

Body Mass Index, Dietary Habits, and Nutrition Knowledge among Primary School Students

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Abstract

Problem Statement: Today, the increase in technological advances and economic opportunities, which has brought about unbalanced nutrition among children in pre and post adolescence period, has led to an increase in body weight which may cause our children to become obese adults in the future. There is a need for studies to determine children's nutritional state at the adolescence period in Turkey and to suggest solutions. For this reason, the problem of the study is as follows; "What are the dietary habits and level of nutrition knowledge among students in grades 6-7-8 in Burdur province?"

Purpose of Study: The study aims to determine the levels of knowledge on nutrition and dietary habits among students in grades 6, 7, and 8 in Burdur province.

Methods: In this study, a survey model in cross-sectional nature was employed. The study universe was composed of grades 6, 7, and 8 in the official primary schools during the 2007-2008 academic year in Burdur province. The sample group consisted of 613 students randomly selected from the study universe. The data collection instrument was composed of two sections. The first section was formed to socio-demographic features of students, the second section included 18 items, which aimed to test participants' knowledge and habits about nutrition.

Findings and Results: Of all the participants, (43%) students were found to be "underweight", (37.1%) were determined as "normal weight" and (3.1%) were determined as "overweight" according to BMI values.

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In the comparisons between sexes, no statistically significant difference was found between the BMI values of male and female students. While it was observed that the participants generally had sufficient amount of information on nutritional content of food, they were only found to be confused about the type of nutrition found in milk. The amount of daily water intake among students aged between 11 and 15 is sufficient in 59% of the students; however, 38% of the students do not drink sufficient amount of water.

Conclusions and Recommendations: In conclusion, there is a direct relationship between nutrition and academic achievement. The key points of nutrition information should be presented to children. Since it is the mother who arranges the nutritional intake at home, families and class teachers should be facilitated to attend various educational programs to enable them to teach healthy dietary habits.

Keywords: Adolescents, body mass index, nutrition, habits

Nutrition is one of the most fundamental requirements of all living beings, and it is a bridge between food and health (Baysal, 1997). The aim of nutrition is to take in all the nutritional elements adequately that individuals need according to their age, sex, and physiological conditions. The human organism requires energy in three conditions. The first is basal metabolism, the second is physical activity that one engages in, and the third is the specific dynamic effect of nutrition (Termogenesis).

Energy is necessary for activities other than energy spent for operating the respiratory and digestive systems and organs and preserving body temperature during the day for life. This is called necessary energy for physical activity, while the energy spent for removal of heat that emerges during food digestion is called specific dynamic effect of nutrition (Mc Ardle & Katch, 1986). The necessary energy for daily life is obtained from such nutritional elements as carbohydrates, proteins, and fats (Baysal, 1997). Of the basic energy sources in the human body, carbohydrates are the element that is stored, therefore, when carbohydrates are consumed too much, it is noted to cause extreme weight gain (Ersoy, 2004).

The other nutrition element that provides necessary energy for daily life is fats. Fats supply not only fat soluble vitamins (A, D, E, K) but also essential fat acids that are necessary to be taken with care on a diet as the body cannot synthesize them. Fats are divided into three main groups as saturated fats, monounsaturated fats, and polyunsaturated fats. Saturated fats are stored and they increase blood cholesterol levels, thus increasing certain risks related to heart diseases (Ersoy, 2004). Carbohydrates are reported to supply about 4 kilocalories per gram and fats supply 9 kilocalories per gram as energy (Paker, 1991).

Adequate and balanced nutrition is important as regards its effects on individuals' health and achievement, and transfer of proper nutrition habits to future generations. Precautions that may be taken to improve society's nutritional condition are bound to fail without emphasizing education. Nutrition awareness can be

achieved through informing the public in the way that people can implement nutrition science in their daily lives (Bulduk, Demircioğlu & Yabancı, 2000).

Fast developments in the fields of science and technology and the increase in economic power have resulted in a decrease in health problems related to inadequate nutrition, while leading to an increase in problems related to overeating and excessive energy intake (Özenoğlu, 2001). Being overweight is a public health problem which occurs as a result of energy imbalance by excessive energy intake (Gündağ, 1993). Being overweight bears the risk of cardiovascular diseases, some cancers, diabetes, mortality and morbidity, and intensifies many chronic diseases. It may lead to hypertension, osteoarthritis, gall stones, dislipidemia, and digestive, respiratory, and muscular-skeletal systemic problems. Moreover, besides physical problems, it may have psychological and psychosocial consequences, and may affect longevity and life quality in a negative way (Shaff, & Newcomb, 1998).

