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**PHYSICAL ACTIVITY AND SELF-RATED HEALTH: SOCIAL  
ISSUE**

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**Abstract**

The article is devoted to the study of the relationship between the level of physical activity and self-rated health of school-aged children. The issues of the influence of physical activity on various indicators of the physical, mental and social components of health are widely studied now. The results of a number of studies reveal that the components of the health of school-aged children have a significant relationship with indicators of physical activity and physical fitness. However, the question of the nature of the relationship between physical activity and self-assessment of indicators characterizing the health of schoolchildren remains insufficiently studied. The data presented in the article were obtained during the 2017/2018 research cycle of the cross-national HBSC study in the Russian Federation. Follow indicators were selected for the study: the indicator of physical activity from moderate to vigorous intensity, and a group of indicators characterizing schoolchildren's self-esteem of health, mood, sleep quality, activity and emotional state. School-aged children engaged in physical activity for at least an hour 7 times a week more positively assess their health, mood, sleep quality, activity and emotional state. The next task is to clarify whether this phenomenon is an indicator of their general positive attitude as a result of a higher level of physical activity, or their health is actually better due to a higher level of physical activity.

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*Keywords:* Physical activity, self-related health, adolescents



## 1. Introduction

Many people realize the benefits of exercise for health and well-being, but by no means all make daily physical training and sports a part of their life. At the same time, the WHO pays the closest attention to proper nutrition and physical activity from moderate to vigorous intensity for at least 60 minutes every day, since these two components can take the health of both children and adults to a qualitatively new level and prevent some non-communicable diseases, such as, for example, cardiovascular diseases or diabetes.

Assessment of the impact of physical activity on the growth and development of adolescents has already long attracted researchers; in recent decades, this topic has become especially relevant due to adolescents' passion for low-active kinds of activities, active introduction of the information environment and virtualization of many areas of adolescent communication (Koroleva et al., 2014). Physical activity is believed to be an important determinant of health status, including functioning of the cardiovascular system, skeletal integrity and psychological well-being (Kleszczewska et al., 2017). Health self-assessment (HSA) is a widely studied indicator among adults and the elderly, but is not often studied in adolescents; however, it is at this age that the perception of health self-assessment develops (Malta et al., 2018; Wade & Vingilis, 1999).

## 2. Problem Statement

The recent years have witnessed an increasing interest of researchers in the problem of self-rated of adolescent health. For example, the studies by Fyodorov and Erlikh (2016) determined the distinctive features of the phenomenon of “adolescent health” based on the analysis of the behavioral and psychosocial factors of adolescent health, including self-rated health, medical awareness, position of health in the system of life values, harmful habits, environmental attitudes, stress factors and physical activity (Fyodorov & Erlikh, 2016). The longitudinal studies by Crocker et al. (2006) to assess the relationship of the physical self-concept with the behavior and emotions in adolescent girls showed that specific physical self-awareness is an important predictor of physical activity.

The studies by Norwegian scientists Breidablik et al. (2008) involving 2800 adolescents and using regression analysis have shown that adolescents conceptualize health as a construct related with medical, psychological, social factors and lifestyle. The results of the Russian-British comparative study by Hagger et al. (1998) evidence the children's ability to distinguish four different aspects in the field of physical self-worth (PSW): perceived sports competence (Sport), physical fitness (Condition), attractiveness of the body (Body) and physical strength (Strength). Similar approaches were used in the studies by Biddle et al. (1993), where four subdomains of physical self-worth were used based on factor analysis: sports competence, body attractiveness, perceived strength and physical condition. The studies by Inchley et al. (2011) emphasize the importance of physical self-perception in relation to the behavior of adolescents involved in physical activities. For example, among adolescent boys, the high perceived competence increased physical activity 3.8 times. Among older girls, the high self-efficacy of physical exercises increased physical activity 5.2 times. The results of the study by Raudsepp et al. (2002) show

that physical self-awareness is a significant correlate of physical activity and physical fitness in children and adolescents.

Thus, since self-assessment of physical and psychological components of health is formed in childhood and adolescence, and its development has not been studied to a large extent, further understanding and study of this topic (problem) is required.

### **3. Research Questions**

Correlation between physical activity and self-rated health of school-aged children.

Age-related characteristics of physical activity and self-rated health of school-aged children.

Presence of gender differences in the self-assessment of the studied indicators.

### **4. Purpose of the Study**

To reveal the relationship between the indicators of the level of physical activity and schoolchildren's self-rated health.

