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ORIGINAL ARTICLE

Determination of Obesity Awareness Levels of Secondary School Students and Suggestions for Solutions: The Case of Çanakkale

Salih Yakut[1] & Neda Şayan[1*]

[1]Çanakkale Science and Arts Centre, Çanakkale, Turkiye.

Ethical Statement
Research ethics were followed. Institutional permissions were granted from the Ministry of National Education (No: E-60305806-44-40300648, 23/12/2021).

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Conflict of Interest
There are no conflicts of interests to disclose.

ABSTRACT

The purpose of this study is to determine the obesity awareness level of secondary school students. The study was conducted through quantitative research methods. The data were collected by applying the Obesity Awareness Scale to 506 students studying in public and private secondary schools in Çanakkale/Turkiye. The data were analysed by using frequency, *t*-test and ANOVA Test results. According to the results of the study, the obesity awareness level of secondary school students was "good". The item "it is important to be at a normal weight to be a healthy person" was determined as the highest average, and the item "Reviews of magazines, movies and TV play an important role in obesity" was determined as the lowest average. There was a significant gender difference in favour of female students in the obesity awareness level of secondary school students in the overall scale, in the obesity awareness sub-dimension and in the physical activity awareness sub-dimensions. There was not significant difference by school type, grade level and having an athlete license. The average of the body mass index of secondary school students was determined as "normal" according to the criteria of the World Health Organization. In addition, it was determined that male students had a higher weight average than female students.

Keywords: Healthy life, obesity awareness, nutrition, secondary school students.

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***Corresponding Author**
Teacher, Çanakkale Science and Arts Centre, Çanakkale, Turkiye.
Email: nedasayan@hotmail.com

INTRODUCTION

Nutrition, which has the first place in Maslow's theory of needs, is of great importance for the continuation of our lives and the protection of our health (Güngördü, 2021). Having a healthy diet means having balanced and sufficient amount of nutrients in a diet such as water, minerals, protein, carbohydrates, fats, and vitamins from reliable sources in order for people to continue their lives. It is important to get enough nutrients for the human body. Since undernutrition and overnutrition negatively affect human health, people need to be fed correctly and healthily (TÜBİTAK, 2021). Additionally, a child who has a well-balanced diet can grow better and learns more easily (UNESCO, 2022). Moreover, people who eat more healthily are expected to lead a happy life; therefore, obesity should be avoided for a healthy life.

In recent years, alarm bells have been ringing regarding the trend of obesity in children. As of 2022, the rate of childhood obesity is 10 times higher than it was in the 1970s (T.C. Sağlık Bakanlığı, 2022a). The fight against obesity has become inevitable. To cope with obesity, first of all, it is necessary to raise awareness. Education is essential to raise awareness about obesity (İmamoğlu, 2021). Informing both students and parents about having a healthy diet in order to prevent obesity contributes to society. Also, lessons should be drawn from research on obesity.

In order to prevent obesity, we must integrate enough physical activity into our daily lives. Physical activity is a necessary healthy lifestyle behavior for all age groups, from children to adults, to socialize, to stay away from harmful habits, to develop physically and spiritually, and to prevent chronic diseases (Demirtaş, 2021). It has been determined that physical education lessons with the theme of health-related physical activity have a positive impact on healthy lifestyle behavior and physical activity in high school students (Sural, 2021). Factors such as lower levels of physical activity in children, higher time spent in front of the television and computer, opting for school buses for going to school, and frequent use of elevators cause them to lead a sedentary life (Demir, 2020). Therefore, measures should be taken against obesity so that children can lead healthy life.

The use of body mass index is preferred by the World Health Organization in determining obesity. Body mass index calculation is obtained by dividing the weight of the person by the square of the height (Güngördü, 2021). The values formed as the result of the calculation of the body mass index are classified as underweight (18.50 and below), normal (18.51-24.99), overweight (25.00-29.99), and obese (30.00 and above) (T.C. Sağlık Bakanlığı, 2022b). It is highly likely that people with a normal body mass index will have a better quality of life.

As a result of the literature review on obesity awareness, various studies have been found, but it has been determined that there are only a few studies at the level of secondary school students. Relevant studies conducted in recent years are mentioned below.