Excessive eating, low level of physical activity, metabolic and hormonal disorders have an impact in the development of obesity, while in the majority of adult obese individuals, it is known that the beginning of their condition goes back to their childhood, and that 80% of obese adolescents grow up to be obese adults (Gündağ, 1993).

Age, sex, genetic tendencies, nutrition type, knowledge and behavior, psychological factors, and a home-based and sedentary life-style prepare the grounds for obesity in children. An increase in fat mass emerges in muscle tissue among both sexes, males even more, during the physical growth period in adolescents (Karaağaoğlu, 1996; Açık, 2000).

An individual's energy requirement is determined by basal metabolic rate or resting metabolic rate, physical activity, and thermogenesis. Of the twenty-four hour energy expenditure, 73% is used for basal metabolism rate, 15% for used for thermic effect, and 12% is used for physical activity (Gündağ, 1993). The energy expense is lower in obese people as related to the decrease in physical activity (Alikaşifoğlu & Yordam, 1996). Among overweight individuals, thermic effect is lower compared to normal weight individuals. Basal metabolism rate is affected by fatless body mass, age, sex, thyroid hormone, and protein turnover. Thermic effect is affected by food intake, cold effect, thermogenic factors and stress. Physical activity is affected by intensity and duration of an activity (Gündağ, 1993; Schulz, & Schoeller, 1994; Stock, 1999).

Anthropometric measures are important as they are an indicator of protein and fat storage in the determination of nutritional condition. The frequently used anthropometric methods are growth and body combination, body weight, height, body mass index (BMI), diameter and circumference measurements, skin curve thickness, bioelectrical impedance (BIA) measurement as well as body fat ratio and fatless body mass determination (Bilgiç, 2003; Küçükkömürler, 2001; Pekcan, 1996; Pekcan, 2000; Sürücüoğlu & Özçelik, 2003; Utter, et al., 2001).

The aim of the study is to determine nutrition knowledge levels and dietary habits of primary education students. The research problem is "What are the dietary

habits and nutrition knowledge among students at grades 6, 7, and 8 in Burdur province and villages?" Sub problems are;

- 1-What are the socio-demographic characteristics of the participants of the study?
- 2-What are the students' height-weight and BMI averages according to grade levels?
- 3-Is there a statistically significant difference between mean height-weight and BMI values according to sexes?
- 4- Is there a statistically significant relationship between BMI values and daily number of meals consumed?
- 5- Is there a statistically significant difference between daily consumed numbers of meals?
- 6- How is the mean BMI values with regard to grade levels?
- 7- Is there a statistically significant difference between grade levels and BMI values?
- 8- How is the frequency and percentage distributions of responses to the questions on nutrition knowledge?
- 9- How is the frequency and percentage distributions of responses to the questions on dietary habits?
- 10- How is the frequency and percentage distributions of generally skip meals and never skip of the students in the day?
- 11- How is the frequency and percentage distributions of food types consumed at breakfast and amount of daily water intake stated by study group?

In this study, the independent variables were determined as sex, grade levels, and the dependent variables were determined as BMI values, dietary habits, and questions on nutrition knowledge.

Method

Research Method

In this study, a survey model in cross-sectional nature was employed. Research Universe composed of 2,883 students in 174 branches attending grades 6, 7, and 8 in 33 primary schools during 2007-2008 academic year in Burdur province and central villages.

Sampling

The random sampling technique was used as the sampling method of the study. For the selection of samples, all the primary schools were accessed. In the study, approximately 21% of the population (613 questionnaires) was reached.

For the administration of the questionnaire, primarily the necessary approval was obtained to conduct the study. Then, the aim and procedures of the study were explained to students. Second, the questionnaires were distributed and voluntary contribution to the study was asked. The students willing to participate were given one class hour, after which the questionnaires were collected by the researcher.

Data Collection Instrument

In the study, the first section was formed to determine the nutrition habits and knowledge level, which encompassed information about participants' sex, age, grade, height, and weight. The second section included a total of 7 questions about dietary habits, 4 of which were of yes/no type questions and 3 presented four alternatives from which to select. The final section had 4 items, which tested participants' knowledge levels about nutrition.

