



Relationship Between Physical Activity Levels of the Secondary School Students and Their Safe Environment, Playing Conditions and Media Usage*

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ABSTRACT

This study was carried out to examine the relationship between physical activity (PA) levels of secondary school students and their safe environment, playing conditions and media usage. The sample of the study was consisted of 628 students aged between 11-14 years old. The universe of the study was composed of students studying in the secondary schools in these provinces. The data of the study were collected by means of "The Questionnaire for Safe Environment, Playing Conditions and Media Usage Affecting PA Level" and "Physical Activity Questionnaire for Children". The results of the study showed that the average screen time of students was 114.25 ± 97.24 minutes per day, the most occupied device was television and screen time on all devices was more among the boys. When analyzed for devices one by one, the difference between the genders was not found to be statistically significant, but it was statistically significant when evaluated over total time. It was also found that students who did not have internet access were physically more active than the students with limited or unlimited internet access at home; and the students without media restrictions were found to be more active than students with media restrictions. The results also showed that PA levels of the students were found to be significantly different based on the factors such as the presence of a playground close to student's home, having a playmate, playing actively with parents, and having a toy or device that enhancing PA. In addition, the PA levels of students who were helping with the housework, playing in an amateur sports team or performing exercise regularly were found to be significantly higher. In the multivariate model analysis, it was found that media restriction and playing conditions together were not found to represent the change in PA level.

Keywords: Child, physical activity, media, environment, game

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1. INTRODUCTION

Technology that developed with the industrial revolution has led to physical immobility by decreasing the amount of physical labor spent by the human during their daily lives. This situation creates a huge cost by contributing to the spread of non-communicable diseases (Alwaan, 2011). An opinion defines physical immobility as pandemic (Kohl et al., 2012). World Health Organization (WHO, 2009) classified physical immobility among the most significant risk factors for non-communicable diseases and reported that it caused more than 3 million preventable deaths. Besides, it has been accepted as a secondary risk factor for obesity and obesity-associated health problems. It has been estimated that physical immobility is responsible for 6-10% of all deaths derived from non-communicable diseases (coronary heart diseases, type 2 diabetes, breast and colon cancers). Moreover, it is known that physical immobility caused 9% of early deaths or more than 3/5 of 57 million deaths

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occurred all over the world in 2008 (Lee et al., 2012). Whereas, PA is an integral component of health and well-being states (Janssen and LeBlanc, 2010).

Several systematic reviews conducted with children and adolescents (5-17 years old) have reported physical, physiological, mental, cognitive, social health and academic success benefits of PA (Esteban-Cornejo, Tejero-Gonzalez, Sallis, and Veiga 2015; Janssen & LeBlanc, 2010). Regular PA plays an important role in decreasing early death risk associated with cardiovascular diseases, cancer, diabetes and chronic respiratory diseases by 25%, in decreasing the incidence of high blood pressure according to national conditions and in stopping the increase in diabetes and obesity rates (WHO, 2010). Moreover, many studies have shown that regular PA affects academic success in a positive way (Fedewa and Ahn, 2011; Shephard et al., 1984; Singh, Uijtdewilligen, Twisk, Van Mechelen and Chinapaw, 2012; Telford, Cunningham, Telford and Abhayaratna 2012). Also, performance in tasks such as planning, paying attention to details and recall, organizing and time and space management were found to be associated with PA in a previous study (Davis et al., 2011). A meta-analysis also reported a positive correlation between PA and cognitive performance among school-age children in eight measurement categories including perceptual skills, IQ, verbal tests, mathematical tests and memory (Sibley, 2003).

Despite the known benefits of PA, WHO reported a trend towards a lower level of daily PA worldwide. It has been estimated that roughly three in every ten individuals aged 15 years and older (approximately 1,5 billion individuals) can not achieve current PA recommendations, the situation is worse among the adolescents and four in every five adolescents between 13-15 years old do not comply with the current guidelines worldwide (Hallal et al., 2012). A previous study claimed that 80% of the younger individuals (11-17 years old) did not achieve the recommendations for a 60-minutes daily PA of moderate to severe intensity (Sallis et al., 2016). Scientists and public institutions state that current PA levels among the children are insufficient and most children in the world can not meet the daily recommended activity levels (Sisson and Katzmarzyk, 2008). Studies have postulated that many changes occur at physiological and behavioral level due to psychosocial, environmental and developmental factors during adolescence period and a rapid decline occurs in the PA level among the children (Akman and Garipağaoğlu, 2019; Öztürk and Garipağaoğlu, 2019; Taylor et al., 2002).

