

Physical activity of pupils: Engagement of pupils younger school age in extracurricular sports activities

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Abstract: One of the most important health problems of today's society is hypokinesia accompanied by obesity. The assumption is that reduced physical activity has a large negative impact on the school population. The problem of reduced commitment and involvement of pupils in extracurricular activities is increasingly evident in recent times, which results in a number of negative health effects on the human body of an individual. This study comprised a group of pupils from first to the fourth year of elementary school in Pale (city East Sarajevo, BIH). The total sample consisted of 175 pupils (84 male and 91 female) age 11 to 14±0,5years. As a way of gathering the required information, we used an anonymous questionnaire of the open type in order to collect information about pupils involvement in extracurricular sports activities. The survey was conducted in October 2017 and all the pupils voluntarily participated in the study. Based on the survey results have been obtained the necessary information to reflect the very good of physical activity, of the pupils population. Of the total sample of pupils, the survey confirmed that 100% are physically active pupils. This is an encouraging result because today we have less physically active school children.

Key Words: pupils, engagement, physical activity, health



Ratko Pavlović working as a Professor of Sports and Rehabilitation Sciences at the University of East Sarajevo, He received his Ph.D. degree in 2006 at the Faculty of Physical Education in Eastern Sarajevo. He participated in more conferences, scientific conferences and symposia. He published more of 180 scientific papers. He is the author of 5 textbooks and one practicum of Athletics. Also, he serves as a member of the editorial board of 50 international scientific journals. He is a member of more international scientific organizations which includes Athens Institute for Education and Research, A World Association of Academics and Researcher, World Academy of Science, Engineering and Technology, Science Research Association and the Global Academic Organization, Sports Medicine Association of Serbia and Anthropological Society of Serbia. His current research interests are Track and Field, Anthropometrics, Motor Control, Sports science, Motor skills and Physical Education.

1 Introduction

Hypokinesia (disease of modern society), is on the rise among adolescents of both sexes. The consequences hypokinesia are numerous, in terms of damage to health of the individual and often the health of the wider population. Hypokinesia is often more expressed in older than in younger school age. Younger children, unconsciously, mostly through the game, neutralize this problem, and with age this problem increases [1]. However, some studies show that this period is very sensitive on this issue. Even 13-14% of children in the U.S. are defined as obese, while in England is 10-17%. In 2001, researches about obesity, which included six countries (Brazil, United Kingdom, Hong Kong, Netherlands, Singapore and the United States) found that children aged 4-11 have overweight rate of 2-3% between 1984 and 1994 the number of obese children has increased to 50% [2]. The best method to prevent and stop this rapid growth in obesity is a combination of regular physical exercise and a balanced nutrition [3, 4]. Boot et al. conducted a study in order to determine changes in the prevalence of overweight and obesity among young Australians (aged 7-15 years), 1969-1985. The

results showed that between 1985 and 1997 the prevalence of overweight and obese population has increased by 60-70%, obesity 2-4 times and a combination of body weight and obesity has doubled. The findings were consistent for both sexes. For the period 1969 to 1985 there were no changes in the prevalence of overweight and obesity in girls but among boys the prevalence of overweight increased by 35%, the prevalence of obesity has tripled, and the prevalence of overweight and obesity combined has increased by 60%. Studies of some authors in addition to monitoring of body dimensions follow the trend of development of motor skills. The results of the six-year follow-up of 296 patients (aged 10 to 16 years in 2001 and 2007) by Ekblom, et al. 2009 showed that there are no differences in BMI in sixteen year olds and low values of aerobic capacity and high BMI at age 10 years predicts obesity at the age of 16. There was no difference in the prevalence of overweight plus obesity between the sample 2001 and 2007. As a conclusion, normal weight and good aerobic fitness at 10 years old children reduce the risk of elevated BMI in relation to 16-year olds.

Extracurricular physical activity (EPA) performed after formal school hours comprises various sports and physical activities (PAs) performed in educational contexts. EPA aims to advance children's motor skills and physical health. Boys and girls typically engage in different physical activities and thus work separately. EPA was found to (a) decrease the number of time children spend in sedentary activities, such as sitting at home watching TV or playing video games [5]; (b) increase the amount of time children spend in PA [6]; (c) contribute to children's health status by decreasing the risk for obesity [7]; and (d) increase fitness components such as endurance, speed, strength, and motor coordination [8].