### **5. Research Methods**

Taken as the basis were the data of the international study "Health Behaviour in School-aged Children" for the 2017/2018 research cycle in Russia (Gavrilov et al., 2018). The research is conducted every four years and provides a range of indicators of the health and well-being of children and adolescents of 11, 13 and 15 years of age based on the schoolchildren's responses to the questionnaire (Inchley et al., 2020). Two indicators were selected for the study: the indicator of physical activity from moderate to vigorous intensity, and the indicator of the schoolchildren's self-rated health. The consideration of the PA indicator involves two groups of students of 11, 13 and 15 years of age: the first group is schoolchildren whose level of physical activity meets the WHO recommendations: PA from moderate to vigorous intensity for at least 60 minutes a day, seven days a week (11 y.o. (girls n=112, boys n=154); 13 y.o. (girls n=75, boys n=124); 15 y.o. (girls n=92, boys n=152). The second group is the schoolchildren practicing PA for at least an hour three times a week (that is, in fact, they only attend physical education classes at school) (11 y.o. (girls n=140, boys n=130); 13 y.o. (girls n=217, boys n=162); 15 y.o. (girls n=289, boys n=203). The schoolchildren were asked the following question about the level of physical activity: "Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?" The question regarding the self-rated health by schoolchildren was as follows: "Would you say your health is...?". In this case, only one of the answer options was taken into account, namely "excellent" (other answer options: "good", "fair", "poor"). Thus, the study allows tracing the relationship between the regularity of physical activity and schoolchildren's assessment of their health as excellent.

## 6. Findings

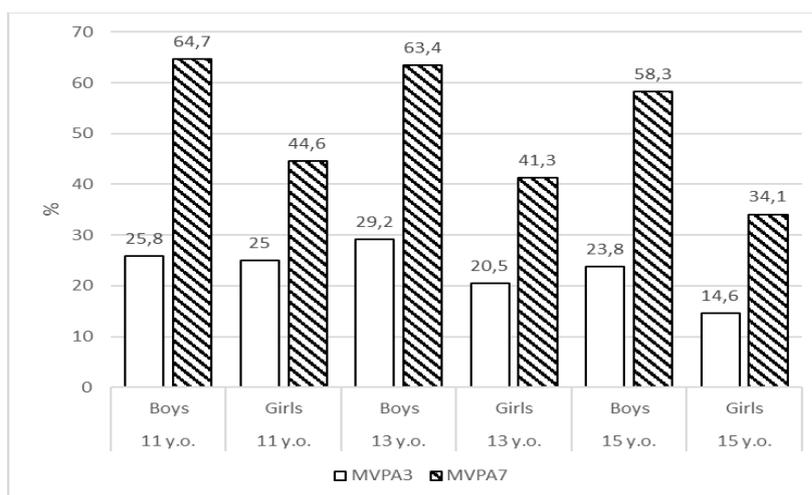
Depending on the level of physical activity the adolescents were preliminarily divided into two groups:

- MVPA 3 – adolescents engaged in PA for at least an hour 3 times a week;
- MVPA 7 - adolescents engaged in PA for at least an hour 7 times a week;

The reliability of the differences of the responses in MVPA3 and MVPA7 groups was compared by using the nonparametric Mann–Whitney U-test.

Our attention was drawn to the questions of the questionnaire rather evidencing the psycho-emotional components of health. Since adolescence is known to have specific features related with emotional instability and motivation (Puhov et al., 2020).

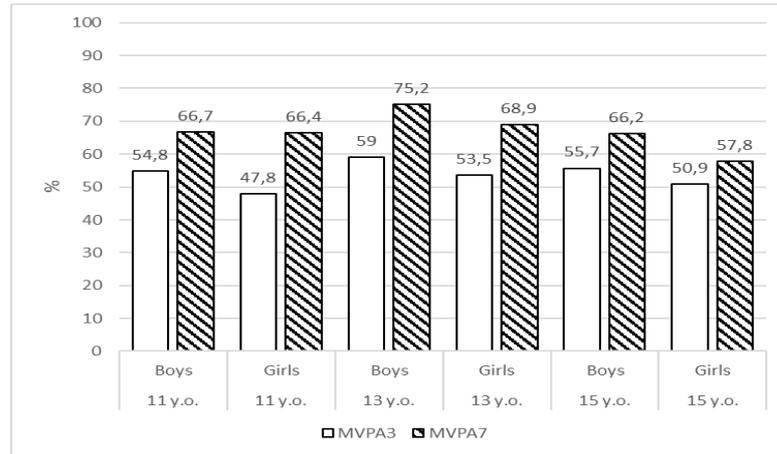
Our research has shown that when answering the question “Would you say your health is...?” the overwhelming majority of 11-15-year-old adolescents of the MVPA 7 group rate their health status as excellent, and the boys' self-assessment in this indicator is higher than that of girls and tends to decrease with the increase of the age from 11 to 15 years (from 64.7 to 58.3%, respectively) (Figure 01).