Akarsu (2021) stated that obesity is an important disease that is influential not only in adolescents but also in childhood, and he determined the obesity frequency in his research slightly above the literature. Altan (2021) stated in his study that the inclusion of parents and teachers in the children's obesity prevention program would be effective in increasing awareness and encouraging them for healthy lifestyle behaviors. Akmeşe and Güçlü (2021), in their research study conducted with 447 secondary and high school students in Kütahya to determine health-promoting behaviors, suggested that health education and healthy behavior development programs and trainings should be given, and health literacy should be brought to the forefront through teachers. Gulay et al. (2021) investigated the relationship between physical activity and obesity levels in students aged 8-10 in Kayseri. In the study, height, weight, and body mass index were calculated, and it was concluded that approximately one-fourth of the participant students were obese, their

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physical activity levels were low, and the obesity levels of female students were high. It was suggested to improve their lifestyle and habits by increasing the physical activity levels of parents and the children. In Öztürk's (2021) study, it was determined that high school students had insufficient knowledge about balanced nutrition and obesity. Students in high school had misconceptions about nutrition in the 9th-grade Biology course curriculum and held incorrect beliefs. In the study of Kabadayı (2021), it was stated that parental diet did not directly increase obesity in children, but the age, marital status and body mass index of the parents had an effect on the obesity status of children. In that study, it was observed that the obesity rate was higher in children of divorced families.

Demir (2020) examined children's eating behavior, food addiction, physical activity and obesity in his doctoral thesis and developed an obesity prevention program. He emphasized that the inclusion of the obesity prevention program he developed in the national education curriculum might have a positive effect. Kaşlı (2020), in his research with children aged 6-17 at Ankara Keçiören Training and Research Hospital, stated that informing children about nutrition, inspecting nutrition areas such as canteens and dining halls, and increasing physical activity times would be effective in preventing obesity.

Çavdar (2018) emphasized that teachers and parents should also receive nutrition education, and it might have a positive effect on a balanced diet and sufficient nutrition. He also suggested that dietitians should give nutrition education in schools in cooperation with the Ministries of Health and Education. Özmet (2018) examined the relationship between healthy lifestyle attitudes and healthy lifestyle choices of 258 5th-grade secondary school students in Istanbul. It was determined that the awareness levels of obese students regarding healthy lifestyle behaviors and physical activity were low. Koç (2016) stated that for the early detection of childhood obesity, school health nurses can be assigned to schools to monitor the height and weight of the students by scanning them periodically.

When the studies on obesity are examined, it has been observed that people are prone to more sedentary life in recent years, the rate of obesity has increased gradually, and the problems regarding having a healthy diet and life have increased. In today's world, it is necessary to create obesity awareness first to prevent obesity. For this reason, it is very important to raise awareness regarding obesity from the secondary school age, which is one of the most important educational levels for a child.

Problem Status

Obesity or being overweight is defined as a risk for health, which indicates abnormal or excessive fat accumulation (TDK, 2022). Between the years of 1975 and 2016, the rate of obesity in children increased from 4% to 16% globally (WHO, 2022). Childhood obesity is increasing in the world, especially in secondary-income countries (UNICEF, 2022). Awareness should be raised against obesity, especially in childhood. Since children spend most of their time in schools, obesity awareness, physical activity and balanced nutrition are very important for a healthy life in this period (Allen, 2011: 56). Thus, it is thought that it will be beneficial to raise obesity awareness on children at an early age.

Risk factors such as unhealthy diet and sedentary lifestyle spread widely in most countries of the Organization for Economic Cooperation and Development (OECD), triggering diseases and deaths (OECD, 2022). In order to get rid of these diseases, a healthy diet should start at an early age. In Turkiye, which is a member of the OECD, it is seen that the prevalence of obesity in children exceeds 10%. National-scale studies investigating obesity prevalence are limited (Kabadayı, 2021: 4); however, increasing the number of studies on obesity in children may provide an advantage in early diagnosis of obesity.

Although there is a compulsory Health Information and Traffic Culture course in Turkish high schools' weekly course schedule, there are no lessons related to obesity or healthy life and nutrition in the weekly course schedule at the secondary schools (MEB TTK Weekly Course Schedules, 2022). The absence of lessons about healthy living, nutrition and obesity in secondary schools may create problems in children's health.