Various sports activities have been found to affect Bone properties in children; for example, combat sports [9]. Girls practicing gymnastics, where loading of body weight on the upper body muscles is eminent, were found to develop substantial upper bone strength [10], while girls dancing ballet, thereby loading weight on the lower body, developed greater strength in their lower body bones [11]. Similar results were reported in boys: amateur football players maintained a significant advantage in lower body bone.

It is known that the use of motor stimuli just within the regular physical and medical education classes is in most cases insufficient to cause significant improvements to anthropological status. Therefore, it is necessary to constantly encourage

students to engage in additional sports activities outside the regular classes according to their preferences [12]. Recent research on ontogenesis of schoolchildren and youth shows that the development of particular anthropological abilities and characteristics, especially the motor skills, should begin as early as possible, that is, during the periods when there are optimal endogenous and exogenous conditions, based on planning, programming and implementation of control of the physical exercise process [13].

An interesting study of physical abilities among adolescents was conducted by Heath, Pate, & Pratt, in 1993 and they came to the conclusion that with the age-specific motor skills stagnate while in the younger population are on the rise, especially if they are involved in some form of physical activity [14]. Helping children and adolescents to adopt physically active lifestyle is an integral part of health education and health promotion which services provide school nurses, family and community. Pender and Fox propose the motivational models and variables that can be identified, and which are required for further testing to determine their significance in the promotion of physical activity during childhood and adolescence [15, 16]. Heath et al., assessed engagement in physical activity 11 631 high school pupils in America [17] All pupils in grades 9 through 12, 37% reported engaging in 20 minutes of vigorous physical activity three or more times per week. Participation in vigorous physical activity was higher among boys than girls ($P<.01$) and higher among white students than among those of other races and ethnic groups ($P<.01$). Overall, 43.7% of boys and 52% of girls reported that they were not enrolled in physical education classes. Of the students who reported attending physical education class during the past 2 weeks, 33.2% reported exercising 20 minutes or more in physical education class three to five times per week. In contrast, rates of participation in varsity and junior varsity sports remained constant across grade levels, but participation in recreational physical activity programs showed a lesser magnitude and also decreased with advancing grade. More than 70% of students reported spending at least 1-hour watching television each school day, and more than 35% reported watching television 3 hours or more each school day. Participation in vigorous physical activity and physical education class time devoted to physical activity are substantially below the goals set in Healthy People 2000. As students move toward graduation, we observed disturbing declines in participation in community recreation programs and overall vigorous activity. Students appear to spend considerably more time watching television than

participating in physical activity. Public health efforts should focus on increasing the physical activity levels of our youth to enhance their current well-being and to reduce the risks of future chronic disease.

Based on several studies of children and adolescents in the United States and Israel presented the engagement of children in school physical activities [18]. They came to the conclusion that in adolescents and young adults are the benefits of physical activity, which should be continued later in life. Healthy habits in adolescence must continue into adulthood. It is also an activity of children and adolescents falling into adulthood.

In order to collect information about student involvement in extracurricular sports activities an anonymous questionnaire was prepared and Based on the survey results have been obtained the necessary information to reflect the relative lack of physical activity, of the studied population [19]. Of the total sample of pupils (82 male and 127 female), aged 15 to 18 years, the survey confirmed that only about 35% are physically active pupils. The alarming are the results which showed that with the increasing age of pupils they are less physically active, and in the higher years is an evident negative trend in physical activity (sports). The purpose of study [20] was to examine the effect of extracurricular physical activity (EPA) on bone properties, muscle strength, and motor coordination. Participants were 114 boys and 108 girls, aged 7-8 years, who were divided into several physical activities.

The results of this study indicate that the effect of EPA is associated with muscle strength and motor coordination. Several studies revealed a positive relationship between MS and extensive participation in sports activities high level gymnasts girls significantly strengthened their upper body muscles [21], and boys who maintained an amateur handball training regimen strengthened their limbs more than boys who participated in a general physical education program [22]. MC is the degree to which various parts of the body are synchronized to perform one task aimed at attaining the most efficient movement outcomes [23]. Sufficient coordination enables the movement to be executed with greater efficiency, and this new motor skills can be learned. Lack of coordination, on the other hand, results in activity avoidance and sedentary behavior [24].

The problem of this study was to determine the involvement of young school pupils in extracurricular sports activities.

2 Method

The study covered a population of elementary school-age pupils from VI to IX class of elementary school in Pale. The total sample consisted of 175 pupils (male 84, female 91), aged 11-14±0,5 years. As a way of gathering the required information, we used an anonymous questionnaire of the open type in order to collect information about student involvement in extracurricular sports activities.

