Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.47750/jptcp.2023.30.08.039

Overweight and Obesity and their Association with Food Habits Among Public Schools Adolescents in Jordan

Nisser Alhroub[1*], Murad Alkhalaileh[2], Laith Alosoufe[3], Atallah Hababheh[4], Ibrahim Ayasreh[5]
[1]Faculty of Nursing, Jerash University, Jerash,Jordan
[2]Associate Professor, Department of Adult Nursing, Faculty of Nursing Jerash University, Jerash, Jordan
[3]Assistant Professor, Department of Child and Maternal Health Nursing, Faculty of Nursing, Jerash University, Jerash, Jordan
[4]Assistant professor, Department of Adult health nursing, Faculty of nursing, Jerash University, Jordan
[5]Assistant Professor, Department of Adult Nursing, Faculty of Nursing Jerash University, Jerash, Jordan
***Corresponding author:** Nisser Alhroub, Faculty of Nursing, Jerash University, Jerash,Jordan, Email: Nisserjo@yahoo.com

Submitted: 18 February 2023; Accepted: 11 March 2023; Published: 23 April 2023

ABSTRACT

Adolescence is defined as one of the critical periods related to physical activity behaviors. In this period, regular physical activity decreases, and stable behavior increases (Haghjoo et al., 2022). During adolescence, the prevalence of risk for overweight and obesity increased in developing countries more than in developed countries (Piryani et al., 2016). There is an obvious increase in obesity among adolescents in the world as there is a worrying spread among them according to the indicators of obesity and overweight in the Arab countries, where adolescence is considered one of the critical stages regarding the development of obesity which considered as risk factors in adulthood for some chronic illnesses (Musaiger et al., 2016). Because of the rapid increase in the prevalence of obesity, as well as the associated chronic illnesses, obesity has become an important public health problem for adolescents (Talat & El Shahat, 2016).

Keywords: *Obesity, prevalence, public health*

INTRODUCTION

Globally, the problem of obesity has spread, according to the World Health Organization (WHO), where the prevalence of obesity has increased over the past three decades in many countries (SS, 2016). Many health problems associated with obesity, such as disabilities and death, in addition to the social and financial burden on health care systems. Accordingly, many health professionals sounded the alarm about these problems.

According to studies, the prevalence of obesity is linked to age, gender, eating habits, physical activities, and social and economic status (Okour et al., 2019). Moreover, according to the WHO, the predisposing factors of obesity in adolescence are the increase in energy-dense food, the decrease in physical activity, the change in transportation patterns, in addition to the increase in urbanization, and other reasons. (Baker et al., 2018).

There are many factors that lead to overweight and obesity, such as long time sitting, watching TV, using computers, and others. For Jordan, it is witnessing an epidemiological shift with regard to the rise of non-communicable diseases, as social development in addition to the economic development of any country has a need for good nutrition, as adolescent girls are an important group in society, as adolescent girls are tomorrow mothers, there is paramount importance for their health in giving birth to healthy children in order to reduce cases of diseases (Hamad et al., 2016).

Abu Baker & Daradkeh, (2010) conducted a study in Jordan, they found that there is a prevalence of overweight of 15.7% and a prevalence of obesity of 8.7%. they were also indicated that the highest prevalence was observed among students who live in urban areas and who have working parents. In another study conducted in Jordan about the relation between lifestyle factors and obesity among adolescents, the results revealed that identifying the factors contributes developing preventive programs to control obesity among adolescents in Jordan (Tayyem et al. 2014).

In cross-sectional study, Zalewska & Maciorkowska, (2017) indicated that the percentage of young people who suffer from a lack of body mass is (8.4%), in addition to the percentage of students who have a normal weight is (77.6%), as out of the total number, overweight and obesity were 14.0%. The study recommend the need to transfer knowledge regarding the causes of overweight and obesity in addition to the rules related to a healthy diet as factors that lead to disease prevention (Zalewska & Maciorkowska, 2017).

Despite the fact that there are many studies conducted in Jordan regarding overweight and obesity in adolescents, there were no recently published studies found related to obesity and overweight and their relationship to dietary habits in adolescents.The main purpose of the current study is to assess the association between overweight and obesity with food habits among public school adolescents in Jordan. This study answered the following research questions:

What is the prevalence of overweight and obesity among public schools adolescents in Jordan?

