# Association between Obesity with Sleep and Leisure Activities among Middle School Students at Al-Rusafa Third Education Directorate Schools in Baghdad City

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## Abstract:

**Introduction:** Obesity represents one of the biggest and most serious worldwide health problems which is growing dramatically around the globe. Obesity causes a serious adverse effect on the health of an individual. It ranks as the second highest avoidable reasons for fatality.

**Objectives:** To determine the proportion of overweight and obesity and to determine the relationship between BMI with sleep and leisure activities among middle school students.

**Methodology:** Correlational descriptive study was being carried out at middle schools in Baghdad City from September 4th 2023 to March 20th 2024. The study involved 360 students (12–15 years old). Using non-probability (convenience) sampling technique. Measurements included BMI, weight, and height.

**Results:** The study found that 26.6% of students were overweight or obese. Students in first grade had the lowest percent (5.6%), while third-graders had the highest rate (11.8%). The data indicates that was negative and strong association between student's BMI and practice of sport. There was no evidence of a relationship between the prevalence of obesity and lesiure activities.

**Recommendation:** Preventive programs focusing on encouraging lifestyle changes, eating patterns, and increased physical activity levels must be undertaken in the early stages of a child's development.

**Keywords: Obesity, Body Mass Index, Sleep, Leisure Activity, Middle School Students**

## 1.        Introduction

Obesity is a medical condition characterized by a high-level fatty tissue, which Could become harmful on someone's fitness(1). Obesity represents one of the most significant problems in the health of the community(2), and its prevalence has basically risen over the previous thirty years(3). It was widely believed that children who came from families with lower incomes and those living in urban areas had been the principal victims of teenage weight gain (4). Unfortunately, while teenage weight gain prevalence reaches within wealthy neighborhoods and greater-financial status residences, it presently has an influence upon every level of socioeconomic status (4).

Obesity is measured by body mass index (BMI), as a ratio of an individual's weight divided by height (kilograms/meters)$^2$, is estimated to be the second- leading avoidable reason for mortality following smoking (5). Clearly, Obesity elevates the probability for fatalities with excess weight. Obesity causes serious harmful consequences for health (6).

Obesity has grown to epidemic proportions; from 1991 to the year 2001, the percentage of obese Americans grew by 74%. Furthermore, around 15 percent of children and teens aged 6 to 19 were overweight (7). Schoolchildren in the Arabian Gulf Countries are more likely to be overweight or obese. According to studies, the rate of overweight or obese individuals was 14.6 percent within Kuwait; 21 percent along with thirty-five percent in Bahrain; twenty-eight percent in males as well as 18.6% in females from Qatar; while 43.6 percent and 34.8 percent in men and women in KSA (8).

Based on the survey conducted in 2015, 31.8 percent of Iraqis were overweight, 33.9 percent were obese, and 65.7% were overweight and obese (9). Additionally, 22.3% of adolescents attending secondary schools in Kirkuk City stated that they were obese. Boys represented 55.8% of the obese adolescents, 42.5% of those who were 13 years old, and 79.2% had a moderate economic background (10).

Obesity raises the probability of different kinds of illnesses, specifically cardiac illness, the second kind diabetes, issues with breathing when sleeping, specific kinds of tumors, and joint arthritis (1). Obesity originates from many different kinds of reasons. They include the environment, genetics, physical activity, meals, and emotional variables (11). Toddlers of attending school spend a large number of their duration front of electronic Products including computers, gaming systems, mobile devices, and screens are more probably to becoming obese and engage in limited activity (12). Furthermore, a study in students demonstrated that an irregular sleep pattern acts effectively with inadequate sleep to contribute to the likelihood of obesity (13).

## 2. Research Objectives:

1 .To determine proportion of overweight and obesity among middle school students.

2. To determine the relationship between BMI with sleep and leisure activities among middle school students.

## 3. Methodology:

### 3.1. Study Setting, Population, and Sampling Technique:

Correlational descriptive study was conducted in ten middle schools was selected randomly from 95 school in Baghdad City at the Al-Russafa Third Education Directorate from September 4th 2023 to March 20th 2024. Five were schools of boys, and the other five were schools of girls affiliated with the Al-Rusafa Third Education Directorate. The total population of these ten schools is 5753 students. The study involves 360 randomly selected middle school students (12–15 years old) using the non-probability (convenience) sampling technique.

### 3.2.  The sample exclusion criteria:

a. Students with long-term problems such as hypothyroidism, asthma, etc.

b. Congenital deformities such as scoliosis, lordosis, kyphosis, dwarfism, and gigantism are difficult to quantify and affect BMI levels.