Data Analysis

The descriptive statistics used were percentage, frequency, arithmetic means, minimum and maximum values, respectively, and independent t-test for double comparisons, and for more than two groups between group comparisons were run through one way ANOVA. In the cases where differences were significant, the Scheffe' test was used for paired comparisons and Chi Square test was used for the comparison of categorical variables. The level of significance was set to 0.05.

For calculating student's Body Mass Index, the (BMI) formula was (Body weight, kg / square of height, m²) used. The interval values below <18.99 were considered as underweight, those between 19-23.99 were considered as normal weight and those above 24 kg/m² were considered as overweight in the process of converting BMI values to categorical values (Hay, Hayward, Lewin & Sondheimer 1999).

Findings and Results

This section presents the findings obtained from the statistical analysis of data collected.

Table 1
Socio-Demographic Characteristics of Participants of the Study: Sex, Grade Level, and Age.

Sex	N	%	Grade	N	%	Age	N	%
Female	345	56.3	6	181	29.5	12	153	31.2
Male	258	42.1	7	203	33.1	13	170	27.7
Total	603	98.4	8	229	37.4	14	214	34.9
Overall			Overall					
Total	613	100	Total	613	100	15	38	6.2

Of the students who participated in the study, 56.3% were female and 42.1% were male. 6.2% of the participants were aged 15 years, 34.9% were aged 14 years, 27.7% were aged 13 years, and 31.2% were aged 12 years. 29.5% of the participants attended 6th grade, 33.1% attended 7th grade, and 37.4% attended 8th grade. The response rate to the questionnaire administered increased as the grade level increased.

Table 2
Students' Height-Weight Averages according to Grade Levels

Variable	Grade	N	Mean	Variable	Grade	N	Mean	BMI
Height(cm)	6	172	149.64	Weight(kg)	6	171	40.12	18.01
	7	183	156.87		7	183	46.01	18.90
	8	213	161.74		8	209	49.96	18.91
	Total	568	156.51		Total	563	45.69	Average 18.58kg/m ²

Students' height-weight averages according to grade levels in table 2.; the height values indicated in the self-reports of students were used in the study. When the findings are examined, it can be seen that each year height increases by about 5-7cm. When the rates are studied, the increase in height among 6th and 7th graders is higher than the increase among 8th graders. One explanation for this could be that in general the adolescence period starts in 6th grade. Weight values show a high level of increase among 6th and 7th graders together with the increase in height, while an average degree of increase can be observed among 8th graders by an increase of about 4 kg.

It is natural to observe an increase in body weight as related to sudden increase in height during adolescence. When height and weight measures are compared with the percentile values of children at these ages, it is observed that the height values of 6th - 7th and 8th graders are in 25% and 50% percentiles, while the height values of 6th and 7th graders is close to 50%, and the height values of 8th graders is around 35%. It was also found that weight values are also in 25%-50% percentiles. It can be stated that these values are rather low compared to the average values of Turkey. This may be due to climate, geographical conditions, and nutrition habits of the region and heredity. The BMI value was 18.01 among 6th graders, 18.90 among 7th graders, and 18.91 among 8th graders. When compared with the percentile values of male and female Turkish children aged 12-13 (6th and 7th graders), the BMI values are in 25%-50% percentiles, while the BMI values of male children aged 14 (8th graders) are between 25%-50% percentiles and those of female children are between %15-%25 percentiles. This difference may have been caused by the increase of weight in males as related to muscle development in this period. The height and weight values of the students in this study are lower than the percentile values of children in Turkey, and, as parallel to this, the BMI values are rather low.

Table 3
Between Sexes Independent t-test Results of Height-Weight and BMI Values

	Sex	N	Mean	Standard deviation	Degree of freedom	t	p
Height	Female	272	155.01	10.107	558	2.413	.016
	Male	302	157.23	11.734			
Weight	Female	275	44.58	9.489	552	3.171	.002
	Male	308	47.21	10.446			
BMI (kg/m ²)	Female	261	18.56	3.208	555	1.923	.055
	Male	296	19.08	3.168			

