



Self-Perception Self-Esteem Physical Activity and Sedentary Behavior of Primary Greek- School Students: A Pilot Study

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The aim of the present study was to assess the level of self-perception, self-esteem, physical activity and sedentary behavior of primary school children between 10 and 12 years old in the city of Komotini (Rodopi East Greece, North), to investigate the correlation between the above parameters and to detect possible differentiation on each factor with regard to the age and gender of the children. The sample of the survey consisted of 153 students from five public primary schools. The students were divided according to their gender (boy-girl) and class grade. Data were obtained from the Self-Perception Profile for Children and the "Self-administered physical activity interview checklist". The analysis showed that self-perception, self-esteem and physical activity was on a satisfactory-high level. In addition, the sedentary behavior of participants was high. Physical activity had a positive effect on the self-concept/self-esteem. Girls were found to have a higher level of self-perception than boys in the behavior conduct scale, while boys generally showed higher global self – worth compared to girls. Older students showed higher self-perception in scholastic and social competence, while they had a lower global self -worth. Moreover, it was noted that students whose parents had a high level of education had higher self-concept in scholastic competence.

Keywords: physical activity, self-concept, self-esteem, gender, school-age

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INTRODUCTION

Self-perception is a complex, organized and dynamic system of features that characterizes the ideals, attitudes and behaviors that the individual forms for oneself (Purkey, 1988). Self-esteem is the global appreciation that one has for his/her value as an individual. It is the emotional side of the self. It denotes all the beliefs and attitudes that shape the individual for oneself, recognizing personal strengths and weaknesses (Leontari, 1996). Literature sources mention that the individual perceives self-value through family, school, cultural frame of origin, gender, socialization, personal experience and personal activity. According to Makri-Botsari (2013), the individual profile of a student is formed by their level of self-esteem and self-perception on different sides of their lives such as school competence, peer relationships, athletic competence, physical appearance and behavior. People with high self-esteem are independent individuals, show leadership skills, stress resistance and good health-related behaviors. According to Patrizia, Sebastiano and Rozalba (2013), positive self-esteem of the individual is directly linked to better mental health while its negative side is related to the occurrence of various diseases (psychiatric disorders, depression, obesity and eating disorders, etc)

Physical activity is associated with health and well-being because it enhances cardiorespiratory capacity, muscle strength, bone health and improves cardiovascular and metabolic markers (Andersen, 2009). According to the World Health Organization (WHO, 2018), children aged 5-17 years old should reach at least 60 minutes of moderate physical activity daily. Most of the physical activity should be aerobic while it is important to incorporate vigorous-intensity activities, including those that strengthen muscle and bone, at least 3 times per week. Michalopoulou et al., (2011) using pedometers for the evaluation of physical activity found that boys 9-14 years are more physically active than girls.

Engaging themselves in sport and physical activities contributes to the social and emotional development of children because they learn to behave with discipline, they trust themselves, have self-control and self-esteem, adapt to new situations, cooperate, compromise and resist to various problems (Batista et al., 2016). Participation in training programs can lead to an increased level of self-esteem in teenage girls by reducing negative feelings and preventing symptoms of depression (Zayed & Kilani, 2014). It also reduces anxiety and antisocial behavior among students of both sexes compared to those that do not practice to exercise programs (Yildirim, 2012). Generally, exercise improves the mental health of adolescents (Asare & Danquah, 2015). Furthermore, Fedewa and Ahn (2011) found that physical activity contributes positively to the academic performance of children while aerobic exercise seems to have the greatest effect.

Moreno and Cervelló (2005) found that boys who exercised had higher self-perception levels of physical image compared to girls. Accordingly, the physically active girls had a better self-perception of their self-image in comparison to physically inactive girls. Finally, they suggested that students with a higher overall fitness level showed higher levels of general self-conception. Stein et al. (2007) claimed that the increase of physical

activity levels was positively related to higher self-perception of sociability and athletic ability. More specifically, girls who increased their physical activity levels in five or more hours per week increased their social and athletic self-perception levels by 33% and 44% respectively. At the same time, boys who increased their physical activity levels by ten or more hours per week improved their social self-perception by 45%. In total, participants with reduced physical activity levels presented lower self-perception scores.