PA levels began to decrease among 11-15 year old adolescents (especially among females) in many European countries including Turkey. This circumstance is especially more important for the children with lower socioeconomic levels and contributes to the increased rates of overweightness and obesity among the children in Europe (Alwaan, 2011; WHO, 2010). Physical immobility has been known as a risk factor that is neglected and needs to be intervened especially for low-income and moderate-income countries all over the world in terms of protection, promotion and maintenance of health (Das and Horton, 2012). Moreover, the relationship between physical immobility among school-age children and adolescents and its physical, mental, social and cognitive adverse health outcomes in their future lives is worrisome (Janssen and LeBlanc, 2010; Poitras et al., 2016), and it is a sign of lower physical fitness and lower PA levels in their future lives (Telama et al., 2005). Previous studies revealed a positive correlation between the PA levels during childhood and adolescence periods and PA levels at adulthood (Telama et al., 2005). Children who start PA during early ages continue to perform PA in later periods (del Mar Bibiloni et al., 2012; Memiş and Yıldıran, 2007).

Recognition of the factors affecting the engagement of younger people in PA during childhood and adolescence periods is highly important for the individuals to implement the positive habits gained against PA throughout their lives. In this context, the reasons of children's PA behaviors in this period in order to develop and improve public health interventions should be understood. PA is associated with demographic and biological, psychological, cognitive and emotional, social and cultural, behavioral and physical and environmental factors in general is well-known (Bauman et al., 2012; Sallis, Owen and Fotheringham 2000). However; some factors were found to be less studied in order to come to a conclusion (safe environment, playing conditions and media usage); and thus, more research is needed to test recognized factors. Although the results of previous studies have shed a light on the factors affecting engagement in PA and on the relationship between PA and these affecting factors, the facts that majority of the studies were found in the international literature and limited number of studies in our country were conducted with secondary school students (Coşkun Karagöz 2021; Karaca, Çağlar, Bilgili and Ayaz 2011; Uçak and Asma 2021) make it necessary to carry out more research on the investigation of factors affecting the engagement of students in PA. There is not sufficient data reflecting the PA status and variables of childhood and adolescence in our country when reports of international authorities, studies including comparative international data and systematic reviews (Hallal et al., 2012; Laird, Fawkner, Kelly, McNamee and Niven, 2016; Morton, Atkin, Corder, Suhrcke and Van Sluijs 2016) were examined. In the light of these data, it is required to conduct more studies on the PA levels during adolescence when PA is decreased and its long-term effects are observed, and on the affecting factors. In this context, the aim of this current study is to investigate the relationship between the PA levels of secondary school children between 11-14 years old and their safe environment, playing conditions and media usage that may affect their engagement in PA and to reveal the outcomes for developing new interventions.

1.1. Purpose of the Study

The aim of this current study is to investigate the relationship between the PA levels of secondary school children between 11-14 years old and their safe environment, playing conditions and media usage that may affect their engagement in PA and to reveal the outcomes for developing new interventions.

2. METHODOLOGY

This cross-sectional and descriptive study was carried out to investigate the relationship between PA levels of 11-14 year old students and their safe environment, playing conditions and media usage.

