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# Investigation of Obesity Awareness and Physical Activity Levels of Primary School Students (Van City Example)

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**ABSTRACT**
The goal of this study was to examine the relationship between awareness of obesity status and physical activity levels of students attending the 2nd grade of primary education. A total of 558 students studying in Van city center, 285 boys and 273 girls, participated in this study in the survey model. The study data were gathered using the "Physical Activity Questionnaire for Children (PAQC)", the "Obesity Awareness Scale", and "Personal Information Form". In the analysis of the study data, SPSS statistical package software was used for descriptive statistics, and as the data had normal distribution, ANOVA, t-test, and Pearson Correlation tests were used.There was a significant difference ($p<0.05$) between the students' income level, academic achievement, parent's occupation, parent's educationlevel, gender, age and physical activity levels. Physical activity levels in primary school students were found to have a positive and very significant relationship with obesity awareness ($r=0.116$, $p=0.000$). Furthermore, there was a positive and significant relationship between the PAQC score and the sub-dimensions of obesity ($r=0.103$, $p=0.015$), nutrition ($r= 0.111$, $p=0.008$), and physical activity ($r = 0.095$, $p=0.024$). As a result, students who consider their income level and academic success to be good are more likely physical activity levels. As the obesity awareness of the students increases, their physical activity levels increase. This article was presented as an oral presentation at The 10th International Conference in Physical Education, Sports and Physical Therapy - ICPEST - November 18 -20 2016.

**Keywords:** physical activity, obesity awareness, primary school

## INTRODUCTION

Obesity and overweight are defined as abnormal or excessive increases in body fat that endanger one's health. An individual would be evaluated as overweight with a body mass index (BMI) of over 25, and obese with a BMI of over 30. According to data procured by the World Health Organization (WHO)in 2017, the resultant death of more than 4 million people each year due to being overweight or obese indicate that this is a global epidemic disease. From 1975 to 2016, the rate of overweight and obesity among children and adolescents between the ages 5 to 19 had increased more than fourfold; %4 to %18 globally (https://www.who.int/health-topics/obesity#tab=tab_1 2022).

Childhood and adolescent obesity are regarded as a serious global issue, and numerous studies are being conducted in this area. The most important factors causing obesity, according to these studies, are malnutrition habits (Moore et al., 2017; Gure and Inan, 2001; Aryana et al., 2012; Allen, 2011; Pancar, 2018a; Pancar, 2018b), technological and social developments that lead to a sedentary lifestyle (Gurel and Inan, 2001). The need for physical activity in children is thought to increase as a result of this sedentary lifestyle, and this need should be met adequately (Aryana et al., 2012; Allen, 2011; Kirisciogluet al., 2019; Cinar et al. 2019). Physical activity is described as movements that ensure a balance of body mass control and energy consumption, and exercise is described as regular and systematic physical activity. Regular and consistent physical activity has been pointed out to help prevent obesity, lower the risk of many serious chronic diseases, and improve psychological well-being (Ay and Pancar, 2022; Pancar, 2021).

It will be effective to explain, develop, and support policies to endorse physical activity and healthy nutrition in children, as well as to increase the accessibility of environments for safe play and physical activity (Nigg et al., 2016). It is recognized that nutrition alone cannot be an effective and healthy method in the fight against obesity; it must be evaluated alongside physical activity, and lifestyle must be regulated within this framework (Koksal and Ozel, 2008). Childhood obesity should be regarded as a precursor to adult obesity (Baltaci and Duzgun, 2008; Barlow, 2007).

It is denoted that physical abilities and children's basic movement abilities, which are necessary precursors of physical activity and participation in later lifestyle and physical activity, contribute significantly to development. Physical fitness and activity can be beneficial to lessen the negative effects of being overweight and obese on the brain and cognition (Moore et al.,2017). Children should be encouraged in terms of physical activity during school. It is critical that they enjoy physical activity and that it becomes a habit for them.

Obesity and overweight have a negative impact on social-emotional skills (Gil Madrona et al., 2019). When physical activity is shown appropriately, it can be beneficial for children to develop their social ability, behaviour, self-esteem, and post-school attitudes, as in addition to their cognitive and academic development in certain situations (Bailey, 2006). Within the last couple of years, children's rest and play times have either been limited due to academic concerns or withheld from them through punitive methods. For the benefit of a child's health and well-being, recess time should be considered as children's personal time. It should not be taken over for academic or disciplinary reasons (Ramstetter et al., 2010).