In comparisons between sexes, statistically significant differences were found between the height and weight values of male and female students, while no difference was found between the BMI values of males and females. The average height of female students in the study is 155 cm, while the average height of male students is 157.2 cm. As a result of the study, it was found that there is a statistically significant difference regarding height ($t_{(558)} = -2.413$, $p < 0.05$). In this case, it was found statistically significant that male students in grades 6 to 8 are taller than female students. The average weight value of female students in the study is 44.58 kg, while the average weight value of male students is 47.21 kg. As a result of the comparison conducted, a significant difference was found in favor of male students regarding weight values ($t_{(552)} = -3.171$, $p < 0.001$). This may show that weight values rise as do height values, as parallel to the relationship between height and weight, and the significant difference found between male and female height-weight values can be explained by male students having higher amount of muscle mass compared to female students at the same age. A significant relationship in the positive direction was found at a medium level between height and weight values of the participants ($r = 0.646$, $p < 0.001$). This indicates that as height values increase, weight values also increase; in other words, height accounts for 42% of the weight variable. Although much difference between male and female height and weight values is not expected at the time when they have just entered adolescence period, the statistically significant difference between weight values implies that male students have a higher amount of muscle mass and thus use up more power and oxygen and the energy spent is higher compared to female students even at this age. The higher amount of energy spent by male students at this age may be interpreted as requiring higher amount of nutrition compared to female students.

Table 4

Chi-Square Test Results with regard to Daily Number of Meals Consumed According to BMI Values

		<i>How many meals do you consume a day?</i>				Total
		One	Two	Three	Four	
Underweight	Frequency	13	25	233	43	314
	Within groups %	4.1	8.0	74.2	13.7	100
Normal weight	Frequency	9	12	154	16	191
	Within groups %	4.7	6.3	80.6	8.4	100
Overweight	Frequency	1	0	19	4	24
	Within groups %	4.2	0	79.2	16.7	100
Total	Frequency	23	37	406	63	529
	Within groups %	4.3	7.0	76.7	11.9	100

$$\chi^2=6.283 \text{ sd}=6 \text{ p}>0.05$$

When compared to Neyzi's (2008) percentile values regarding sex, girls' height values were found to be between the interval of 25%-50%. Boys' height values were found to be 157.3 cm, which is very close to 50%. This may indicate that males are at a medium level regarding height values, and females are below medium level. Weight values were found to be in the interval of 10%-25% for females. The weight of males was found to be between 25%-50%. This indicates that female students' body weight values are quite low compared to the values of Turkish girls of the same age and the values for males were evaluated to be low. This may be regarded normal considering height, as weight is expected to be low as parallel to height. The BMI values of females were found to be closer to 25% percentile rather than 50% percentile, while males' BMI values were found to be 50%. These values were found to be low as parallel to weight-height variables since they were obtained from height and weight variables.

When we categorized participants according to BMI values, it was found that there was no significant difference between groups with regard to the number of daily meals that they consume ($X^2=6.283$ $sd=6$ $p>0.05$). It was observed that the number of meals consumed by all three groups was three, and that this comprised 76.7% of the groups. It was seen that a great majority in these three groups adhered to the rule of consuming three main meals a day as the main number of meals and stayed within the normal BMI limits, and that the children who were in the obese category also had a general meal distribution of three meals a day, although their number was lower than normal weight and underweight student groups. This may indicate that overweight students' metabolism rate slowed down as a result of skipping smaller meals between main courses and having an average of three main meals. Although the frequency of consuming four meals among underweight, normal weight, and overweight children was found to be 13.7%, 8.4% and 16.7%, respectively, the number of overweight students is lower compared to the number in other categories. This may indicate a lack of physical activity or existence of a hereditary disorder among students in the overweight category.

Table 5

Chi-Square Results of Daily Consumed Number of Meals

Number of Meals	Observed N	Expected N	Residual	Degree of Freedom	Chi Square	p
One	28	152.3	124.3			
Two	44	152.3	-108.3			
Three	464	152.3	311.8	3	857.962	0.001
Four	73	152.3	-79.3			
Total	609					

According to the singular sample Chi square test results shown in Table 5, the number of meals most often stated is three ($f=464$) and the number of meals least often stated is one ($f=28$). The number of students who consume three meals a day in the study was found statistically significant compared to the rest of the students ($X^2=857.962$ $sd=3$ $p<0.001$). Considering that the number of main meals that should be consumed is three and the number of meals to be consumed between main meals should be two, a majority of the students in the study are found to adhere to this rule, keeping their BMI values in normal limits. Moreover, as they mainly commute between school and home on foot, they keep their activity level higher than students in big cities. For this reason, we may think that they keep themselves more active by not riding other vehicles often for short distances.