What is the relationship between overweight and obesity (BMI) with food habits among public schools adolescents in Jordan?

Are there significant statistical relationship between gender, age group, region, monthly family income, education level of parents with body mass among public school's adolescents?

METHODOLOGY

Study Design

A descriptive cross-sectional design was used to conduct the current study.

Study Setting

The research was take place at public schools in Jordan (Middle, North, and South). Public schools were chosen because of the difficulties of obtaining permission from private schools to conduct the study, in addition to the lack of data on private schools.

Sample and sampling technique

Jordan divided into three regions (Middle, North, and South), A multi-stage stratified random sampling technique used to recruit study participants, in the first stage a governorate selected randomly from each region, then two schools from each governorate selected randomly, one of which is a male school and the other a female school, where six schools selected from the three regions. After that, adolescent students randomly selected from each school.

The estimated sample size is 600, based on the distribution of population in Jordan 30% of study sample recruited from middle region, and 10% from south region and 20% from north region

Instrumentation

A food frequency questionnaire (FFQ) adopted in this study. The questionnaire consists of two sections. The first section composes of demographic characteristics such as gender, age group, region, monthly family income, education

level of parents, and body mass. The second section contains 10 questions related to food habits, which consists of a limited list of foods and drinks with response categories to indicate the usual frequency of consumption during the required time period.

Data Collection procedure

The data collected in two months January and February 2023, the researcher approach the administrator of each selected school and distribute the questionnaires to study participants individually and asked the participants to submit the completed questionnaires to the administrator, after one week the researcher returned back to the school and collected the completed questionnaires.

Analysis

Data analysed using descriptive statistics such as frequency .furthermore, suitable inferential statistics will be performed to identify the differences between groups using SPSS version 22.

Ethical Considerations

Ethical approvals obtained from Jarash Private University IRB, in addition to obtaining ethical approval from the Ministry of Education and each school if requested, in addition, the agreement to participate in the current study obtained from each student by filling consent form. Data coded in numbers and no identity will be used in data collection, participants assured that they can withdraw from the study at any time without any consequence. Moreover, nobody can access data except the research team.

RESULTS

Socio-Demographic Characteristics

Six hundred adolescent were interviewed. The demographic characteristic of the adolescent are shown in Table (4.1).

TABLE 1: Socio-demographic characteristics of the study participants (N =600)

Variables		Number	%
Age (years)	11-13	302	50.3
	14-16	298	49.7
Gender	Male	300	50.0
	Female	300	50.0
Region	Middle	300	50.0
	South	100	16.7
	North	200	33.3
Monthly Family Income (JD)	Below 500	197	32.8
	500-999	139	23.2
	1000-1499	142	23.7
	More than 1500	122	20.3
Education Level for Parents	Elementary	163	27.2
	Diploma Degree	162	27.0
	Bachelor degree	178	29.7
	Postgraduate degree	97	16.2
Body Mass Index (BMI)	Underweight (under 18.5)	141	23.5
	Healthy Range (Between 18.5 and 24.9)	107	17.8
	Overweight (between 25 and 29.9)	195	32.5
	Sever Obesity (40 or over)	157	26.2

Data were collected through the period from January 12th 2022 to February 10th 2023. The number of participants who were consented to participate and completed the questionnaires is

600 participants . Table 1 reveals the distribution of participants in numbers and percentages by socio-demographic characteristics. Overall, 50.3% of participants were from the age group (11-13) , 49.7 % were from the age group (14-16) . According to the region most of our participants were from middle areas about 50.0%, while participants from south and north areas represent about (16.7%, 33.3%) respectively. Regarding to the monthly family income (JD) were as following : Below 500 (32.8%), 500-900 (23.2%), 1000-1499 (23.7%) and more than 1500 (20.3%). According to the educational level for parents were as following : Elementary (27.2%), Diploma degree (27.0%), Bachelor Degree (29.7%), and (16.2) were postgraduate degree. Most of our participants were overweight (32.5%) and Sever Obesity (26.2%) as shown in figure no (1.1).

