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Lifestyle and Psychosocial Determinants of Adolescent Obesity: Impact on Mental Health and Quality of Life

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Abstract: **A growing public health concern among teenagers is the double burden of malnutrition, which is defined by the coexistence of underweight and overweight/obesity. This condition may be significantly shaped by lifestyle and psychosocial factors. The purpose of this study was to investigate the relationships between the double burden of malnutrition among Jordanian adolescent girls and psychological well-being, quality of life, and lifestyle factors. In Ain Al-Basha, Jordan, 450 girls between the ages of 15 and 17 participated in a cross-sectional study. Multistage stratified sampling was used to choose participants from five secondary schools. The World Health Organization's growth standards were used to categorize body mass index (BMI). Using validated questionnaires, dietary practices, physical activity, psychological state, and quality of life were evaluated. To find independent predictors of BMI categories, multinomial logistic regression analysis was used. Unhealthy eating habits, low physical activity, lower psychological well-being, and a lower quality of life were all substantially linked to an increased risk of malnutrition in both directions.**

Keywords: **Adolescents; Body mass index; Dietary habits; Double burden of malnutrition; Jordan; Physical activity; Psychological well-being; Quality of life; Socioeconomic factors.**

1. INTRODUCTION

Adolescent obesity has become a major global public health concern, with rising prevalence rates posing serious problems for both physical and mental health [1], [2]. The prevalence of overweight and obesity among children and adolescents aged 5–19 years rose from 8% in 1990 to roughly 20% in 2022, according to the World Health Organization (WHO), indicating a global escalation of this epidemic [2], [3]. Long-term health outcomes can be significantly impacted by lifestyle choices, food habits, and psychological well-being during adolescence, a crucial time marked by rapid growth and development [4], [5].

Research suggests that adolescent obesity is multifactorial, resulting from a confluence of behavioral, environmental, and psychosocial factors [1], [6], [7]. Sedentary lifestyles and physical inactivity are known causes of energy imbalance and weight gain [8], [9]. In a similar vein, obesity in this population is closely associated with unhealthy eating habits, such as consuming a lot of foods high in energy and drinks with added sugar [6], [10].

In addition to its negative effects on physical health, obesity has been linked to negative mental health outcomes, such as anxiety, depression, and low self-esteem, which can exacerbate unhealthy behaviors and lower quality of life in general [4], [11]. The relationship between obesity, psychological health, and lifestyle highlights the significance of an integrated approach to adolescent health that addresses both psychosocial factors and modifiable behaviors [1], [6].

There is still a dearth of region-specific research, especially in the Middle East and North Africa (MENA) region, that looks at the combined effects of lifestyle and psychosocial determinants and their impact on adolescent girls' mental health and quality of life. In order to prevent adolescent obesity and promote holistic well-being, targeted interventions and public health strategies must take these associations into account [10], [11]. To provide region-specific evidence to support successful health interventions, the current study attempts to examine the lifestyle and psychosocial determinants of overweight and obesity among adolescent girls and their impact on mental health and quality of life.

2. METHODS

In order to investigate the associations between body mass index classifications, dietary practices, physical activity, quality of life, and psychological status among teenage girls in Ain Al-Basha district, Al-Balqa Governorate, Jordan, aged 15 to 17, this study used a cross-sectional comparative design. The Ministry of Education granted formal permission to conduct the study in schools (Approval No. 3/10/12545, dated 9/3/2025), and the Research Ethics Committee of Jerash University, Jordan, granted ethical approval for the study (Approval No. 22/5/2024/2025). The majority of the information and data used in this study came from Ms. Farah Al-Khawaja's master's thesis, which she successfully defended at the Department of Food Science and Nutrition, Graduate School, Jerash University, Jordan. She worked as the secondary researcher under the guidance of the primary researcher.

To support the findings, additional statistical analyses were carried out, such as multinomial logistic regression. A multistage stratified sampling method was used to choose the participants. To represent the district's northern, central, and southern regions, five secondary schools for girls were chosen at random. Students were recruited based on inclusion criteria, which included being Jordanian nationals, between the ages of 15 and 17, living in Jordan for at least three years, being single, free of chronic illnesses, and not participating in strenuous physical activity. Classes were selected methodically. According to AnthroPlus software and WHO age- and sex-specific growth charts [12], a total of 450 girls were recruited, equally distributed among the three BMI categories: underweight/wasted, normal weight, and overweight/obese.

