High Prevalence of Obesity among Male Compared to Female Students of Health Colleges of King Saud University (KSU) in Riyadh

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Abstract: **Obesity is considered a major health problem. Several factors were reported to be associated with obesity in this country such as age, sex, socio-economic status, sedentary behaviors and eating habits.**

OBJECTIVES: Our study was aiming to identify the prevalence of obesity among students of health colleges of King Saud University (KSU) in Riyadh, explore the socio – demographic characteristics, factors related to obesity, the lifestyle of the participants and to compare the result of male to female students.

METHODS: This was a community-based quantitative analytical cross sectional study. A sample of 292 under graduated students (146 males and 146 females, participants were chosen randomly from the KSU Health Colleges, Saudi Arabia, during the period from the beginning of Dec 2012 to March 2013. Measurements used were height and weight, calculating the Body Mass Index (BMI) of the participants and interviewing them through face to face questionnaire.

RESULT: The overall prevalence of obesity among students of health science colleges of KSU in Riyadh was 13.7%. The majority of our participants were Saudi Arabian, while the percentage of non-Saudis was 3.8%. The mean age of the participants was 21.25 with standard deviation of 1.16. Half of the participants were males and the rest were females. The prevalence of obesity among males was higher than females (92.5% from the overall prevalence compared to (7.5%) female P value = 0.000. 72.5% of obese participants were having family history of obesity (P value = 0.016). Again 77.5% of obese participants were having chronic diseases (P value = 0.000), especially dyslipidemia which was found in 17.5% of obese participants with (P value = 0.000).

RECOMINDATION: Modification lifestyle is needed, people with chronic diseases should take their medication regularly.

Keywords: **Obesity, chronic diseases, community-based quantitative analytical.**

1.   INTRODUCTION

Obesity means having too much body fat. It is different from being overweight, which means weighing too much. A person is considered overweight if his or her BMI (body mass index) is ranging between 25 and 29.9; while a person is considered obese if his or her BMI is over 30. Weight gain occurs when you eat more calories than your body uses up. If you eat food which provides more calories than your body needs, the excess is converted to fat. Initially, increase in fat cells occurs. When they can no longer expand, they increase in number. If you lose weight, the size of the fat cells decreases, but the number of cells does not. Obesity, however, has many causes. The reasons behind the imbalance between calorie intake and consumption vary by individual. Your age, gender, genes, psychological makeup, and environmental factors all may contribute. Genes may play a role in efficiency of metabolism and storage and distribution of body fat. Obesity tends to

run in families. **(1)** Before the 20th century, obesity was not common; in 1997 the WHO formally recognized obesity as a global epidemic. As of 2005 the WHO estimates that at least 400 million adults (9.8%) are obese, with higher rates among women than men. The rate of obesity also increases with age at least up to 50 or 60 years old. Once considered a problem only of high-income countries, obesity rates are rising worldwide. These increases have been felt most dramatically in urban settings. The only remaining region of the world where obesity is not common is sub- Saharan Africa. **(2)** In Saudi Arabia, obesity consider as a major health problem because it's a common problem which is gradually increase. This study shows the situation of obesity in Saudi Arabia in 2000. The prevalence of obesity ranged from 14% in children less than 6 years to about 83 % in adults. Women were more prone to be overweight or obese than men. Several factors were reported to be associated with obesity in this country such as age, sex, socio-economic status, employment, education, and parity. The available data clearly indicate a high prevalence of adult obesity particularly in women in the Kingdom. **(3)** A study was done in Saudi Arabia which is the association of lifestyle factors with overweight and obesity between adolescents in Saudi Arabia. The study show that obese males and females were less active when compare them with non obese especially in vigorous physical activity. Also there is decrease in vegetable intake, decrease drink milk and breakfast lower intake. **(4)** While in a study was done in Kuwait to determine the prevalence of obesity and elevated levels of blood lipids among college students. Result shows prevalence of elevated level of lipid in the blood and BMI-based obesity which was higher in male than female; also there were prevalence of overweight and Waist circumference obesity especially in female. **(5)**

2. METHODS

2.1. Ethical approval:

Ethical clearance was obtained from University of King Saud Faculty of Medicine Research Committee, Saudi Arabia. Informed consent was taken from the students. In the consent we insured that all information of the participants will be safe and will be used only for the research purposes and the privacy of the participant will not be violated by any of the researchers. The importance and aims of the study were explained and permission to participate in the study was obtained.

2.2 Study design:

Quantitative (Analytical cross sectional, community based study). Including observations, measurement of the height and the weight of the participants, calculating the BMI (Body Max Index) and Interviewing the participants through face to face questionnaire.

2.3. Population under study:

Male and female students of KSU health colleges.With inclusion criteria being undergraduate and exclusion criteria being a postgraduate student.

2.4. Study area:

Riyadh is the capital and largest city of Saudi Arabia. It is also the capital of Riyadh Province, and belongs to the historical regions of Najd and Al-Yamama. King Saud University (KSU) is a public university in Riyadh, Saudi Arabia. The university was created to meet the shortage of skilled workers in Saudi Arabia. The student body of KSU today consists of about 51,168 students of both sexes.

2.5 Sample size:

A sample of 292 under graduated students (146 males and 146 females at 95% level of confidence and power of 80%) has been chosen randomly from the KSU Health Colleges, Saudi Arabia,

The sample size formula used to estimate sample size for the population is shown below:

$$n = \frac{(Z_\alpha + Z_\beta)^2 ((p_1 q_1) + (p_2 q_2))}{(p_1 - p_2)^2}, where \quad q_1 = (1 - p_1), q_2 = (1 - p_2)$$

N= {(1.96+0.842)2 [(0.159×0.841)+(0.296×0.704)] } ÷ { (0.159 – 0.296)2 } = 292 participants

NF=146   NM=146

2.6 Sampling technique: Stratified sampling technique. We have five health colleges; we took a proportion from each college and chose the participants randomly.