Table 6

Mean BMI and Standard Deviation Values Between Grades

Grades	N	Arithmetic Mean	Std. Deviation
6	164	17.8867	2.92672
7	172	18.7026	3.06849
8	197	19.0515	2.62224
Total	533	18.5805	2.90165

Mean BMI and standard deviation values between grades is as table 6.

Table 7

Anova Results of Grade Level and BMI

Source of Variance	Square Total	Degree of Freedom	Mean Square	F	p	Significant difference
Between groups	125.193	2	62.597	7.620	.001	6-7
Within groups	4354.005	530	8.215			6-8
Total	4479.198	532				

When the average BMI values are studied between categories, the highest value ($M=19.0515$) can be seen in 8th grade, and the lowest value ($M=17.8867$) can be encountered in 6th grade, while the value obtained for 7th grade is ($M= 18.7026$). It was observed that the BMI values increase from 6th to 8th grades. When the results of ANOVA test are examined, a significant difference is observed in the BMI values between grades ($F_{(2-530)}=7.620$, $p<0.01$). As a result of the Scheffe' test used to understand the groups in which the significant difference occurs, it was statistically

proven that the BMI values of 6th graders were lower than the BMI values of 7th and 8th graders. When the values of 7th and 8th graders were compared, the difference was not found statistically significant, although 8th graders had a higher average than 7th graders. As the grades increased, the BMI values increased from 6th to 8th grades. It can be asserted that it is a period of sudden change at the start of adolescence. Moreover, 3.9% of the students were in overweight category, which may be low because of the high level of energy spent as we have not yet become one of the prominent countries regarding technological development.

Table 8
Frequency and Percentage Distributions of Knowledge Questions Asked to Students

Questions	Number of Correct Answers	Percentage of Correct Answers	Number of Wrong Answers	Percentage of Wrong Answers
<i>What is balanced nutrition?</i>	410	78.8	110	21.2
<i>What nutrition does wheat contain most?</i>	327	67.1	160	32.9
<i>What nutrition does meat contain most?</i>	328	65	177	35
<i>What nutrition does milk contain most?</i>	135	27.2	361	72.8

The number of correct answers given to the questions were, in the order of percentile distribution, "What is balanced nutrition" with the highest percentage (f= 410, 78.8%), "What nutrition does wheat contain most?" (f=327, 67.1%), "What nutrition does meat contain most?" (f= 328, 65%) and "What nutrition does milk contain most?" (f=135, 27.2%). It was seen that in general students had sufficient information regarding ingredients of foods, and that they are only confused about the nutrition that milk contains. Thus, it can be asserted that students in the second section of primary education (6th, 7th, and 8th grades) are given basic information about nutrition by their teachers, however, no information is provided on nutrition in detail, and they have not acquired information regarding nutritional value of foods that they need to consume daily at a sufficient level.

Table 9
Frequency Table of Responses to Questions on Dietary Habits of Study Group Students

Questions	Yes		No	
	Number	%	Number	%
<i>Do you eat fruit every day?</i>	433	82.6	91	17.4
<i>Do you consume milk and yoghurt every day?</i>	334	64.5	184	35.5
<i>Do you read the amount of calories that packaged food has?</i>	206	40.5	303	59.5

Students' daily fruit consumption was found to be 82.6%, which may state that this rate is quite high considering the nutrition habits in our country. It can be stated that the students in the study are in a good condition since fruit contains rich amounts of vitamins storage which have an important role in the absorption of nutrition elements in daily diet. The students who responded to the questionnaire consume milk and yoghurt by 64.5%, which is sufficient regarding growth in height, increase in muscular structure for development, and regarding healthy teeth and bone development. However, this also indicates that about 35.5% of the students do not consume milk or milk products. For this reason, families and teachers have a responsibility to facilitate this change in behavior. However, as a result of the questionnaire, it was found that 40.5% of the participants read the amount of calories on packages, while 59.5% do not read this information. It can be said that the students at this age group are not informed about calorie rates.