Obesity status may be influenced by nutritional habits and physical activity preferences in school-age children. During this period, educational activities about obesity risk factors will benefit all types of obesity treatment and prevention efforts (Allen, 2011). As a result, it is thought of as important to raise obesity awareness among school-age children.

It is thought that knowing the awareness and physical activity levels of primary school students about obesity is important in order to develop healthy lifestyle behaviours starting from childhood. The purpose of this study was to determine the relationship between primary school students' awareness of obesity and their levels of physical activity.

## METHOD

A total of 558 students from Van City Centre, 285 boys and 273 girls, took part in this study with a screening model.

The study data were collected using the "Physical Activity Questionnaire for Children (PAQC)" developed by Crocker et al. (1997), the Turkish validity and reliability of which was done by Tanir (2013), the "Obesity Awareness Scale" developed by Allen (2011), the Turkish validity and reliability of which was done by Kafkas and Ozen (2014), and "Personal Information Form". The students' body mass indices were calculated using the WHO-2007 BMI reference formula (Onis et al., 2007). In the analysis of the data, SPSS statistical package program was used for descriptive statistics, as well as student t-test and one-way analysis of variance since the data are normally distributed ($p<0.05$).

Permission was obtained from the Van Governorship Provincial Directorate of National Education, dated 18.11.2015 and numbered 94104669/20/1181416.

## Findings

**Table 1.Body Mass Index (BMI) Descriptive**

| Gender | BMI | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Underweight | | Normal | | Obese | | Total | |
| | N | % | N | % | N | % | N | % |
| Female | 145 | 53.1 | 119 | 43.6 | 9 | 3.3 | 273 | 100 |
| Male | 124 | 43.5 | 145 | 50.9 | 16 | 5.6 | 285 | 100 |
| Total | 269 | 48.2 | 264 | 47.3 | 25 | 4.5 | 558 | 100 |

Obesity was found to be 4.5% overall in our study. When the gender variable was considered, females had a 3.3% obesity rate and males had a 5.6% obesity rate.

**Table 2. Gender and Body Mass Index (BMI)**

| Gender | BMI | | |
|---|---|---|---|
| | N | $\bar{X}$±SD | p |
| Female | 273 | 18.49±3.35 | 0.015* |
| Male | 285 | 19.2±3.51 | |
| Total | 558 | 18.85±3.45 | |

*P<0.05, **P<0.01

When the body mass index was evaluated, significance was determined in favour of female students (P<0.05).

**Table 3. Academic Achievement and PAQC Score**

| Academic Achievement | PAQC Score | | | Differences |
|---|---|---|---|---|
| | N | X̄±SD | p | |
| High | 192 | 2.43±0.73 | 0.044* | High>Low* |
| Moderate | 323 | 2.28±0.72 | | |
| Low | 43 | 2.2±0.75 | | |
| Total | 558 | 2.32±0.73 | | |

*P<0.05, **P<0.01

There is a significant difference between low and high academic achievement (P<0.05). There is a significant difference between academic achievement and physical activity level (P<0.05). Physical activity levels were found to be high in students who rated their academic achievement as high.

**Table 4. Mother's Occupation and PAQC Score**

| Mother's Occupation | PAQC Score | | | Differences |
|---|---|---|---|---|
| | N | X̄±SD | p | |
| Officer | 21 | 2.34±0.88 | 0.021* | Other> Officer, Worker, Self-Employed, Housewife* |
| Worker | 8 | 2.31±0.71 | | |
| Self-Employed | 10 | 2.32±0.9 | | |
| Housewife | 503 | 2.3±0.71 | | |
| Other | 16 | 2.93±0.98 | | |
| Total | 558 | 2.32±0.73 | | |

*P<0.05, **P<0.01

The difference between those who responded as "other" and "all of them" was significant (P<0.05). Although students who evaluated their mother's profession as "other" in demographic information had higher levels of physical activity, there was no significant difference (P>0.05). In other words, when the table is examined, the highest average in the "other" option is 2.93±0.98.

