

# Obesity Study among Secondary School Students at Duhok City

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**Abstract:** Obesity has become a significant worldwide contributor to morbidity with an alarming increase in incidence of childhood obesity. Risk factors for this disease include diabetes, obesity and metabolic syndrome. Few studies have evaluated the impact on teenage obesity in secondary School Students in Kurdistan Region-Iraq. This study aims to evaluate school children obesity, overweight and underweight among students of secondary school in the region of Kurdistan, Iraq. In this study, 200 teenage students aged 12-19 were included. The height and weight of the children were measured. The children Body Mass Index (BMI), BMI z-scores and obesity status was determined. The results indicated that 7% of the teenage tested were obese and 33% were overweight and 6% were underweight. BMI were positively associated with other healthy children in the tested group with weight of 54 % and their healthy status of liver function status. While negatively results associated with obese statuses of fat liver. Monitoring, child food intake and encourage them to eat healthy food will positively associated with normal child's weight status and decrease liver diseases and death in the future.

**Keywords:** Obesity, diet, secondary school, teenager, students

## 1. Introduction

Obesity is a medical condition in which excess body fat or white adipose tissue, which it has accumulated to the extent that it may have a negative effect on health, leading to reduced life expectancy and increased health problems [1]. In Western countries, people are considered obese when their body mass index (BMI), a measurement obtained by dividing a person's weight by the square of the person's height. Obesity can affect any person from young children to older adults. There are many causes of obesity such as over-eating, genetics, hormones, the environment, and lack of physical activity. There are many effects of obesity like health issues, depression, eating disorders, and death. Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, obstructive sleep apnea, certain types of cancer, and osteoarthritis [2][3].

The incidence of obesity has raised now days, it is estimated that there are at least 1.46 billion obese adults worldwide. Each year, approximately 280,000 adults in the United States die from obesity-related illnesses. Many of these deaths are associated with cardiovascular disease, the number one cause of death. Other health consequences of obesity include renal disease, hypercholesterolemia, stroke, cancers [4][5]. Obese perhaps more alarming is the increase in overweight children, as over the



past 25 years, this rate has risen up from 6% to 19% [6] [7] [8] [9]. Childhood obesity is already epidemic in some areas and on the rise in others. An estimated 17.6 million children under five are estimated to be overweight worldwide [10]. It has been estimated about 10 million children suffer from obesity, considered one of the leading causes of many life-threatening diseases [11][12]. Thus, due to this high impact fact, there is a great need to evaluate the obesity status in this region. Thus, this is the first study that aimed to evaluate the frequencies of obesity rates for children at age 12-19 years old of a secondary school at Duhok city in the Kurdistan region of Iraq.

## 2. Method

Approximately about 200 participants participated in the study voluntarily from a secondary school located in Zakho city, Duhok, Kurdistan region. They participants were informed before participating that the voluntary nature of their participation and all their information as well as their test result will be confidentiality and will be respected. The height and weight of the participated students were measured using metric measuring tape and home electronic personal bathroom scale respectively, in order to know if that person is overweight or slim, or if he/she was obese. The students body mass Index BMI, BMI z-scores and obesity status was determined accordingly. The weight of each student was taken in kilograms (kg) and their height in meters (m), and then the BMI was calculated using this formula: Metric BMI = weight (kg) / height (m<sup>2</sup>).

## 3. Results And Discussion

### 3.1. Key finding of the study

Table 1, 2 and 3 shows the results of the BMI frequency index percentage among boys in the secondary school of Kurdistan region. The result shows that 6 % are obese students, 36% are overweight and 50 % were healthy students. While among girls, 8% were obese students, 30 % over weight and students 52 % were healthy. In total two groups boys and girls students the results indicated that 7% of the teenage tested were obese and 33% were overweight and 54% were healthy students. For the underweight condition 8% were recorded among boys and 6% were recorded in girls respectively. The following tables are concluding the result of this study:

**Table 1.** BMI for Boys (total no 50 students)

Healthy %	Over weight %	Obese %	Underweight %
50	36	6	8

**Table 2.** BMI for Girls (total no.50)

Healthy %	Over weight %	Obese %	Underweight %
58	30	8	4

**Table 3.** BMI for Boys and Girls in Total

Healthy %	Over weight %	Obese %	Underweight %
54	33	7	6

### *3.2. The interpretation of BMI*

The interpretation of BMI in terms of body fatness and in comparison with a weight standard varies by sex, age, and other factors. In part because of lower muscle and bone mass, women are characterized by a higher percentage of body fat than men. Women tend to have a higher proportion of body fat stored in subcutaneous rather than visceral adipose tissue. Because of the differences in body composition between men and women, at the same BMI women will tend to have a considerably higher percentage of body fat than men. Older people will tend to have a higher percentage of body fat than younger people at the same BMI because of the changes in body composition with age. Moreover, only if the same body weight standards (or definitions of obesity) are considered. To be appropriate for both men and women do a given value of BMI has the same meaning in terms of relative weight. A given value of BMI may be numerically the same for men and women and for people of different ages, but may not represent the same percentage of body fat, the same degree of risk, or even necessarily the same degree of overweight relative to a weight standard.