Nowadays, children spend a large amount of their time in a sedentary lifestyle. It is estimated that they spend approximately one-third of their waking hours using media (TV/videos, playing video/digital games and personal computing) (Schwarzfischer et al., 2019). High sedentary lifestyle level is correlated to high risk of obesity, metabolic syndrome and cardiovascular disease (Christodoulos, Douda & Tokmakidis, 2012). It also increases the possibility of depression and desperation feelings in adults (Teychenne, Ball & Salmon, 2010; Valtonen et al., 2010). Researchers suggested that health behaviors that students develop may influence adults' health (Wang & Lobstein, 2006.)

According to research data, participating in physical activity improves physical fitness and self-esteem of school-aged children. The negative self-esteem of the individual is directly related to poor mental health and the appearance of various diseases during his or her adolescence or adulthood (depression, obesity and eating disorders ...). The literature study showed that there are not enough researches with a Greek primary school student sample that study the factors affecting the level of self perception, self-esteem, physical activity and sedentary behavior. Research outcome is very important in order to outline the group of children whose mental health is in danger and to allow parents, teachers and the state to proceed to necessary decisions and actions. The purpose of the present study was to evaluate the levels of self-perception, self-esteem, physical activity, sedentary behavior and to investigate the correlation between them concerning primary school children between 10 and 12 years old, also taking into consideration the factors of age and gender and their possible influence on the above parameters.

METHOD

Data Collection

Data was collected during the months of March and April 2018. Participants in this research were recruited from 5 out of 25 primary schools operating in the school district of the Municipality of Komotini in North- East Greece. The study was approved by the Ethics Committee of the Democritus University of Thrace, the Ministry of Education, Research and Religion and the principals of the schools. Students' participation in this research was voluntary and parental permission was given.

Sample

The participants that completed all data collecting procedures were 153 school children (78 boys and 75 girls) aged 10-12 years old. The students were ranked according to gender (male, female), class (fourth, fifth and sixth grades of primary school) and parental educational level (primary school, secondary school, lyceum, university).

Instruments and Procedures

To evaluate students' self-perception and self-esteem levels, the PATEM II-How I Perceive Myself (Makri-Botsari, 2001) questionnaire was used which comprises the Greek version of the Self-Perception Profile for Children questionnaire (Harter, 1985). Its reliability and validity in Greek schoolchildren population aged 10-12 years old is high. The questionnaire consists of 30 statements of assessment of self-perception in the domains of scholastic competence, social competence, behavioral conduct, athletic competence, physical appearance and global self-worth. Each item is scored from 1 to 4, where a score of 1 indicates low competence. The average scores of the five statements pertaining to each domain comprise the self-perception level.

For the measurement of the physical activity level the Self-Administered Physical Activity Checklist -SAPAC (Sallis et al., 1996) was used, with some minor modifications for activities most commonly performed by Greek children (Gioxari et al., 2011). The checklist consists of personal reference scales and measures the frequency of participation in physical activities with a 24-hour recall. The self-referral list consists of 21 different physical activities divided into three different phases of the previous day which are "Before School", "During School" and "After School". The time of active engagement with each physical activity is registered in minutes. Students also select one of the statements "Not at all", "Little" or "Very" to express heavy breathing or fatigue feeling while exercising. In order to measure each participant's score and to classify them as physically active or inactive, the total time of each student's physical activity of the previous day was taken into account (Tambalis et al., 2012). Additionally, students reported the minutes they spent on TV/video and video/computer games during the previous day (sedentary behaviour). Children were instructed to report only activities that lasted for a minimum of five minutes. The reliability and validity of the questionnaire is in an acceptable level in Greece as it has been used to measure physical activity in previous studies concerning primary and teenage Greek students (Delidou et al., 2013; Tsamita & Karteroliotis, 2008).