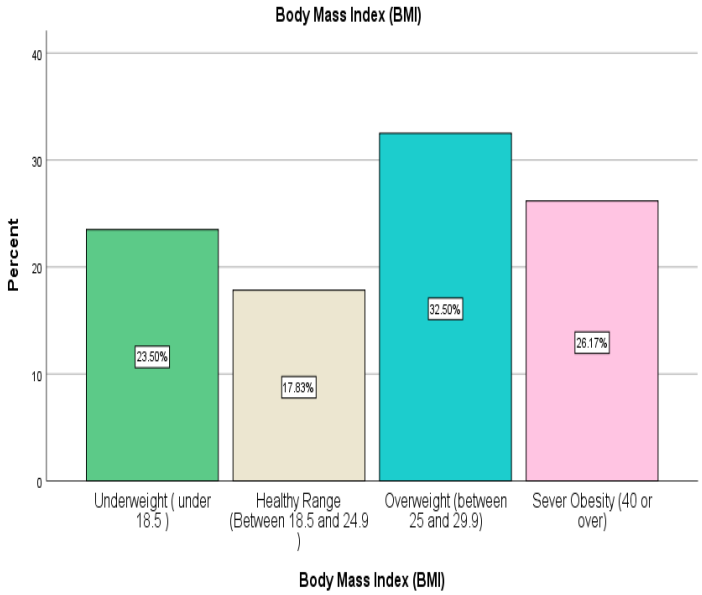

FIGURE 1: Distribution of participants according to the Body Mass Index (BMI)

Socio-demographic variables such as gender (Male &Female) are not notably associated with the general food habits.

TABLE 2: Independent Samples Test (t-test for Equality of Means) for Food Habits and Gender

Domain	Gender	Means	Sd. deviation	t-test	df	p-value
Food Habits	Male Female	15.3833 16.8700	9.20428 9.46423	-1.950	598	0.886

df: degrees of freedom, SD: standard of deviation

Table 2 shows revealed that food habits for gender reported significantly higher mean (16.8700±9.46423) of female than male (15.3833±9.20428) and there is no statistically significant differences in food habits according to gender , p-value = 0.886.

Socio-demographic variables such as region (Middle, South, North) are associated with the general food habits.

TABLE 3: One Sample Statistics (t-test for Equality of Means) for Region and Food Habits

One-Sample Statistics						
	N	Mean	Std. Deviation	Std. Error Mean		
Region	600	.83	.898	.037		
Food Habits	600	16.1267	9.35699	.38200		
One-Sample Test						
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Region	22.724	599	.000	.833	.76	.91
Food Habits	42.217	599	.000	16.12667	15.3764	16.8769

df: degrees of freedom, SD: standard of deviation

Table 3 shows revealed that food habits according to region reported that there is statistically significant differences in food habits according to region , p-value = 0.000

Socio-demographic variables such as BMI are associated with the general food habits.

TABLE 4: One Sample Statistics Regarding Food Habits and Body Mass Index

One-Sample Statistics						
	N		Mean	Std. Deviation	Std. Error Mean	
Body Mass Index (BMI)	600		1.61	1.110	.045	
Food Habits	600		16.1267	9.35699	.38200	
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Body Mass Index (BMI)	35.596	599	.000	1.613	1.52	1.70
Food Habits	42.217	599	.000	16.12667	15.3764	16.8769

Table 4 shows that there is statistically significant differences between food habits and Body Mass Index, p-value = 0.000

Food Habits

TABLE 5: Frequencies and percentages of Food habits

Variables/Items		Number	%
Fruits	1 day/wk	217	36.2
	2– 4 days/wk	118	19.7
	5– 6 days/wk	144	24.0
	Daily	121	20.2

J Popul Ther Clin Pharmacol Vol 30(8):e357–e366; 23 April 2023.