For our knowledge, this is the first study that concerns the evaluation of obesity among the students of secondary school. This result showed that the obesity rate among secondary school students was different from other previous studies that were published by [7] [8] [9], where it was found that the obesity rate was 18% among individual of 12- to 19-year olds. This indicates that the obesity rate among students of Kurdistan region is lower than the obesity rate of the same group age from other countries. This might be due to the healthy food and life style of the people of Kurdistan. On contrast, the overweight ratio of the tested group was 36 % among boys, with 30 % among girls. This might be due to the increased consumption amount of junk food among this group. It has been reported [13] that children who are overweight at age 15 ranges from 10% in Denmark to 38% in the United States and the higher rate was among the girls group which is quite close to our result. In fact, it has been reported that overweight or obese has steadily increased since 2000 in the majority of countries [13]. Therefore, it can be said that overweight and obesity problem in Kurdistan region is starting to increase. This is considered as a bad indication for this group health because it can cause many diseases and lead to death too. Thus, this problem is starting to increase and must be control and monitor from now. In addition, it has been found that BMI were positively associated with child weight 54 % healthy status of liver function status. While negatively results associated with obese statues of fat liver and hepatitis Steatohepatitis. Monitoring and involvement of child food diet, while encourage him/her will positively associated with normal child's weight status as this will lead to decrease the diseases such as liver diseases that related to diet and obesity and death in the future.

### *3.3. Challenges with childhood obesity*

The professionals in the WHO recognize childhood obesity as a major public health concern resulting in the potential for substantial health care costs to the nation. However, the current level of financial investment by the public and private sectors in the development of effective prevention and weight management strategies is not consistent with the gravity of the problem. There is a substantial underinvestment of resources to adequately address the scope of the childhood obesity crisis. Looking at the risk factors for obesity, especially poor eating habits and inactivity can help you understand who's to blame for the rise of obesity. The main causes of excess weight in youth are similar to those in adults, including individual causes such as behavior and genetics. Behaviors can include dietary patterns, physical activity, inactivity, medication use, and other exposures. Additional contributing factors in our society include the food and physical activity environment, education and skills, and food marketing and promotion [14]. Many overweight children are eating oversized portions and too many of the un-nutritious foods, including high-Fat Foods, high Calorie Foods, junk Food fast food and juice and soda. Also, the lack of physical activity is another big risk factor for childhood obesity, as well a family history of obesity. Surprisingly, many studies show that not getting enough sleep increases the risk of childhood obesity, while short sleep duration in infancy is a risk of childhood overweight [14].

#### 4. Conclusion

Nowadays, eating healthy and notorious food has started to gain the attention of researchers, parents, nutritionist and doctors due to its impact on our health, body and mind. Obesity is a leading cause of death worldwide, with increasing rates in adults and children. Obesity in secondary school age is stigmatized in much of the modern world. However, our result showed that the total percentage number of obese students in our tested group is about 6-8 % which is not very high compared to other Middle Eastern and Western countries.

#### References

- [1] Du Plessis SS, Cabler S, McAlister DA, Sabanegh E, Agarwal A. The effect of obesity on sperm disorders and male infertility. *Nature Reviews Urology*. 2010 Mar;7(3):153.
- [2] Lavie CJ, Milani RV, Ventura HO. Obesity and cardiovascular disease: risk factor, paradox, and impact of weight loss. *Journal of the American College of Cardiology*. 2009 May 26;53(21):1925-32.
- [3] Obulutsa Jn. *Rural Urban Prevalence And Associated Factors Of Overweight And Obesity In Adult Patients Seeking Healthcare. 2015. A Case Of Pcea Kikuyu Hospital, Kenya* (Doctoral Dissertation, University Of Nairobi).
- [4] Ogden C, Carroll MD, Curtin LR, Lamb MM, Flegal KM. About childhood obesity. *JAMA*. 2010;303(3):242-9.
- [5] Zhang C, Rexrode KM, Van Dam RM, Li TY, Hu FB. Abdominal obesity and the risk of all-cause, cardiovascular, and cancer mortality: sixteen years of follow-up in US women. *Circulation*. 2008 Apr 1;117(13):1658-67.
- [6] Ogden CL, Yanovski SZ, Carroll MD, Flegal KM. The epidemiology of obesity. *Gastroenterology* [Internet]. 2007 [cited 2015 Aug 08]; 132: 2087-102.
- [7] Grummer-Strawn LM, Reinold CM, Krebs NF, Centers for Disease Control and Prevention (CDC). Use of World Health Organization and CDC growth charts for children aged 0-59 months in the United States.
- [8] Broyles S, Katzmarzyk PT, Srinivasan SR, Chen W, Bouchard C, Freedman DS, Berenson GS. The pediatric obesity epidemic continues unabated in Bogalusa, Louisiana. *Pediatrics*. 2010 Mar 30;pediatrics-2009.
- [9] Flegal KM, Carroll MD, Kit BK, Ogden CL. Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999-2010. *Jama*. 2012 Feb 1;307(5):491-7.
- [10] Atiyeh BS, Sarhane KA. Overweight and obesity: a true global epidemic. *Body Contouring Following Bariatric Surgery and Massive Weight Loss Post-Bariatric Body Contouring*. Sharjah, United Arab Emirates: Bentham Science Publishers. 2012 Feb 9:3-11.
- [11] Lobstein T, Baur L, Uauy R. Obesity in children and young people: a crisis in public health. *Obesity reviews*. 2004 May;5:4-85.
- [12] Go Jefferies JK. *The role of context and professional agency in the spread of healthcare innovation: an exploratory study of healthcare professionals' views of diabetes self-management and the X-PERT Programme* (Doctoral dissertation, University of Nottingham).
- [13] OECD (Organisation for Economic Cooperation and Development). Obesity Update 2017. [www.oecd.org/health/obesity-update.htm](http://www.oecd.org/health/obesity-update.htm) © OECD 2017.
- [14] Taveras EM, Rifas-Shiman SL, Oken E, Gunderson EP, Gillman MW. Short sleep duration in infancy and risk of childhood overweight. *Archives of pediatrics & adolescent medicine*. 2008 Apr 1;162(4):305-11.