



**ASSESSMENT OF OBESITY AND ITS RELATION TO OTHER DISEASES AMONG
THE STUDENTS OF FACULTY OF APPLIED MEDICAL SCIENCES IN ALBAHA
UNIVERSITY, KSA**

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ABSTRACT

Background: Obesity has been identified as an epidemic in the Kingdom of Saudi Arabia and yet the numbers of overweight and obese adults and children continue to grow. The disease is associated with several serious health conditions including, diabetes mellitus type2, heart disease, high blood pressure, Cancer, Hypoxia, Sleep apnea, Hernia, and Arthritis. **Objectives:** To assess the effect of obesity on other diseases like hypertension, diabetes mellitus, cholesterol levels, heart disease, insomnia, eating habits, exercise and family history of gout among university students. **Materials and Methods:** This study was done among 300 students from different departments of the Faculty of Applied Medical Sciences, Albaha University. The descriptive-analytical method was used which is based on the interview and observation and collection of information through a questionnaire. **Results:** The results showed hypertension in 11% of obese students, while 9% of them have diabetes mellitus. Further findings among these 300 students showed 7% high cholesterol level, 14% heart diseases, 20% sleep disorders, 85% do not exercise, 19% eats more than three times a day, 17% prefers fast food and 86% does not have meals with the group, 15% of students have obesity in their families while 2% have the history of the obesity-related disease (Gout). **Conclusion:** Obesity is a possible predictor of diseases like hypertension, diabetes, and sleeps related disorders among university students.

KEYWORDS: Obesity, Hypertension, Diabetes mellitus, Heart disease, Albaha.

1. INTRODUCTION

Obesity has reached epidemic proportions globally, with more than 1 billion adults overweight at least 300 million of them clinically obese, and is a major contributor to the global burden of chronic disease and disability.^[1] Often coexisting in developing countries with under-nutrition, obesity is a complex condition, with serious social and psychological dimensions, affecting virtually all ages and socioeconomic groups. Increased consumption of more energy-dense, nutrient-poor foods with high levels of sugar and saturated fats, combined with reduced physical activity, have led to obesity rates that have risen three-fold or more since 1980 in some areas of North America, the United Kingdom, Eastern Europe, the Middle East, the Pacific Islands.^[2] Obesity and overweight pose a major risk for serious diet-related chronic diseases, including type 2 diabetes, cardiovascular disease, hypertension and stroke, and certain forms of cancer.^[3] Obesity is most commonly caused by a combination of excessive food energy intake, lack of physical activity,

and genetic susceptibility, although a few cases are caused primarily by genes, endocrine disorders, medications, psychiatric illness or insomnia.^[4] Evidence to support the view that some obese people eat little yet gain weight due to a slow metabolism is limited. On average, obese people have greater energy expenditure than their thin counterparts due to the energy required to maintain an increased body mass.^[5]

Dieting and exercising are the main treatments for obesity. Diet quality can be improved by reducing the consumption of energy-dense foods, such as those high in fat and sugars, and by increasing the intake of dietary fiber. With a suitable diet, anti-obesity drugs may be taken to reduce appetite or decrease fat absorption. If diet, exercise, and medication are not effective, a gastric balloon may assist with weight loss, or surgery may be performed to reduce stomach volume and/or bowel length, leading to feeling full earlier and a reduced ability to absorb nutrients from food.^[6,7] Obesity is a

leading preventable cause of death worldwide and one of the most serious public health problems of the 21st century among children and adults.^[2] Obesity is stigmatized in much of the modern world (particularly in the Western world), though it was widely seen as a symbol of wealth and fertility at other times in history and still is in some parts of the world.^[8]