Table 10

Frequency Table of Dietary Habits of Students in the Study

Which meal of the day do you never skip?	Frequency	%	Which meal of the day is the one you generally skip?		
				Frequency	%
<i>Morning</i>	149	24.3	<i>Morning</i>	200	32.6
<i>Noon</i>	100	16.3	<i>Noon</i>	91	14.8
<i>Evening</i>	179	29.2	<i>Evening</i>	47	7.7
<i>All</i>	166	27.1	<i>All</i>	251	40.9
Total	594	96.9	Total	589	96.1
Overall Total	613	100	Overall Total	613	100

The distribution of the repast that never skip of students, as presented in table 10. Breakfast is a meal which should never be skipped by adolescents and adults. However, according to the analysis, breakfast appears as in third place as the meal never skipped. Yet, breakfast should be the first meal that is never skipped because in the hours that pass during sleep from night to morning, digestion is completed long before, and thus the body needs food again for daily requirements.

Table 11
Frequency Table of Food Consumed for Breakfast and Amount of Water Intake Stated by Study Group

What do you Have for breakfast?	<i>f</i>	%	How much water do you drink a day?	<i>f</i>	%
<i>One glass of tea</i>	15	2.4	<i>2-3 glasses</i>	102	16.6
<i>Glass of milk</i>	6	1	<i>4-5 glasses</i>	131	21.4
<i>Olives, cheese, butter, bread, milk, jam</i>	553	90.2	<i>6-7 glasses</i>	147	24
Total	574	93.6	<i>8 glasses and more</i>	216	35.2
Overall Total	613	100	Overall Total	613	100

Of the respondents of the questionnaire, 90.2% stated that they had olives, cheese, butter, bread, jam, and milk for breakfast. To the question of the amount of water that they drink per day, 35.2% of the respondents stated 8 glasses or more, 24% stated about 6-7 glasses, and 21.4% stated between 4-5 glasses. This shows that the students have a sufficient and balanced breakfast. The daily amount of water consumption seems adequate among 59% of the respondents, but 38% do not consume enough amount of water. Teachers and parents should remind children that should not wait to be thirsty to drink water.

Conclusions and Recommendations

This study examined dietary habits and knowledge of nutrition among students at grades 6, 7, and 8 at Ministry of Education schools in Burdur province and villages. In the comparison between sexes in our study, a statistically significant difference was found between the height values of male and female students ($t_{(558)} = -2.413$, $p < 0.05$). As a result of the comparison, a significant difference was found with regard to weight values ($t_{(552)} = -3.171$, $p < 0.001$) in favor of males. A positive and significant relationship was found at medium level between the height values and weight values of the participants in the study ($r = 0.646$, $p < 0.001$).

The height values of females were found to be within the percentile intervals of 25%-50% when compared to the percentile values reported by Neyzi et al. (2008). The height values of males were found very close to 50%. The weight values of females were found within the intervals of 10%-25% and the weight values of males were found to be within the intervals of 25%-50%. This was evaluated as girls having considerably lower weight values compared to the girls at same age, and boys having low weight values. This may be regarded as normal considering that height explains 42% of weight.

As a result of the evaluation of the students who participated in the study with regard to BMI values, 338 (43.1%) students were found to be "underweight", 291 (37.1%) were found to be "normal weight" and 24 (3.1%) were found to be

“overweight”. The BMI values of the participants of the current study are between the percentile intervals of 25%-50% of the BMI percentile values of male and female children in 6th -7th grades (aged 12-13), while their values are in the percentile intervals of 25%-50% of males in grade 8 (aged 14), and 15%-25% of the female students. When we categorized participants according to BMI values, it was found that there was no significant difference ($X^2=6.283$ $sd=6$ $p>0.05$) between groups with regard to the number of daily meals.

When the mean BMI values between grades were studied, an increase in BMI values was observed from 6th to 8th grades. When the results of ANOVA test were examined, no significant difference was observed with regard to BMI values in different grade levels ($F_{(2-530)}=7.620$, $p<0.01$). While it was observed that the participants generally had sufficient amount of information on nutritional content of food, they were only found to be confused about the type of nutrition found in milk.

The daily fruit consumption of students was found to be 82.6%, the milk and yoghurt consumption of the respondents was found to be 64.5%. As a result of the questionnaire, it was found that 40.5% of the respondents read the amount of calories on the packages of food, and 59.5% of the respondents do not read this information.