According to the participants' scores, the following markers were calculated: weighted moderate-to-vigorous physical activity MET score (weighted MVPA METs) (min of activity * MET value * intensity rating), the total time (minute) of engagement in physical activity (moderate and vigorous), the number of physical activities that students participated during previous day, and the time (min) they spent on TV/video, video/digital games. Activities ranging from 1.1 to 5.9 MET were increased by 1.1 if respiratory fatigue was reported for a short time and by 1.25 if it was mentioned for a long time. For high intensity activities (e.g. 6 MET or above) "heavy breathing" was waited for longer (Jacobs et al., 1993). If respiratory fatigue was reported for a long time, MET values were increased by 1.25, while if respiratory fatigue was zero, activity was less intense than expected and MET was increased by 0.75 (Sallis et al., 1996, p.843).

Limitations of the present study

In the present study, the participants represented one-third of the total student attendance of the fourth, fifth and sixth grade of each school that was granted permission by the

Ministry of Education, Research and Religion. This is due to the fact that a small number of parents gave their signed permission for their children to participate in the survey.

Statistical Analysis

The scales of the PATEM II questionnaire as well as the weighted index of physical activities in the sum of physical activities, the total time of physical activity, sedentary behavior and the number of activities were defined as dependent variables. Gender, grade, educational level and profession of the students' parents were defined as independent variables. For the parameters with a normal distribution there was applied a independent t-test for the gender variable and one-way analysis for the grade, educational level and profession of parents. On the contrary, for those variables that there wasn't existed normal distribution, non-parametric tests were performed (Mann Whitney U and Kruskal Wallis test respectively). The significance level was defined as $p < 0.05$.

FINDINGS

From the normal distribution test to the scores of the PATEM II questionnaire, it was revealed that there was no normal distribution. Table 1 shows the results from the Mann Whitney's U test on the questionnaire scales. A statistically significant difference between boys and girls was found only in the behavioral conduct ($U=2316.00$, $N_1=78$, $N_2=75$, two-sided $p=0.024$), where girls had a higher perception. Boys had higher self-esteem and self-perception levels than girls on the other scales.

Table 1

Mann-Whitney's Test Results on the PATEM II Questionnaire Scales on the Gender of Students

Scales	Gender	N	Median (range)	Mean Rank	Mann-Whitney U	Z	p
Scholastic Competence	B	78	3,20 (2,60)	75,06	2773,50	-,556	,578
	G	75	3,20 (2,20)	79,02			
Social Competence	B	78	3,10 (2,60)	83,74	2399,50	-1,930	,054
	G	75	3,00 (2,80)	69,99			
Athletic competence	B	78	3,10 (2,80)	82,58	2490,00	-1,594	,111
	G	75	2,80 (2,80)	71,20			
Physical appearance	B	78	3,20 (2,00)	80,67	2639,00	-1,051	,293
	G	75	3,00 (2,80)	73,19			
Behavioral conduct	B	78	3,20 (2,20)	69,19	2316,00	-2,260	,024
	G	75	3,40 (2,20)	85,12			
Global self- worth	B	78	3,40 (2,40)	78,24	2828,00	-,357	,721
	G	75	3,20 (2,60)	75,71			

B: boy, G: girl

From the control of the Weighted MVPA METs of Physical Activity, the total time of physical activity, the sedentary behavior time on TV/video or video/ PC and the number of activities of the participants according to gender, it was ascertained that the average total sedentary behavioral time of boys ($M=111.67$, $SD=55.93$) is significantly higher than that of girls ($M=86.23$, $SD=56.07$). The same relationship was also found in the time students occupied with video/PC ($M=50.51$, $SD=33.99$ Vs $M=29.72$, $DF=30.85$). Girls participated in more activities than boys (Table 2).