It is very important to gain obesity awareness at the secondary school level, which is one of the most valuable educational time periods for children. In this study, it is thought that examining the obesity awareness levels of students according to different variables may lead to some improvements which will help children be more knowledgeable about the topic and lead a healthy life.

Research Problems and Questions

The overarching research problem in this study was: "What is the obesity awareness level of secondary school students"?" To the end of this question, four sub-questions were sought to be answered.

1. Is there a significant difference in the obesity awareness level of secondary school students in general and sub-dimensions of the scale according to gender, grade level, type of the school and having an athlete licence?
2. What is the average body mass index of secondary school students?
3. What is the average height and weight of secondary school students?
4. Is there a significant difference in the average height and weight of secondary school students according to gender grade level, type of the school and having an athlete licence?

Purpose of the Study

In this study, it was aimed to determine the obesity awareness levels of secondary school students and to examine them according to the variables of gender, grade level, school type and athlete licenses. In addition, it is aimed to draw attention to obesity awareness in secondary school students and to offer solutions.

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METHOD

Research Design

The quantitative research method was applied in this study. Studies in the literature on obesity awareness were examined, and related readings were done in this area. As a result of the literature research and readings, the applied scales were examined to obtain data on the subject. Allen (2011) developed Obesity Awareness Scale, then Kafkas and Özen (2014) adjusted it to Turkish. So, it was decided to use this scale by taking expert opinions.

Universe and Sample

Students studying in private and public secondary schools in Çanakkale city constitute the universe of the research. The sample of the research was formed from secondary school students studying in Çanakkale Central district to represent the whole city. A simple random sampling technique was preferred due to its ease of accessibility. There were 17 public secondary schools and 7 private secondary schools in Çanakkale city center in the 2021-2022 academic year. There were 7256 students in these secondary schools (MEB Okullar, 2021). Based on voluntary participation, 506 usable questionnaires were reached.

Instruments

The Obesity Awareness Scale was applied to gather the data. Allen (2011) developed Obesity Awareness Scale, then Kafkas and Özen (2014) adapted it into Turkish. Since the Cronbach Alpha value of the scale was 0.87, and the confirmatory factor analysis values (RMSEA=.046, CFI=.93, GFI=.91) were found at a good level, the scale was accepted as reliable and valid. There are three sub-dimensions; Obesity Awareness (OA; Items 1, 3, 4, 6, 7, 9, 10, 19, 20), Nutrition Awareness (NA; Items 2, 5, 8, 11, 12, 14), Physical Activity Awareness (PAA; (item 13, 15, 17, 18). When the mean values of the responses to the scale are calculated, they are accepted as low (0-1), mediocre (1.1-2.0), good (2.1-3.0), high (3.1-4.0) (Kafkas & Özen, 2014:1,13).

Procedure

To use the Obesity Awareness Scale, permission was received from the scale owner through an email. In addition, permission was received from the Çanakkale Provincial Directorate of National Education with the letter dated 31.12.2021 and numbered 40300648 to apply the scale to private and public secondary school students. After obtaining permission, data were collected in person on a voluntary basis, but 55 papers were excluded from the study because height and weight information were missing. In addition, 16^{th} item was removed because most of the participant students left it blank in the scale (32 Body Mass Index (BMI) value is a healthy BMI value).

Data Analysis

The usable data collected from 506 students were analyzed with the Statistical Package for Social Sciences (SPSS) program. The values obtained as a result of the calculations made in the Cronbach Alpha, Likert type scales are between 0 and 0.40 unreliable, between 0.40 and 0.60 low reliability, between 0.60-0.80 highly reliable, 0.80-1.00 is accepted as high reliability (Yıldız & Uzunsakal, 2018: 19). The Cronbach Alpha test was used for the reliability of the data and is shown in Table 1.

Table 1. *Reliability Test Results*

Scale	Number of items	Alpha
Overall scale	19	0.74
Obesity Awareness (OA)	9	0.50
Nutrition Awareness (NA)	6	0.62
Physical Activity Awareness (PAA)	4	0.42

When Table 1 is examined, it is seen that the overall Cronbach's Alpha value of the Obesity Awareness Scale is very reliable at 0.74, the OA sub-dimension has low reliability at 0.50, the NA sub-dimension is very reliable at 0.62, and the PAA sub-dimension is low-reliable with 0.42. It was accepted that the answers given to the scale were reliable and valid considering the calculated values.