2.1. Participants

The universe of the study was consisted of secondary school students who were studying in the schools which were chosen according to the table of random numbers considering ease of access among five cities representing 5 developmental levels based on the classification of statistical regional provinces. The study sample was determined based on power analysis calculated in accordance with pre-treatment which was carried out with 50 students who were selected in a school before starting the study. The students who were enrolled in the pre-treatment were not included in the sample. Missing data or lack of feedback in data collection forms and also, the rate of data loss that may occur as a result of a question in the Physical Activity Questionnaire (PAQ-C) describing a situation that prevents the data belonging to that child from being evaluated were considered while calculating sample size. Accordingly, data were collected from 750 students and 122 of the forms collected were not included in the study due to the abovementioned reasons. As a result, data of 628 students were included in the study. The students who were studying in these schools and aged between 11-14 years old constituted the sample of the study. Data were collected until achieving the targeted numbers from the schools chosen after sample size was distributed according to the population size of 5 provinces. The study was carried out between 01.03.2019 and 01.05.2019. Participants who were studying in the secondary schools, who met the sample selection criteria and who provided a written and verbal consent for participation were included in the study. Data were collected in the physical education and sports room/hall between the classes. An ethics committee approval was obtained from Nevşehir Hacı Bektaş Veli University non-Interventional Research Ethics Committee (number: 27.09.2018/11) to conduct the study. Moreover, a ministerial permission was taken from the Ministry of National Education on 01.11.2018 and an authorization to use was taken from the author of PAQ-C.

2.2. Instruments

Data of the study were retrieved by using "Questionnaire for Safe Environment, Playing Conditions and Media Usage Affecting PA Level" and "PAQ-C". Detailed information regarding data collection instruments was given below:

Questionnaire for Safe Environment, Playing Conditions and Media Usage Affecting PA Level: This questionnaire was composed of 19 closed-ended questions. The questionnaire was prepared by the researchers in line with the literature (Aubert, 2016; Das and Horton 2012; Tremblay et al., 2014; Coşkun and Karagöz, 2021) by considering the features as safe environment, playing conditions and media usage that may affect PA levels of children. Then, opinions of 3 experts were taken for the content of questions included in the questionnaire, the order of questions and answer options, page layout and font format; and necessary changes were made based on the suggestions taken. Later on, a pre-treatment was made by applying the edited questionnaire with 10 students. Clarity of questions, answering time and their availability were tested during the pre-treatment and questions to be edited were revised and final version of the questionnaire was generated. According to this, questions concerning after-school responsibilities, their states of performing amateur sports and regular exercise, total time they spent for each screen behavior during the weekdays (from Monday to Friday) and weekends (Saturday and Sunday), access to internet and electronic devices, media usage rules, mode of transportation to school, presence/absence of playground close by, playmates, toys requiring to be physically active and time spent with parents were included in the questionnaire as well as sociodemographic characteristics of the children.

Physical Activity Questionnaire for Children (PAQ-C): PAQ-C was developed by Kowalski, Crocker and Kowalski in 1997 in the United States of America. Validity and reliability study of its Turkish form was conducted by Emlek Sert and Bayık Temel (2014). This questionnaire includes nine items and examines physical activities executed by the student within the last seven days and the frequency of these activities. In this context, execution of any of the indicated activities within the last seven days (hopscotch, football, basketball, gymnastics, etc.), attendance to physical education course, their activities at breaks, lunchtime, after school, evenings and weekends and their frequency, the frequency of their spare time activities within the last seven days and the frequency of sports, games, dance and other physical activities during the last seven days are questioned. In addition to these, their spare time activities such as sports, dance or games during the last seven days are examined. These are 5-likert type questions of different structures that indicate the frequency of the behavior. First item includes 21 activities (hopscotch, football basketball, gymnastics, etc.). An average score is calculated by dividing the frequency ("never did (1 point), 1-2 times (2 points), 3-4 times (3 points), 5-6 times (4 points), 7 and more (5 points)") by the number of activities (21). The ninth item is a table showing seven days of the week. Students are asked to fill in the table by indicating the frequency of sports, games, dance and other physical activities for each day of the week by thinking about the previous week. Average score is calculated by dividing the score obtained from the ninth item to 7 (number of days); and a total score is calculated by the answers given to the items of this 9-item questionnaire. Minimum score for each item of PAQ-C is 1 and maximum score is 5. Thus, minimum score that may be taken from PAQ-C is 9 whereas maximum score is 45. 10th item of PAQ-C is excluded from scoring. This item was created to exclude the questionnaire of the students from evaluation in case of the presence of a condition preventing them to perform physical exercise within that week. Test-retest reliability was at an acceptable level in

the original scale ($r = .75$ for males, $r = .82$ for females) (Kowalski, Crocker and Donen, 2004; Emlek Sert and Bayık Temel, 2014). Answering time of the form was determined as 20 minutes following pre-treatment.

