The Prevalence of overweight and obesity among employees in Babil Health Directorate

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ABSRTACT

Objective: To estimatethe prevalence of overweight and obesity and determine the association of gender, age and Diabetes Mellituswith BMI among employees in the Babil Health Directorate.

Method: Cross-sectional survey of 280 employees randomly selected inthe Babil Health Directorate aged 20-65years during January 2017.

Result:in the sample of 280 participants, 60% were males and 40% were females. The mean for age was 41.2±9.4 years. The overall mean BMI was(29.42±5.08) kg/m^2 which is located in the overweight category. The mean BMI of males was (28.8±4.4) kg/m^2 lower than that of females (30.4±5.7) kg/m^2. The study showed the mean BMI for diabetic persons were(29.2±5) kg/m^2 higher than that of non-diabetic(23.9±5.4)kg/m^2. The mean BMI difference statistically significant between male and female and there is statistically significant difference of the mean BMI between age groups.

Conclusions and Recommendations: According to this study, overweight and obesity in males and females should be regarded an epidemic health problem among adult age groups. Itneeds urgentimprovement in the education aboutlifestyle changes, especially healthy diet and physical activity.

INTRODUCTION: Overweight and obesity are defined as abnormal or excessive fat accumulation that may affect health.Simple index of weight for height that is commonly used is body mass index (BMI)which is defined as a person's weight in kilograms divided by the square of height in meter (kg/m^2). In 2014, 1.9 billion adults(39%) aged 18 years and over were overweight and more than 600 million (13%) were obese[1]. Obesity is more common in women while overweight is more common in men[2].

Overweight as a main feature of epidemiological transition which has increased in most developing countries during the last decades[3]and the same phenomena has recently been suggested in the Iraqi population[4].

Nutrition transition was result from economic improvement over the last 50 years in most of the countries has resulted in greater affect the diets that are higher in fat especially saturated fat, refined carbohydrate, and low in fiber. This nutrition trend has also been accompanied with an inactive lifestyle and increased level of stress[5,6].

Obesity has become an epidemic in many parts of the world and World Health Organization regards obesity as an epidemic that could put the population in many countries at risk of developing of non-communicabledisease, including cardiovascular disease, many types of cancer and Diabetes Mellitus, osteoarthritis,gall bladder disease, sleep apnea, respiratory disease, mobility difficulties and social problems[7,8,9].

SUBJECTS AND METHODS: Cross-sectional study in a sample of 280 employees randomly selected (169 males and 111 females) aged (20- 65) years were assessed in the Babil Health Directorate during January 2017.

Data on age, sex, history ofDiabetes Mellitus were collected from participants in the interview.

MEASURMENTS:

Height and weight were measured by trained surveyors using valid, comparable methods.Body weight was measured to the nearest 0.1kg by usinga digital scale (SECCA, Germany) without shoes and heavy clothes. Height was measured to the nearest 0.5 cm by using non-stretch tape(REL,England) which is fixed to the flat vertical wall.

Body Mass Index (BMI)value was calculated by dividing weight in kilogram to the height in square meter. For adults WHO, define overweight and obesity as follows:Overweight is BMI equal or greater than 25 and obesity is BMI equal or greater than 30 and morbid obesity is BMI equal or greater than 40. The normal weight when BMI is between 18.9-24.9kg/m^2.

DATA ENTERY AND ANALYSIS: the SPSS statistical package 23 was used for data entry and analysis of the data in the study. Data were presented as frequency and percentage. Z test and the ANOVA test used to test the difference between the mean BMI according to gender, age groups and Diabetic Mellitus 2.

RESULTS: a total of 280 employees was involved in the study aged (22-65) years,mean was (41.2±9.4) (95%CI40-42.3). Weight (81.2±156kg), (95%CI79.4-83.1) and height (1.66±0,9cm), (95%CI 1.65-1.67). About 80% of participants under 50 yearsand 60% of males and 40% of females were included in the study.

Table 1: Distribution of the sample according to age and gender

		No.	Accumulative %
Age groups	20-29 years	31	11
	30-39 years	91	43.5
	40-49 years	101	79.5
	50-59 years	49	97
	60-69 years	8	100
Gender	Male	168	60
	Female	112	40

The percentage of overweight, obesity and morbid obesity are 37%, 42% and 4% respectively. The prevalence of   obesity and morbid obesity were higher in females than in males while the prevalence of overweight was higher in males than females as showed in Table 2.

Table 2: Distribution of BMI categories according to gender

	BMI categories				Total
	Normal	Overweight	Obesity	Morbid obesity	
Male	31 (18%)	69 (41%)	65 (39%)	4 (2%)	169 (100%)
Female	18 (16%)	34 (31%)	53 (48%)	6 (5%)	111 (100%)
Total	49 (17%)	103 (37%)	118 (42%)	10 (4%)	280 (100%)

The mean BMI in females higher than males and the Z test between the two means was significant (Z test=2. 61, p= 0.008) for that difference and estimated effect size was small (Eta squared =0. 022) (Table 3).