**Figure 1.** The share of schoolchildren in the MVPA3 and MVPA7 groups who rate their health as “excellent”. The differences between the MVPA3 and MVPA7 groups are significant for all age groups ( $p < 0.01$ ) except 13-year-old girls

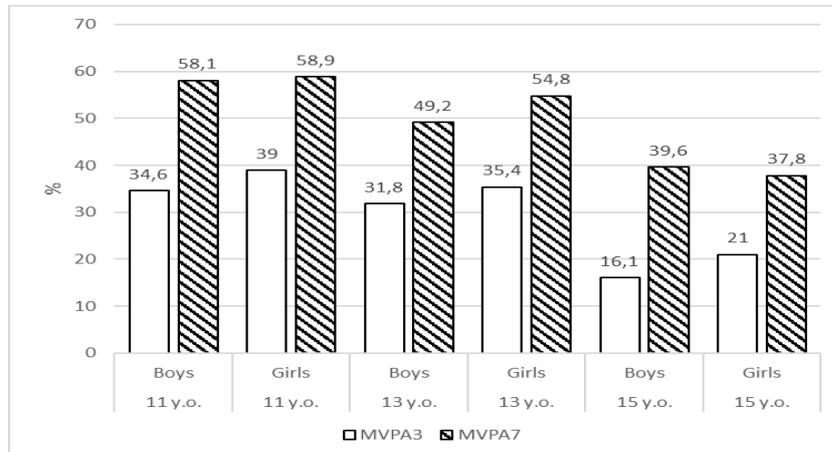
Please replace this text with context of your paper. In the MVPA 3 group of adolescents, the results on this issue are 2-2.5 times lower; with boys the maximum percentage is shown in the group of 13-year-old adolescents (29.2%), girls show lower self-rated health, and the indicator decreases with the increase of the age from 11 to 13 years, the indicator decreases (from 25% at 11 years to 14.6% at 15 years).

When responding to the statement “My sleep was restless” (Figure 02), the overwhelming majority of adolescents in the MVPA7 group choose the answer “rarely or none of the time” (from 75.2% at the age of 13 years, 66.2% at the age of 15 years old among boys, and 68.9 to 57.8, respectively, among girls), the responses of children of the MVPA3 group are similar with lower values (54.8% at the age of 11 years, 59% at the age of 13 years and 55.7% at the age of 15 years among boys, and 47, 8%, 53.5% and 50.9%, respectively, among girls).



**Figure 2.** The share of schoolchildren in MVPA3 and MVPA7 groups reporting that their sleep was restless “rarely or none of the time” during the past week. The differences between MVPA3 and MVPA7 groups are significant for 11-year-old girls and 13-year-old boys and girls ( $p < 0.05$ )

With the answer “All of the time (5-7 days)” to the statement “I was happy” (Figure 03), in the group of MVPA 7 adolescents there was a downward trend in the percentage of respondents with the age increase among boys (from 58.1 of boys of 11 years to 39.6% of 15-year-olds). Among girls of this group, there is also a downward trend from 11 years (58.1%) to 13 years (54.8%), with a significant decrease by 15 years (37.8%).