When the values of kurtosis and skewness are between -2 and +2, it is accepted that the data are normally distributed (George & Malley, 2020: 114). The kurtosis and skewness information were used to calculate the normality of the data and are shown in Table 2.

Table 2. *Normality Test Results*

Scale	Skewness	Kurtosis
Overall scale	-0,70	0,11
Obesity Awareness (OA)	-0,23	0,11
Nutrition Awareness (NA)	-0,89	0,11
Physical Activity Awareness (PAA)	-0,40	0,11

According to Table 2, since the skewness and kurtosis values in general and sub-dimensions of the Obesity Awareness Scale were between -2 and +2, it was accepted that the data were normally distributed. The parametric tests t-Test and Anova Test were used because the data had a normal distribution. The p value of <0.05 was accepted as a statistically significant difference in the analysis results. Tukey HSD test, one of the Post Hoc sub-analyses, was used to determine the difference after the Anova Test.

Demographics of Participants

Demographic information of 506 students belonging to the Obesity Awareness Scale applied in public and private secondary schools in Çanakkale city center is presented below. It is seen that the distribution of the participants by gender is 49.2% female and 50.8% male, according to Table 3.

Table 3. *Gender*

Gender	f	%
Female	249	49,2
Male	257	50,8
Total	506	100,0

Looking at Table 4, it is seen that the distribution of the participants by grade level is 28.7% for 5th grade, 17.8% for 6th grade, 29.8% for 7th grade, and 23.7% for 8th grade.

Table 4. *Grades*

Grade	f	%
5	145	28,7
6	90	17,8
7	151	29,8
8	120	23,7
Total	506	100,0

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When Table 5 is examined, it is understood that 76.9% of the participants study at a public school and 23.1% at a private school.

Table 5. *Types of school*

Type of school	f	%
Public	389	76,9
Private	117	23,1
Total	506	100,0

When Table 6 is examined, 34.4% of the participants have an athlete license, while 65.6% do not have an athlete license.

Table 6. *Status of participants having athlete license*

Sporter license	f	%
Yes, there is	174	34,4
No, there is not	332	65,6
Total	506	100,0

RESULTS

In this part of the study, findings on Obesity Awareness Scale was given and the obesity awareness levels of the participant students were examined according to various variables (gender, class level, school type, sporter license). In addition, the participants' body mass index, height and weight information were presented.

Table 7. *Distribution of Responses to the Obesity Awareness Scale*

Scale items	x̄	ss
1- Childhood obesity is the rise in our school, society and country.	2,70	0,81
2- It is essential to eat with families most evenings to be healthy.	3,00	0,89
3- Obese children are more likely to develop health issues related to their weight, such as diabetes.	3,00	0,86
4- The majority of obese children will grow up with their obesity and maintain a normal weight as an adult.	2,35	0,88
5- It is important to drink eight glasses of water every day to stay healthy.	3,23	0,90
6- Peer pressure (peer exercise and eating habits) plays an important role in the causes of obesity.	2,78	0,90
7- Spending more time on the computer, playing video games and watching television instead of playing outside or participating in a game is an important factor in obesity	2,86	1,06
8- If I don't do physical activity regularly, I feel restless.	2,76	0,97
9- Obese children may have more friendship and self-confidence problems.	2,83	0,95
10- Reviews of magazines, movies and TV play an important role in obesity.	2,24	0,95
11- Eating a variety of foods every day contributes to a healthy diet.	2,75	0,94
12- It is essential to eat nutritious food for breakfast every day to stay healthy.	3,26	0,922
13- Burning calories during exercise is necessary to maintain a healthy body weight.	3,17	0,84
14- Bad eating behaviors such as eating junk food every day are an important cause of obesity.	3,18	0,95
15- Regular exercise can provide relief and relief from stress.	3,02	0,92
17- Doing moderate-intensity exercise for 30-60 minutes 3 days a week is sufficient to maintain a healthy body weight.	2,87	0,91
18- Short distance (10 minutes) walking or doing short activities is enough to prevent bad health effects and to be healthy.	2,69	0,92
19- You are more likely to be obese if other members of your family are obese.	2,27	0,98
20- it is important to be at a normal weight to be a healthy person.	3,29	0,91
Total	2,86	

According to Table 7, the question answered by the participant students with the highest average is "Item 20: it is important to be at a normal weight to be a healthy person.". The question answered with the lowest average is "Item 10: Reviews of magazines, movies and TV play an important role in obesity".

