Received: 11 Jan 2024 | **Accepted:** 17 Mar 2025 **Genel Tıp Derg. Volume** 35/**Issue** 3 (June), 462-470
DOI: 10.54005/geneltip.1617724

ORIGINAL ARTICLE

The Comparison of Body Mass Indexes, Dietary Habits, and Physical Activity Attitudes of Refugee and Turkish Adolescents

Mülteci/Sığınmacı ve Türk Adölesanların Beden Kütle İndeksleri, Fiziksel Aktivite Tutumları ve Beslenme Alışkanlıklarının Karşılaştırılması

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How to cite ?

Solmaz B, Özaydın T. The Comparison Of Body Mass Indexes, Dietary Habits, And Physical Activity Attitudes Of Refugee And Turkish Adolescents. Genel Tıp Derg. 2025;35 (3): 462-470

ABSTRACT

Aim: This descriptive comparative study compared the body mass indexes, dietary habits, and physical activity attitudes of refugee adolescents and Turkish adolescents studying at a secondary school.
Methods: A total of 345 students participated in the study. Data were collected using the Questionnaire Form, the Family Welfare Scale, the Physical Activity Attitude Scale, and the Index for the Evaluation of Dietary Habits in Adolescent Students. Descriptive statistics (mean, standard deviation, number, and percentage), the Chi-square test, the independent groups t-test, the multiple regression analysis, and the ANCOVA analysis were performed to analyze the data.
Results: A statistically significant difference was found between refugee adolescents' and Turkish adolescents' mean Index for the Evaluation of Dietary Habits score. It was revealed that there was a statistically significant relationship between the BMI levels of the refugee students and their age, number of siblings, and the working status of the mother. In addition, it was found that when the effect of family welfare level was controlled, being a refugee or being Turkish had a significant effect on the Index for the Evaluation of Dietary Habits score.
Conclusion: It is important to develop healthy dietary habits in adolescents.

Keywords: Adolescent health, exercise, nutrition, refugee, school health

ÖZ

Amaç: Bu tanımlayıcı karşılaştırmalı çalışma, bir ortaokulda öğrenim gören mülteci adölesanlar ile Türk adölesanların beden kütle indekslerini, beslenme alışkanlıklarını ve fiziksel aktivite tutumlarını karşılaştırmak amacıyla yapılmıştır.
Gereç ve Yöntemler: Araştırmaya toplam 345 öğrenci katılmıştır. Veriler Anket Formu, Aile Refahı Ölçeği, Fiziksel Aktivite Tutum Ölçeği ve Adölesan Öğrencilerde Beslenme Alışkanlıklarını Değerlendirme İndeksi kullanılarak toplanmıştır. Verilerin analizinde tanımlayıcı istatistikler (ortalama, standart sapma, sayı ve yüzde), Ki-kare testi, bağımsız gruplar t testi, çoklu regresyon analizi ve ANCOVA analizi uygulanmıştır.
Bulgular: Mülteci adölesanlar ile Türk adölesanların Beslenme Alışkanlıklarını Değerlendirme İndeksi puan ortalamaları arasında istatistiksel olarak anlamlı bir fark bulunmuştur. Mülteci adölesanların BKİ düzeyleri ile yaş, kardeş sayısı ve annenin çalışma durumu arasında istatistiksel olarak anlamlı bir ilişki olduğu ortaya çıkmıştır. Ayrıca aile refah düzeyinin etkisi kontrol edildiğinde mülteci veya Türk olmanın Beslenme Alışkanlıklarını Değerlendirme İndeksi puanı üzerinde anlamlı bir etkiye sahip olduğu bulunmuştur.
Sonuçlar: Adölesanlarda sağlıklı beslenme alışkanlıklarının geliştirilmesi önemlidir.