Vegetables	1 day/wk	159	26.5
	2– 4 days/wk	84	14.0
	5– 6 days/wk	183	30.5
	Daily	174	29.0
Soft Drinks	1 day/wk	160	26.7
	2– 4 days/wk	83	13.8
	5– 6 days/wk	185	30.8
	Daily	172	28.7
Sweets and Baked Goods	1 day/wk	157	26.2
	2– 4 days/wk	79	13.2
	5– 6 days/wk	185	30.8
	Daily	179	29.8
Potato Chips	1 day/wk	154	25.7
	2– 4 days/wk	80	13.3
	5– 6 days/wk	191	31.8
	Daily	175	29.2
Cake/Pastries	1 day/wk	168	28.0
	2– 4 days/wk	70	11.7
	5– 6 days/wk	186	31.0
	Daily	176	29.3
Diary Foods and Fats	1 day/wk	148	24.7
	2– 4 days/wk	75	12.5
	5– 6 days/wk	202	33.7
	Daily	175	29.2
Breads, Cereals, Starches	1 day/wk	151	25.2
	2– 4 days/wk	80	13.3
	5– 6 days/wk	193	32.2
	Daily	176	29.3
Meats and Other Alternatives	1 day/wk	124	20.7
	2– 4 days/wk	103	17.2
	5– 6 days/wk	209	34.8
	Daily	164	27.3
Beverages	1 day/wk	149	24.8
	2– 4 days/wk	75	12.5
	5– 6 days/wk	191	31.8
	Daily	185	30.8

Table 5 shown that the frequency of consumption fruits among adolescents it was classified as one day/week among (36.2%) of participants, 2-4 days/week among (19.7%), 5-6 days/week among (24.0%) and daily among (20.0%). Frequency consumption of eating vegetables was classified as (1day/wk, 2-4 days /week, 5-6 days/week, and daily) among (26.5%, 14.0%, 30.5% , 29%) of participants respectively. Most of our participants were consumption soft drinks and Sweets and Baked Goods 5-6 days/week (30.8%).

In addition to that , most of our participants consumed Potato Chips daily (31.8%) .

(31.0%), (33.7%), (32.2%) from our participants consumed Cake/Pastries , Diary Foods and Fats , Breads, Cereals, Starches from 5-6 days/weekly respectively.). Frequency consumption of eating Meats and Other Alternatives was classified as (1day/wk, 2-4 days /week, 5-6 days/week, and daily) among (20.7%, 17.2%, 34.8%, 27.3%) of participants respectively. There were (31.8%) from our participants eating beverages from (5-6 days/wk).

TABLE 6: One Sample Statistics Regarding Food Habits

	N	Mean	Std. Deviation	Std. Error Mean
Food Habits	600	16.1267	9.35699	.38200

One-Sample Test						
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Food Habits	42.217	599	.000	16.12667	15.3764	16.8769

df: degrees of freedom, SD: standard of deviation

Table 6 shown that there is a statistical significant relationship between food habits among adolescents at p-value = 0.000

TABLE 7: Correlations between Food Habits and Body Mass Index

		Food Habits	Body Mass Index (BMI)
Food Habits	Pearson Correlation	1	.191**
	Sig. (2-tailed)		.000
	N	600	600
Body Mass Index (BMI)	Pearson Correlation	.191**	1
	Sig. (2-tailed)	.000	
	N	600	600

Table 7 shown the correlation between the food habits and body mass index, there is a significant correlation between food habits and body mass index, p-value= 0.000.

TABLE 8: Correlations between Region and Body Mass Index

Correlations			
		Body Mass Index (BMI)	Region
Body Mass Index (BMI)	Pearson Correlation	1	-.247**
	Sig. (2-tailed)		.000
	N	600	600
Region	Pearson Correlation	-.247**	1
	Sig. (2-tailed)	.000	
	N	600	600

Table 8 shown the correlation between the Region and body mass index, there is a significant correlation between region and body mass index, p-value= 0.000.

TABLE 9: Correlations between Monthly Family Income and Body Mass Index

Correlations			
		Body Mass Index (BMI)	Monthly Family Income (JD)
Body Mass Index (BMI)	Pearson Correlation	1	.624**
	Sig. (2-tailed)		.000
	N	600	600
Monthly Family Income (JD)	Pearson Correlation	.624**	1
	Sig. (2-tailed)	.000	
	N	600	600

Table 9 shown the correlation between the Monthly Family Income and body mass index, there is a significant correlation between monthly family income and body mass index, p-value= 0.000.