**Table 5. Mother's Occupation and OAS Score**

| Mother's Occupation | OAS Score | | Obesity Sub-Dimension | | Nutrition Sub-Dimension | | Physical Activity Sub-Dimension | |
|---|---|---|---|---|---|---|---|---|
| | N | X̄±SD | P | X̄±SD | P | X̄±SD | P | X̄±SD | P |
| Officer | 21 | 61.38±11.13 | 0.51 | 26.85±5.85 | 0.035* | 19.33±3.92 | 0.11 | 15.19±3.12 | 0.041* |
| Worker | 8 | 55.25±4.3 | | 23±3.7 | | 17±3.02 | | 15.25±2.31 | |
| Self-Employed | 10 | 48.6±15.99 | | 20.1±7.18 | | 15.4±6.31 | | 13.1±3.75 | |
| Housewife | 503 | 53.96±12.29 | | 23.51±6.25 | | 16.96±4.44 | | 13.48±3 | |
| Other | 16 | 54.5±13.05 | | 25.4±6.57 | | 16.18±4.51 | | 12.87±2.7 | |
| Total | 558 | 54.17±12.34 | | 23.62±6.27 | | 17±4.46 | | 13.55±3.02 | |
| Differences | | | | Other, Officer> Self-Employed* | | | | Officer, Worker>Other* | |

*P<0.05, **P<0.01

Table 5 shows that the mother's occupation influences the students' responses to the obesity and physical activity sub-dimensions (P<0.05). While the students whose mothers were officers had a higher total obesity awareness score than the other groups, the mean obesity sub-dimension was 26.85±5.85, while the mean physical sub-dimension score of 15.19±3.12 was more significant and different than the other groups.

**Table 6. Father's Education Status and OAS Score**

| Father's Educational Status | OAS Score | | | Obesity Sub-Dimension | | Nutrition Sub-Dimension | | Physical Activity Sub-Dimension | |
|---|---|---|---|---|---|---|---|---|---|
| | N | X̄±SD | P | X̄±SD | P | X̄±SD | P | X̄±SD | P |
| A. Not literate | 60 | 55.18±12.92 | 0.048* | 24.73±6.76 | 0.026* | 17.05±4.57 | 0.409 | 13.4±2.82 | 0.029* |
| B. Literate | 74 | 52.14±10.99 | | 22.54±5.73 | | 16.47±4.22 | | 13.13±2.84 | |
| C.PrimarySchool | 227 | 53.51±13 | | 23.16±6.54 | | 16.87±4.69 | | 13.47±3.11 | |
| D. High school | 120 | 54.25±11.58 | | 23.8±5.73 | | 17±4.24 | | 13.44±3.04 | |
| E. University | 55 | 58.85±12.07 | | 25.8±6.22 | | 18.18±4.46 | | 14.87±2.81 | |
| F.Post-graduate | 22 | 53.04±10.69 | | 22.54±5.41 | | 16.95±3.57 | | 13.54±2.9 | |
| Total | 558 | 54.17±12.34 | | 23.62±6.27 | | 17±4.46 | | 13.55±3.02 | |
| Differences | | E>B* | | E>B,C, F* | | | | E>A, B, C, D, F* | |

*P<0.05, **P<0.01

Table 6 shows that the educational status of the students' fathers influences their response to obesity awareness, obesity sub-dimension, and physical activity sub-dimension (P<0.05). As can be seen, there is a significant difference in favour of children whose fathers are university graduates.

**Table 7. Gender and PAQC Score**

| Gender | PAQC Score | | |
|---|---|---|---|
| | N | X̄±SD | P |
| Female | 273 | 2.16±0.66 | 0.00** |
| Male | 285 | 2.47±0.76 | |
| Total | 558 | 2.32±0.73 | |

*P<0.05, **P<0.01

It is clear that the gender variable has an impact on physical activity. Male students have higher levels of physical activity than female students (P<0.01).

**Table 8. Income Level and PAQC Score**

| Income Level | PAQC Score | | | Differences |
|---|---|---|---|---|
| | N | X̄±SD | P | |
| High | 64 | 2.65±0.94 | 0.00** | High>Moderate, Low* |
| Moderate | 370 | 2.3±0.67 | | |
| Low | 124 | 2.22±0.73 | | |
| Total | 558 | 2.32±0.73 | | |

*P<0.05, **P<0.01

There is a highly significant difference between those who say high, and those who say medium and low (P<0.01). It can be seen that students' levels of physical activity are affected by their income level. While students with high income have an average physical activity score of 2.65±0.94, students with low income have an average score of 2.22±0.73 (P<0.01).