Anahtar Kelimeler: Adölesan sağlığı, egzersiz, beslenme, mülteci, okul sağlığı

Introduction

Migration is one of the oldest phenomena of humanity and an important problem of today's society with its ethnic and racial diversity (1). The International Organization for Migration defines migration as a population movement in which people are displaced by crossing borders or by moving within a country without crossing national borders for various reasons, regardless of the duration and quality of the movement (2). A refugee is defined as a person who fears that s/he will be persecuted because of her/his race, beliefs, nationality, and political views or because s/he is part of a certain social group (3).

Political and social problems experienced throughout the world have led to a significant increase in the number of refugees in recent years (4, 5). Turkey is geographically close to the countries experiencing such problems, which has caused intense immigration to the country (6). It has been reported that Turkey is the country hosting the highest number of refugees in the world with approximately four million refugees (5). In the migration process, the whole society is negatively affected, but children, adolescents, and women are

Peer-Review: Double anonymized - Two External
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considered to be the most affected groups (7). On average, 44% of the refugees in Turkey are children and adolescents, and this number is increasing day by day (5). Refugee adolescents encounter the traumatic effects of migration such as infectious diseases, economic problems, and inability to adapt to the school environment in the regions where they migrated (8). The economic, social, cultural, and mental problems these adolescents are exposed to negatively affect their adoption of healthy lifestyle behaviors (9).

Nutrition has an important place among health-promoting behaviors (10). For refugee adolescents, nutrition is one of the issues that should be given special attention (11). Since refugee adolescents have not yet completed their development, they have difficulty adapting to the environment they migrate to and are influenced more by adverse environmental conditions (12). They experience nutritional problems and developmental delays after migration (13). School-age refugee adolescents living inside or outside the camps are in an extremely vulnerable position. Therefore, it is significant to evaluate their physical health and nutritional status, and one of the important parameters used in this assessment is the Body Mass Index (BMI) (14). Compared to their home countries, refugee adolescents' dietary habits change in the country they migrated to. In the process of adapting to the food types of the new culture, adolescents are either undernourished or overfed (15, 16). In addition, it is seen that refugee adolescents consume insufficient fruit, vegetables, and calcium for economic reasons and have negative nutritional behaviors such as consumption of ready-made food and sugar and not having breakfast (17). Accordingly, the BMI values of refugee adolescents and the adolescents in the country they migrated to may differ, causing the former to be in the disadvantaged group (15, 16).

One of the important factors that play a role in the health-promoting behaviors of disadvantaged adolescents is physical activity. Physical activity is necessary for the physical and mental development of adolescents, as well as for their psychological and social development to be compatible with society (18). Accessing physical activity opportunities and being supported through sports are important for refugee adolescents in the adaptation process since they increase their quality of life (19).

Although refugees generally migrate to low and middle-income countries, previous studies on refugee children and adolescents were mostly conducted in high-income countries (20). In addition, the literature on the dietary and physical activity habits of refugee adolescents living in low- and middle-income countries is limited (21). The review of the literature revealed that most of the studies on refugee children and adolescents were conducted with participants living in camps or applying to clinics in hospitals (22-26), and studies conducted at schools are limited. It is important to have information about the dietary and physical activity habits of refugee adolescents, to take precautions, and to design preventive intervention studies. This study was carried out to compare the BMI, dietary habits, and physical activity attitudes of refugee adolescents and Turkish adolescents aged 10-14 studying at secondary school in an urban area in Konya, Turkey.

Research Questions

The study aimed to address the following research questions:

1.Do refugee adolescents and Turkish adolescents differ in terms of BMI, dietary habits, and physical activity attitude levels?

2.Do the BMI levels of refugee adolescents and Turkish adolescents change depending on their socio-demographic characteristics?

3.What are the factors affecting the BMI levels of refugee adolescents and Turkish adolescents?

Materials and Methods

Study design

This study is descriptive and comparative.

