

Original Article

Prevalence of overweight and obesity among the constituents of Jubail University College - Female Branch

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Published online: September 30, 2013

(Accepted for publication September 20, 2013)

DOI:10.7752/jpes.2013.03065;

Abstract:

This study aimed to determine the prevalence of overweight and obesity among the constituents of Jubail University College -Female Branch for the duration of AY 2012-2013. A total of 619 respondents were studied from the total population of 1785. The population was grouped according to their age and was categorized into levels: Preparatory students, Bachelor students, Faculty and Administrative Staff, and as Saudi and Non-Saudi nationals. Individual height and weight were measured and the corresponding BMI indices were computed using WHO table for BMI classification as standard. Frequency distributions and percentage measurements were used to obtain data for qualitative analysis and interpretation. The correlation was tested using Correlation Ratio or Eta Coefficient across variables.

The results showed a high BMI value among the faculty group and age above 40 years old. However, the BMI values for students and administrative staff have a high probability to deviate to being overweight. A higher regression rate is observed in between BMI and age affirming the possibility of creeping obesity. The study further revealed that overweight and obesity is prevalent in the older population. It is significant to note that the larger population has a greater chance of being overweight and obese. Given these results, the study recommends greater awareness on how to prevent the occurrence of overweight and obesity through physical fitness and nutrition among female constituents of Jubail University College. The gathered data may also contribute to generate a BMI standard norm for Saudi females and may also be used as a basis for the inclusion of physical fitness activities to College female students in the Kingdom.

Key words: obesity; overweight; body mass index; JUC constituents; Saudi Arabia.

Introduction

The advanced technological lifestyle forces people to be more inactive and adept to eating fast food and prepared meals available in the market. These incidents contribute to the increase in the number of overweight and obese people. Physiologically, the accumulation of excess body fat may affect the individual's health adversely (Kopelman, 2000). It changes the adipose tissue metabolic and endocrine function that leads to an increased release of fatty acids, hormones, and proinflammatory molecules that contribute to obesity associated complications (Weisberg et.al. 2003) such as diabetes (Gale et.al 2004, Kopelman 2000, Whitney and Rolfes 2002), heart disease (Friedman 2000, Gale et.al 2004, Kopelman 2000), cancer (Gale et.al 2004, Kopelman 2000), hypertension (Friedman 2000, Whitney and Rolfes 2002), sleep-breathing disorders (Whitney and Rolfes 2002, Gale et.al 2004, Kopelman 2000), asthma (Gale et.al 2004), gall bladder disease (Whitney and Rolfes 2002), arthritis (Gale et.al 2004), reproductive complications (Gale et.al 2004) and psychological disturbances (Gale et.al 2004).

Based from the World Health Organization fact sheet (WHO Media Center, 2012), overweight and obesity are the fifth leading risk for global deaths. At least 2.8 million adults die each year as a result of being overweight or obese. In addition, 44% of diabetes, 23% of the ischaemic heart disease and between 7% and 41% of certain cancer cases are accredited to overweight and obesity. However, people who weigh below the standard may also have cardiovascular disease but more or about 65% of the world's population live in countries where overweight and obesity kill more people than underweight.

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. (WHO Media Center, 2012). It is a result from a combination of genetic susceptibility, increased availability of high-energy foods and decreased requirement for physical activity in modern society (Kopelman, 2000). However, some experts believe that some individual can be overweight but not obese, like in the case of body builders where large amount of muscle mass are acquired (Dalton 1997).

The most common method used by researchers and advisory institutions to describe the degree to which a person is overweight is by body mass index (BMI). It is a simple index of weight-for-height that is commonly used to classify underweight and obesity in adults. It is calculated as the weight in kilograms divided by the square of the height in meters (kg/m²) (Stern and Kazaks 2009). BMI ≥ 25.00 = Overweight and BMI ≥ 30.00 = Obese. (WHO.Global Database on Body Mass Index.2006)

A high BMI value may increase the risk of cardiovascular diseases (heart disease and stroke), diabetes, musculoskeletal disorders (osteoarthritis) and cancers (endometrial, breast and colon). (WHO Media Center)

Almajwal et. al. (2009) studied the performance of body mass index in predicting diabetes and hypertension in the Eastern Province of Saudi Arabia and concluded that there is an increased risk of diabetes and hypertension relative to BMI, starting at a BMI as low as 21, but overall in Saudi Population, there is no cut-off level of BMI with high predictive value for developing these chronic diseases, including the WHO definition of obesity of 30.