Table 8. *Information on Obesity Awareness Scale of Participating Students*

Scale	x̄	Ss
Overall scale	2,86	0,39
Obesity Awareness (OA)	2,70	0,41
Nutrition Awareness (NA)	3,03	0,54
Physical Activity Awareness (PAA)	2,94	0,56

Looking at Table 8, the average of the responses to the Obesity Awareness Scale was calculated as $\bar{x}$=2.86. Obesity awareness sub-dimension average was calculated as $\bar{x}$=2.70, Nutrition awareness sub-dimension average as $\bar{x}$= 3.03 and Physical activity awareness sub-dimension average as $\bar{x}$=2.94. The obesity awareness level of middle school students was determined as "good" according to all sub-dimensions of the scale and in general.

Table 9. *T-test results by gender*

	Gender	n	$\bar{x}$	ss	t	df	p
Overall	Female	249	2,91	0,37	3,19	504	0,00
	Male	257	2,80	0,40			
OA	Female	249	2,76	0,40	3,00	504	0,00
	Male	257	2,65	0,41			
NA	Female	249	3,07	0,52	1,60	504	0,11
	Male	257	2,99	0,57			
PAA	Female	249	3,02	0,53	3,18	504	0,00
	Male	257	2,86	0,58			

When Table 9 is examined, a statistically significant difference was found in the general scale, OA and PAA sub-dimensions according to gender. This difference is in favor of female students.

Table 10. *ANOVA test results by grade level*

Grades					ANOVA results					
Overall	Group	f	$\bar{x}$	Ss	Source	KT	Sd	KO	F	P
	5. grade	145	2,85	0,43	Between groups	0,57	3	0,19	1,26	0,91
	6. grade	90	2,80	0,35	In group	75,43	502	0,15		
	7. grade	151	2,90	0,37	Total	75,99	505			
	8. grade	120	2,86	0,39						
OA	Group	f	$\bar{x}$	Ss	Source	KT	Sd	KO	F	P
	5. grade	145	2,70	0,46	Between groups	1,19	3	0,40	2,35	0,07
	6. grade	90	2,60	0,36	In group	84,6	502	0,17		
	7. grade	151	2,74	0,39	Total	85,77	505			
	8. grade	120	2,72	0,40						
NA	Group	f	$\bar{x}$	Ss	Source	KT	Sd	KO	F	P
	5. grade	145	3,07	0,61	Between groups	0,37	3	0,12	0,42	0,74
	6. grade	90	3,01	0,52	In group	149,55	502	0,30		
	7. grade	151	3,04	0,51	Total	149,92	505			
	8. grade	120	3,00	0,52						
PAA	Group	f	$\bar{x}$	Ss	Source	KT	Sd	KO	F	P
	5. grade	145	2,85	0,57	Between groups	2,03	3	0,68	2,20	0,09
	6. grade	90	2,91	0,58	In group	154,94	502	0,31		
	7. grade	151	3,01	0,54	Total	156,98	505			
	8. grade	120	2,98	0,54						

According to Table 10, there was no significant difference in the obesity awareness levels of the participating students in the general scale and in all sub-dimensions.

Table 11. *T-test results by school types*

	School	n	$\bar{x}$	ss	t	df	p
Overall	Public	389	2,86	0,40	0,02	504	0,98
	Private	117	2,86	0,36			
OA	Public	389	2,70	0,42	- 0,76	504	0,45
	Private	117	2,73	0,39			
NA	Public	389	3,03	0,54	- 0,53	504	0,60
	Private	117	3,06	0,56			
PAA	Public	389	2,97	0,57	2,11	504	0,04
	Private	117	2,84	0,51			

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According to Table 11, there is no significant difference in the obesity awareness level of the participants in the overall scale, in the OA and NA sub-dimensions, while there is a significant difference in the PAA sub-dimension. This difference is in favor of public school students.