Target population and samples

The study was conducted in a secondary school in Konya/Turkey between January 2021 and February 2022. The population of the research consisted of 513 students (140 Syrian refugees and 373 Turkish students) aged 10-14, studying in this secondary school. The researchers aimed to reach the whole population with the full count method to have a larger sample and to obtain more reliable results (27). Among the target population, a total of 345 adolescents (119 refugee students and 226 Turkish students) were included in the study because there were absent students (90 students), who did not want to participate in the study (60 students), and who did not meet the inclusion criteria (8 students with chronic diseases and 10 students who could not read and write in Turkish).

Inclusion and exclusion criteria

The students who could read and write in Turkish and who were secondary school students in the age group of 10-14 were included in the study. Those with a chronic disease, on regular medication, illiterate in Turkish, and wanting not to participate in the study were excluded from the study.

Data collection tools

Data were collected using the Questionnaire Form, the Family Welfare Scale, the Index for the Evaluation of Dietary Habits in Adolescent Students, and the Physical Activity Attitude Scale.

The Questionnaire Form

The form, developed by the researcher in line with the literature (14, 28), includes a total of 13 questions on the socio-demographic characteristics (age, gender, perception of economic status, number of siblings, number of people living in the family, education and working status of the parents) and the health characteristics (body weight, height, BMI value) of the students.

The Family Welfare Scale

The form also includes the Family Welfare Scale, which consists of four questions regarding the number of vehicles in the family, the availability of a private room for the child, the number of holidays in the family, and the number of computers in the family. The scale was used in the health behavior research of school-age children (2006), and in a study conducted by the World Health Organization (WHO) to evaluate adolescent dietary habits. It was recommended to use the Family Welfare Scale (FWS) in determining the socio-economic status. The scale score is calculated according to the answers given to the questions. A score of 0-3 indicates a low level of welfare, while scores between 4-5 and 6-7 indicate a medium and high level of welfare, respectively (29-31).

The Index for the Evaluation of Dietary Habits in Adolescent Students (DHI)

The index was developed by Demirezen and Coşansu (32) to evaluate the dietary habits of adolescent students. The Cronbach's alpha of the DHI is 0.68. The risk level of dietary habits is evaluated according to the risk ranges created based on the total score obtained from the DHI. The index includes a total of six questions. According to the total score obtained from the DHI, dietary habit risk levels are as follows: 0=no risk, 1-6 points=mild risk, 7-12 points=moderate risk, 13- 18 points=high risk, and 19-24 points=very high risk (32). In the current study, the Cronbach's alpha was found to be 0.54.

Scale

Body weight was measured with a calibrated Seca brand scale (sensitivity to 0.1 kg). While measuring the body weight, the students stood in an upright position with feet together; they did not wear shoes; and they had light clothes on (removing belt, wallet, phone, coat, etc.).

Tape Measure

An automatic, non-stretchable tape measure (Rolfix brand, 1.5mt) was used to measure height. While measuring the height, the students stood with their feet side by side and the head was in the Frankfort plane (the eye triangle and the top of the auricle were at the same level).

The Physical Activity Attitude Scale (PAAS)

The scale was developed by Yıldızer et al. (33) to evaluate secondary school students' attitudes toward physical activity. It includes 25 items under five sub-dimensions (Affinity, Willingness, Benefit, Socialization, and Self-Trust) on a five-point Likert-type scale. The Cronbach's alpha of the scale was determined as 0.91. The Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett sphericity test values of the scale were calculated. The KMO value was found to be 0.897, and the Bartlett test of sphericity was significant ($p<0.05$) (33). In this study, the Cronbach's alpha was found to be 0.76.

Data collection process

The data were collected using the face-to-face interview technique in the classroom environment by obtaining written consent from the families of the students and verbal consent from the students. The questionnaires and scales were administered to the students during the class hour. The administration of the questionnaire form and the scales took about 20 minutes. In addition, the height and body weight of the students were measured by the researcher in an empty classroom, and their BMI was calculated. In the calculation of the BMI of the

adolescents, the program recommended by the Ministry of Health was used (https://hsgm.saglik.gov.tr/tr/yemekhareket-hesaplamalar).