In the study conducted by Abdulrahman A. Al-Nuaim et.al., he used BMI to determine the occurrence of obesity among Saudi Arabian adult population and relate it to socio-economic variables. They found out that the prevalence of overweight was 31.2% (95% confidence interval: 30.3%, 32.1%); 33.1% for males and 29.4% for females. For obesity, the overall prevalence was 22.1%; males 17.8% and females 26.6%. The researchers further conclude that age, residential area, region, income, gender, and education are statistically significant predictors of obesity. They further found out that the prevalence of obesity was higher in females than males, lower in subjects living in rural areas with traditional lifestyles than those in more urbanized environments, and increased with age.

In a similar study, Yousef Abdullah Al-Turki studied this time male students of King Saud University in Riyadh and found out that the prevalence estimate of overweight was 31% and the prevalence estimate of obesity was 23.3% in the study group. He further concluded that student's awareness about overweight and obesity health problems is an essential step towards decreasing the prevalence of overweight and obesity among the university students and in the community.

JS Al Malki et.al. from the Department of Zoology at King Saud University in Riyadh studied overweight and obesity in Saudi females of childbearing age and found that incidences of overweight and obesity were more in married females than single women.

This study attempted to investigate on the occurrence of overweight and obesity using BMI indices among Jubail University College (JUC) constituents. This may be an initial step in identifying and recognizing the importance of knowing the health risks of overweight and obesity. Moreover, this study may be used to identify the need to inculcate physical activities and exercise more in the Academic curriculum of the College.

Method

This research was conducted among the constituents of Jubail University College-Female Branch. The study was done with the approval of the Deputy for Academic Affairs. The population was categorized into levels: Preparatory students, Bachelor students, Teaching staff and Administrative staff. They were further divided in between nationalities. Individual height and weight were measured and the corresponding BMI indices were computed.

A personal interview of the respondent was conducted to gather the information needed in the study.

The sample size was computed using the Slovin's Formula as shown below:

$$n = \frac{N}{1+N(e)^2} \quad \text{where: } n - \text{is the sample} \\ N - \text{total number of population} \\ e - \text{is the margin of error}$$

A five percent (5%) margin of error was used in this study. The distribution of the respondents is shown in table below.

Table 1. The distribution of the population, sample size and actual respondents in various levels of the constituents of Jubail University College - Female Branch.

Level	Population	Sample Size
Preparatory	461	214
Bachelor	1194	300
Staff	28	26
Faculty	99	79
Total	1785	619

Samples were chosen randomly among the respondents of the study. A stratified random probability sampling method was used to give equal chance to all members of the population to become a respondent. The study was done during the period from December 2012 until March 2013.

Results and discussions

The profile of the respondents is presented in the succeeding table (Table 2). The data shows that half of the population (50.7%) is from 20-29 years old. Respondents below 20 years old is 43.6% barely from 30-39 years old (3.1%) and above 40 years old (2.6%).

The population of this study is dominated by students in the bachelor level (53.9%) since they comprise the majority of JUC population. Followed by the Preparatory students with 35.5% and fractions coming from faculty (7.7%) and Staff (2.8%).

As to nationality, a great majority are Saudi national (94.5%). Foreigners or Non-Saudis comprised a little portion (5.5%) of the population.

Table 2. Profile of the respondents

Age	Frequency	Percentage (%)
below 20	270	43.6
20-29	314	50.7
30-39	19	3.1
above 40	16	2.6
Total	619	100.0
Level	Frequency	Percentage (%)
Preparatory	214	34.6
Bachelor	300	48.4
Staff	26	4.2
Faculty	79	12.8
Total	619	100.0
Nationality	Frequency	Percentage (%)
Saudi	585	94.5
Non-Saudi	34	5.5
Total	619	100.0

Body mass index results were based on the international classification of adult underweight, overweight and obesity according to BMI. (Table 3)

Table 3: The International Classification of adult underweight, overweight and obesity according to BMI

BMI	Classification
< 18.5	underweight
18.5–24.9	normal weight
25.0–29.9	overweight
30.0–34.9	obesity
35.0 >	extremely obese

Subjects mean height is 1.7m and varies by 1.9. Among age groups, individuals between 30-39 years old (63.3 kilograms) and above 40 years old (69.0 kilograms) are heavier than subjects between 20-29 years old and below 20 years old. The latter age group also showed a highest variation in weight with SD 19.3 kilograms (Table 4). The data gathered further revealed that across levels, faculty has a greater weight mean having 66.4 kilograms compared to preparatory students (57.8 kilograms), bachelor students (57.9 kilograms) and staff (58.5 kilograms) (Table 5). In terms of nationality, Saudi nationals (57.9) are lighter compared to non-Saudi nationals having (66.7 Kgs) (Table 6).