Table 2

Mean, Standard Deviation and T-test of Weighted MVPA METs, Total Time of Physical Activity, Number of Physical Activities, Total Sedentary Behavior Time and Time in TV/Video, Video/Pc of Participants during the Previous Day According to Gender

Variables	Gender	N	Mean	S. D.	t	df	p																																																								
Weighted MVPA METs	B	78	1005,78	387,94	1,660	151	,099																																																								
	G	75	901,568	388,50				Total time of physical activity (min)	B	78	163,65	53,84	,347	151	,729	G	75	160,31	65,17	Number of physical activities	B	78	5,64	2,26	-,925	151	,356	G	75	6,01	2,70	Total sedentary behavior time (min)	B	78	111,67	55,93	2,799	150	,006	G	75	86,23	56,07	TV/video (min)	B	78	61,15	41,68	,722	150	,471	G	75	56,38	39,78	Video/ PC games (min)	B	78	50,51	33,99	3,957	151	,000
Total time of physical activity (min)	B	78	163,65	53,84	,347	151	,729																																																								
	G	75	160,31	65,17				Number of physical activities	B	78	5,64	2,26	-,925	151	,356	G	75	6,01	2,70	Total sedentary behavior time (min)	B	78	111,67	55,93	2,799	150	,006	G	75	86,23	56,07	TV/video (min)	B	78	61,15	41,68	,722	150	,471	G	75	56,38	39,78	Video/ PC games (min)	B	78	50,51	33,99	3,957	151	,000	G	75	29,72	30,85								
Number of physical activities	B	78	5,64	2,26	-,925	151	,356																																																								
	G	75	6,01	2,70				Total sedentary behavior time (min)	B	78	111,67	55,93	2,799	150	,006	G	75	86,23	56,07	TV/video (min)	B	78	61,15	41,68	,722	150	,471	G	75	56,38	39,78	Video/ PC games (min)	B	78	50,51	33,99	3,957	151	,000	G	75	29,72	30,85																				
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	G	75	56,38	39,78				Video/ PC games (min)	B	78	50,51	33,99	3,957	151	,000	G	75	29,72	30,85																																												
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	G	75	29,72	30,85																																																											

The results from the non-parametric test (Kruskal Wallis H) in the PATEM II questionnaire scales according to class grade of the participating students are presented in Table 3. The class (age) statistically influences the scholastic competence ($\chi^2=6.123$, $df=2$, two-sided $p=0.047$) and the social competence ($\chi^2=7.152$, $df=2$, bilateral $p=0.028$). Test Bonferroni showed that difference was found among the students of the fourth and fifth grade. The 6th grade students had the lowest self-esteem.

Table 3

Results of Kruskal Wallis H Test in the Scales of the PATEM II Questionnaire on the Pupil's Class

Scales	Class	N	Median (range)	Mean Rank	Chi-Square	df	p
Scholastic competence	4 th	77	3,20 (2,60)	71,48	6,123	2	,047
	5 th	43	3,40 (2,00)	91,09			
	6 th	33	3,20 (2,20)	71,52			
Social competence	4 th	77	3,00 (2,80)	69,55	7,152	2	,028
	5 th	43	3,20 (1,60)	91,84			
	6 th	33	3,00 (2,60)	75,06			
Athletic competence	4 th	77	2,80 (2,60)	77,18	3,530	2	,171
	5 th	43	3,20 (2,80)	85,15			
	6 th	33	2,80 (2,80)	65,97			
Physical appearance	4 th	77	3,00 (2,80)	73,05	4,613	2	,100
	5 th	43	3,40 (2,40)	89,12			
	6 th	33	3,00 (2,20)	70,42			
Behavioral conduct	4 th	77	3,20 (2,20)	74,43	,562	2	,755
	5 th	43	3,40 (1,60)	78,95			
	6 th	33	3,40 (2,20)	80,45			
Global self-worth	4 th	77	3,40 (2,60)	76,46	5,356	2	,069
	5 th	43	3,60 (1,80)	87,74			
	6 th	33	3,20 (2,40)	64,26			

Table 4 shows the results from non-parametric test (Kruskal Wallis H) in parameters of physical activity and sedentary behavior. It was found that the participants' class (age) didn't significantly affect the weighted MVPA METs, the total time of physical activity, the number of physical activities and their general sedentary behavior including TV/video, video/PC time. The 6th grade students were engaged in a small number of physical activities and spent little time on physical activities as well as on TV/video, video/PC.