2.3. Data Analysis

The data were evaluated in SPSS 23.0 version; and sociodemographic data were assessed by using descriptive analyses (number, percentage, mean, standard deviation, minimum and maximum values). Normality assumption was analyzed by Shapiro Wilk test, and variance homogeneity assumption was analyzed by Levene test. Two groups were compared by independent samples t test when normal distribution and variance homogeneity were ensured and by Welch t test when the assumption of normal distribution is met but the assumption of homogeneity of variance is not met. Since parametric test assumptions were met, analysis of variance (ANOVA) was used to compare more than two groups. Post hoc analysis was carried out with Bonferroni correction in statistically significant tests. A pilot study was performed over 50 children in order to calculate sample size. Sample size was calculated by considering the effects of variables such as safe environment, playing conditions and media usage that may affect their PA on PA questionnaire scores through G-power (vers 3.1) program. Accordingly, highest calculated sample size was determined to include all variables. Accordingly, the highest sample size was calculated for the variable of playground near the child's residence; and the effect of this variable on the PA level was compared with independent samples t-test. Minimum sample size was calculated as 580 with an error rate of 5%, a power of 95% and an effect size of 0.30. Two-sided $p < 0.05$ was accepted as statistically significant.

3. FINDINGS

Table 1 includes sociodemographic characteristics of the students and the features as playing conditions and media access.

Table 1.
Student Characteristics

| Characteristics | $\bar{X} \pm SD$ | Min.-Max |
|--|------------------|-------------|
| Age | 12,86±1,257 | 11-14 |
| PAL | 25,05±6,914 | 9-42 |
| | f | % |
| Gender | | |
| Female | 344 | 54,8 |
| Male | 284 | 45,2 |
| Place of residency | | |
| Urban | 457 | 72,8 |
| Rural | 171 | 27,2 |
| Grade | | |
| 5 th | 115 | 18,3 |
| 6 th | 133 | 21,2 |
| 7 th | 185 | 29,5 |
| 8 th | 195 | 31,1 |
| Maternal education level | | |
| Undergraduate/postgraduate | 139 | 22,1 |
| High school | 144 | 22,9 |
| Elementary | 345 | 54,9 |
| Paternal education level | | |
| Undergraduate/postgraduate | 193 | 30,7 |
| High school | 202 | 32,2 |
| Elementary | 233 | 37,1 |
| Status of playing in the amateur sports team | | |
| Yes | 167 | 26,6 |
| No | 461 | 73,4 |
| Status of performing regular exercise | | |
| Yes | 97 | 15,4 |
| No | 531 | 84,6 |
| Type of transportation to school | | |
| Physically active transportation | 330 | 52,5 |
| Vehicle transportation | 298 | 47,5 |
| Playmate | | |
| Yes | 551 | 87,7 |
| No | 77 | 12,3 |

| Internet access | | |
|-------------------|------------|--------------|
| Yes | 551 | 87,7 |
| No | 77 | 12,3 |
| Screen time | | |
| Less than 1 hour | 32 | 5,0 |
| 1-3 hours | 417 | 66,4 |
| More than 3 hours | 179 | 28,5 |
| Total | 628 | 100,0 |

Mean age of the students included in the study was 12,86±1,257 years old. Mean PA level score of the students was found to be 25,05 (min-max: 9-42). 54,8% of the students were females and 31,1% were 8th graders. Most of the students were living in the urban (72,8%) and half of the mothers (54,9%) and most fathers had an education of elementary level. Most of the students did not participate in an amateur sports team (73,4%) and did not perform exercise regularly (84,6%). More than half were going to school as physically active and 87,7% had a playmate. Screen time was found to be 1-3 hours among 66,4% of the students. It was determined that 87,7% of the students could get access to internet limited or unlimitedly (Table 1).