Table 1Quantitative indicators physical activity of pupils

School Class	Total of sample	Male	Female	Percentage (%)	Kind of sport			
					Male	N (84)	Female	N (91)
VI class (11 years)	51	22	29	100%	Winter sports	1	Volleyball	25
					Volleyball	2	Dance	2
					Basketball	7	Winter sports	1
					Football	7	Combat sports	1
					Combat sports	5		
VII class (12 years)	46	22	24	100%	Volleyball	4	Volleyball	14
					Basketball	4	Gymnastics	6
					Football	7	Dance	4
					Winter sports	3		
					Combat sports	4		
VIII class (13 years)	43	20	23	100%	Football	4	Winter sports	3
					Volleyball	3	Volleyball	7
					Basketball	6	Combat sports	5
					Combat sports	5	Gymnastics	4
					Winter sports	2	Basketball	4
IX class (14 years)	35	20	15	100%	Football	5	Volleyball	10
					Basketball	3	Basketball	1
					Combat sports	7	Winter sports	1
					Volleyball	2	Gymnastic	3
					Winter sports	2		
					Tennis	1		
Total	175	84	91					

The survey was conducted by a professor of physical education in October 2017. It is important to note that all the students voluntarily participated in the study.

3 Results and Discussion

In the VI class, of 51 male and female pupils all (100%) were involved in some sports (physical) activity. Most are engaged in sports games (27 Volleyball, 7 Basketball, and 7 Football), combat sports (6), Dance (2) and winter sports 1.

In the VII class of 46 pupils, all practice a sport, are actively involved in extracurricular activities that are sports clubs. And in this age, the most dominant are sports games male and female (Volleyball, Football and Basketball), combat sport (male), gymnastics and dance (female).

The VIII class of 43 pupils, 100% practice a sport, are actively involved in sports. Dominant sports games for boys and girls (volleyball, basketball, and football), Combat and winter sports and gymnastics in girls.

In IX class, this includes the age of about 14 years, a nearly identical result. Out of 35 male and female pupils, all were physically active. The results are almost identical as for class VIII, where dominated by sports games, martial arts, gymnastics and winter sports (Table 1 & Figures 1-5)

In general, the results showed that it is observed the positive trend of involvement in extracurricular physical activity from 11 to 14 year (Table 1). Playing sports, as a form of physical activity is in a very positive. The total sample of 175 high school 100% of the population is engaged in extracurricular physical activities, ie. are involved in sports clubs. Today, physical activity is one of the most important factors for the normal development of the organism as a whole.

Tracking and evaluating the qualities and abilities is extremely important for optimal growth and development as well as for each person's health. The modern way of life turns children, students and youth into sedentary civilization with countless negative effects, most common one being the growing percentage of obese children and adults, with a tendency of early registration and monitoring of chronic diseases.