Data analysis

The Statistical Package for the Social Sciences, version 25 (SPSS) was used to analyze the data. As a part of descriptive statistics, number and percentage distributions were calculated. The Kolmogorov-Smirnov test was performed to analyze the assumptions of the normal distribution of continuous variables. Parametric tests were used for normally distributed data, and nonparametric tests were used for data that did not show normal distribution. The Chi-square test, the independent group's t-test, the One-way Analysis of Variance, and the Bonferroni test, which is one of the post hoc tests, were used in the analysis of dependent and independent variables. To examine the factors affecting the BMI levels of the students, the multiple linear regression analysis was performed using the Stepwise method. In addition, the ANCOVA (Covariance) analysis was performed to control the socio-economic characteristics. The level of significance was set at $p<0.05$.

Ethical considerations

Before the study, ethics committee approval (decision no: 2021/6) was obtained from Selcuk University and written institutional permission was obtained from the Directorate of National Education. The study was conducted under the principles of the Declaration of Helsinki. Written consent was obtained from the parents of the students who participated in the study. Verbal consent was obtained from the students.

Results

Of the students, 34.5% (n=119) were refugees and 65.5% (n=226) were Turkish. The mean age of the refugee students was 12.26±1.19, while that of the Turkish students was 11.83±1.15. A statistically significant difference was found between refugee adolescents and Turkish adolescents in terms of the variables of age, gender, number of siblings, family type, family welfare level, whether the mother and the father are alive, mother's level of education, and parents' working status ($p<0.05$). (Table 1).

Table 1. Distribution of the sociodemographic characteristics of the refugee students and the Turkish students (n=345)

Variables	Refugee	Turkish	Chi-square test and p-value
Age	n (%)	n (%)	
10-12	60 (50.4)	156 (69.0)	
13-14	59 (49.6)	70 (31.0)	11.528
Mean Age	(12.26±1.19)	(11.83±1.15)	0.001*
Gender			
Female	63 (52.9)	83 (36.7)	8.397
Male	56 (47.1)	143 (63.3)	0.004*
Number of Siblings			
Two or less	13 (10.9)	89 (39.4)	30.312
Three and more	106 (89.1)	137 (60.6)	0.001**
Number of People Living in the Family			
Four or less	9 (7.6)	87 (38.5)	37.139
More than four	110 (92.4)	139 (61.5)	0.001**
Family Type			
Nuclear family	63 (52.9)	180 (79.6)	31.931
Extended family	56 (47.1)	46 (20.4)	0.001**
Family Welfare Level			
Low welfare level	114 (95.8)	156 (69.0)	
Medium welfare level	5 (4.2)	58 (25.7)	33.121
High welfare level	0 (0.0)	12 (5.3)	0.001**
Whether the Mother Alive			
Yes	114 (95.8)	225 (99.6)	6.446
No	5 (4.2)	1 (0.4)	0.011*
Whether the Father Alive			
Yes	111 (93.3)	224 (99.1)	9.439
No	8 (6.7)	2 (0.9)	0.002*
Mother's Level of Education			
Illiterate	56 (47.1)	34 (15.0)	
Literate	21 (17.6)	34 (15.0)	49.959
Primary/Secondary school	38 (31.9)	121 (53.6)	0.001**
High school and over	4 (3.4)	37 (16.4)	
Mother's Working Status			
Working	10 (8.4)	53 (23.5)	11.826
Not working	109 (91.6)	173 (76.5)	0.001*
Father's Level of Education			
Illiterate	42 (35.3)	9 (4.0)	
Literate	22 (18.5)	36 (15.9)	69.143
Primary/Secondary school	45 (37.8)	119 (52.7)	0.001**
High school and over	10 (8.4)	62 (27.4)	
Father's Working Status			
Working	76 (63.9)	213 (94.2)	52.921
Not working	43 (36.1)	13 (5.8)	0.001**
Total	119 (100.0)	226 (100.0)	

*p<0.05 **p<0.001

When the mean DHI scores of the students were compared, it was found that the mean DHI score of the Turkish students was statistically significantly higher than that of the refugee students ($p<0.001$). However,

no significant difference was found between the BMI values of the refugee students and the Turkish students and their mean Physical Activity Attitude Scale sub-dimension (affinity, willingness, benefit, socialization, self-trust) scores (p>0.05) (Table 2).