Table 12. *T-test results by athlete licenses*

	License	n	x̄	ss	t	df	p
Overall	Yes	174	2,84	0,42	- 0,53	504	0,60
	No	332	2,86	0,37			
OA	Yes	174	2,68	0,45	- 0,80	504	0,42
	No	332	2,71	0,39			
NA	Yes	174	3,04	0,60	0,24	504	0,81
	No	332	3,03	0,52			
PAA	Yes	174	2,91	0,59	- 0,75	504	0,45
	No	332	2,95	0,54			

When Table 12 is examined, there is no significant difference in the obesity awareness levels of the participating students in the general scale and in all sub-dimensions.

Table 13. *Information on body mass index of participants*

	f	x̄
Body mass index	506	19,55
Height (cm)	506	156,15
Kilogram (kg)	506	48,21

Looking at Table 13, the average body mass index of the participant students was calculated as 19.55 (normal), and the average height of the participants was 156.15 cm, and the average weight was 48.21 kg.

Table 14. ***T-test results of participants' height and weight status by gender***

	Gender	n	x̄	ss	t	df	p
Height	Female	249	155,31	8,97	- 1,82	504	0,69
	Male	257	156,96	11,27			
Weight	Female	249	46,32	11,14	- 3,23	504	0,00
	Male	257	50,05	14,60			

When Table 14 is examined, there is a significant difference in the average weight of the participants according to gender. It was observed that the mean weight of male students was higher than the mean weight of female students.

Table 15. *Height and weight Anova test results by class level of participants*

	Grades				ANOVA results					
	Group	**f**	**x̄**	**Ss**	**Source**	**KT**	**Sd**	**KO**	**F**	**P**
Height	5. grade	145	148,03	8,24	Between groups	20997,49	3	6999,16	110,44	0,00
	6. grade	90	153,56	7,73	In group	31813,10	502	63,37		
	7. grade	151	158,17	7,88	Total	52810,59	505			
	8. grade	120	165,38	7,89						
	Group	**f**	**x̄**	**Ss**	**Source**	**KT**	**Sd**	**KO**	**F**	**P**
Weight	5. grade	145	40,69	8,64	Between groups	21309,99	3	7103,33	54,19	0,00
	6. grade	90	46,39	12,56	In group	65806,96	502	131,09		
	7. grade	151	48,32	10,59	Total	87116,95	505			
	8. grade	120	58,54	14,27						

According to Table 15, a significant difference was found in the average height and weight of the participants according to the grade level. Post Hoc Tukey test was used to detect this difference. It has been observed that 8th graders have a higher level of height and weight average than 5th, 6th and 7th graders. 7th graders have a higher level of height and weight average than 5th and 6th-grade students. 6th graders have a higher level of height and weight average than 5th graders.

Table 16. *T-test results of participants' height and weight status by school types*

	School	n	x̄	ss	t	df	p
Height	Public	389	156,12	10,35	- 0,12	504	0,90
	Private	117	156,25	9,86			
Weight	Female	389	48,74	13,82	1,64	504	0,06
	Male	117	46,47	10,41			

When Table 16 is examined, it can be seen that there is no significant difference in the mean height and weight of students according to the school type.

Table 17. *T-test results of participants' height and weight status by sporter licenses*

	License	n	x̄	ss	t	df	p
Height	Yes	174	156,30	10,29	0,24	504	0,81
	No	332	156,07	10,21			
Weight	Yes	174	46,99	12,16	-1,52	504	0,13
	No	332	48,86	13,59			

Looking at Table 17, there is no significant difference between mean height and weight of participants according to license status of the athlete.

DISCUSSION AND CONCLUSION

This study aimed to determine the obesity awareness levels of secondary school students. Data from 506 participants were obtained by applying the Obesity Awareness Scale in 6 private and 17 public secondary schools in Çanakkale, Turkiye. The collected data were analyzed with the SPSS program through Anova and t-Tests. The results of the study are presented below.

According to the results, it was seen that the obesity awareness level of secondary school students (x̄=2.86) was "good". Obesity awareness level sub-dimension (x̄=2.70), nutritional awareness sub-dimension (x̄=3.03), and physical activity awareness sub-dimension (x̄=2.94) were determined as "good". İmamoğlu (2021) found the obesity awareness level of secondary school students to be "good" in his research in Sinop. Dincçag et al. (2017) found the obesity awareness level of adults to be insufficient. Öztürk (2021), in his study conducted in Bursa, stated that high school students' balanced diet and obesity attitudes were at a high level with 4.03.

