important to males as well, but they primarily aim at gaining muscle mass while with females, the main motive is mostly weight loss, as the research shows (Rachel, Marika, & Levina, 2016).

In our research, apart from the motive of physical appearance and weight loss, the important differences between arithmetic means are established for the motive of competition. The research finding suggests that female adolescents are, due to school obligations, used to a sedentary lifestyle but are aware that sitting for long periods at school and home does not affect their health positively. That is why physical activity makes action easier. Seeing how female participants are less motivated by ego-oriented factors than male participants, it is assumed that they will in motives of action and physical appearance achieve higher results, because physical activity does not mean challenge and competition but certain level on which they maintain and improve their health and perform daily chores with more ease and success.

The female participants in this research cite lack of time, laziness, lack of habit, fatigue from other responsibilities and health reasons as obstacles to participating in physical activities, while male adolescent, in addition to lack of time, mention burden of responsibilities and disinterest. The findings of this research are in accordance with the study by Cox (2005).

Overview of the empirical results of our research indicates that there is statistically significant difference between sexes on the stress and anxiety variable, showing that they were more present with female than with male adolescents. Research findings also show that on the items of the DASS-21 scale, with female participants, there is no significant difference between the group which exercises rarely or never and the one which exercises three or more times a week. With male participants, the difference was significant only with the depression variable. However, in the research done by Šimunić & Barić (2011), and Greblo, Pedišić, & Jurakić (2008), there is a claim that female participant who exercised three or more times a week had higher level of self-assessed physical health. In addition, having access to the

differences between arithmetic means of the motive of stress management, we can see that female adolescents exhibit lower results. That is why it is expected that the female subsample does not participate in physical activity with the same intensity and for the same reasons male adolescents do. At the same time, some other activities of female participants also reduce the symptoms of stress more than physical activity, that is, they are not the result of accidental result variation around the common arithmetic mean but are created in the female adolescent population.

Even though the satisfactory psychometric characteristics of the measuring instruments used were evaluated in this transversal study, it is important to mention couple of methodological flaws that would be useful to bear in mind during future researches. The first limitation concerns the used measuring instruments which were based on self-assessment. The second limitation concerns the variability measures and testing methods of self-assessing the differences between the two arithmetic means which did not give clear answer on causal relationship between the analyzed variables. Despite the mentioned methodological limitations, his research has theoretical and practical value.

In the future longitudinal research, the sample of participants should include all phases of adolescence, where all the significant differences in motivation and frequency of participation in physical exercising would be examined. One should also take into account personal, group cognitive and social factors which influence participation in physical activity in adolescent population.

The application of foreign measuring instruments (Adolescents' physical activity participation motivation questionnaire and the depression anxiety and stress scale) has shown good metric characteristics, which points to their use with Serbian population. The research findings have confirmed the research hypothesis that there is statistically significant difference in the frequency of physical activity participation in favor of male adolescents, therefore the participants who more frequently take part in physical activity will achieve relevantly lower

scores on the depression anxiety and stress scale. Furthermore, in regard to gender, the existence of statistically significant difference in the physical activity participation motivation was determined: with the participants of both genders, the common dominating motives were maintaining and improving health and organism reinvigoration, where male high school seniors found the motives of strength and perseverance in physical activity participation most important, and female adolescents found agility to be the most important. It was confirmed that male adolescents, who more often take apart in physical activities, manifest relatively lower scores on the depression scale when compared to female adolescents, while no statistically significant difference in any dimension was found on the anxiety and stress scale.

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