**Original Article**

# PREVALENCE OF OBESITY AMONG CHILDREN UNDER 5 YEARS ATTENDED TO PRIMARY HEALTH CARE CENTERS IN MOSUL CITY

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## ABSTRACT

**Background:** Childhood obesity is a "condition in which excess body fat negatively affects a kid's health or wellbeing". Due to expanding the occurrence of Childhood obesity and its various health impacts, it is considered as a serious general wellbeing concern. **Aim:** To determine the prevalence of overweight and obesity among children under 5 years attended primary health care centers in the Mosul city. **Methods: Study Setting**: Primary health care centers were chosen as three centers from both right & left sectors of Mosul City. **Study Design**: Cross-section study, which is a descriptive observational study. **Sample Size**: Three hundred and ten (310) children of both sexes aged under 5 years attended primary health care centers were examined, this sample was distributed by multistage stratified simple random technique. **Data Analysis:** Descriptive and analytic statistical tools were applied. For comparison between two means, independent t-test was used and chi-square test was applied for comparison between two categorical variables. Questionnaire form was arranged utilizing summarized questions. **Results**: In the present study, prevalence of overweight and obesity was 10.32%, 56.4% of the study sample were males, the rest were females and 59.4% of obese children were males while 40.6% of them were females. Mean age was 24.6 months with a range of 2 – 60 months, mean weight was 11.6 kg with arrange of 4.5 – 25.5 kg, mean height 83 cm with a range of 58 – 120 cm. All of obese children ate jam and only 9.5% of normal children ate jam, 40% of obese children moderately active and 27% of normal children moderate active, whereas 40% of obese not active and 26% of normal also not active. About half of normal children were active (47%) and only 20% of obese child were active. **Conclusion**: The present study concludes that there was a powerful association between eating some items of feeds like jam, also there was a reverse relationship between obesity and physical activity.

**KEYWORDS:** About half of normal children were active (47%) and only 20% of obese child were active.

## INTRODUCTION

Obesity in children is a general wellbeing burden in numerous nations. The first problem happen in obese kids are passionate or psychological.[1] Studies have shown that child overweight prompts the advancement of biomarkers of severe illnesses later in life. type II diabetes among Hispanic kids, for instance, is on the ascent because of hereditary susceptibility joined with obesity.[2] In addition to type II diabetes, overweight kids have an expanded danger for creating asthma, joint problems, cholesterol, depression, and anxiety. Physical and psychosocial effects of moderate to severe overweight include: obstructive apnea, hyperlipidemia, early onset of puberty in females, gallbladder disease, hypertension, pancreatitis, polycystic ovary syndrome, and long-term damage to the cardiovascular system.[3] A systematic review of studies looking at the relationship between physical activity in children and obesity found about half had found no effect and the balance had a negative effect (i.e. Increased physical activity levels were protective).[4] Aim of study to determine the prevalence of overweight and obesity and associated factors among children under five years visited primary health care centers in Mosul City.

## SUBJECTS AND METHODS

Preceding to data collection (an official permit) was collected from the Nineveh Health Directorate (NHD) to

ease data collection from primary health care centers (PHCCs) that were to be participating in this study. also (informed oral consent) was collected from the concerned PHCCs managers, workers and participants.

**Sampling Technique:** To estimate the minimum sample size in the present study, Gorstein et al.,[5] sample size equation was used, which is
Where:

$$N = \frac{(z^2)(pq)}{d^2}$$

Z= z-value for 95% confidence (1.96).
P= prevalence of childhood obesity, which was 10 %.
q=1-p
d= is the desired level of absolute precision. In this work the value 0.05 was used. Since data collection was carried out from multiple PHC centers with different population size in the catchment areas; the estimated design effect (DEFF) used was to multiply the value given by the equation by 2. For the non-response or recording error the calculated sample size was inflated by 5%.

The sample of this study will be distributed by multistage Stratified Simple random method. 310 children were collected. Six health care centers spread across the Left and Right Sectors of Mosul City were undertaken. Right Sector PHC centers
1- AL-Yarmuke health center.
2- AL-Hadbaa health center.
3- Nablus health center.

Left Sector PHC centers
1- Al-Quds health center.
2- AL-Sharqy health center. 3- AL-Noor health center.

**Target Population**
- Under five years healthy male and female children attending primary health care centers for vaccination or accompany with their mothers.
- The period of data collection was three months: May-June and July 2013.
- All children included in the sample were examined by the investigator for the following

**Anthropometric Measurements**
- Body weight in Kg; baby was weighted with minimum amount of clothing, measurements was carried out using Seca scale/UNICEF.
- Height in cm, if the child was equal or older than two years (standing); height was taken by using wooden board of WHO/Seca.
- Length if the child was younger than two years (lying); In this measurements plastic or wooden board of WHO/Seca was used.
- Calculate the body mass index (BMI) = weight in

kg/[length(height)in m]$^2$ Then putting data in WHO Anthro program.