In 2013, the American Medical Association classified obesity as a disease.^[9] The surgical literature breaks down "class III" obesity into further categories whose exact values are still disputed:^[10] 1) Body Mass Index (BMI) ≥ 35 or 40 kg/m^2 is *severe obesity*. 2) BMI of $\geq 35 \text{ kg/m}^2$ and experiencing obesity-related health conditions or $\geq 40\text{--}44.9 \text{ kg/m}^2$ is *morbid obesity*. 3) BMI of ≥ 45 or 50 kg/m^2 is *super obese*. Excessive body weight is associated with various diseases, particularly cardiovascular diseases, diabetes mellitus type 2, obstructive sleep apnea, certain types of cancer, osteoarthritis and asthma as a result, obesity has been found to reduce life expectancy.^[4] Large-scale American and European studies have found that mortality risk is lowest at a BMI of $20\text{--}25 \text{ kg/m}^2$ in non-smokers and at $24\text{--}27 \text{ kg/m}^2$ in current smokers, with risk increasing along with changes in either direction.^[11] In Asians, risk begins to increase between $22\text{--}25 \text{ kg/m}^2$.^[12] BMI of $30\text{--}35 \text{ kg/m}^2$ reduces life expectancy by two to four years, while severe obesity (BMI $> 40 \text{ kg/m}^2$) reduces life expectancy by ten years.^[13] Obesity increases the risk of many physical and mental conditions. These comorbidities are most commonly shown in metabolic syndrome^[4], a combination of medical disorders that includes: diabetes mellitus type 2, high blood pressure, high blood cholesterol, and high triglyceride levels.^[14] Health consequences fall into two broad categories: those attributable to the effects of increased fat mass (such as osteoarthritis, obstructive sleep apnea, and social stigmatization) and those due to the increased number of fat cells (diabetes, cancer, cardiovascular disease, non-

alcoholic fatty liver disease).^[4] Hence, the objective of the present study was to assess the effect of obesity on other diseases like hypertension, diabetes mellitus, cholesterol levels, heart disease, insomnia, eating habits, exercise and family history of gout among the Students of the Faculty of Applied Medical Sciences in Albaha University, Kingdom of Saudi Arabia (KSA).

2. MATERIALS AND METHODS

The descriptive-analytical method was used which is based on the interview and observation and collection of information through a standard questionnaire. The study was done in the Faculty of Applied Medical Sciences, Albaha University, Albaha, KSA in the month of January-March 2020. Informed consent forms were obtained from the study participants, who were willing to participate on a voluntary basis. The 300 students of different ages and departments are included irrespective of any other demographic data. Standard questionnaires were used to collect information from the students. The questionnaire was based on the blood pressure (yes/no), diabetes mellitus (yes/no), cholesterol levels (high/normal), Heart Diseases (yes/no), sleep disturbances (yes/no), physical Exercises (yes/no), meals per day (frequency), Fast Food per day (yes/no), Obesity in family history (yes/no), Diseases associated with obesity (yes/no). Body Mass Index (BMI) measurement obtained by dividing a person's weight by the square of the person's height, exceeds 30 kg/m^2 , with the range $25\text{--}30 \text{ kg/m}^2$ defined as overweight. The data acquisition of the BMI was determined by the following ranges: BMI = $25\text{--}29.9 \text{ kg / m}^2$ (overweight), BMI $\geq 30 \text{ kg / m}^2$ (obesity), and BMI $\geq 40 \text{ kg / m}^2$ (severe obesity).

3. Statistical Analysis

Data obtained was entered in the MS-Excel and SPSS- P. value ≥ 0.05 spreadsheet and statistical analysis done using the distribution of responses for frequencies and percentages.

4. RESULTS

Table 1: The relation between obesity and blood pressure of students.

Element	Frequency	Percentage%
Normal blood pressure	267	89
Hypertension	33	11
Total	300	100

P value 0.000

Table 1 shows 33 (11%) of the students were suffering from hypertension (abnormal blood pressure), while normal blood pressure was found in 267 (89%) of the students.

Table 2: The relation between obesity and diabetes mellitus.

Suffer from diabetes mellitus	Frequency	Percentage%
No	274	91
Yes	26	9
Total	300	100

P value 0.001

Table 2 shows 274 (91%) of students do not suffer from diabetes, while 26 (9%) of them suffering from diabetes.

Table 3: The relation between obesity and cholesterol levels.

Element	Frequency	Percentage%
Normal cholesterol levels	279	93
Abnormal cholesterol levels	21	7
Total	300	100

P value 0.000

In table 3, 21 (7%) of students show hyper cholesterol levels and 279 (93%) of them have normal cholesterol levels.

Table 4: The relation between obesity and Heart Diseases.

Heart Diseases	Frequency	Percentage%
No	259	86
Yes	41	14
Total	300	100

P value 0.003

Table 4 showed 41 (14%) of respondent suffering from heart diseases. P value 0.000

Table 5: The relation between obesity and sleep disturbances.