TABLE 10: Correlations between Education level for parents and Body Mass Index

		Body Mass Index (BMI)	Education Level for Parents
Body Mass Index (BMI)	Pearson Correlation	1	.573**
	Sig. (2-tailed)		.000
	N	600	600
Education Level for Parents	Pearson Correlation	.573**	1
	Sig. (2-tailed)	.000	
	N	600	600

Table 10 shown the correlation between the education level for parents and body mass index, there is a significant correlation between education level for parents and body mass index, p-value= 0.000.

TABLE 11: Correlations between Gender and Body Mass Index

		Body Mass Index (BMI)	Gender
Body Mass Index (BMI)	Pearson Correlation	1	.024
	Sig. (2-tailed)		.557
	N	600	600
Gender	Pearson Correlation	.024	1
	Sig. (2-tailed)	.557	
	N	600	600

Table 11 shown the correlation between gender and body mass index, there is no significant correlation between gender and body mass index, p-value = 0.557.

DISCUSSION

In Jordan, during the past decades, the prevalence of overweight and obesity among adolescents has increased, as studies have assumed that Jordanians' attitudes are affected by dramatic changes in lifestyle, where reliance is placed on means of transportation, in addition to the increase in the consumption of fast food and sweets, as well as Free time leads to watching TV, using the Internet, in addition to playing computer games (Baker et al., 2018).

Our study revealed that the prevalence of overweight and obesity is (32.5%, 26.2%) respectively among the included subjects. According to one of the studies conducted in Jordan on adolescents, where it was concluded that there is an increase in weight among adolescents (36.2%), and obesity among adolescents is (9.9%) (Hamad et al., 2016). These results are close with the results of our study regarding the prevalence of obesity among adolescents. One of the studies indicated that, according to reports issued by UNICEF Egypt and consistent with our study, which provided data related to overweight and obesity, as it showed that 33% of the participants suffer from overweight and obesity (Genena & Salama, 2017).

Our study found that shows that there are statistically significant differences between food habits and Body Mass Index, p-value = 0.000. According to one of the studies which conducted on adolescents agreed with the results of our current study, as the current study found that there is a correlation and relationship between adolescents' eating habits and body mass index ($r = +6.25$; $p < 0.05$) (Najagaraja, 2007). On the other hand, there is another study that contradicted the results of our study, which was conducted in Turkey, and found that there is a

negative association between eating habits and body mass index ($r = -0.085$; $p < 0.05$) (Benazeera, 2014).

The results of our current study, regarding the association of body mass index (BMI) with demographic characteristics, such as the region, the monthly family income, the educational level of the parents, found that there is a statistically significant relationship between the demographic characteristics that have been mentioned with the BMI, p-value = 0.000. Moreover, there is no significant correlation between gender and BMI, p-value = 0.557. One study indicated that there is a positive correlation between demographic characteristics such as father's occupation and age with body mass index ($p < 0.05$) (Eljamay et al., 2022). In Jordan, One of the studies indicated in its results that the monthly income of the family, the education of the mother and the state of work are among the factors that have a significant impact on weight gain among adolescents (Okour et al., 2019).

CONCLUSIONS

Through the results of our study, we found that there is a prevalence of obesity and overweight among adolescents in public schools in Jordan, in addition to that the body mass index was associated with various dietary habits that are practiced by adolescents, as there are different dietary habits among adolescents, as the results of our study found. There are some demographic characteristics that had a correlation in the body mass index and had an effect on the changes with regard to overweight and obesity, such as the region, the educational level of the parents, the monthly income of the family, in addition to that there was no correlation between the body mass index and gender.

Implications For Nursing

Paying attention to the nutritional habits of adolescents, focusing on addressing the issue of obesity and overweight is very important, and we must focus and increase the level of knowledge in healthy eating and the harmful effects of obesity and overweight, as there is a great role for nursing and health care teams in health education about correct eating habits in terms of healthy eating and avoiding obesity and weight gain.

Recommendations For Further Future

We recommend, through our study, to focus on health education and focus on healthy eating in order to reduce excess weight and obesity, as it is necessary to follow intervention strategies in order to improve eating habits as well as reduce and limit the prevalence of obesity and overweight.