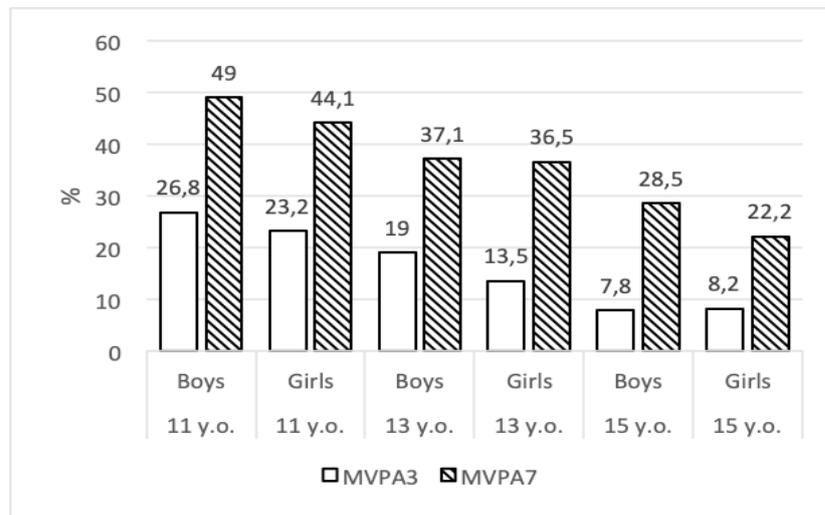


**Figure 3.** The share of schoolchildren in MVPA3 and MVPA7 groups reporting that they were happy “all of the time” during the past week. The differences between MVPA3 and MVPA7 groups are significant for boys and girls ( $p < 0.05$ )

The values in MVPA 3 group are 1.5-2 times lower compared to MVPA 7 group. There is a downward trend in the percentage of respondents with the age increase both among boys (from 34.6% of 11-year-old boys to 16.1% 15-year-old adolescents) and girls (from 39% of 11-year-old girls to 21% of 15-year-old girls).

When responding to the statement “I have felt cheerful and in good spirits” (Figure 04), the response “all of the time” was chosen by a larger number of respondents in the MVPA 7 group. There is also a downward trend in the percentage of respondents who chose this answer with the age increase.

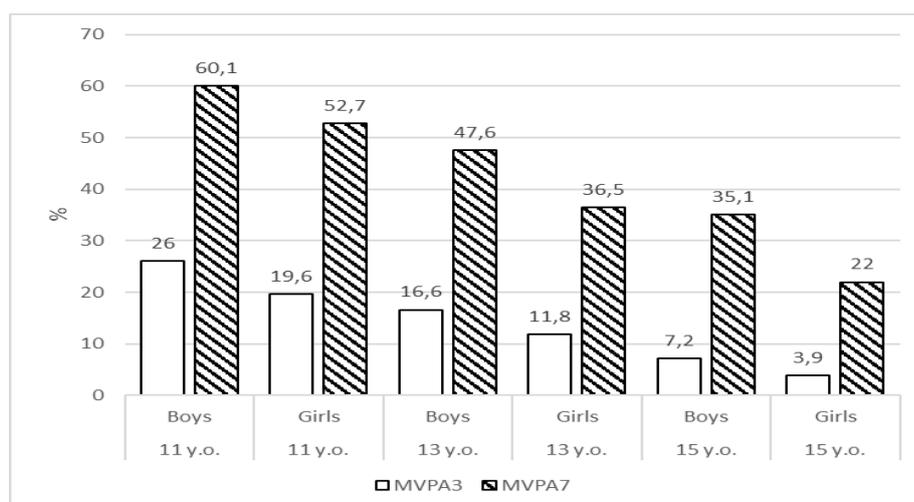
Boys in all age groups (11-13-15 years old) choose this answer more often than girls. In the MVPA 3 group, the values are 2-3 times lower than in the MVPA 7 group both among boys and girls.



**Figure 4.** The share of schoolchildren in the MVPA3 and MVPA7 groups who reported that during the last two weeks they have felt cheerful and in good spirits “all of the time”.

The differences between MVPA3 and MVPA7 groups are significant for boys and girls ( $p < 0.01$ )

When responding to the statement “I have felt active and vigorous” all of the time (Figure 05), the response “all of the time” was chosen by a larger number of respondents in the MVPA 7 group. There is also a downward trend in the percentage of respondents who chose this answer with the age increase both among boys and girls, with lower values in different age groups of girls. In the MVPA 3 group, the same trends were shown with 1.5-3.5 times lower values compared to the MVPA 7 group both among boys and girls.



**Figure 5.** The share of schoolchildren in the MVPA3 and MVPA7 groups who reported that over the past two weeks they have felt active and vigorous “all of the time”. The differences between MVPA3 and MVPA7 groups are significant for boys and girls ( $p < 0.01$ )

## 7. Conclusion

Children who are more physically active are more likely to report that their health is excellent, they usually feel cheerful and in good spirits, active and vigorous all of the time (reliable in most cases) compared to their less physically active peers. Physical activity has a positive impact on adolescents' health and can be used as health promotion means. The next task is to clarify whether this phenomenon is an indicator of their general positive attitude as a result of a higher level of physical activity, or their health is actually better due to a higher level of physical activity.

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