Sleep disorders	Frequency	Percentage%
No	240	80
Yes	60	20
Total	300	100

P value 0.001

Table 5 showed 60 (20%) of obese students have sleep disorders and 240 (80%) of them do not have any disorders associated with sleep.

Table 6: The practice of Physical Exercises.

Practice of Physical Exercises	Frequency	Percentage%
Yes	45	15
No	255	85
Total	300	100

P value 0.000

Table 6 showed 255 (85%) of students do not practice physical exercise.

Table 7: Number of meals per day.

Number of meals/days	Frequency	Percentage%
Three	243	81
More than three	57	19
Total	300	100

P value 0.000

Table 7 showed 57 (19%) of students have a habit of more than three meals per day, while the rest of the students i.e. 243 (81%) have meals three or less.

Table 8: Taking Fast Food per day.

Element	Frequency	Percentage%
Favor fast food	51	17
Do not favor fast food	249	83
Total	300	100

P value 0.000

Table 8 showed 51 (17%) of students prefer fast food while 249 (83%) students do not prefer it.

Table 9: A history of Obesity in the family.

Element	Frequency	Percentage%
There are obese in the family	46	15
There are no obese in the family	254	85
Total	300	100

P value 0.000

Table 9 showed 46 (15%) of the students have a family history of obesity and the rest 254 (85%) do not have obesity in their family.

Table 10: Diseases associated with obesity (Gout).

Element	Frequency	Percentage%
Infected with Gout	6	2
Uninfected with Gout	276	92
I do not know	18	6
Total	300	100

P value 0.000

Table 10 showed 6 (2%) of students have a history of the obesity-related disease (Gout), 18 (6%) of the students do not know, and 276 (92%) do not have a history of Gout.

5. DISCUSSION

In the present study, 300 students from all the departments of the Faculty of Applied Medical Sciences, Albaha University, Albaha, KSA participated using a self-administered pre-tested questionnaire. In the present study 33 (11%) obese students showed abnormal blood pressure values (hypertension). The study conducted by Seravalle and Grassi^[15] found that obesity is associated with various alterations at the inflammatory, endothelial, and hormonal levels. These alterations induce stimulation of several other mechanisms that contribute to the hypertensive state. Large-scale population studies have shown that obesity is the most important independent risk factor for insulin resistance and diabetes mellitus.^[16,17] In the present study also found that 26 (9%) obese students were diabetic. High cholesterol level is reaching higher prevalence rates in KSA.^[18] This finding may suggest that heart diseases will be a major health problem. In the present study also showed 7% hyper cholesterol levels and 14% heart diseases among university students. Twenty percent of students were suffering from sleep disturbances in present study. Koren and Taveras^[19] showed insufficient sleep is associated with an increased risk of obesity, diabetes mellitus, hyper cholesterol level, and metabolic syndrome; this study agrees with our results. There are 255 (85%) obese students not doing exercise, 57 (19%) have a habit of eating more than 3 times a day and 51 (17%) prefer fast food. Exercise, in conjunction with diet, is critical to losing weight and maintaining health in obese patients. While it can be challenging for an obese person to transition to a healthy lifestyle, the physical and emotional benefits of a regular exercise program make it worth the effort.^[20] Reduction in obesity by adopting healthier eating habits and increasing physical activity is of considerable importance to the students of Albaha University.^[18] In the present study 46 (15%) and 6 (2%) of the obese students have family histories of obesity and obesity-related disease (Gout). It may be due to family history of obesity is the major predictor of obesity and the metabolic abnormalities on amino acids, acylcarnitine's, inflammation, and insulin resistance.^[21] The university should initiate policies to reduce obesity and obesity-related conditions through inter-university programs, technical assistance and training, leadership, surveillance and research, intervention development and evaluation, translation of practice-based evidence and

research findings, and partnership development. These initiatives will make healthy choices in nutrition and physical activity available, affordable, and easy likely prove most effective in combating obesity of university students.

6. CONCLUSION

The possible risks like hypertension, diabetes, sleep-related disorders, heart diseases increased with obesity. Overweight and obesity are the results of a variety of social-behavioral, cultural, environmental and physiological factors. Addressing nutrition and physical activity jointly is essential in the prevention and treatment of obesity.

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8. Conflicts of Interest: None declared.

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