



## Adolescent Obese Females and Quality of Lifestyle: An Examination of Anthropometric and Socio-Economic Factors in Tehran-Iran

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### ABSTRACT

Background: Due to the social development and concurrent lifestyle changes, the spread of overweight and obesity, as well as related chronic and metabolic diseases, is on the rise. Various studies have indicated that family lifestyle modifications can have beneficial effects on childhood obesity prevention in the long term. This study aimed to determine the effect of lifestyle changes on anthropometric indices and other related factors in obese female students aged 11-14. Methods: This study was performed on 452 random obese female high-school students in three low-income areas of Tehran who had BMI greater than 2SD above the WHO 2007 reference. General information and a lifestyle questionnaire were provided by their parents. Anthropometric indices and body fat percentage were calculated by skin folds and calipers. Finally, all of the information was analyzed by SPSS. Results: There was a significant and direct relationship between the lifestyle score and the father's employment status ( $p < 0.001$ ), mother's employment status ( $p = 0.004$ ), father's education ( $p = 0.005$ ), mother's education ( $p = 0.017$ ), family economic status ( $p < 0.001$ ) and homeownership status ( $p < 0.001$ ). Among the anthropometric variables, there was a significant difference only between weight ( $p = 0.09$ ) and height ( $p = 0.003$ ) with lifestyle. Conclusion: The results of this study showed that factors such as parents' occupation and education, homeownership status and household economic status have a significant relationship with lifestyle scores.

**Keywords:** *lifestyle, obesity, girl students, anthropometric indices, Socio-Economic Factors.*

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### INTRODUCTION

In 1997, overweight (BMI > 25 kg/m<sup>2</sup>) and obesity (BMI > 30 kg/m<sup>2</sup>) were highlighted by the WHO as public health problems. Living in developed countries with characteristics such as energy intake, exceeding energy needs, and reduced physical activity, which are the main

causes of obesity, have led to the upward trend of this disease [1, 2]. In Iran, according to the latest WHO report in 2011, the prevalence of overweight and obesity were 51.4% and 19.4%, respectively [3]. According to available statistics, the prevalence of obesity in children aged 7-12 years old is also growing [4]. Additionally, obesity raises the risk of chronic diseases, which can

cause many health-economic costs to the country and patients, due to their complications [5-7]. Studies have always shown that the prevalence and incidence of obesity increase with unhealthy lifestyles, and in particular inappropriate diet and inactivity [8, 9]. Lifestyle modifications are effective in preventing obesity in the long term [10]. The lifestyle modification approach is based on the following four strategies: 1. Increasing awareness about dietary habits and exercise; 2. Modifying stimulants that affect eating; 3. Improving eating principles such as controlling eating speed, and; 4. Positive reinforcement and motivation for weight loss [11, 12]. Studies have shown that applying non-invasive methods and training can be effective in correcting the way people live [13]. Besides, in many studies, fat-rich foods have generally been associated with obesity, increased energy intake, and nutrient deficiencies [14]. It has also been reported that most children and adolescents are more likely to have high-fat diets and consume less fruit and vegetables [15]. Different studies have identified changes in traditional family structures, the appetizing nature of these foods, their low cost and easy access, as causes of the prevalence and dramatic increase in fast food consumption [16]. Also, increased demand for fast food and high-fat food consumption has been directly linked to watching TV and inactivity in various studies [17]. According to several papers, there is probably a link between lifestyle improvements and the reduction of the prevalence of obesity in households, and especially in children. The aim of this study, therefore, was to determine the effect of lifestyle changes on anthropometric indicators and other related factors in obese female students aged 11-14.

#### MATERIALS AND METHODS

452 overweight ( $z$  score $>2$ ) female students aged 11-14 were randomly selected with similar general characteristics. After receiving written consent from their parents, information about the age, sex and socioeconomic level of the family were collected through interviews with the students. Body weight was measured to the nearest 0.1 kg using a Seca scale with subjects wearing light clothing (i.e. no sweaters, jackets, or belts) and no shoes. Height was measured to the nearest 0.1 of a centimeter using a Seca sta-

diometer, in a standing position and with shoes removed. Body mass index (BMI) was calculated from the height and weight data;  $BMI = kg/m^2$ . Obese people with  $z$  score $> 2$  were selected using standard BMI curves determined by the WHO. To determine the percentage of body fat, the skin fold was calculated by caliper in the triceps of the arm. A lifestyle score was obtained through a lifestyle questionnaire (LSQ). The Health & Lifestyle Questionnaire (HLQ) was launched in 2014 to better describe TRA membership through the publication of summary statistics to both the twin and the researcher communities. The questionnaire contained demographic questions and covered a broad range of health conditions and risk factors. The present study was conducted to construct and determine the validity and reliability of the lifestyle questionnaire related to cancer. Based on the findings, this questionnaire is a reliable one. Lifestyle is defined as behaviors that are often controlled by persons or behaviors that increase health risks. The questionnaire consisted of 29 phrases and 4 dimensions: physical health, nutrition, and weight control, exercise and health, and psychological health. The scores of this questionnaire range from 29 to 174.