Table 2.
Time Spent by the Students in front of the Screen Based on Gender

| | n | $\bar{X} \pm SD$ min/day | Min.-Max | t | p* |
|--------------|-----|-----------------------------|--------------|--------|---------------------------|
| Television | | | | | |
| Female | 344 | 65,80±42,02 | 0-120 | | |
| Male | 284 | 66,04±45,14 | 0-340 | 2,072 | 0,038^x |
| Total | 628 | 65,92±43,57 | 0-340 | | |
| Computer | | | | | |
| Female | 344 | 30,25±38,47 | 0-300 | | |
| Male | 284 | 33,31±36,25 | 0-300 | 2,117 | 0,041^{**} |
| Total | 628 | 31,73±37,36 | 0-300 | | |
| Tablet/phone | | | | | |
| Female | 344 | 16,31±47,10 | 0-120 | | |
| Male | 284 | 16,87±47,46 | 0-140 | -0,942 | 0,401 ^y |
| Total | 628 | 16,59±47,28 | 0-140 | | |
| Total | | | | | |
| Female | 344 | 112,37±96,27 | 0-240 | | |
| Male | 284 | 116,23±98,75 | 0-340 | 4,492 | 0,000^{**} |
| Total | 628 | 114,25±97,24 | 0-340 | | |

^x p value was obtained by using t test for independent groups.

^y p value was obtained by using Welch t test.

Results have shown that mean total screen time of the students is 114,25 min and that male students are more exposed to screen compared to female students at a statistically significant level when evaluated with other devices ($p < 0,05$). While devices were examined separately, a statistically significant difference was found between males and females in terms of time spent in front of television and computer ($p < 0,05$) whereas no significant difference was found in terms of tablet/phone ($p > 0,05$). In addition to this, it was also found that students were mostly occupied with television when usage times were examined in terms of device type (Table 2).

Table 3.
Physical Activity Levels of the Students Based on Their Media Access

| | n | % | PAL $\bar{X} \pm SD$ | F/t | p |
|-----------------|-----|------|----------------------------|-------|--------------------------|
| Internet access | | | | | |
| None | 77 | 12,3 | 26,09±6,91 ^a | | a & b |
| Limited | 405 | 65,5 | 25,32±6,02 ^{a, b} | 2,072 | 0,039^x |
| Unlimited | 146 | 23,2 | 24,06±6,32 ^b | | |
| Computer | | | | | |
| Own | 146 | 23,2 | 24,97±6,74 | | |
| Common usage | 228 | 36,3 | 26,14±5,98 | 0,522 | 0,647 ^x |
| None | 254 | 40,4 | 26,39±6,99 | | |

| Phone | | | | | |
|----------------------------|-----|------|------------|--------------|--------------------------|
| Own | 128 | 20,4 | 24,91±6,74 | | |
| Access to parent's phone | 355 | 56,5 | 25,02±6,98 | -0,687 | 0,538 ^x |
| None | 145 | 23,1 | 26,01±6,94 | | |
| Tablet | | | | | |
| Yes | 174 | 27,7 | 24,96±6,93 | 0,044 | 0,768 ^z |
| No | 454 | 73,3 | 25,82±7,55 | | |
| Other digital game devices | | | | | |
| Yes | 347 | 55,3 | 25,87±6,74 | 0,821 | 0,433 ^z |
| No | 281 | 44,7 | 25,51±6,24 | | |
| Media restriction | | | | | |
| Yes | 489 | 77,9 | 24,04±6,71 | 3,016 | 0,045^z |
| No | 139 | 22,1 | 25,38±6,94 | | |

^{a, b, c} the difference between the groups with different letters is significant ($p < 0.05$)

^xp value was found by using t test for independent groups.

^zp value was found by using ANOVA.

In the study, it was found that students without internet access had a significantly higher level of PA compared to those with limited or unlimited internet access ($p = 0.039$). Lack of any technological devices (computer, phone, tablet, other digital game devices) at student's home, own or common usage were not found to create a significant difference in PA levels of the students ($p > 0.05$). PA levels of the students without media restriction were found to be significantly higher than the students with media restriction ($p = 0.045$) (Table 3).

Table 4.