The distribution of meals that students in the study group never skip evening meals. Of the respondents of the study, 90.2% have olives, cheese, butter, bread, jam and milk for breakfast. 35.2% drink a daily amount of 8 glasses and more water, 24% drink 6-7 glasses, and 21.4% drink 4-5 glasses of water. The amount of daily water intake among students aged between 11 and 15 is sufficient in 59% of the students; however, 38% of the students do not drink sufficient amount of water. Our study's recommendations;

- Primary school teachers should present basic information about nutrition in lessons on life sciences, natural sciences, technology, and physical education.
- Branch teachers, particularly physical education teachers, in primary school may be suggested to incorporate activities regarding dietary habits as part of conditions affecting physical development into their annual unit plans.
- Radio and Television Supreme Council may require television channels to provide basic information on nutrition for a few minutes in primetime.
- Parent education may be spread in public education centers to raise their awareness on particularly nutrition.
- Ministry of National Education may add a course of an hour per week called “nutrition” at primary and secondary levels in their curriculum.

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İlköğretim (6-7-8. Sınıf) Öğrencilerinin Beden Kütle İndeksleri, Beslenme Alışkanlıkları ve Bilgi Düzeyleri
(Özet)

Problem durumu: Günümüzde meydana gelen teknolojik gelişme ve ekonomik olanakların artması sonucu ergenlik dönemi öncesi ve sırasında dengesiz beslenme ve aktivite azlığından artan vücut ağırlığı, gelecekte çocuklarımızın obez yetişkinler olmalarına neden olmaktadır. Bu nedenle ülkemizde adolesan dönem çocuklarının beslenme durumlarını ortaya koyan ve öneriler getiren çalışmalara ihtiyaç duyulmaktadır. Bu ihtiyaçtan hareketle Araştırmanın problemi: "Burdur il merkezi ve merkez köylerinde eğitim gören 6-7 ve 8. sınıf öğrencilerinin beslenme alışkanlıkları ve bilgi düzeyleri nedir?" olarak belirlenmiştir.

Araştırmanın Amacı: Milli Eğitim Bakanlığı Burdur İli ve merkez köyleri ilköğretim okulları 6-7-8. sınıf öğrencilerinin beslenme bilgi düzeyi ve alışkanlıklarını belirlemektir. Araştırma tarama modeli olup kesitsel bir araştırmadır. Burdur il merkezi ve merkez köylerinde 2007-2008 öğretim yılında 33 ilköğretim okulunda 6-7 ve 8. sınıflarda 174 şubede öğrenimlerini sürdüren 2883 öğrenci araştırma evrenini oluşturmaktadır.

Araştırmanın Yöntemi: Araştırmada örneklem yöntemi olarak basit seçkisiz örnekleme tekniği kullanılmıştır. Evrenin yaklaşık %21'ine ulaşılmıştır. Araştırma ile ilgili gerekli izin alınarak, öğrencilere çalışmanın amacı açıklanmıştır. Anketler gönüllü olanlara bir ders saati içinde doldurtularak toplanmıştır. Veri toplama aracında; Beslenme alışkanlık ve bilgi düzeylerini belirlemek için oluşturulan birinci bölümde; cinsiyet, yaş, sınıf, boy, kilo, anne-baba mesleği ve eğitim durumları ile ilgili bilgiler alınmıştır. İkinci bölümde beslenme alışkanlıkları ile ilgili 4'ü evet-hayır, üçü dört seçenekli toplam 7 soru yer almış, üçüncü ve son bölümde ise beslenme bilgilerini sınanan 4 madde yer almıştır. Verilerin analizinde kullanılan betimsel istatistikler sırası ile yüzde, frekans, aritmetik ortalama, minimum, maksimum değerler olurken; ikili karşılaştırmalarda bağımsız t testi, ikiden çok gruplarda gruplar arası karşılaştırmalarda tek yönlü Anova, farkın anlamlı olması durumunda ikili karşılaştırmada Scheffe' testi, kategorik değişkenlerin karşılaştırmalarında ise kay kare testi kullanılmıştır. İstatistiksel işlemlerde anlamlılık düzeyi 0.05 alınmıştır. Araştırmada, cinsiyet, sınıf düzeyleri, bağımsız değişkenler; BKİ değeri ve beslenme

alışkanlığı ve beslenme bilgi soruları bağımlı değişkenler olarak ele alınmıştır. Ölçme aracından elde edilen verilerle her bir öğrencinin Beden Kütle İndeksleri (BKİ) (Vücut ağırlığı, kg / boy uzunluğunun karesi, m²) formülüyle hesaplanmıştır. BKİ değerleri kategorik hale dönüştürülürken aralık değerleri <18.99'un altında olanlar zayıf, 19-23.99 aralığında olanlar normal, 24 kg/m² üzerinde olanlar şişman olarak belirlenmiştir.