Table 4

Results of Kruskal Wallis H in Parameters of Physical Activity and Sedentary Behavior According to Students' Class

Parameters	Class	N	Median (range)	Mean Rank	Chi-Square	df	p
Weighted MVPA METs	4 th	77	915,50 (1708,50)	74,45	2,629	2	,269
	5 th	43	1060,30 (2159,50)	86,06			
	6 th	33	1030,00 (1520,00)	71,14			
Total time of physical activity (min)	4 th	77	175,00 (270,00)	76,29	3,090	2	,213
	5 th	43	185,00 (310,00)	85,49			
	6 th	33	160,00 (245,00)	67,59			
Number of physical activities	4 th	77	6,00 (13,00)	80,03	4,865	2	088
	5 th	43	6,00 (11,00)	82,91			
	6 th	33	5,00 (9,00)	62,24			
Total sedentary time (min)	4 th	77	100,00 (255,00)	79,41	1,384	2	,501
	5 th	42	92,50 (160,00)	77,27			
	6 th	33	90,00 (190,00)	68,73			
TV/video (min)	4 th	77	60,00 (180,00)	81,82	4,204	2	,122
	5 th	42	60,00 (120,00)	77,20			
	6 th	33	45,00 (160,00)	63,20			
Video/PC (min)	4 th	77	35,00 (150,00)	76,02	,640	2	,726
	5 th	43	30,00 (120,00)	74,70			
	6 th	33	30,00 (90,00)	82,29			

The educational level of the father and the mother was found to significantly affect students' perceptions of academic performance, while it did not affect their perception of physical competence and sedentary behavior. Students whose father or mother was a graduate of a higher education institution had higher self-perception in their academic performance.

From the Pearson correlation test carried out between the PATEM II questionnaire scales, the physical activity and sedentary behaviors parameters examined, there was a significant correlation: a. their athletic competence with the weighted MVPA METs, their total time (min) of participation and the number of activities in the previous day ($p < 0.01$). b. their physical appearance with their total time of attendance and the number of activities ($p < 0.05$). Global self-worth strongly correlates with the weighted MVPA METs ($p < 0.05$) (Table 5).

Table 5
Pearson Correlation Scores between PATEM II Questionnaire Scales and Parameters of Physical Activity and Sedentary Behavior

Variables	1	2	3	4	5	6	7	8	9	10
Scholastic competence										
Social competence	,346*									
Athletic competence	,171*	,391**								
Physical appearance	,435**	,311**	,396**							
Behavioral conduct	,408**	,273**	,118	,362**						
Global self- worth	,366**	,438**	,354**	,520**	,377**					
Weighted MVPA METs	ns	ns	,447**	ns	ns	,163*				
Total time of physical activity (min)	ns	ns	,496**	,167*	ns	ns	,874**			
Number of physical activities	ns	ns	,434**	,165*	ns	ns	,571**	,748**		
TV/video (min)	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Video/PC (min)	ns	ns	ns	ns	ns	ns	,198*	ns	ns	,165*

** : Correlation is significant at the 0.01 level (2-tailed), * : Correlation is significant at the 0.05 level (2-tailed), ns: non- significant.

DISCUSSION

The aim of the present study was to assess the level of self-perception, self-esteem, physical activity and sedentary behavior of students (aged 10-12 years old) of primary schools operating in the school district of Komotini, North-East Greece and investigate the relationship between those variables also taking into consideration the factors of age and gender and their possible influence on the above parameters. In general, the students' level of self-perception and self-esteem was satisfactory high. Slightly less was the perception of their athletic competence. Girls had significantly higher self-perception in behavior conduct and marginally better in interpersonal relationships than boys. Ganelos (2003), who also found the same relationship to the students of 6th grade, attributed the difference to the tendency of boys that want to be more vivid and naughty than the girls who are quiet and gathered. On the other scales, the difference was not significant among students of different gender, a comparable conclusion was also reached by other researchers (Arens & Hasselhorn, 2014). However, this finding doesn't agree with Rashid et al. (2017), who found significant differences between teenagers of different gender in self-esteem levels.