Table 2. Comparison of the physical activity attitude levels, dietary habits, and mean BMI scores of refugee students and Turkish students (n=345)

Variables	Refugee Mean (SD)	Turkish Mean (SD)	Test-value[a]	p-value
*BMI (kg/m2)	20.18 (3.92)	20.33 (4.03)	0.620	0.752
**DHI	7.44 (3.61)	9.23 (3.63)	4.351	0.001
Affinity	18.94 (5.27)	18.65 (5.49)	0.474	0.636
Willingness	14.53 (6.40)	14.34 (6.10)	0.274	0.784
Benefit	17.43 (5.01)	16.93 (5.13)	0.217	0.384
Socialization	15.20 (3.61)	14.95 (4.77)	1.051	0.617
Self-Trust	11.29 (4.23)	10.39 (3.94)	1.955	0.051

[a]t-test in independent groups; * Body Mass Index; **Dietary Habits Index; SD: Standard deviation

Table 3 presents the comparison of the sociodemographic characteristics and the mean BMI scores of the students. The analysis revealed a statistically significant relationship between the BMI values of the refugee students and their age, the number of siblings, and the working status of their mothers (p<0.05). However, it was determined that there was no statistically significant relationship between the BMI values of refugee students and gender, number of people living at home, family type, family welfare level, and parent's education level (p>0.05). It was further revealed that the BMI values of Turkish students did not differ across age, gender, number of siblings, number of people living at home, family type, family welfare level, parents' education level, and parents' working status (p>0.05) (Table 3).

The multiple linear regression analysis was performed with the Stepwise method to evaluate the combined effects of the BMI of refugee students and the statistically significant variables (difference analysis). The analysis revealed that age, mother's working status, and the number of siblings are the factors influencing

Table 3. The change in the BMI of the students according to their sociodemographic characteristics

Variables		Body Mass Index (BMI)			
		Refugee		Turkish	
		Mean (SD)	Test and p-Value	Mean (SD)	Test and p-Value
Age[a]	10-12	18.87 (3.87)	-3.905	20.14 (4.06)	-1.066
	13-14	21.52 (3.52)	**0.001**	20.75 (3.95)	0.287
Gender[a]	Female	20.20 (3.84)	0.036	19.94 (4.17)	-1.093
	Male	20.17 (4.05)	0.971	20.55 (3.94)	0.276
Number of Siblings[a]	two or less	18.06 (2.77)	-2.093	20.48 (3.96)	0.464
	three and more	20.44 (3.97)	0.038	20.23 (4.08)	0.643
Number of People Living at Home[a]	four or less	17.73 (2.41)	-1.976	20.84 (4.19)	1.509
	more than four	20.39 (3.96)	0.050	20.01 (3.90)	0.133
Family Type[a]	Nuclear family	19.97 (3.85)	-0.640	20.46 (4.12)	0.947
	Extended family	20.43 (4.02)	0.523	19.82 (3.62)	0.345
Family Welfare Level[a]	Low welfare level	20.26 (3.96)	0.985	20.55 (4.20)	1.218
	Medium and high welfare level	18.49 (2.43)	0 0.327	19.84 (3.59)	0.225
Mother's Level of Education[b]	Illiterate	19.73 (3.77)		19.46 (2.62)	
	Literate	20.25 (3.35)	0.600	19.47 (3.92)	1.690
	Primary/Secondary school	20.84 (4.45)	0.616	20.57 (4.37)	0.170
	High school and over	19.95 (3.91)		21.13 (3.89)	
Mother's Working Status[a]	Working	22.86 (3.57)	2.289	20.98 (3.98)	1.358
	Not working	19.94 (3.88)	0.024	20.13 (4.03)	0.176
Father's Level of Education[b]	Illiterate	19.33 (3.37)		19.86 (3.03)	
	Literate	19.95 (4.48)	1.620	19.48 (3.58)	0.763
	Primary/Secondary school	21.14 (4.23)	0.189	20.43 (4.29)	0.516
	High school and over	19.98 (2.70)		20.70 (3.87)	
Father's Working Status[a]	Working	22.28 (3.77)	0.361	20.37 (4.00)	0.572
	Not working	20.01 (4.21)	0.718	19.71 (4.62)	0.568