Lali *et al.* had previously confirmed the validity of the lifestyle questionnaire as a multi-dimensional tool for assessing and measuring lifestyle by using a factor analysis test [18]. The reliability of this questionnaire has also been calculated using Cronbach's alpha method. Cronbach's alpha for the dimensions of the lifestyle questionnaire has been measured as 0.89, 0.87, 0.85 and 0.88, respectively. The test grading took place on a 6-point scale, from 1 (opposite) to 6 (totally agree). Finally, all data extracted from this study were analyzed with SPSS software version 17. The expression of the data is in the form of a mean $\pm$ standard deviation. Also, the chi-square and one-way ANOVA tests were used to evaluate the quantitative and qualitative variables of this study, respectively, and  $p < 0.05$  was considered significant.

#### RESULTS:

According to the findings, lifestyle score was classified into three categories: weak, moderate and high. Based on the analyses, the associations of all quantitative and qualitative data of partic-

ipants with lifestyle were examined, and are displayed in Table 1. There was a significant and direct relationship between the lifestyle score on the one hand, and the father's employment status ( $p < 0.001$ ), mother's employment status ( $p = 0.004$ ), father's education ( $p = 0.005$ ), mother's education ( $p = 0.017$ ), family economic status ( $p < 0.001$ ) and homeownership status ( $p < 0.001$ ) on the other, according to Table 1. Also, the relationship between the area of residence and lifestyle was statistically near significant ( $p = 0.068$ ). However, among the anthropometric variables, there was a significant relationship observed only between weight ( $p = 0.09$ ) and height ( $p = 0.003$ ) with lifestyle.

According to the results, participants with the highest weight and height demonstrated higher lifestyle scores, while the lowest rate of these indicators had poor lifestyle scores.

#### DISCUSSION:

In a study by Amal A. Mohammed *et al.*, which aimed to investigate the effects of educational interventions on lifestyle modifications in patients with high blood pressure, the results showed that lifestyle modifications in the intervention group, as well as blood pressure, cholesterol, physical activity, and dietary habits, were significantly different from the control group [19]. Also in a study by Entezari *et al.*, the effects

of educational interventions on lifestyle modifications based on choice theory were studied in women with obesity. The results of this study showed that educational intervention improved physical health, weight control, exercise, and the psychological health of the intervention group, with a statistically significant difference from the control group [20]. There are few studies in this field, but existing studies are consistent with the present study, and show the relationship between participants' height and weight, lifestyle scores, and socioeconomic status.

#### CONCLUSION:

In general, trying to change the lifestyle of children and adolescents can undoubtedly reduce the prevalence of obesity and its complications at that age, and reduce the excessive costs of healthcare and treatment. The results of this study showed that factors such as parents' occupation and education, homeownership status, and household economic status have a significant relationship with lifestyle scores.

#### Limitation:

We had a lot of limitations in this study such as not using the DEXA method because of budget constraints, the insufficient sample size in each group and in general, the methods available in this scheme.