REFERENCES

1. Abu Baker, N. N., & Daradkeh, S. M. (2010). Prevalence of overweight and obesity among adolescents in Irbid governorate, Jordan. EMHJ-Eastern Mediterranean Health Journal, 16 (6), 657-662, 2010.
2. Baker, N. N. A., Al-Ali, N., & Al-Ajlouni, R. (2018). Attitudes of Jordanian adolescent students toward overweight and obesity. The Open Nursing Journal, 12, 15.
3. Benazeera, U. J. (2014). Association between eating habits and body mass index (BMI) of adolescents. Int J Med Sci Public Health, 3(8), 940-3.
4. Eljamay, S. M., Elawkly, A. A., & Younis, F. H. (2022). The Rate of Socioeconomic and Demographic Factors Affecting Body Mass Index (BMI) among Teenagers in Derna City, Libya. African Journal of Advanced Pure and Applied Sciences (AJAPAS), 91-97.
5. García Rodríguez, M., Romero Saldaña, M., Alcaide Leyva, J. M., Moreno Rojas, R., & Molina Recio, G. (2019). Design and validation of a food frequency questionnaire (FFQ) for the nutritional evaluation of food intake in the Peruvian Amazon. Journal of Health, Population and Nutrition, 38(1), 1-11.
6. Genena, D. M., & Salama, A. A. (2017). Obesity and eating habits among university students in Alexandria, Egypt: a cross sectional study. World journal of nutrition and health, 5(3), 62-68.
7. Hamad, H. J., Abu-Hassouneh, D. T., Ibrahim, M. O., Al-Islam, M., & Faris, E. (2016). Prevalence of obesity among Jordanian school-aged adolescents in greater Amman. Prevalence, 33, 91-96.
8. Haghjoo, P., Siri, G., Soleimani, E., Farhangi, M. A., & Alesaeidi, S. (2022). Screen time increases overweight and obesity risk among adolescents: a

systematic review and dose-response meta-analysis. BMC primary care, 23(1), 1-24.
9. Musaiger, A. O., Al-Mannai, M., Al-Haifi, A. R., Nabag, F., Elati, J., Abahussain, N., ... & Al-Mufty, B. (2016). Prevalence of overweight and obesity among adolescents in eight Arab countries: comparison between two international standards (ARABEAT-2). Nutricion hospitalaria, 33(5), 1062-1065.
10. Najagaraja, G. J. (2007). Co-relation study to assess the eating habits and body mass index of the adolescents from school and colleges [M. sc thesis]. Rajiv Gandhi Health Science.
11. Okour, A. M., Saadeh, R. A., Hijazi, M. H., Al Khalaileh, H. E., & Alfaqih, M. A. (2019). Socioeconomic status, perceptions, and obesity among adolescents in Jordan. The Pan African Medical Journal, 34.
12. Piryani, S., Baral, K. P., Pradhan, B., Poudyal, A. K., & Piryani, R. M. (2016). Overweight and its associated risk factors among urban school adolescents in Nepal: a cross-sectional study. BMJ open, 6(5), e010335.
13. Roy, S. K., Jahan, K., Alam, N., Rois, R., Ferdaus, A., Israt, S., & Karim, M. (2021). Perceived stress, eating behavior, and overweight and obesity among urban adolescents. Journal of Health, Population, and Nutrition, 40(1), 1-13.
14. SS, M. A. (2016). A review of the prevalence of obesity in Saudi Arabia. J Obes Eat Disord, 2(2), 1-6.
15. Talat, M. A., & El Shahat, E. (2016). Prevalence of overweight and obesity among preparatory school adolescents in Urban Sharkia Governorate, Egypt. Egyptian Pediatric Association Gazette, 64(1), 20-25.
16. Tayyem, R. F., Al-Hazzaa, H. M., Abu-Mwe, S. S., Bawadi, H. A., Qatatshe, A., & Musaiger, A. O. (2014). Association of Lifestyle Factors with Obesity Indices among Adolescents in Amman, Jordan. Malaysian Journal of Nutrition, 20(1).
17. Zalewska, M., & Maciorkowska, E. (2017). Selected nutritional habits of teenagers associated with overweight and obesity. PeerJ, 5, e3681