**Table 9. Income Level and OAS Score**

| Income Level | OAS Score | | | Obesity Sub-Dimension | | Nutrition Sub-Dimension | | Physical Activity Sub-Dimension | |
|---|---|---|---|---|---|---|---|---|---|
| | N | X̄±SD | p | X̄±SD | p | X̄±SD | p | X̄±SD | p |
| High | 60 | 58.7±12.73 | 0.00** | 25.95±6.19 | 0.00** | 18.4±4.46 | 0.00** | 14.34±3.38 | 0.01* |
| Moderate | 74 | 54.14±11.21 | | 23.46±5.76 | | 17.08±4.17 | | 13.58±2.82 | |
| Low | 227 | 51.95±14.6 | | 22.89±7.44 | | 16±5.07 | | 13.04±3.30 | |
| Total | 558 | 54.17±12.34 | | 23.62±6.27 | | 17±4.46 | | 13.55±3.02 | |
| Differences | | High>Moderate, Low* | | High>Moderate, Low* | | High>Moderate, Low* | | High>Low* | |

*P<0.05, **P<0.01

Table 9 shows that income level influences obesity awareness status (P<0.01). There is also a significant difference in the physical activity sub-dimension of students with high income levels (P<0.05).

**Table 10.Spending Time with Multimedia Devices (TV, Computer, Tablets or Cell Phone) and PAQC– OAS Score**

| Spending Time | PAQC Score | | | OAS Score | |
|---|---|---|---|---|---|
| | N | X̄±SD | P | X̄±SD | P |
| 1 Hour | 161 | 2.28±0.73 | 0.553 | 54.15±12.91 | 0.974 |
| 2 Hour | 164 | 2.29±0.68 | | 54.17±11.66 | |
| 3 Hour | 109 | 2.35±0.74 | | 54.6±11.94 | |
| 4 Hour and above | 124 | 2.39±0.79 | | 53.83±12.91 | |
| Total | 558 | 2.32±0.73 | | 54.17±12.34 | |

*P<0.05, **P<0.01

There is no significant difference between the time students spend with multimedia devices and their physical activity levels and obesity awareness levels (P>0.05).

**Table 11. Age and PAQC Score**

| Age | PAQC Score | | | Differences |
|---|---|---|---|---|
| | N | X̄±SD | P | |
| 11 | 43 | 2.7±0.78 | 0.00** | 11>12,13,14,15* |
| 12 | 145 | 2.42±0.75 | | |
| 13 | 203 | 2.26±0.72 | | |
| 14 | 141 | 2.17±0.70 | | |
| 15 | 26 | 2.37±0.53 | | |
| Total | 558 | 2.32±0.73 | | |

*P<0.05, **P<0.01

There was a significant difference (P<0.05) between those aged 11 and the others. There is a very significant difference between age and level of physical activity (P<0.01). Physical activity levels were found to be higher in students at the start of the second level of primary education (2.7±0.78).

**Table 12. PAQC Score and OAS Score**

| | OAS Score | | Obesity Sub-Dimension | | Nutrition Sub-Dimension | | Physical Activity Sub-Dimension | |
|---|---|---|---|---|---|---|---|---|
| | r | p | r | p | r | p | r | p |
| PAQC Score | 0.116 | 0.000** | 0.103 | 0.015* | 0.111 | 0.008** | 0.095 | 0.024* |

*P<0.05, **P<0.01

The PAQC score and the OAS score have a positive and very significant relationship (r=0.116, p=0.00). Furthermore, there is a positive and statistically significant relationship with the sub-dimensions of the OAS.

**DISCUSSION AND CONCLUSION**

This research revealed that students' obesity awareness and physical activity levels were linked to a variety of factors. Obesity is thought to affect physical activity and obesity awareness. When the effect of gender is examined, female students' body mass indexes are found to be healthier. There is significance in favour of girls. Dastan et al. (2014), Özilbey (2013), Kendirli et al. (2007), Grassi et al. (2016) discovered a higher prevalence of overweight and obesity in boys than in girls; Arıkan et al. (2020) found it remarkable that obesity is high in both genders, especially in young children. In their studies, Ceylan and Turan (2008), Oztora (2005), Ulutaş et al. (2014), Ozturk and Akturk (2011), and Ari and Suzek (2008) identified no connection between obesity and gender. Aragão et al. (2014) stated that the prevalence of overweight and obesity is high in childhood.