Physical Activity Levels of the Students Based on After-School Safe Environment and Playing Conditions

| | n | % | PAL $\bar{X} \pm SD$ | F/t | p |
|--------------------------------|-----|------|-------------------------|------------------------|------------------------------|
| Place of residency | | | | | |
| Province | 457 | 72,8 | 24,96±7,36 | -0,837 | 0,403 ^y |
| Rural | 171 | 27,2 | 25,42±5,55 | | |
| Playground closeby | | | | | |
| Yes | 330 | 52,5 | 25,93±6,57 | 3,239 | 0,001^x |
| No | 298 | 47,5 | 24,15±7,16 | | |
| Status of going out alone | | | | | |
| Never | 85 | 13,5 | 24,99±6,74 | | |
| Sometimes | 312 | 49,7 | 24,72±6,89 | | |
| Most of the time | 148 | 23,6 | 25,4±7,06 | 0,862 | 0,460 ^z |
| Always | 83 | 13,2 | 24,98±6,9 | | |
| Playmate | | | | | |
| Yes | 551 | 86,9 | 25,53±6,87 | 4,469 | 0,000^x |
| No | 77 | 13,1 | 21,82±6,36 | | |
| Status of playing with parents | | | | | |
| Never | 205 | 32,6 | 23,91±5,62 ^a | | |
| Sometimes | 151 | 24,0 | 25,87±4,78 ^b | | |
| Most of the time | 141 | 22,5 | 26,79±6,54 ^b | -5,065 | 0,000^z |
| Always | 131 | 20,8 | 25,66±7,13 ^b | | |
| Toys enhancing PA | | | | | |
| More than 1 | 228 | 36,3 | 28,9±6,858 ^a | a & b 4,491 | a & b, a & c, |
| At least 1 | 178 | 28,3 | 24,41±6,74 ^b | a & c 5,193 | b & c |
| None | 222 | 35,4 | 21,15±6,54 ^c | b & c 3,873 | 0,000^z |

^{a, b, c} the difference between the groups with different letters is significant ($p < 0.05$)

^xp value was found by using t test for independent groups.

^yp value was found by using Welch t test.

^zp value was found by using ANOVA.

No statistically significant difference was found between PA levels of the students living in the province or rural in the study ($p < 0.05$). Also, PA levels of the students who were going out alone at different times were not found to be statistically significant ($p < 0.05$). Students who had a playground closeby, who had a playmate, who were playing with their parents and who had a toy or device enhancing PA were found to have significantly higher PA levels compared to the students who did not have all these ($p < 0.05$) (Table 4).

Table 5.
Physical Activity Levels of the Students Based on Their Spare Time Activities

| | n | % | PAL $\bar{X} \pm SD$ | F/t | p |
|--|-----|------|-------------------------|--------|--------------------------|
| Type of transportation to school | | | | | |
| Physically active transportation | 330 | 52,5 | 24,21±6,96 | -0,987 | 0,524 ^x |
| Vehicle transportation | 298 | 47,5 | 25,28±6,82 | | |
| After-school responsibilities | | | | | |
| None except homework | 435 | 69,3 | 24,73±7,14 ^a | | a & b |
| Helping with housework | 171 | 27,2 | 26,06±6,29 ^b | 5,704 | 0,000^z |
| Working in a job | 22 | 3,5 | 24,71±6,56 ^a | | |
| Playing in an amateur sports team | | | | | |
| Yes | 167 | 26,6 | 28,44 ±6,53 | -7,724 | 0,000^y |
| No | 461 | 73,4 | 23,26±6,64 | | |
| Performing regular exercise | | | | | |
| Yes | 97 | 15,4 | 28,98±6,8 | -6,020 | 0,000^y |
| No | 531 | 84,6 | 24,39±6,7 | | |

^{a, b} the difference between the groups with different letters is significant ($p < 0.05$)

^x p value was found by using t test for independent

^y p value was found by using Welch t test.

^z p value was found by using ANOVA.

No statistically significant difference was found between the students who were going to school as physically active (walking, cycling, scooter, etc.) and who were going with a vehicle in terms of their PA levels ($p = 0.524$). Moreover, PA levels of the students who were helping with the housework, who were playing in an amateur sports team and who were performing exercise regularly were found to be significantly higher than those who were not doing all these ($p < 0.05$) (Table 5).

4. RESULTS, DISCUSSION AND RECOMMENDATIONS

This study aimed to examine the relationship between PA levels of 5th, 6th, 7th and 8th grade secondary school students aged between 11-14 years old and their safe environment, playing conditions and media usage.