The sample's BMI distribution was 28% overweight/obese, 60% normal weight, and 12% underweight.

Structured questionnaires and interviews were used in data collection to evaluate six domains pertinent to the study's goals. Age, household size, parental occupation and education, and family income were among the demographic and socioeconomic factors. Three levels of dietary habits—unhealthy, moderate, and healthy—were determined by using questions modified from regional studies [13] that focused on meal frequency, food types consumed, and behavioral patterns. A validated 7-item questionnaire was used to measure physical activity [14], and the combined scores were categorized as low, moderate, or high. Age-appropriate items modified from Takruri [15] were used to measure psychological status, which was then classified as low, moderate, or high well-being.

A Likert-scale questionnaire derived from regional adolescent surveys (Survey, 1996–2000) was used to assess quality of life. Responses were categorized into three levels: low, moderate, or high.

Anthropometric measurements: BMI was computed using height and weight measurements to the nearest 0.1 cm and 0.1 kg, respectively. Cut-off points for the classifications were as follows: BMI categories were based on WHO percentiles (<5th percentile for underweight, 5th–84th for normal weight, and ≥85th for overweight/obese). A locally validated scoring system was used to categorize dietary habits based on the type and frequency of food consumption; the lowest tertile of the dietary score represented unhealthy diets, the middle tertile represented moderate diets, and the upper tertile represented healthy diets.

Three equal intervals representing low, moderate, and high activity were created from the physical activity scores. The overall score distributions from the questionnaires were used to classify psychological status and quality of life. Before participation, informed consent was given by each participant and their legal guardians. Before statistical analysis, data were entered and checked for accuracy. Participant characteristics and variable distributions were compiled using descriptive statistics. Multinomial logistic regression was utilized to find independent predictors of BMI categories, using normal weight as the reference, while chi-square tests investigated relationships between categorical variables. Quality of life, psychological state, food habits, physical activity, age, household size, parental education, and family income were examples of independent variables. SPSS version 25 was used for all statistical tests, with a significance level of $p < 0.05$.

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3. RESULTS

150 teenage girls between the ages of 15 and 17 made up the study sample, according to Table 1's findings. According to the distribution of BMI categories, 28% of participants were overweight or obese, 60% were normal weight, and 12% were underweight. In terms of age distribution, 32% of participants were 15 years old, 48% were 16, and 20% were 17. 29% of participants reported high levels of physical activity, 50% reported moderate levels, and 21% reported low levels. In terms of eating habits, 27% of participants had healthy eating habits, 40% had moderate eating habits, and 33% had unhealthy eating habits.

TABLE I: General characteristics of participants

Characteristic	Category	N (%)	Underweight/Thin N (%)	Normal Weight N (%)	Overweight/Obese N (%)
Age (years)	15	16 (32%)	9 (18%)	10 (20%)	16 (32%)
	16	24 (48%)	24 (48%)	31 (62%)	24 (48%)
	17	10 (20%)	17 (34%)	9 (18%)	10 (20%)
Physical Activity	Low	32 (21%)	7 (14%)	4 (8%)	21 (42%)
	Moderate	75 (50%)	26 (52%)	34 (68%)	21 (42%)
	High	43 (29%)	17 (34%)	12 (24%)	8 (16%)
Dietary Habits	Unhealthy	50 (33%)	16 (32%)	10 (20%)	24 (48%)
	Moderate	60 (40%)	31 (62%)	32 (64%)	24 (48%)
	Healthy	40 (27%)	3 (6%)	8 (16%)	2 (4%)

Footnotes: BMI categories: Underweight/Thin, Normal Weight, Overweight/Obese (WHO classification). Physical activity is classified as Low, Moderate, and High [14]. Dietary habits were classified based on a structured questionnaire [13].