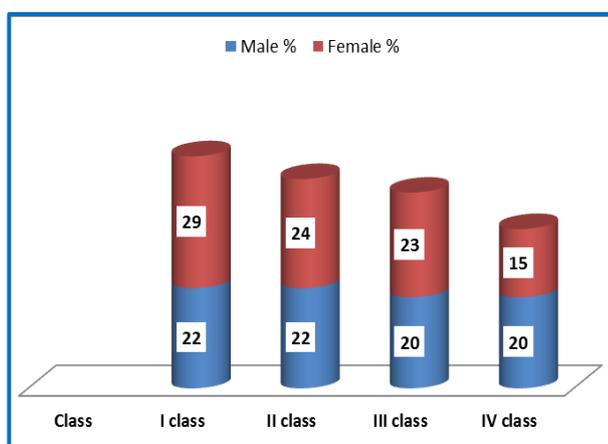
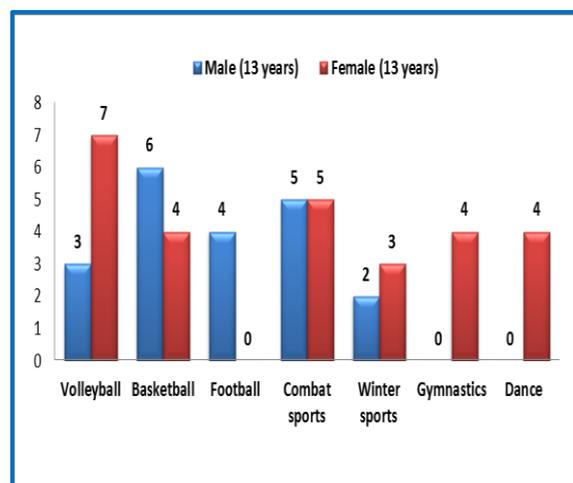
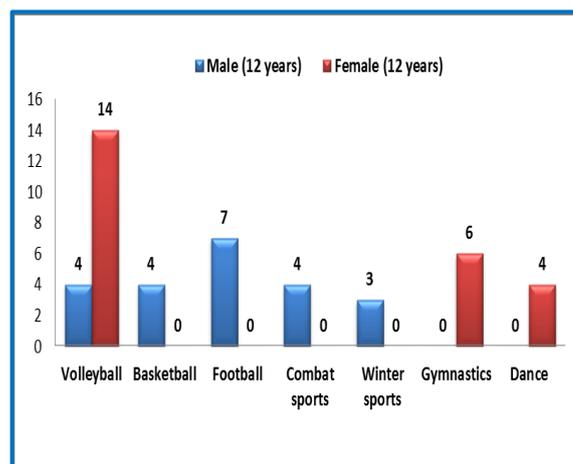
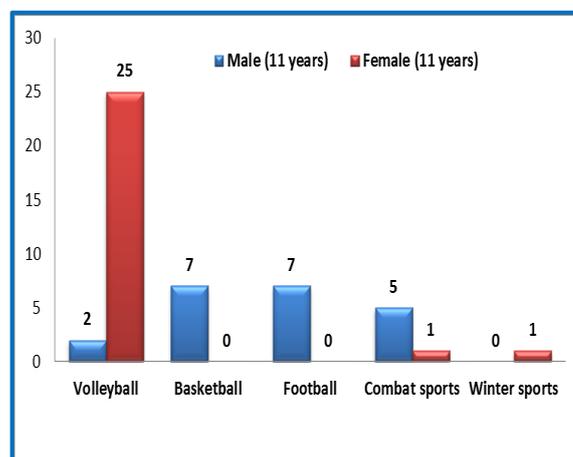


Figure 1. Percentage of physical activity of male and female pupils.

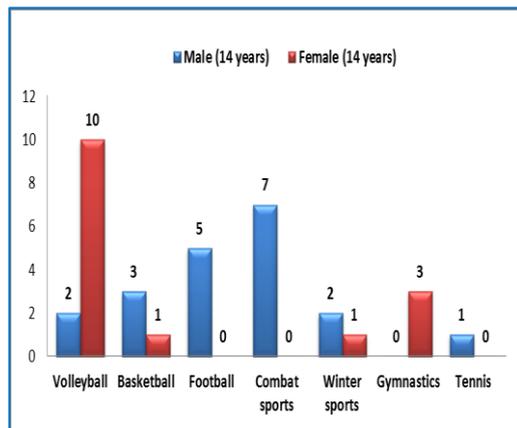


Figure 2-5. Physical activity of pupils elementary school

Unfortunately, such a trend continues even though the positive effects of regular physical activity were proven and consolidated in the Declaration of the World Health Organization WHO [25].

According to the definition of the World Health Organization, a person who during one week devotes less than 30 minutes to activities that elevate heart rate, cause heat exhaustion and shortness of breath, is physically inactive. Modern public health approaches encourage at least 30 minutes of physical activity per day. It is noted that children and youth do not spend the time estimated for psychophysical rest and recovery as best as they should, that is, they spend most of their time in sedentary inactivity, which can lead to unwanted consequences for the functionality and health of the organism [26].

According to the results of the survey on the health behavior of schoolchildren, conducted in 2002 (Federation of BiH), the rate of physically inactive students between 11-13 years old is 27.2%. The rate is lower for boys (21.3%) than for girls (33%). Physically inactive students are defined as those who are never active or are active two days per week or less. Students should be offered as much attractive contents as possible, adapt them to their age, the degree of their characteristics and abilities, the level of their motor skills and achievements or, in simple terms, enable each student to take the teaching process in accordance with the current state of their anthropological status [27]. These results are in contrast to ours, where the total sample is 100% physically active, which is rare at this age. These results are probably the result of a higher level of pupil awareness of the importance of physical activity, from an old one, and on the other, to proving to be a result in a certain sport they have chosen.