[a]t-test in independent groups; [b]One-way analysis of variance; SD: Standard deviation

BMI (p<0.05). It was found that while age (β=0.281) and the number of siblings (β=0.173) affected BMI positively, the mother's working status (β=-0.206) affected BMI negatively and significantly. The BMI value increased by 0.926 points as the age increased by one unit. In addition, the BMI value increased by 2.170 points as the number of siblings increased by one unit. It was found that the BMI value of children whose mothers were not working decreased by 2.900 points. These independent variables accounted for 14.2% of the BMI of refugee students (R^2=0.142, F=4.019, p<0.05). Since BMI was the common parameter of physical activity and nutrition level in the study, the analyses were based on this value. In addition, since there was no significant difference between BMI and sociodemographic characteristics in Turkish students, further analysis was not performed for Turkish students (Table 4).

Table 4. Factors affecting the BMI of refugee students.

Variables	B	SE	β	t	p
Fixed value	10.287	4.492		2.290	0.024
Age	0.926	0.284	0.281	3.258	0.001
Mother's working status (mother not working)	-2.900	1.210	-0.206	-2.397	0.018
Number of siblings (three or more)	2.170	1.082	0.173	2.005	0.047
R= 0.405	**R^2 =0.142**	**F= 4.019**		**p =0.047**	

It was found that family welfare level, which is covariance, is related to the DHI score; however, when the effect of the family welfare level was controlled, being Turkish or a refugee had a significant effect on the DHI score (F (0.027) = 9.312 p<0.002 Adj R2=0.072) (Table 5)

Table 5. The difference between refugee students and Turkish students in terms of Dietary Habits Index (DHI) score adjusted based on the family welfare scores (ANCOVA Analysis)

Dietary Habits Index Total Score						
Source	**Type III Sumof Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared**
Corrected Model	369.388[a]	2	184.694	14.349	0.000	0.077
Intercept	9864.320	1	9864.320	766.360	0.000	0.691
Family Welfare Level Total Score	119.858	1	119.858	9.312	0.002	0.027
Grup	78.297	1	78.297	6.083	0.014	0.017
Error	4402.108	342	12.872			
Total	30391.000	345				
Corrected Total	4771.496	344				
R Squared = 0.077, Adjusted R Squared = 0.072						

Discussion

The study was conducted to compare the BMI, dietary habits, and physical activity attitudes of refugee adolescents and Turkish adolescents. The findings revealed a difference in the dietary habits of the two groups, while other variables were found to be similar. It was found that age, mother's working status, and the number of siblings are the factors affecting the BMI variable, which is the result of dietary habits and physical activity level in refugee adolescents. No relationship was found between the BMI of Turkish adolescents and their sociodemographic characteristics.

Previous studies in the literature pointed to a relationship between the number of siblings and BMI. Adolescents with fewer siblings were found to have higher BMI values (34-36). The similarity in the BMI values of Turkish students in this study may be due to their similar sociodemographic characteristics.