The study results showed that daily screen time of the students was approximately 2 hours. When all devices (television, computer and tablet-phone) were evaluated together, it was observed that male students were significantly more exposed to screen compared to the female students. Besides, a significant difference was found between females and males in television and computer usage whereas no significant difference was found in tablet/phone. When usage times of these devices were examined, it was observed that students were mostly occupied with television. American Association of Pediatrics does not recommend more than 2 hours of exposure to screen (Schmidt et al., 2012). In this context, in this study, students' daily screen time as approximately 2 hours can be met as a desired result. Similar studies in the literature have shown higher levels of screen exposure among the students (Aydoğdu Karaaslan, 2015; Cheng et al., 2004; Hastings et al., 2009; Mustafaoğlu and Yasacı, 2018). A previous study conducted in the USA reported that total screen times of the children reached to nearly 7 hours per day (Rideout, Foehr and Roberts, 2010). Another research indicated that children watched television for an average of 3-4 hours per day. These findings show that students will spend 7 years of their lives with watching television when they become 70 years old (Lowry Wechsler, Galuska, Fulton and Kann 2002). Other studies have confirmed that males are more exposed to screen compared to the females (Hastings et al., 2009; Mustafaoğlu and Yasacı, 2018; Aydoğdu Karaaslan, 2015). The main source of this difference may be the fact that male individuals are the target group of produced technologies. On the other hand, cultural differences may have an effect on this finding.

The results of the study have shown that lack of technological devices at student's home, having on their own devices or common usage do not affect PA levels of the students. In a previous study, more than half of the secondary school students were found to have a television in their bedrooms (Rideout, Foehr and Roberts, 2010). Studies have claimed that presence of a television where a child is sleeping causes a higher usage of television (Dennison, Erb and Jenkins, 2002; Wiecha, 2001) and televisions are generally removed after they are placed in the bedroom of a child (Saelens et al., 2002). Despite our finding that whether there is a technological device or not and it is inside the child's room or in common usage is not associated with PA levels, it is important for the families to consider the presence of technological devices in the child's room since the placement of the devices inside the child's room increases screen exposure time according to the existing literature (Dennison, Erb and Jenkins, 2002; Wiecha, 2001). Since these devices may be used when children cannot perform a PA (for instance; while lying down at night), relationship between PA levels of the children and device presence factors can be statistically insignificant. On the other hand, it was determined that students without an internet access were physically more active than the students with a limited or unlimited internet access at home. Children, that do not have internet at home, may fill in this time more physically active instead of spending time for several applications (playing a game, watching videos, etc.) in the internet. The study by Çakır (2013) also supports this finding.

In the current study, it was concluded that majority of the students were playing computer games to spend time and children were deprived of other activities. Another study revealed a negative correlation between digital game addiction and PA levels of secondary school students (Hazar, Demir, Namlı and Türkeli, 2017). Children having internet at home may become addicted to digital games. In addition to this, study findings have shown that children of the parents, who do not restrict media, have statistically higher levels of PA compared to restricting parents. While children with media restriction are expected to be more active, our findings show the opposite. This result may be derived from the fact that children without media restriction do not need such a restriction since they are already physically active due to some behavioral and environmental conditions. In other words, families might not prefer media restriction since their children are physically active and/or have acceptable level of screen time.

The results of the study have shown that PA levels of the students are not significantly different based on their place of residency or states of going out without a parent. However, the presence of a playground near the student's home, having a playmate, playing active games with the parents and having a toy or device enhancing PA are found to increase their PA levels. Previous studies have supported this finding of the current study. In the study by Liu et al. (2012) which was conducted with children living in the rural and urban, no statistically significant difference was found in the PA levels of the children aged between 12-19 years old who were living in the urban and rural. Living far away from the playgrounds was associated with lower PA in a previous study (Boehmer, Lovegreen, Haire-Joshu and Brownson, 2006). In another study, higher number of activity fields within walking distance was associated with increased PA (Gordon-Larsen, Page and Popkin 2006). Moreover, Cengiz and İnce (2013) found in their study that elementary school students living in a better physical and social environment performed a higher level of after-school PA. Other than this, circumstances such as playing game with the child within domestic environment and going out together affect PA levels (Dobbins et al., 2013; Kahn et al., 2002). In this context, it may be concluded that presence of a playground that the child can access easily during spare time, creating opportunities to play with playmates and playing actively with the parent increase PA level.