Table 4. Height, weight and body mass index across age of the respondents

Age	Mean Height	+/-	Mean Weight	+/-	Mean BMI	+/-	Classification
below 20	1.6	0.1	57.5	11.7	22.9	4.5	Normal
20-29	1.9	7.2	58.3	12.7	23.1	4.9	Normal
30-39	1.6	0.1	63.3	10.4	25.7	4.8	Overweight
above 40	1.6	0.1	69.0	19.3	26.6	7.2	Overweight
Mean	1.7	1.9	62.0	13.5	24.6	5.4	Normal

Table 5. Height, weight and body mass index across level of the respondents

Level	Mean Height	SD	Mean Weight	SD	Mean BMI	SD	Classification
Preparatory	1.6	0.1	57.8	11.9	23.0	4.5	Normal
Bachelor	1.9	6.9	57.9	12.6	23.0	4.8	Normal
Staff	1.6	0.0	58.5	5.1	23.1	2.3	Normal
Faculty	1.6	0.1	66.4	15.4	26.2	6.1	Overweight
Mean	1.7	1.8	60.2	11.3	23.8	4.4	Normal

Table 6. Height, weight and body mass index across nationality of the respondents

Nationality	Mean Height	SD	Mean Weight	SD	Mean BMI	SD	Classification
Saudi	1.8	5.3	57.9	12.3	23.0	4.7	Normal
Non-Saudi	1.6	0.1	66.7	14.7	26.2	5.9	Overweight
Mean	1.7	2.7	62.3	13.5	24.6	5.3	Normal

The data showed that the subjects above 40 years old has the highest BMI mean of 26.6 and SD 7.2 (Fig. 1). Preparatory students obtained a mean BMI of 23 with SD 4.5, bachelor students has 23 with SD 6.1, administrative staff has 23.1 with SD 2.3 and faculty with 26.2 and SD 6.1 (Fig. 3). It is to be noted that the BMI means for preparatory, bachelor and administrative staff are classified as normal but there still cases of obesity and close to being overweight as we have observed the incidences of overweight in the population. Also, extreme obesity was observed to prevail in the population aging from 20-29 years old and below 20 years old. The faculty has a high BMI mean with 26.2 and SD 6.1. (Fig. 3) Across nationality, the foreigners or non-Saudis have a higher BMI mean of 26.2 with SD 5.9 compared to Saudi nationals with 23 and SD 4.7.(Fig. 2)

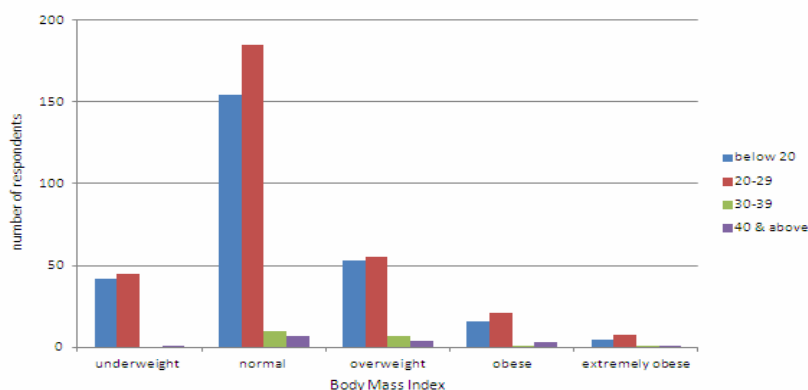


Fig. 1. Body mass index of respondents across age.

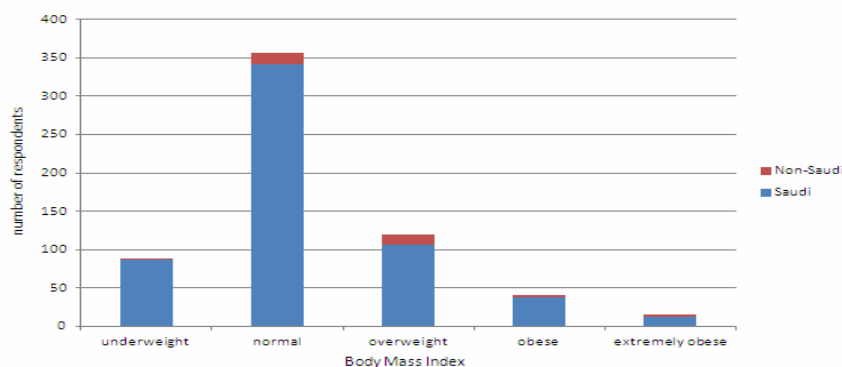


Fig. 2. Body mass index of respondents across nationality.