Table 3: The distribution of the mean BMI according to the gender.

Gender	No	Mean BMI	Std. Deviation
Male	169	28.7679	4.49594
Female	111	30.4280	5.73646

The overall mean BMI was 29.4kg/m^2 and it was almost normal in the ages 20-29 years, then the trend of the mean BMI starts to increase with age to reach the range of overweight and obesity. After the age of 60 years trend of the mean BMI returned to overweight in males only as shownin (Table 4).

Table 4: Distribution of mean BMI according to gender and age groups

Gender	Age groups				
	(20-29) y	(30-39) y	(40-49) y	(50-59) y	(60-69) y
Male (28.7±4.4)	26.1±4.6	29.3±4.4	28.2±3.7	30.2±5.2	29.3±3
Female (30.4±5.7)	23.4±2.8	28.7±5.8	31.5±4.7	32.6±5.9	

The highest mean BMI in was among males aged 50-59 years and lowest in aged 20-29 years. A similar difference was seen among women except there were no women aged 60 years and more in the study as shown in (Table 5).

Table 5:Descriptive data onmean BMI according to age groups

Age groups	No.	Mean BMI	Std. Deviation	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
20-29 years	31	25.3580	4.37760	23.7523	26.9637
30-39 years	91	29.1913	4.89566	28.1718	30.2109
40-49 years	100	29.9532	4.60791	29.0389	30.8675
50-59 years	49	31.3655	5.70308	29.7274	33.0036
60-69years	9	29.3935	3.05960	27.0417	31.7453
Total	271	29.4260	5.08010	28.8284	30.0236

The ANOVA test was significant for the difference between mean BMI for age groups (F=7. 759, df= 4, p= 0.000) and estimated effect size was small (Eta squared =0. 10)

Table 6 showed all cases of Diabetes Mellitus were prevalent among persons with obesity (BMI> 30).

Table 6: Diabetes Mellitus cases, according to mean BMI

Diabetes Mellitus	Mean BMI	Std. Deviation	No
Yes	32.9360	5.49910	12(4%)
No	29.2688	5.01428	268(96%)

Only 12 (4%) of employees in the sample havea history of Diabetes Mellitus. Ten of employees (83%) with DM were aged more than 40 years. The mean BMI for diabetic persons werehigher than that of non-diabetic and theZ test between means was significant (Z test=2. 268, p= 0.02).

DISCUSSION:

The overall of the mean BMI in the study was 29.4 which islocated in the upper limit of the overweight category.Overweight more prevalent in malesaged under50 years and female agedunder 40 years. While obesity more prevalent in males aged 50-60 years only and in femalesabove40 years. The aging process may change the total body weight, both male and female gain weight until they reach the age of 60 and start to lose weight after 60 years [10].

This study revealed that overweight and obesity were extensive (prevalent) among male and female employees in the Babil Health Directorate. This study agreed with the Iraqi survey for non-communicable disease risk

factors in 2006 [4].

In this study, the maleswere more likely to be overweight, under the age of 40 years while the females more likely to be obese in the age range between 40 - 60 years.This has been reported in several previous studies and might be related to gender differences in metabolism and hormonal balance[11].

Generally, more females preferred to be slightly underweight as their ideal figure and may be driven by media influences that portray thin figures as ideal for females. This had beenshown in our study that female aged below 30 years had a normal BMI. On the other hand, more males preferred their ideal figure to be somewhat overweight[12].

But the females still were increasingly susceptible to excess weight gain because they were less likely to engage in regular exercises or sporting activities partly due to lack of facilities that are gender sensitive, but also to some degree due to the fact that they are culturally constrained to taking care of their children and house. Also the walk to their work places decrease because of transporting by buses or their own cars[13].

Only 12 (4%) of employees were diabetic type 2.Ten cases (83%) aged more than 40 years. Their mean BMI was locatedin obesity category and higher than that of other non-diabetic employees. The mean BMI difference was statistically significant.This might be the obese individuals have a higher proportion of body fat. Fat cells, inparticular, make it more difficult for insulin to be used correctly by the body. Although it is possible for people who are neither overweight nor obese to develop type 2 diabetes.The link between increases in fatty acids as the resultant for diabetes mellitus is the topic of disagreement and a contributing factor may be the direct cause. **Type2 diabetes** is the most widespread type of Diabetes and was traditionally found mainly in persons over the age of 41 years[14].

STRENGHT AND LIMITATIONS:

The main strength of this study is that it is the first of its kind to examine the prevalence of overweight and obesity inthe Babil Health Directorate where the employeeshad been spending more than 8 hours in sedentary style without exercise. The difficulty increase with age to change lifestyle which are beneficial to health, and therefore early intervention might decrease the burden of overweight and obesity.However, our study also had limitations. Our findings are purely descriptive and lacking to explore of the possibility of confounding among statistically significant relationships. Also the descriptive data about marital status, history of endocrine diseases, residency, number of children and additional work (private work) not collected.

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