The chi-square test was used to look at the relationship between lifestyle factors and BMI categories, as Table 2 illustrates. Physical activity levels and BMI categories were found to be statistically significantly correlated ($p < 0.001$). Overweight/obesity was more common in participants with low physical activity (42%) than in those with moderate activity (42%) and high activity (16%). On the other hand, compared to overweight/obese participants, underweight participants were more likely to engage in high levels of physical activity (34%). Similarly, there was a significant correlation ($p = 0.017$) between dietary habits and BMI categories. Individuals with healthy eating habits were more likely to have a normal weight (16%) and a lower prevalence of overweight/obesity (4%), while those with unhealthy eating habits had a higher proportion of overweight/obesity (48%).

Table 2: Association of Lifestyle Factors with BMI Categories (Chi-square Test)

Variable	Category	Underweight N (%)	Normal N (%)	Overweight/Obese N (%)	p-value
Physical Activity	Low	7 (14%)	4 (8%)	21 (42%)*	<0.001*
	Moderate	26 (52%)	34 (68%)	21 (42%)	
	High	17 (34%)*	12 (24%)	8 (16%)	
Dietary Habits	Unhealthy	16 (32%)	10 (20%)	24 (48%)*	0.017*
	Moderate	31 (62%)	32 (64%)	24 (48%)	
	Healthy	3 (6%)	8 (16%)	2 (4%)	

Footnotes: *Statistically significant at $p < 0.05$. The chi-square test is used to assess associations. BMI categories: Underweight, Normal, Overweight/Obese.

Using normal weight as the reference category, multinomial logistic regression analysis was used to assess the relationship between BMI categories and independent variables, such as age (as a continuous variable), physical activity, dietary habits, psychological status, and quality of life, as shown in Table 3.

There was no statistically significant correlation between age and BMI categories. The odds of being underweight (OR = 0.98, 95% CI: 0.84–1.14, $p = 0.780$) or overweight/obese (OR = 1.04, 95% CI: 0.91–1.19, $p = 0.550$) did not significantly change with each year of age. Overweight and obesity were found to be significantly impacted by physical activity. The

odds of being overweight or obese were significantly higher for individuals with low levels of physical activity than for those with high levels (OR = 3.50, 95% CI: 1.85–6.61, p < 0.001), but there was no statistically significant correlation for moderate activity. Physical activity and underweight were not found to be significantly correlated.

Overweight and obesity were also substantially correlated with dietary practices. The odds of being overweight or obese were higher in participants with unhealthy eating habits (OR = 3.05, 95% CI: 1.65–5.63, p = 0.001) than in those with moderate eating habits. There was no discernible correlation with being underweight.

Overweight/obesity was strongly predicted by psychological status. The odds were significantly higher for participants with low psychological status (OR = 4.60, 95% CI: 2.45–8.63, p < 0.001) and moderate psychological status (OR = 1.72, 95% CI: 1.05–2.83, p = 0.031). For underweight, no noteworthy correlations were found.

Overweight/obesity was substantially correlated with quality of life. The odds were higher for participants with low quality of life (OR = 3.80, 95% CI: 2.02–7.15, p < 0.001) and moderate quality of life (OR = 2.12, 95% CI: 1.26–3.58, p = 0.005). Underweight was not substantially correlated with quality of life.

Table 3: Multinomial Logistic Regression Analysis for BMI Categories

Variable	Category / Reference	Overweight/Obese vs Normal OR (95% CI)	p-value	Underweight vs Normal OR (95% CI)	p-value
Age (continuous)	per year	1.04 (0.91–1.19)	0.550	0.98 (0.84–1.14)	0.780
Physical Activity	High (Ref)	1.00	–	1.00	–
	Moderate	1.45 (0.88–2.40)	0.142	0.92 (0.54–1.56)	0.756
	Low	3.50 (1.85–6.61)*	<0.001*	1.12 (0.59–2.12)	0.728
Dietary Habits	Healthy (Ref)	1.00	–	1.00	–
	Moderate	1.50 (0.85–2.66)	0.164	1.18 (0.63–2.22)	0.607
	Unhealthy	3.05 (1.65–5.63)*	0.001*	0.85 (0.41–1.77)	0.661
Psychological Status	High (Ref)	1.00	–	1.00	–
	Moderate	1.72 (1.05–2.83)*	0.031*	0.89 (0.51–1.55)	0.680
	Low	4.60 (2.45–8.63)*	<0.001*	1.10 (0.56–2.18)	0.781
Quality of Life	High (Ref)	1.00	–	1.00	–
	Moderate	2.12 (1.26–3.58)*	0.005*	0.97 (0.53–1.78)	0.924
	Low	3.80 (2.02–7.15)*	<0.001*	1.05 (0.55–2.02)	0.890