### 3.3.  Sampling Size:

The sample size was calculated by using formula conducted Via Thompson:

$$n = \frac{N \times P \times (1-P)}{\left[N-1 \times \left(\frac{d^2}{z^2}\right)\right] + [P \times (1-P)]}$$

Where: n = Required size of the sample, N = Overall participants of ten school was already selected = 5753, d = 0.05 (margin of error), Z = 1.96 with a 95 percent confidence range, P = 0.50 (Probability value).

### 3.4.  Measurements:

The structured questionnaire was presented to the students in Arabic and contained information about their demographics, weight, height, BMI, sleep frequency, nap time, and leisure activities. The body weight was determined using an electronic Seca digital scale (Model 890). The respondent's bodyweight was determined to an additional 0.1 kilograms via an electronic scale while bare feet and bearing a light clothing. After measuring height with a Seca stadiometer (Model 217), the following methods were used to determine body height to the nearest relative 0.5 centimeters.

BMI was computed by taking the square of the weight in kilograms and the height in meters, using the following formulas: heels together, barefoot, head touching the ruler. Obesity was defined as the 95th percentile, and overweight as the 85th to less than 95th percentile. The BMI range of 5th to 85th percentiles was considered normal. Underweight is defined as having a BMI that is less than the fifth percentile. The BMI calculation was done using the CDC-approved (BMI percentile calculator).

### 3.5.  Statistical Analysis of Data:

The statistical package for social sciences (SPSS V. 26) Was utilized to enter followed by analyze information gathered. Centers for Disease Control and Prevention (CDC, 2000) standard for calculating BMI for age was followed for measuring BMI for age and sex. For a significant statistical association between some characteristics and weight status, the spearman's rho test was

performed, while point biserial correlation was used to detect the association between BMI and sleep and daily activities.

### 3.6.  Ethical consideration:

Ethical clearance and approval to conduct the study were obtained from the College of Nursing, University of Baghdad, and Al-Rusafa Third Education Directorate. We wrote that in the structured questionnaire, "Everything in this paper will remain confidential. Thus, you do not have to write your name".

## Results
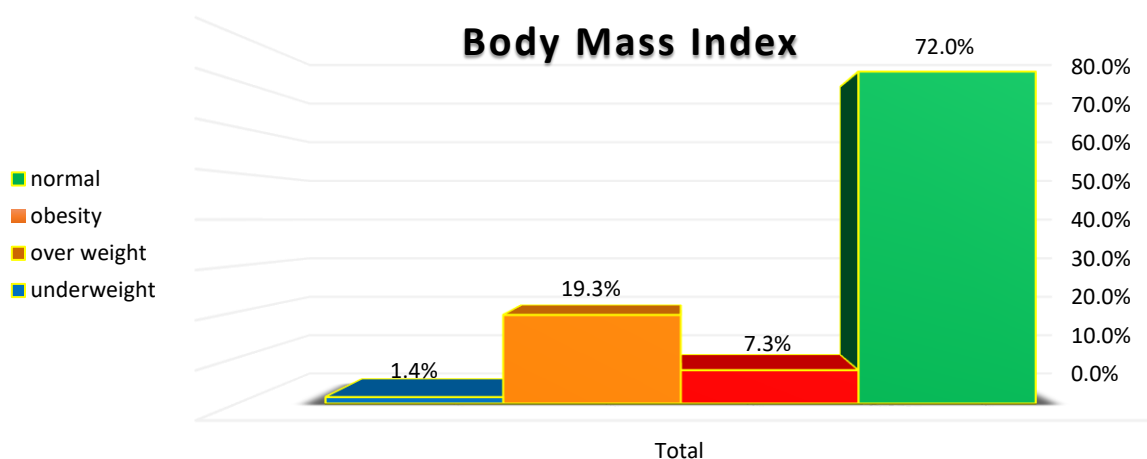


**Figure  ( 1). - Distribution of Middle School Students According to BMI N=357**

Figure (1) revealed that 72% of middle school students with a health bodyweight, 19.3percentage appeared overweight; 7.3 percent were obese; and 1.4 percent were underweighted.

**Table ( 1). - Distribution of Students according to BMI by their Age**

| BMI | 12 Years | 13 Years | 14 Years | 15 Years | Total | Correlation* | P-Value |
|-----|----------|----------|----------|----------|-------|--------------|---------|

| | F | % | F | % | F | % | F | % | F | % | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Underweight** | 2 | 0.6 | 0 | 0.0 | 2 | 0.6 | 1 | 0.3 | 5 | 1.4 | 0.185** | 0.000 |
| **Normal** | 96 | 26.9 | 84 | 23.5 | 69 | 19.3 | 8 | 2.2 | 257 | 72 | | |
| **Overweight** | 10 | 2.8 | 27 | 7.6 | 29 | 8.1 | 3 | 0.8 | 69 | 19.3 | | |
| **Obesity** | 5 | 1.4 | 9 | 2.5 | 10 | 2.8 | 2 | 0.6 | 26 | 7.3 | | |
| *Total* | *113* | *31.7* | *120* | *33.6* | *110* | *30.8* | *14* | *3.9* | *357* | *100* | | |

f: Frequency, %: Percentage, *Spearman's rho correlation coefficient, **Correlation is significant at the 0.01 level, P: Probability

The data table (1) revealed Those between the ages of twelve and fourteen had the largest proportions of a healthy weight, with around 26.9%. The above information demonstrated an association between the students' ages and their BMI.