The scores on the scales of self-perception and self-esteem of students according to the class (students aged 10-12 years old) ranged at high levels with the 5th grade students presenting higher level in these variables compared to others. Significant difference was noticed in the self-perception in scholastic and social competence among students of the 4th and 5th grade. Students of 4th grade had lower level than those of the 5th grade, probably due to the difficulty of the lessons taught in this class. Students of 6th grade, although engaged in a small number of activities, devoted a little time to physical activities, the weighted MVPA METs was high. This means that these students were engaged in intensive activities requiring high energy consumption. Maybe they were involved in some sports.

The level of physical activity and sedentary behavior of the participants was high. The average of the weighted MVPA METs and the total physical activity time of the boys were not significantly higher than that of the girls. This result is contradictory to research findings made by other scholars who have found that girls are 19% less physically active than boys (Telford et al., 2016). The extent study of the data revealed that girls spend more time on moderate-intensity physical activities while boys in intense ones. The finding may be due to the existence of social stereotypes requiring girls to engage in less demanding physical activities (Vu et al., 2006). For this reason, there may be little girls' superiority over boys in the number of activities they were engaged in.

Engaging in physical activities consist a behavior that is affected by environmental, social and demographic factors. The school yard is an outdoor environment that has a strong influence on their everyday lives. The size and adequacy of the school yard equipment recommend key determinants that affect the physical activity of the 6th grade students during their school breaks (Delidou et al., 2013). The sample students attended schools with large courtyards.

In the present study, the weighted MVPA METs of the participants was high. However, the boys didn't show higher levels of physical activity compared to the girls. This fact may be due to the finding that the parents of the participants in a large percentage (46,4% of fathers and 59,4% of mothers) had high educational level (university graduates) and were informed of the benefits of physical activity. As a result, they encouraged their children to engage in physical activities regardless their gender (Papastolopoulou, 2012).

The level of participation in physical activities and sedentary behavior wasn't affected by the attendance class and thus the age of the participants. Little was the supremacy of 5th grade students in physical activity, while 4th grade students prevailed in sedentary behavior. The students who participated in the present research stated that they were very active but at the same time they presented a long time of sedentary behavior as their energy expenditure was at or near levels of calm for a long time. The boys differed considerably from girls in the total time they spent watching TV/video or video/PC before and after school. This finding was also verified by other researchers for the Greek students of the same age (Gioxari et al., 2013). Boys were more engaged than girls with computer.

The correlation between self-esteem and students' perception of physical appearance, social competence, behavioral conduct, scholastic and athletic competence was important. Self-perception of scholastic competence determines to a large extent the global self -worth of students (Gianelos, 2003). Global self -worth is related to the weighted MVPA METs, which is also correlated to the students' perception of their athletic competence. A conclusion was reached by Stein et al. (2007), who support that the increase in physical activity positively relates to the change in social and athletic self-esteem. Moreno and Gimeno (2005) argued that increasing the incidence of physical activity leads to more positive self-responses to physical fitness and physical self-image. In the present study, the total time spent on physical activities and the number of them was related to the participants' perception of their athletic competence

and physical appearance. Ekeland et al. (2004), found that exercise has short-term positive benefits for the self-esteem of children and adolescents. However, Liu et al. (2015) who conducted a meta-analysis on the effects of physical activity in self-esteem and self-perception of children and adolescents have concluded that the participation in physical activities is associated with increased self-esteem and self-perception.

CONCLUSION

The results showed that self-perception, self-esteem and physical activity (weighted MVPA METs, total time of physical activity and number of physical activities) was on a high level. Students' self-esteem and athletic competence is significantly correlated to weighted MVPA METs. Self-perception and self-esteem of 4th and 6th grade students ranged at lower levels than those of 5th grade. The 5th grade students had the highest score on all of the scales of the PATEM II questionnaire while 6th grade students had the lowest levels of self-esteem. The participants spent a lot of time in sedentary lifestyle activities. Boys were more engaged in intense physical activities, while girls in moderate intensity ones. Boys were more engaged in TV/video and video/Pc than girls. The factors that significantly affect self-perception and self-esteem of 10-12 years old students were the time spent on physical activities and the time spent on high intensity activities. However, it should be noted that this research is a pilot study, so based on both threats and research constraints, further study is needed in order to generalize the equivalent conclusions.

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