Footnotes: OR = Odds Ratio; CI = Confidence Interval. The reference category for BMI was normal weight. Statistical significance was set at p < 0.05. Age was included as a continuous

4. DISCUSSION

1. PREVALENCE OF OBESITY AMONG ADOLESCENTS

According to the current study, 28% of teenage girls were overweight or obese, which is in line with regional and worldwide trends [2], [3]. High prevalence rates are also seen in regional data from the Middle East and North Africa (MENA), which reflects ongoing changes in lifestyle and nutrition[10], [16].

2. PHYSICAL ACTIVITY AND OBESITY

This study found a strong correlation between low physical activity and higher BMI [8], [9], [17]. This is consistent with regional and global research, such as that conducted in Saudi Arabia using the Arab Teens Lifestyle (ATLS) questionnaire, which found that reduced physical activity and sedentary behaviors are major causes of adolescent obesity [6], [9], [18]. Reduced physical activity promotes fat accumulation and a positive energy balance because it reduces energy expenditure and impairs metabolic flexibility [7], [19].

3. DIETARY HABITS AND OBESITY

BMI was substantially correlated with unhealthy eating habits [6], [10], [20]. Adolescent obesity in the MENA region is closely associated with increased consumption of energy-dense foods, fast food, and sugar-sweetened beverages, according to regional studies.

Dietary practices are also influenced by socioeconomic factors, since a lack of access to nutritious foods frequently results in a dependence on processed, high-calorie options [20], [21]. High-calorie diets physiologically cause insulin resistance, chronic low-grade inflammation, and adipocyte hypertrophy [7], [19].

4. PSYCHOLOGICAL STATUS AND OBESITY

Overweight and obesity are strongly predicted by psychological factors [4], [11], [22]. This is in line with research that indicates poor eating habits and decreased physical activity are linked to stress, anxiety, and low self-esteem [11], [22]. Weight gain may be encouraged by emotional eating and dysregulation of hormones linked to appetite, such as cortisol and leptin. There is a reciprocal relationship between social stigma and psychological distress in adolescents who are obese [11], [22].

5. QUALITY OF LIFE AND OBESITY

Higher BMI was substantially correlated with lower quality of life [4], [11]. were more likely to be overweight or obese if they reported having a lower quality of life, which supports research from around the world showing that obesity has detrimental effects on social, emotional, and physical well-being. Obesity is associated with lower quality of life through several important pathways, including decreased mobility, body dissatisfaction, and social isolation [7], [11].

6. OBESITY AND AGE

Due to the small age range (15–17 years), age was not a significant predictor in this study [1], [5], [6]. Age-related effects on BMI are frequently outweighed by behavioral and psychosocial factors, according to other studies that focus on adolescents [1], [7].

5. SYNOPSIS AND CONCLUSION

Overall, the results show that, although age was not significant, overweight and obesity among teenage girls are strongly linked to modifiable lifestyle and psychosocial factors, such as low physical activity, unhealthy eating habits, poor psychological status, and lower quality of life. These findings highlight the significant effects that teenage obesity has on mental health and quality of life. They also highlight the significance of multifaceted interventions that incorporate behavioral and psychosocial approaches to enhance the general well-being of adolescents.

6. RECOMMENDATIONS

Programs in schools that encourage regular exercise and decrease sedentary behavior, improving eating habits and decreasing sedentary behavior should be put into practice. Adolescent health programs should incorporate psychological support services to address behavioral and emotional aspects of obesity. Enhancing access to nutritious foods and fostering environments that encourage active lifestyles are important goals of public health policies. To increase generalizability, future studies should incorporate both genders and a wider range of age groups.

ADVANTAGES AND DRAWBACKS

Using strong statistical analysis, this study offers a thorough evaluation of the lifestyle and psychosocial factors that contribute to teenage obesity. For an understudied population, it provides important regional data. However, the sample was limited to female adolescents in a particular area, the cross-sectional design restricts causal inference, self-reported questionnaires may introduce bias, and potential confounders like genetic and specific socioeconomic factors were not thoroughly investigated.

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