A comprehensive review of correlates of physical activity was conducted, and semi-quantitative results were summarized separately for children (ages 3-12) and adolescents (ages 13-18). The 108 studies evaluated 40 variables for children and 48 variables for adolescents. About 60% of all reported associations with physical activity were statistically significant. Variables that were consistently associated with children's physical activity were sex (male), parental overweight status, physical activity preferences, intention to be active, perceived barriers (inverse), previous physical activity, healthy diet, program/facility access, and time spent outdoors.

Eisenmann examined the relationship between physical activity, TV watching, and weight in U.S. youth ages 14 to 18 years [28]. Data from a nationally representative sample of 15,143 U.S. high-school students participating in the 1999 Centers for Disease Control and Prevention (CDC) Youth Risk Behavior Survey were examined. Prevalence rates of participation in the moderate physical activity (MPA), vigorous physical activity (VPA), and television watching (TV) were determined. The association between MPA, VPA, TV and the body mass index (BMI) and overweight status (BMI \geq 85th percentile of age- and sex-specific CDC/National Center for Health Statistics reference values) were examined by analysis of covariance and logistic regression. Overall, 45% reported participating in MPA \geq 3 d/week, 65% reported participating in VPA \geq 3 d/week, and 25% reported watching TV \geq 4 h/school day. Boys reporting six to seven bouts of MPA had a significantly lower BMI compared with boys reporting three to five or less than two. The mean BMI differed significantly between the lowest and highest levels of MPA groups in girls. The mean BMI was significantly lower in the highest VPA group compared with the other two groups in both sexes. There was a significant graded response for BMI across all levels of TV. Decreased levels of MPA and 3 to 4 days of VPA were significantly associated with an increased risk of overweight in boys when compared with those engaging in 6 to 7 d/week (odds ratio=1.26 to 1.37). A graded response existed between TV and overweight in both sexes. Boys and girls were approximately 20% to 25% less likely to be classified as overweight if they reported 2 to 3 hours of TV per day and approximately 40% less likely to be classified as overweight if they reported \leq 1 hour of TV per day compared with those who watched \geq 4 hours of TV. In general, youth who engaged in less physical activity watched more TV per week.

On the sample 878 adolescents aged 11 to 15 years, 42% of whom were from minority backgrounds Centers for Disease Control and Prevention body

mass index-for-age percentiles divided into 2 categories: normal weight (<85th percentile) and at risk for overweight plus overweight (AR+O) (>or=85th percentile) [29]. Overall, 45.7% of the sample was classified as AR+O with a body mass index for age at the 85th percentile or higher. More girls from minority backgrounds (54.8%) were AR + O compared with non-Hispanic white girls (42%) ($\chi^2(1)=7.6$; $P=.006$). Bivariate analyses indicated that girls and boys in the AR + O group did fewer minutes per day of vigorous physical activity, consumed fewer total kilojoules per day, and had fewer total grams of fiber per day than those in the normal-weight group. Boys in the AR + O group also did fewer minutes per day of moderate physical activity and watched more minutes per day of television on nonschool days than normal-weight boys. Final multivariate models indicated that independent of socioeconomic status (as assessed by household education level), girls had a greater risk of being AR + O if they were Hispanic or from another minority background (odds ratio [OR] = 1.65; 95% confidence interval [CI], 1.09-2.49) and a reduced risk of being AR + O as minutes per day of vigorous physical activity increased (OR = 0.93; 95% CI, 0.89-0.97). A low level of vigorous physical activity was the only significant risk factor for boys being AR + O (OR = 0.92; 95% CI, 0.89-0.95). Analyses based on meeting behavioral guidelines supported these findings and showed that failing to meet the 60 min/d moderate to vigorous physical activity guideline was associated with overweight status for both girls and boys. In addition, boys who failed to meet sedentary behavior and dietary fiber guidelines were more likely to be overweight. Of the 7 dietary and physical activity variables examined in this cross-sectional study, insufficient vigorous physical activity was the only risk factor for higher body mass index for adolescent boys and girls. Prospective studies are needed to clarify the relative importance of dietary and physical activity behaviors on overweight in adolescence. In the majority of studies have a proven negative effects of a lack of physical activity of children and youth resulting disruption of homeostasis, leading to increasing BMI, which is the first indication of the potential of certain diseases, even in young children [30].