In this study, 4.5% of all participants were found to be obese. When the gender variable was considered, females had a 3.3% obesity rate and males had a 5.6% obesity rate. Many researchers have determined the obesity rate differently. Ulutas et al. (2014) determined the prevalence of obesity as 40.4% in males and 59.6% in females. According to Savashan et al. (2015), 7.5% of 3,963 children aged 6-11 years in their study were obese. In a study of 1,510 people aged 6 to 17, Simsek et al. (2005) found that 4.8% of all children were obese. Ozturk and Akturk (2011) found that the prevalence of obesity was 6.5%. In their 2011 study, Onsuz et al. (2011) observed that 13.9% of students were obese, 14.2% were overweight, 62.7% were normal, and 9.2% were underweight or very thin.

According to the 2003 International Obesity Commission report, one out of every ten child aged 5-17 worldwide is overweight or obese (Ergul and Kalkim, 2011) state that approximately one-fifth of primary school students have obesity problems (Ozturk and Akturk, 2011). According to the percentiles of body mass index, 16.9% of the participants were obese, and 6.8% were severely obese, according to Çifçili et al. 2003 as cited Dişçigil,2007) In a cross-sectional study of 1,266 students from elite private and public schools in urban and rural areas, Bhargava et al. (2016) revealed that 15.6% were overweight and 5.4% were obese. Zayed et al. (2016) stated that the total prevalence of overweight and obesity was 17.3% and 15.7%, respectively. Altindag and Sert (2009) found obesity rate as 22.9% in children aged 11-13 years.

It is clear from this study that the gender variable influences physical activity. Male students were found to have higher levels of physical activity than female students (P<0.01). There is a significant difference between the physical activity levels of boys and girls in the studies conducted by Hekim and Yuksel (2015), Akman et al. (2012), Taskinoz (2011), Tanir (2013), and Kusgoz (2005). According to Mendes (2011), there is no gender difference in physical activity levels. According to Yuksel (2019), the physical activity levels of adolescents, their obesity awareness, and nutritional behaviours differed significantly depending on gender, and males' physical activity levels differed significantly from females'.

Kara (2017) stated in his study that there was no significant difference in the OAS sub-dimensions and PAQC scores based on the gender of the students. In their study, Kudas et al. (2005) identified that girls' physical activity levels were lower than boys' both during and after school hours, and that children's physical activity levels decreased during school hours. In their study, Yuksel and Akil (2019) found a significant link between physical activity levels and obesity awareness levels, as well as physical activity levels and nutritional behaviour sub-dimensions.

The physical activity levels of students who rated their academic success as high in our study were also found to be high. In the studies conducted by Bilgin (2017), Ayan et al. (2014), Telford et al. (2012), Tanir (2013), Castelli et al (2007) a positive and significant relationship was found between the physical fitness levels of students and their academic achievement. In their studies, Unuvar (2018), Yildiz (2017), Dogan (2016), and Kaynak (2006) observed no significant relationship between physical activity and academic achievement.

In this study, determined a highly significant differences in physical activity levels between ages (P<0.01). Students' physical activity levels were found to be higher at the beginning of the second level of primary education (2.7±0.78). According to Tanir (2012), there is no statistically significant difference in physical activity levels among students based on age groups. According to Kara (2017), there is no significant difference between the OAS sub-dimensions and PAQC scores of students based on their age.

When the study findings were analyzed, the students' mean total obesity awareness score was 54.17±12.34, while their mean physical activity score was 2.32±0.73. Yuksel (2019) stated that his obesity awareness study revealed a total score in nutritional behaviours (43.75±8.01), obesity awareness (56.28±9.90), and physical activity level (18.01±5.95). Kara (2017) reported students' obesity awareness scores (x=2.85), nutrition awareness scores (x=3.08), physical activity awareness scores (X=3.17), and physical activity level scores (x=3.03). According to Yilmaz and Kocatas (2019), the average physical activity score of students is moderate.