**Table 1-** Quantitative and Qualitative Characteristics of Participants Based on Lifestyle\*

|                     |                              | Weak      |         | Moderate  |         | Excellent |         | P-value** |
|---------------------|------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
|                     |                              | Mean or N | % or SD | Mean or N | % or SD | Mean or N | % or SD |           |
| School Grade        | 7 <sup>th</sup>              | 12        | 27.3    | 53        | 34.4    | 99        | 30.4    | 0.68      |
|                     | 8 <sup>th</sup>              | 20        | 45.5    | 57        | 37.0    | 121       | 37.1    |           |
|                     | 9 <sup>th</sup>              | 12        | 27.3    | 44        | 28.6    | 106       | 32.5    |           |
| Head of the Family  | Father                       | 38        | 86.4    | 147       | 95.5    | 303       | 92.9    | 0.107     |
|                     | Mother or other              | 6         | 13.6    | 7         | 4.5     | 23        | 7.1     |           |
| Father's Occupation | Unemployed                   | 6         | 14.6    | 7         | 4.5     | 5         | 1.5     | <0.001    |
|                     | Self-employment              | 23        | 56.1    | 105       | 68.2    | 196       | 60.5    |           |
|                     | Retired or workman           | 5         | 12.2    | 12        | 7.8     | 33        | 10.2    |           |
|                     | Clerk or manager             | 7         | 17.1    | 30        | 19.5    | 90        | 27.8    |           |
| Mother's Occupation | Housekeeper                  | 39        | 88.6    | 134       | 87.0    | 256       | 78.8    | 0.044     |
|                     | Employee                     | 5         | 11.4    | 20        | 13.0    | 69        | 21.2    |           |
| Father's Education  | Illiterate or primary school | 6         | 14.6    | 23        | 14.9    | 52        | 16      | 0.005     |
|                     | High school or diploma       | 33        | 80.5    | 112       | 72.7    | 198       | 60.9    |           |
|                     | Academic education           | 2         | 4.9     | 19        | 12.3    | 75        | 23.1    |           |
| Mother's Education  | Illiterate or primary school | 8         | 18.2    | 32        | 20.8    | 43        | 13.2    | 0.017     |

|   |                                 |         |       |                      |       |                      |       |        |
|---|---------------------------------|---------|-------|----------------------|-------|----------------------|-------|--------|
|   | High school or diploma          | 33      | 75.0  | 108                  | 70.1  | 224                  | 68.7  |        |
|   | Academic education              | 3       | 6.8   | 14                   | 9.1   | 59                   | 18.1  |        |
| <b>Residential Region</b>                   | Region 9                        | 7       | 15.9  | 13                   | 8.4   | 60                   | 18.4  | 0.068  |
|   | Region 14                       | 12      | 27.3  | 46                   | 29.9  | 99                   | 30.4  |        |
|   | Region 16                       | 11      | 25.0  | 37                   | 24.0  | 68                   | 20.9  |        |
|   | Region 17                       | 2       | 4.5   | 16                   | 10.4  | 40                   | 12.3  |        |
|   | Region 18                       | 12      | 27.3  | 42                   | 27.3  | 59                   | 18.1  |        |
| <b>Economic Status</b>                      | Weak                            | 25      | 56.8  | 37                   | 24.0  | 24                   | 7.4   | <0.001 |
|   | Mild                            | 18      | 40.9  | 115                  | 74.7  | 254                  | 77.9  |        |
|   | Good                            | 1       | 2.3   | 2                    | 1.3   | 48                   | 14.7  |        |
| <b>House Ownership</b>                      | Owner                           | 8       | 18.2  | 56                   | 36.4  | 157                  | 48.2  | <0.001 |
|   | Tenant, organizational or other | 36      | 81.8  | 98                   | 63.6  | 169                  | 51.8  |        |
| <b>House Type</b>                           | Apartment                       | 42      | 95.5  | 141                  | 91.6  | 288                  | 88.3  | 0.24   |
|   | Villa                           | 2       | 4.5   | 13                   | 8.4   | 38                   | 11.7  |        |
| <b>Age (years)</b>                          |                                 | 13.950  | 0.813 | 13.812               | 0.871 | 13.838               | 0.865 | 0.64   |
| <b>Weight (kg)</b>                          |                                 | 79.564  | 6.627 | 80.384               | 9.697 | 82.030               | 9.832 | 0.09   |
| <b>Height (cm)</b>                          |                                 | 157.500 | 5.612 | 157.951 <sup>a</sup> | 6.071 | 159.631 <sup>a</sup> | 5.816 | 0.003  |
| <b>Body Mass Index (kg/m<sup>2</sup>)</b>   |                                 | 32.074  | 2.077 | 32.150               | 2.771 | 32.098               | 2.386 | 0.97   |
| <b>Thickness of Skinfold (mm)</b>           |                                 | 43.643  | 5.835 | 43.584               | 6.223 | 44.134               | 5.770 | 0.60   |
| <b>Number of Sisters and Brother</b>        |                                 | 1.20    | 0.795 | 1.32                 | 0.934 | 1.21                 | 0.983 | 0.48   |
| <b>Number of People Living in Household</b> |                                 | 4.00    | 0.778 | 4.12                 | 0.959 | 4.07                 | 0.916 | 0.69   |

\*\* presented as Mean (SD) for quantitative variables and frequency (%) for qualitative variables

\*\* calculated by chi-Square or one-way ANOVA test; Significant at the 0.05 level.

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