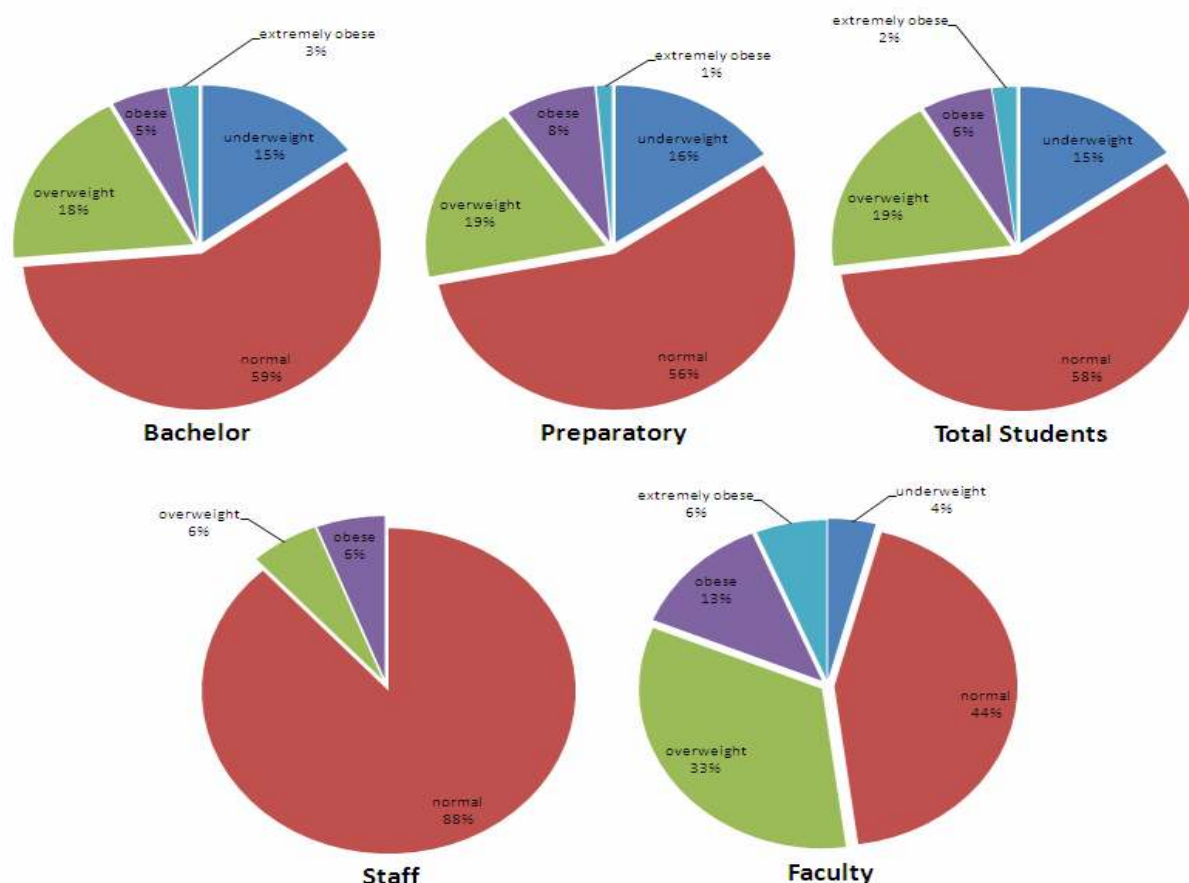


Fig. 3.

Regression statistics between BMI and various independent variables.

	Age	Nationality	Level
R Square	0.0308	0.0213	0.0127
Standard Error	4.6948	4.7177	4.7385

Computed correlation ratio revealed a value of 0.0308, 0.0213 and 0.0127 for age, nationality and level, respectively. These imply that 3.08% of the variability in the BMI indices can be explained or accounted for by age. Moreover, 2.13% of the variations are from nationality and 1.27 % was from level.

From the above computed data, it is affirming to know that the occurrence of obesity in JUC constituents is not at all alarming. Observations on age above 20 years old showed a higher percentage of overweight and obesity than that of the younger population. This may indicate incidence of creeping obesity on aging population.

Conclusions

The author would like to commend the population being normal however, it is important to take note that the larger population may vary from being overweight or underweight thus a need to be cautious and pay attention to the nutritional intake and physical fitness awareness are necessary to maintain the health status of the population.

This study would like recommend the inclusion of physical activities to the academic curricula that may further reduce the chance of obesity occurrence among its constituents.

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