In this study, it revealed a positive and highly significant relationship between primary school students' physical activity levels and their awareness of obesity (r=0.116, p=0.00). Furthermore, a positive and significant relationship was discovered between PAQC score and the sub-dimensions of obesity (r=0.103, p=0.015),

nutrition (r=0.111, p=0.008), and physical activity (r=0.095, p=0.024). According to Yuksel (2019), there is a positive and negligible correlation between participants' physical activity levels and their obesity awareness levels.

It has been observed that the mother's occupation influences children's obesity awareness and physical activity levels. In other words, children whose mothers work have a higher level of obesity awareness and physical activity. In a study conducted in parallel with this one, Gozu (2007) observed that obesity was prevalent in the children of housewife mothers. According to Kara (2017), there was no significant difference in the OAS sub-dimensions and PAQC scores of students based on their parents' occupations.

In our study, the educational status of the students' fathers influenced their responses to the obesity awareness total score, obesity awareness, obesity sub-dimension, and physical activity sub-dimension (P<0.05). There is significance in favour of children with fathers who are university graduates.

Kara (2017) states that there is asignificant difference between students' OAS sub-dimensions and PAQC scores based on their parents' educational levels. Atli et al. (2016) observed no statistical significance between the total score and the sub-dimensions of parents' education status, reading books, watching television, fast food eating habits, and obesity awareness in their study.

In the International Childhood Obesity study, researchers took a sample size of 4,752 children aged 9-11 years from 12 countries. They found positive associations between parent and child overweight in all countries, positive associations between parental education and child overweight in countries with lower economic status, or negative associations between parental obesity and child's physical activity. They revealed findings that were consistent with previous studies that found negative relationships between education and physical activity in children. Considering the relationships between parental education, the child's weight status and physical activity, and the developmental stage of different countries, it is stated that it is critical to investigate familial factors further when investigating the overweight child and their physical activity. (Muthuri et al., 2016).

In this study, there is no significant difference between the time students spend with multimedia devices and their physical activity levels and obesity awareness levels (P>0.05). On the contrary, information from National Health Review Research 2 and 3 revealed significant associations between the prevalence of obesity and time spent watching television in 6,965 children aged 6-11 years and 6,671 children aged 12-17 years (Dietz and Gortmaker, 1985). Hong et al. (2016) stated that physical activity reduces the risk of obesity. Bhargava et al. (2016) surveyed 1,266 students from elite private and public schools in urban and rural areas. They observe that overweight and obesity are significantly associated with passive transportation to school, missed play opportunities during lunch breaks, a lack of participation in household chores, and physical inactivity as a result of excessive TV watching. According to Yildirim and Uskun (2018), the presence of overweight individuals in the family/close environment, car transportation to school, and being asked to maintain the same weight by their best friend of the same sex are all significant risk factors for obesity. In their study, Ghobadi et al. (2018) stated that eating in front of the television is associated with obesity.

Simsek et al. (2005) observed that students' television viewing time was long, but their physical activity levels were low. Simsek et al. (2005) revealed that students' physical activity levels were low in their study. Television watching times were determined to be long. The use of smartphones, tablets, computers, and video games is linked to a number of risk factors for obesity (Kenney and Gortmaker, 2017). According to Kara (2017), there is no significant difference between OAS sub-dimensions and PAQC scores based on students' use of technological tools.

There was a significant difference in the physical activity sub-dimension of students with high income levels in our study (P<0.05). According to Kara (2017), there is no significant difference in the OAS sub-dimensions and PAQC scores based on the students' families' income.

It is accepted that a health-focused physical education curriculum can provide students with increased physical activity within school hours. 97% of secondary school students could benefit from improved physical education classes (Sallis et al., 1997).

## CONCLUSION

When the findings of this study and other research are considered, it is clear that obesity awareness and physical activity are influenced by a variety of factors. The fact that children who continue in primary school have completed their developmental periods, that fast food is easy and inexpensive to obtain, and that parents play an active role in working life can all be considered important factors. Test anxiety has a negative impact on families and children's participation in physical activities. The excessive amount of time spent in front of computers and other technological devices has a negative impact on all members of the family.

It is thought that developing policies to protect public health and ensure the participation of children and families in this process, as well as using sports activities effectively in school programs, will be useful in changing the social perspective.

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