A statistically significant difference was found between the BMI of the refugee students and the age of the students, the number of siblings, and the working status of their mothers. Age, mother's working status, and the number of siblings were found to be the factors affecting the BMI of refugee adolescents. It was found that the BMI value increased as age and the number of siblings increased. However, the BMI value of refugee adolescents whose mothers were working was found to decrease. Belau et al. (37) investigated the factors affecting the BMI of refugees and reported that there was a significant difference between the BMI values of different age groups. They found that the participants in the younger age groups were of normal weight, while the rates of the overweight and the obese were higher in the older age groups. Another similar study revealed a significant relationship between age and BMI (38). Hosseini et al. (39) reported a positive relationship between age and BMI level. As adolescents age, their body weight is expected to increase. Since the growth and development rate increases during adolescence, BMI also increases. The current study showed that the BMI scores of refugee students with three or more siblings were higher than those of the students with two or fewer siblings. Manal İbrahim et al. (40) found a statistically significant linear relationship between the working status of mothers, the number of individuals living at home, and BMI levels in their study with adolescents. However, in another study, the BMI of the refugee students whose mothers were working was found to be significantly higher than that of the

refugee students whose mothers were not working (41). As seen in the literature, a mother's working status may be a factor that increases or decreases BMI. It is thought that this difference may be due to the sample, the regions where adolescents live, and the economic situation.

The study found a statistically significant difference between the dietary habits of the refugee adolescents and the Turkish adolescents. Although the risky nutrition level of the Turkish students was higher than that of the refugee students, both groups were found to be in the middle-risk range (32). One study revealed that Turkish adolescents skip meals, have risky dietary habits, and have an increasing prevalence of obesity (42). The risky dietary habits of students may be because their economic situation is better than refugee adolescents and they have more access to unhealthy foods. Another study conducted to compare the dietary habits of refugee children and the children of the host country reported that the two groups were different, which was due to the size of the refugees' households and their low weight and height (43). One study aimed to identify the nutritional status of Syrian refugee children and their families and the related factors reported malnutrition and unbalanced diet in refugee children (44). Another study on malnutrition in refugees found that approximately 31% of the children were undernourished, and among these children, 19.6% were short and 15.9% were underweight (45). It is an undeniable fact that refugees encounter many obstacles that may affect their adaptation to the food culture of the countries they migrate to. It is stated that nutrition education is not sufficient to help refugees make healthy nutritional choices that are appropriate to the culture of the region they migrate to (46). It is noteworthy that the risky dietary habits of refugee adolescents are due to their living in crowded families and their social and cultural differences.

Limitations and strengths of the study

There are some limitations in this study. First, the study was conducted in a single school, and thus, the findings cannot be generalized to the whole adolescent population. Second, the data is based on the self-reports of the students.

The strength of the study is that it is the first study investigating the BMI, physical activity level, and dietary habits together in refugee adolescents and Turkish adolescents. Since the study is based on anthropometric measurements, the school administration was informed about the status of the students in the risk group after the measurements. Counseling was provided about directing students to health institutions, which is another strength of the study.

Conclusion

The study showed that the mean BMI scores of the refugee adolescents and Turkish adolescents were different; however, their BMI and physical activity attitudes were similar. It was found that as the age and the number of siblings of refugee adolescents increased, their BMI also increased; however, the BMI value of those whose mothers worked was found to decrease. It was concluded that the family welfare level is related to the DHI score, but when the effect of the family welfare level was controlled, being a refugee or Turkish still had a significant effect on the DHI score.

School health nurses should provide nutrition education to adolescents so that they can develop healthy dietary habits. It is recommended to evaluate the risk factors affecting BMI, especially in refugees, and to take measures against these factors. Conducting studies with different epidemiological methods examining the BMI, nutritional levels, and physical activity attitudes of refugee adolescents and Turkish adolescents together may contribute to the literature. It is recommended to design and implement physical activity programs in schools, where students spend most of the day, and to encourage students to participate in these programs.

Conflict of interest

The author declares that there is no conflict of interest.

Financial support

There was no financial support for this study.

Acknowledgment

The authors thank all participating students.

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