**Case definition of obesity in children whose Age from birth to age 5 according to WHO**
- **Obese child:** if the Body mass index (BMI) > 3 standard deviations (SD) above the WHO growth standard median.
- **Overweight child:** if the BMI > 2 standard deviations (SD) above the WHO growth standard median.[6]

**Data analysis and statistical test**
After the completion of the sample collection a dummy table with coding was performed, then data tabulation enters into the Excel software program.

Descriptive statistics and analytics statistics was done by using the Minitab statistical program. Chi-square test was used for comparison between categorical (qualitative) variables. For small frequency cells, Fisher-Exact test was used instead of Chi-square test. P-value ≤ 0.05 was considered significant throughout data analysis.

**RESULTS**

The sample of the present study includes 310 children. Table 1 describes the basic characteristics of study children. Out of the total sample 56.4% were males and the rest were females. Only 15.2% fell in the age group 0-6 months old, and less than half (44.8%) fell in the age group 7-24 months old, and two fifth (40.0%) were 25-60 months old.

**Table (1): Basic characteristics of study sampled children.**

| Parameters | No. (n = 310) | % |
|---|---|---|
| **Sex** | | |
| **Male** | 175 | 56.4 |
| **Female** | 135 | 43.6 |
| **Age groups (months)** | | |
| **0 – 6** | 47 | 15.2 |
| **7 – 24** | 139 | 44.8 |
| **25 – 60** | 124 | 40.0 |

Table 2 illustrates descriptive statistics like mean age was 24.6 months with a range of 2 – 60 months, mean wt. 11.6 kg with a range of 4.5 – 25.5 kg, height mean 83.0 cm with a range of 58.0 – 120.0 cm and child no. mean 3 with a range 1 – 9 children.

**Table (2): Mean parameters: Age, Weight, Height and Number of children.**

| Variable (n=310) | Mean | SD | Minimum | Maximum |
|---|---|---|---|---|
| Age (m) | 24.6 | 16.766 | 2.0 | 60.0 |
| Weight (kg) | 11.6 | 3.865 | 4.5 | 25.5 |
| Height (cm) | 83 | 14.897 | 58.0 | 120.0 |
| Number of children | 3 | 1.5308 | 1.0 | 9.0 |

In this study 32 children out of 310 were obese, so the prevalence of obesity was 10.32% as demonstrated in Table 3. The normal children were 259 about 82.55% of the total sample of this study and underweight child where **BMI ≤ -2 SD** was 19 about 6.13%.

**Table (3): Prevalence of obesity according WHO growth assessment of "BMI to age".**

| Z-score (n=310) | Classification | No. | % |
|---|---|---|---|
| ≥ +2 SD | Overweight & Obese children | **32** | **10.32** |
| +1; < +2 SD | Normal BMI | 62 | 20.00 |
| 0; < +1 SD | Normal BMI | 95 | 30.64 |
| < 0; -1 SD | Normal BMI | 72 | 23.23 |
| < -1; -2 SD | Normal BMI | 30 | 9.68 |
| ≤ -2 SD | Underweight children | **19** | **6.13** |

Table 4 describes the distribution of obesity (%) according to age group. The prevalence of this disorder was 4.26% in the age group 0-6 months old, followed by 12.23% in age groups 7-24 months old. Overall, 10.32% of the examined children were obese.

**Table (4): Prevalence of obesity in the three age groups according WHO classification for growth assessment.**

| Age groups (months) | No. | % | Prevalence of obesity | |
|---|---|---|---|---|
| | | | No. | % |
| 0 – 6 | 47 | 15.16 | 2 | 4.26 |
| 7 – 24 | 139 | 44.84 | 17 | 12.24 |
| 25 – 60 | 124 | 40.00 | 13 | 10.48 |
| Total | 310 | 100.00 | 32 | 10.32 |
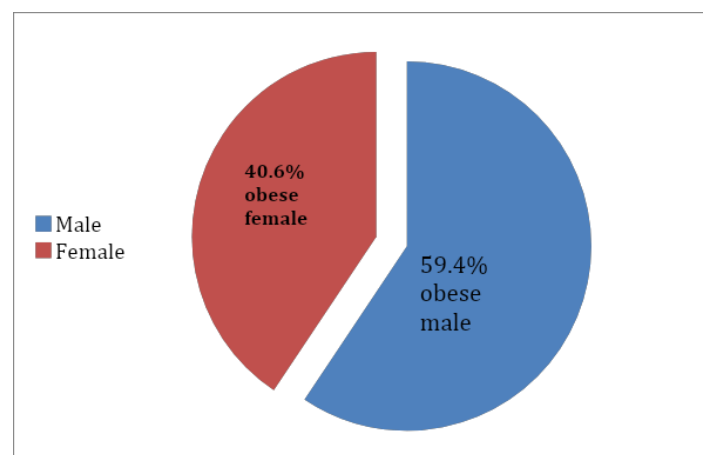


**Figure 1: Obesity prevalence in both sexes.**

Table 5 demonstrates that there was no significant association between obesity prevalence and feeding before breakfast, while there was a significant association between obesity prevalence and eating jam during breakfast as well as drinking tea.