**Table (2). - Distribution of Middle School Students according to BMI by Grade**

| Bmi | First | | Second | | Third | | Total | | Correlation* | P-Value |
|---|---|---|---|---|---|---|---|---|---|---|
| | F | % | F | % | F | % | F | % | | |
| **Underweight** | 2 | 0.6 | 0 | 0.0 | 3 | 0.8 | 5 | 1.4 | 0.162** | 0.002 |
| **Normal** | 97 | 27.2 | 87 | 24.4 | 73 | 20.4 | 257 | 72 | | |
| **Overweight** | 15 | 4.2 | 24 | 6.7 | 30 | 8.4 | 69 | 19.3 | | |
| **Obesity** | 5 | 1.4 | 9 | 2.5 | 12 | 3.4 | 26 | 7.3 | | |
| *Total* | *119* | *33.3* | *120* | *33.6* | *118* | *33.1* | *357* | *100* | | |

f: Frequency, %: Percentage, *Spearman's rho correlation coefficient, **Correlation is significant at the 0.01 level, P: Probability

Table 2 illustrated that second graders make up the largest group of middle school pupils (33.6%), followed by first graders (33.3%) and third graders (33.1%). Furthermore, the results showed an association among children's BMI and their class.

**Table ( 3). - Significant Difference in Exercise of Middle School Students with Sex**

| Variables | Male | Female | Total | *T-Test | P- Value |
|---|---|---|---|---|---|
| | | | | | |

| | | F | % | F | % | F | % | | |
|---|---|---|---|---|---|---|---|---|---|
| **Practice Of Sports** | **Yes** | 98 | 27.4 | 37 | 10.4 | 135 | 37.8 | 7.044 | 0.000 |
| | **No** | 81 | 22.7 | 141 | 39.5 | 222 | 62.2 | | |
| | *Total* | *179* | *50.1* | *178* | *49.9* | *357* | *100* | | |
| **Sport Kind** | **Football** | 43 | 12 | 0 | 0.0 | 43 | 12 | -11.212 | 0.000 |
| | **Bicycle** | 34 | 9.5 | 0 | 0.0 | 34 | 9.6 | | |
| | **Swimming** | 2 | 0.6 | 0 | 0.0 | 2 | 0.6 | | |
| | **Walking\ Running** | 14 | 3.9 | 24 | 6.7 | 38 | 10.6 | | |
| | **Other** | 5 | 1.4 | 13 | 3.7 | 18 | 5 | | |
| | *Total* | *98* | *27.4* | *37* | *10.4* | *135* | *37.8* | | |

*T-test, f: Frequency, %: Percentage, P: Probability

Based on the table (3) showed that tow-third of the participants did not participate in sports; approximately one-third participated. Male and female differences in physical activity were statistically significant (P < 0.05). Students who were male participated in sports at a higher rate than those who were female.

**Table (4). - Distribution of Students according to BMI by their Sleep Pattern**

| Variables | | BMI | | | | Total | Correlation* | P-Value |
|---|---|---|---|---|---|---|---|---|
| | | **Under Weight** | **Normal** | **Over Weight** | **Obesity** | | | |
| **Sleep Duration** | **9 Hours** | 5 | 191 | 38 | 7 | 241 | 0.299** | 0.000 |
| | **9 Hours** | 0 | 66 | 31 | 19 | 116 | | |
| | *Total* | *5* | *257* | *69* | *26* | *357* | | |
| **Nap During The Day** | **Yes** | 4 | 160 | 46 | 13 | 223 | -0.041 | 0.438 |
| | **No** | 1 | 97 | 23 | 13 | 134 | | |
| | *Total* | *5* | *257* | *69* | *26* | *357* | | |

*Biserial correlation coefficient, **Correlation is significant at the 0.01 level, P: Probability
Sig: Significant, N.S: Not significant, H.S: High Significant.

The table (4) demonstrated That there is an important and positively meaningful relationship among middle school pupils' BMI with (sleep duration) at p = 0.000, while there was no significant association with nap.