A significant difference in terms of gender was found in the obesity awareness level of secondary school students in the overall scale, and in the sub-dimensions of obesity awareness and physical activity awareness. However, no significant difference was found in the sub-dimension of nutritional awareness. In other words, the obesity awareness level of female students was found to be higher than male students in the sub-dimensions of obesity awareness and physical activity awareness in general. İmamoğlu (2021) found a significant difference in favor of female students across the scale and in all sub-dimensions. Dincçag et al. (2017) and Özkan et al. (2020) found no significant difference by gender in their studies with adults.

A significant difference was found in the sub-dimension of physical activity awareness according to the school type in the study. However, there was no significant differences in the sub-dimensions of obesity and nutrition awareness in the overall scale. In terms of physical activity awareness, it has been observed that students studying in public schools have a higher level of physical activity awareness than students in private schools. It is estimated that these students do not prefer school buses due to the location of public schools. The schools might be close to the living areas of the students in a walking distance. It is thought that students studying in public schools integrate more physical activity into their lives.

Considering the body mass index averages of secondary school students, it was found to be "normal" with a value of 19.55 according to the World Health Organization reference. It was determined that 7 students were obese, 43 students were overweight, 227 students were normal weight, and 229 students were underweight. Gulay et al. (2021), in a study conducted with children aged 8-10 in Kayseri, determined one-quarter of the participants as obese. In his study, Demir (2020) revealed that studies that include physical activity in schools in the long term have an effect on the formation of a healthier body mass index. In another study, Duran (2021) concluded that women are 1.55 times more obese than men in his research conducted with 206 people in Isparta to increase obesity awareness. Kabadayı (2021), in his research on 184 children and their mothers, found that as as the body mass index of the parents of the children increased, the obesity rate in the children increased, as well. He also added that the obesity rate in the children of divorced families was higher. Kaşlı (2020) concluded that obesity is seen 1.77 times more frequently in children whose mothers are obese and 2.01 times more in children whose fathers are obese.

When the average height and weight of secondary school students were examined, it was found that they were 156.15 cm in height and 48.21 kilograms. When the average height and weight were analyzed by gender, a significant difference was found in the average weight. It was observed that the mean weight of male students was higher than the mean weight of female students.

A significant difference was found in the average height and weight of the students according to the grade level. According to the significant difference, it has been found that the 8th-grade students have a higher level of height and weight average than the 5th, 6th and 7th grades. 7th graders have a higher level of height and weight average than 5th and 6th graders. 6th graders have a higher level of height and weight average than 5th graders. According to the researcher, it is thought that this is an expected result and that it is normal for children to increase in height and weight as they get older.

There was no significant difference in the general and sub-dimensions of the obesity awareness scale of secondary school students in terms of grade level and sporter license status of the students. In the study of İmamoğlu (2021), it was determined that students with a sporter license had a higher level of obesity awareness than those who did not, and there was a significant difference in favor of the 7th graders according to the grade level. In addition, when the average height and weight of the students were examined, no significant difference was found according to the school type and sporter license status.

As a result, it was seen in this study that the obesity awareness level of secondary school students was "good". While the obesity awareness level of secondary school students differs significantly in favor of female students in terms of gender, it does not differ significantly according to grade level, school type and athlete license. The average body mass index of secondary school students was determined as "normal" according to the criteria of the World Health Organization.

Suggestions for Solutions

Raising obesity awareness can be an important part of education and trainings. The Ministry of National Education can add elective or compulsory courses about healthy living and nutrition to the weekly lesson schedule of secondary schools. Municipalities can create more areas for children where they can do physical activity. In secondary schools, students can have their lunch at school under the control of the teachers instead of eating out of school in places that are not fully controlled. Painting, music and poetry competitions can be held in schools to raise awareness of obesity. School gardens and school sports fields can serve children at the weekends.

Short and effective trainings about obesity can be given to parents. The school managements can add healthy life and nutrition as an agenda item in the meetings. Student clubs can be formed about schools, healthy life and nutrition, and obesity awareness. The body mass index of the students can be calculated and followed by the schools, and these results can be shared with the parents, and measures can be taken for obesity at an early age.

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