**Table (5): Comparison between obese and normal child according to the items of feeding before & during breakfast.**

| Parameters | Obese children [n = 28] | | Normal BMI [n = 200] | | P-value* |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| **Before breakfast feeding** | | | | | |
| **Milk** | 7 | 25.00 | 60 | 30.00 | 0.586 |
| **Biscuit** | 4 | 14.29 | 53 | 26.50 | 0.162 |
| **Nestle** | 4 | 14.29 | 48 | 24.00 | 0.251 |
| **At breakfast feeding** | | | | | |
| **Chesses** | 13 | 46.43 | 127 | 63.50 | 0.076 |
| **Bread** | 8 | 28.57 | 88 | 44.00 | 0.121 |
| **Egg** | 17 | 60.71 | 126 | 63.00 | 0.815 |
| **Jam** | 28 | 100.00 | 19 | 9.50 | **0.000** |
| **Tea** | 6 | 21.43 | 106 | 53.00 | **0.002** |

**Chi-square test, d.f = 1. And Fisher-exact test for small frequency cells were used.**

Table 6 comparison between obese and normal BMI child according to the physical activity where p –value significant (0.012) in moderate activity children, also significant (0.009) in not-active children. About half of normal BMI children were active (47%) while only 20% of obese children were active.

**Table (6): Comparison between obese and normal child according to the physical activity.**

| Physical activity | Obese children [n = 30] | | Normal BMI [n = 202] | | P-value* |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| **Active** | 6 | 20 | 96 | 47 | --- |
| **Moderate** | 12 | 40 | 54 | 27 | **0.012** |
| **Not-active** | 12 | 40 | 52 | 26 | **0.009** |

**Chi-square test, d.f = 1. And Fisher-exact test for small frequency cells were used.**

## DISCUSSION

The sample of the present study includes 310 children. Male account 56.4% and 43.6% were females. Mean age was 24.6 months with a range of 2– 60 months, 60% below two years and 40% were two to five years, this is because under two years attendant to the PHCC by their mothers to receive vaccine according to their immunization schedule.

The prevalence of overweight and obesity in the present study was 10.32%, which is higher than Matti study (3.5%).[7] (which was talking about the assessment of nutritional indicators among under five children at Al-Hamdaniya District, which is one of the biggest districts in Nineveh Governorate, on the south east of Mosul city North of Iraq) Pertaining to the nearby countries the prevalence of overweight and obesity for the period 2000-2009 was 4.7% in Jordon, 6.1% in Saudi Arabia, and in Egypt that was 20.5%.[8] The prevalence has increased at an alarming rate. Globally, in 2010 the number of overweight children under the age of five is calculated to be over 42 million. Close to 35 million of these are living in developing countries.[9]

The present study demonstrated no difference in the prevalence of risk of overweight and obesity among less than five children by age and sex this finding is logical with another study achieved in Canada.[10]

And differ from a study conducted by Kaur and co-workers in India.[11] And study of Matti conducted by Al-Hamdaniya.[7] On the same topic Kamal et al.,[12] in Qatar recorded high levels of obesity among girls. The different figures recorded across studies may reflect different cultural habits and attitudes towards nutrition and physical activities. Bellisle et al.[13] have concluded that there does not appear to be a relationship between meal patterning and obesity; while the present study showed that children who ate jam during breakfast associated with overweight and obesity, the association was significant, p=0.000.

As we all know that the physical activity is most important in preventing obesity and also in decreasing it so there is adverse relationship between obesity and physical activity.

In the present study child who plays with ball and drive bicycle these consider active child and those who go into picnic consider moderate active child. Lastly, those children who watch TV consider not active child. There are several psychological effects of watching TV that encourage obesity. TV watching lowers physical activity. It was also found to lower the resting (basal) metabolic rate to a level related to that experienced during trancelike states.[14] In the present study we find significant association between these two variables p=0.012 in those moderate active children and a higher significance in those not active, (p=0.009) in comparison with active children.

A prospective study by Gortmakeret al.[15] showed a strong positive dose–response relationship between time watching television and prevalence of overweight.

**CONCLUSION**

The present study concludes that there was a powerful association between eating some items of foods like jam, also there was a reverse relationship between obesity and physical activity.

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