From the available evidence [31] it appears that most Saudi children and adolescents do not meet the minimal weekly requirement of moderate to vigorous physical activity necessary for effectively functioning cardiorespiratory system. Further more, active Saudi boys tend to have favorable levels of serum triglycerides and high density lipoprotein-cholesterol compared with inactive boys. Sixteen percent of Saudi schoolboys are considered obese (fat

content is above 25% of body mass). Body fat percent of Saudi boys seems to have increased over the past decade. Body fatness correlated significantly with several coronary artery disease risk factors. Based on the available evidence, promotion of physical activity among Saudi children and adolescents appears warranted and national policy encouraging active living is also needed.

Consequences hypokinesia are numerous, and mostly refers to diseases of the cardiovascular system, the respiratory system's asteroid belt and the occurrence of diabetes. If you compare the results of this study with the results of previous studies that conclude that our sample is within the boundaries that have not yet alarming, but they are sensitive it can be a cause for alarm. Obese people die on average four years earlier than people who have normal weight, the researchers at City University. The greatest increase in the risk of premature death was observed in people who are obese in middle age, according to the American Journal of Public Health. The study was based on data collected since 1988. year, and it is proved that obesity is associated with at least a 20% increased risk of death from all causes. Scientists estimate that the total negative effect of obesity on health greater than believed, and in particular are concerned about the increasing number of overweight among children and teenagers. A recent Danish study has been published which claims that men who are obese in the early twenties at two times greater risk than their peers of average weight to die before the age of 55 years. Otherwise, the American Medical Association in June 2013th officially included among the diseases obesity [19].

Increased BMI, WHR and RPI are just some of the indicators of disease, such as heart diseases or diabetes mellitus. Although it has become customary to present high value of these criteria in modern societies, it is surprising to see an increase of these values in athletes. Joyce et al., found that even $\frac{1}{4}$ of American players have the second degree of obesity [32]. Ekblom et al., have shown the correlation of physical inactivity (low levels of aerobic capacity) with predict in of obesity in old age [33]. The negative correlation of insufficient activity with functional abilities confirmed [34].

Butler et al., conducted a survey of 54 female students freshmen to investigate the effectiveness of diet, physical activity and weight change associated with travel from home to college for 5 months [35]. The results showed that, although it was much-reduced calorie intake, increased body weight parameters can be attributed to a significant reduction in overall physical activity. Some authors

[36-39] studies received higher percentages of body fat values of students, which is an indicator of increased BMI values and reduced physical activity, although it is a relatively young and healthy population. Differences existed between female and male subjects, where the girls showed significant malnutrition and men in general, nutritional status.

Sedentary behavior research conducted with a sample of 375 obese children and adolescents aged 12-18 years, 47.9% males and 52.1% females used a questionnaire which examined time spent in sedentary behavior [40]. Children's perception of time spent with the television and the computer is 4.9 hours and lower than the parents' perception of time spent with the television and the computer, which is 5.2 hours. Frequency analysis shows that 79.9% of respondents have no regular sports activities and that only 30.7% of respondents have hobbies, most of which supports sedentary behavior. By comparing the arithmetic means there were found gender differences in the use of television and computers, as well as the degree of physical involvement in sport and hobbies. The results are similar to our results in terms of physical engagement in accordance with the existing findings on the share of sedentary behavior in obesity.

Previously mentioned studies have shown that adolescent age is in the phase of turbulent psychosomatic changes that usually manifest in lack of interest in physical activity and sedentary more for a sedentary way of "modern" life. The results of our sample were also confirmed by some studies that have confirmed the interest and participation in some form of physical activity decreases with age, and that the younger population is more physically involved than older who are in their preoccupation with modern technologies, primarily in watching TV, computer technology. Proposal of some authors [5,16], about finding a model of the variables that can be identified, and which are required for further testing to determine their significance in the promotion of physical activity during childhood and adolescence, can be entirely acceptable. PE teachers should also take a more active role in promoting a healthy lifestyle and the benefits of practicing sports activities.

4 Conclusions

Current research is a good indicator of physical activity and the current status of the population of elementary school male and female pupils in Pale. The obtained results are a global indicator of student engagement in physical activity. In general, the results showed that it has been observed the positive trend of involvement in extracurricular physical activities, from first to fourth

grade, where, playing sports as a form of exercise is in a significant. The total sample of elementary school students 175 (100% pupils) are engaged in extracurricular physical activities, ie. are involved in sports clubs. This represents a very big percentage, which is positive. The pupils are mainly engaged in collective and basic sports, which is important because of the development of motor and functional abilities and proper growth and development of the organism.

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Competing Interests:

The authors declare that they have no competing interests.

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