Araştırmanın Bulguları: Araştırmaya katılan öğrencilerin %56.3 bayan, %42.1 erkektir. Öğrencilerin %29,5'i 6. sınıf, %33.1'i 7. sınıf iken % 37.4'ünün 8.sınıf oldukları saptanmıştır. Araştırmaya katılan öğrenciler BKİ değerleri açısından %43,1 "zayıf", %37,1 "normal" ve %3,1 "şişman" olarak belirlenmiştir. Araştırma grubu öğrencilerden 6. sınıfta olanlar 149,6cm, 7. sınıfta olanlar 156,8cm ve 8. sınıfta olanlar 161,7 cm ortalama boy değerlerine sahiplerdir. Ağırlık değerleri 6. sınıfta ortalama 40,12 kg, 7. sınıfta 46 kg iken 8. sınıfta 49,9 kg olarak saptanmıştır. Cinsiyetler arası yapılan karşılaştırmalarda kız ve erkek öğrencilerin boy, kilo değerleri arasında istatistiksel olarak anlamlı farklılık bulunurken BKİ değerleri arasında anlamlı farklılık istatistiksel olarak bulunmamıştır. Yapılan karşılaştırma sonucunda kilo değerleri açısından erkekler lehine anlamlı bir fark bulunmuştur. Araştırmaya katılanların boy değerleri ile kilo değerleri arasında orta düzeyde pozitif ve anlamlı bir ilişki bulunmuştur. Araştırmaya katılanları BKİ'ine göre zayıf, normal ve şişman olarak sınıflandırdığımızda günlük öğün sayılarına göre gruplar arasında istatistiksel olarak anlamlı fark olmadığı anlaşılmış, yedikleri öğün sayısında üç öğün yemek yiyenlerin sayısı diğerlerine göre istatistiksel olarak anlamlı bulunmuştur. Sınıflar arası BKİ ortalama değerleri incelendiğinde en yüksek değere 8. sınıfta en düşük değere 6. sınıfta ulaşılmıştır. Anova testi sonuçları incelendiğinde sınıf düzeylerine göre BKİ değerlerinde anlamlı bir farklılık gözlenmemiştir. Anlamlı farkın hangi gruplar arasında olduğuna ilişkin yapılan Scheffe' testi sonunda 6. sınıfların 7 ve 8. sınıflara göre BKİ değerlerinin düşük olduğu istatistiksel olarak kanıtlanmıştır. 7. ve 8. sınıflar karşılaştırıldığında ise 8. sınıfların 7. sınıflara göre yüksek ortalamaya sahip olsa da bu fark istatistiksel olarak anlamlı bulunmamıştır. Araştırma grubu, beslenme bilgilerinin sınav sorularından dengeli beslenme nedir?, sorusuna en yüksek oranda doğru cevabı verirken sütte en çok hangi besin grubu bulunur?, sorusuna en düşük oranda doğru cevap vermiştir. Öğrencilere beslenme alışkanlıkları ile ilgili sorulan sorulara verdikleri cevaplardan elde

edilen verilere gore; gunluk meyve tuketimleri yuksek oranda bulunurken sut ve yoğurt tuketim oranları orta, ambalajlı gıda maddelerinin kaç kalorili olduklarını okuma oranları %50'nin altında bulunmuştur. Hiç atlamadıkları ogun akşam yemeęi iken en az tüketilen ogun ogle yemeęi olarak tespit edilmiştir. Son olarak 1/3'i yeterli miktarda su tüketmektedirler.

Araştırmanın Sonuçları ve Oneriler: Araştırmanın bulguları doęrultusunda ogrencilere beslenme ile ilgili temel bilgiler ve anahtar noktalar hayat bilgisi dersinde veya programdaki tum derslerle baęlantılar kurularak zaman zaman aktarılmalıdır. Her eęitim-ogretim doneminde aileler ve ogretmenlere beslenme ile ilgili seminerler verilerek, beslenmenin gunluk hayat kalitesi ve akademik bařarı iin onemi anlatılmalıdır.

Anahtar Sozcukler: Adolesanlar, beden kutle indeksi, beslenme, alışkanlık