Study results have shown that there is no significant difference between PA levels of the students who were going to school as physically active (walking, cycling, scooter, etc.) and who were going with a vehicle. However, students who were taking responsibilities (helping with the housework), playing in an amateur sports team and performing exercise regularly were found to have higher PA levels compared to the students who were not. Previous studies have shown differences in the physical, physiological and anthropometric characteristics of the students who perform exercise and sports at various frequencies (Yörükoğlu and Koz, 2007).

The study results showed that PA behaviors of the students were influenced by safe environment, playing conditions and media usage in general. It is obvious that technological devices such as television, computer and tablet-phone affect human health adversely (Lowry et al., 2002; Hastings et al., 2009; Mustafaoğlu and Yasacı, 2018). However, it should be remembered that young generation has been raised with new information technologies and this situation is a part of their natural environment (Palička, Jakubec and Zvoníček, 2016). Students should be raised as a conscious consumer in accordance with the requirements of the age. Considering that habits acquired during early ages continue in the later periods (del Mar Bibiloni et al., 2012; Memiş & Yıldırım 2007; Telama et al., 2005), acquisition of this habit is highly important in terms of creating a healthy population under various living conditions (such as isolation during the pandemic or living in refugee camp). Accessibility of technological devices such as television, computer and tablet-phone is a factor that may create a negative effect on PA level and thus, human health; and may create an obstacle for individuals to adopt a physically active lifestyle. Awareness should be raised among the families and educators on this subject in order to generate a healthy society; and children should be prevented from being exposed to the screen longer than recommended. Public health workers should counsel families through routine follow-ups or dedicated programs and visits. On the other hand, although technological devices are considered to be responsible for the lack of PA among the individuals, these products can be used as a potential to prevent sedentary lifestyle. Software programs included in these devices can be structurally used to support teaching process, student's attention and improved learning efficiency (Krause and Sanchez, 2014). Besides, the number of technological devices at home, the presence of technological devices in the child's own room, whether there is internet at home or not and how these factors affect the PA level of the child should be observed by the family.

According to the results of the study, playing conditions also affect PA level. The families can discover the playgrounds near the place of residency together with the children. If children have difficulties in finding a playmate, families can behave consciously and provide their children to play with other children by cooperating with their families. Moreover, the family should play actively with their children and spare some time to them. Peer groups including the parents may be created to find playmates. Toys of the children can be chosen among the ones enhancing PA. On the other hand, creating a safe environment was found to affect PA level in a positive way according to the results of the study. In this context, environments such as performing regular exercise after school, playing in a sports team and attending a sports course should be created and supported. The schools should be built as supporting PA and measures supporting PA should be taken inside and around the school. School managers, teachers and other school staff should be supportive and leader for students to participate in PA. In addition, it should be reminded that schools have a large share when we evaluate PA behavior by considering the environment of the student. Students spend nearly 15.000 hours during compulsory education. Therefore, school days constitute the only period where everyone can meet physical skills and activities (Bailey, 2014) and it is an opportunity for the participation in PA.

This study focused on the relationship between PA levels of 5th, 6th, 7th and 8th grade secondary school students between 11-14 years old and their safe environment, playing conditions and media usage. A PA level map of the students in Turkey may be created by determining PA levels of the students at all levels through more comprehensive studies with an enlarged universe. Besides, interventions to enhance PA may be put into practice by investigating the factors affecting PA levels of the students living in various regions of Turkey.

Research and Publication Ethics Statement

Authors complied with the ethical principles and rules during the study. In order to conduct the study, an ethics approval was taken from Nevşehir Hacı Bektaş Veli University non-Interventional Research Ethics Committee (date: 09.27.2018/11). Also, a ministerial permission was obtained from the Ministry of National Education on 11.01.2018 and a permission to use was taken from the authors of the PAQ-C.

Contribution Rates of Authors to the Article

The authors confirm the contribution to the study as in the following: study conception and design: BG, NBG; data collection BG, IA, MTK; analysis and interpretation of results: BG, OD; preparation of draft manuscript: BG, IA; all authors reviewed the results and approved the final version of manuscript.

Statement of Interest

The authors included in this study did not declare any conflict of interest with other individuals, institutions and organizations.

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