**Table (5). - Distribution of Students according to BMI by their Leisure Activity**

| Variables | | BMI | | | | Total | Correlation* | P-Value |
|---|---|---|---|---|---|---|---|---|
| | | **Under** | **Normal** | **Over** | **Obesity** | | | |

| | | Weight | | Weight | | | | |
|---|---|---|---|---|---|---|---|---|
| **Watching TV** | **Yes** | 3 | 190 | 55 | 21 | 269 | **0.068** | **0.198** |
| | **No** | 2 | 67 | 14 | 5 | 88 | | |
| | *Total* | *5* | *257* | *69* | *26* | *357* | | |
| **Play Video Games** | **Yes** | 2 | 95 | 32 | 10 | 139 | **0.044** | **0.404** |
| | **No** | 3 | 162 | 37 | 16 | 218 | | |
| | *Total* | *5* | *257* | *69* | *26* | *357* | | |
| **Internet And Social Network Sites** | **Yes** | 4 | 182 | 53 | 20 | 259 | **0.048** | **0.361** |
| | **No** | 1 | 75 | 16 | 6 | 98 | | |
| | *Total* | *5* | *257* | *69* | *26* | *357* | | |

*Biserial correlation coefficient, **Correlation is significant at the 0.01 level, P: Probability

Sig: Significant, N.S: Not significant, H.S: High Significant.

The Table (5) revealed that there was a lack of connection between the BMI of middle school children and daily activities.

**Discussion**: The current study (Figure 1) showed the proportions of children aged 12 to 15 individuals reported as underweight (1.4%), a normal weight (72%), overweight (19.3%), or obese (7.3%). The findings of the current inquiry are consistent with study conducted in Egypt which demonstrated that this percentage of persons in the study (69.3%) reflects healthy and underweight, overweight (20%), and obesity (10.7%), respectively (14).

In terms of age, the findings of this study (Table 1) showed that the prevalence of obesity among students was the highest within the age group (14years). In addition, BMI has been demonstrated rising with age. The outcome is consistent with study conducted in Dubai. Which discover that obesity was the biggest rate in those beyond the age of 14 (15). Regarding the prevalence of overweight and obesity among grades, the highest percentage in the study sample was in the third grade (Table 2). The results agree with a study conducted in KSA (16).

The current findings discovered a significant difference among sport participation (table 3) with student's sex. According to this study, exercise levels are greater within boys compared to girls. Females have lower physical activity levels than males, which can be attributed to some local cultural, religious, and traditional beliefs, limited resources in sports specifically for women, fewer advertisements, attractive television programs and magazines for women's gyms, and excessive parental supervision of children. All of these issues may contribute to females' low engagement in physical exercise programs. These results were compatible with a study carried out in Iran (17).

According to the current data (table 4), It showed an important correlation (with p=0.000) between weight and sleep duration among overweight and obese adolescents. The results of the current inquiry line up to the findings from a study conducted in Indonesia on the relationship among sleep duration with BMI of the participants, showing an important connection (p = 0.003). Regardless of that, is unknown the ways a

shortage of sleeping is linked with weight gain (18). Based on the findings of the current study, there is no significant correlation (with a p=0.438) among BMI with napping during the day. Similar to a finding of a study conducted in Saudi Arabia, which found Considering individual's BMI and Napping were not important connection (with a p=0.994) (19).

Based on results (table 5), around 30% of the participants in this study spend more than 3 hours daily sitting towards televisions. It conforms the quantity revealed in previous investigations that was higher than 2 hours recommended by the American Academy of Pediatrics. (20). Extended time spent on TVs decreases lipoprotein lipase function, resulting in decreased percentage of plasma triglycerides obtained by Musculoskeletal, decreased amounts of high-density lipid, with a rise within circulating fat followed eating a food, each of these effect upon lipid storage in fat deposits or artery walls (21). The present study identified non important relationship regarding body mass index and TV (with p=0.198). These results were similar with a study that discovered non meaningful association among viewing television and a body mass index in KSA (16). The recent study's results demonstrated not important connection (p = 0.404) among BMI with video games. The findings are consistent with the study's results that was carried out in Saudi Arabia, which indicated that there was no significant link among participant's body mass index with regular playing of online games (with p=0.755) (19). Furthermore, the findings of the current study demonstrated a not statistically significant relationship (p = 0.361) among body mass index along with using of the web and social media networks. The outcomes were equivalent to a study carried out in France, which found the association The association among the student's Bodyweight and internet usage did not appear statistically important (22).

**Conclusion :** Obesity among teenagers is a serious medical issue in Baghdad. The findings of this study indicated that 26.6% of the sample was overweight or obese. On the other hand, the study looked at the correlations between obesity and several student factors, and it revealed a significant link between a student's gender and BMI (p=0.000). Another association was discovered between a student's participation in sports and BMI (p=0.000). All of these findings support the seriousness of the obesity problem.

**Recommendation:** Finally, the report recommends that politicians focus on teaching parents and students the best methods to live healthier lives. We also advocate for the inclusion of a broader range of sports in schools to ensure that all kids have the opportunity to engage in physical activity. It is critical to assist adolescents in developing active lifestyles and healthy behaviors.

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