2.7 Data analysis: (Statistical Package for Social Science, version 21) was used.
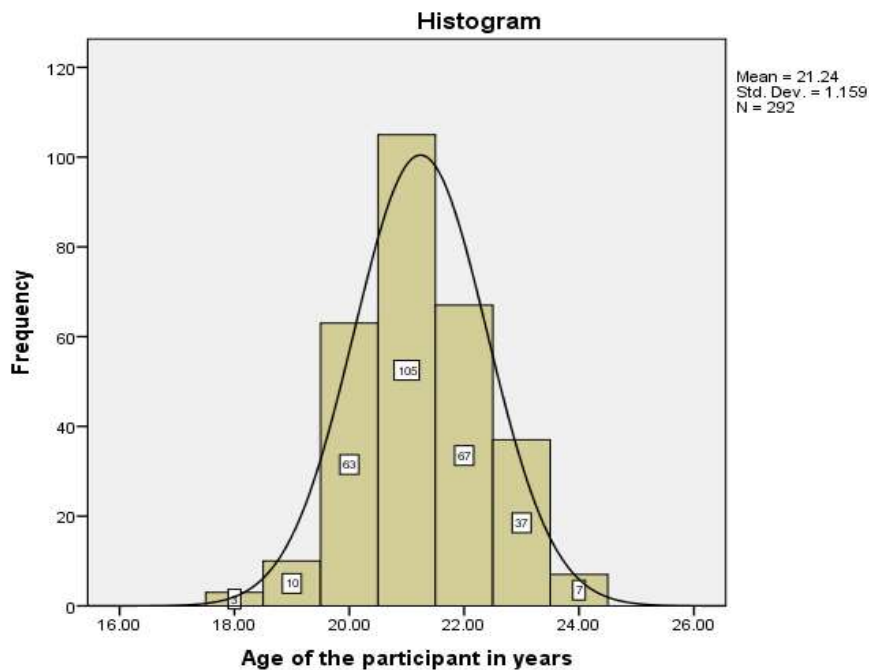
3. RESULTS

Figure No. (1)   Shows the distribution of the participant ages among students of KSU health colleges in Riyadh during the period from Dec 2012 to March 2013 (n=292)
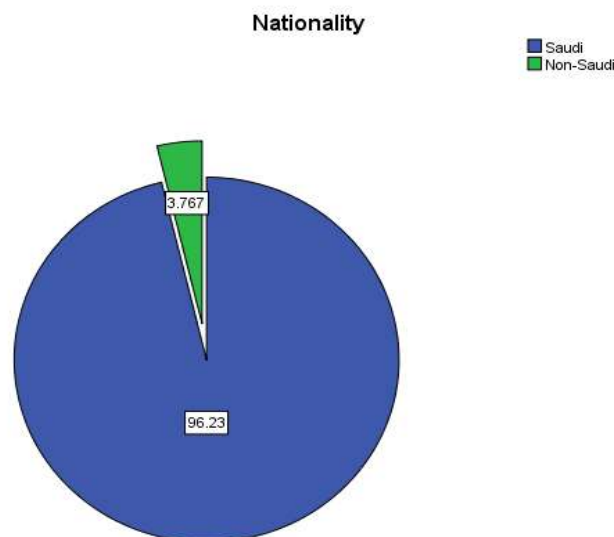

Fig. No. (2) Shows the nationality (S a u d i, Non-Saudi) among students of KSU health colleges in Riyadh during the period from Dec 2012 to March 2013 (n=292
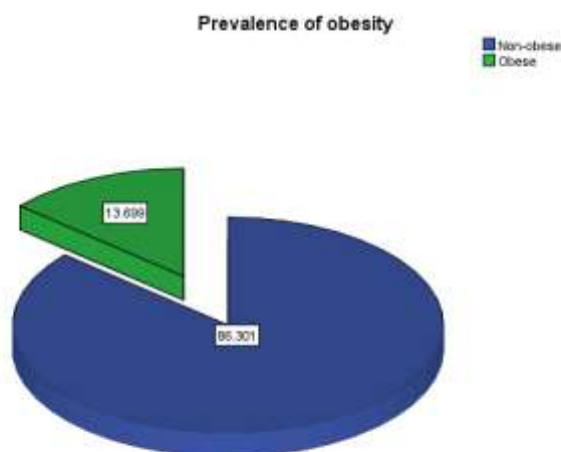
Figure No. (3) Shows the prevalence of obesity among students of KSU health colleges in Riyadh during the period from Dec 2012 to March 2013(n=292)

Table No. (1) Shows the relationship between Gender and BMI among students of KSU health colleges in Riyadh during the period from Dec 2012 to March 2013(n=292)

			BMI Group		Total
			Non-obese	Obese	
Gender	Male	Count	109	37	146
		% within Gender	74.7%	25.3%	100.0%
		% within BMI Group	43.3%	92.5%	50.0%
	Female	Count	143	3	146
		% within Gender	97.9%	2.1%	100.0%
		% within BMI Group	56.7%	7.5%	50.0%
Total		Count	252	40	292
		% within Gender	86.3%	13.7%	100.0%
		% within BMI Group	100.0%	100.0%	100.0%

P value = 0.00, which is significant.

Table No. (2) Shows the relationship between Chronic diseases and BMI among students of KSU health colleges in Riyadh during the period from Dec 2012 to March 2013 (n=292)

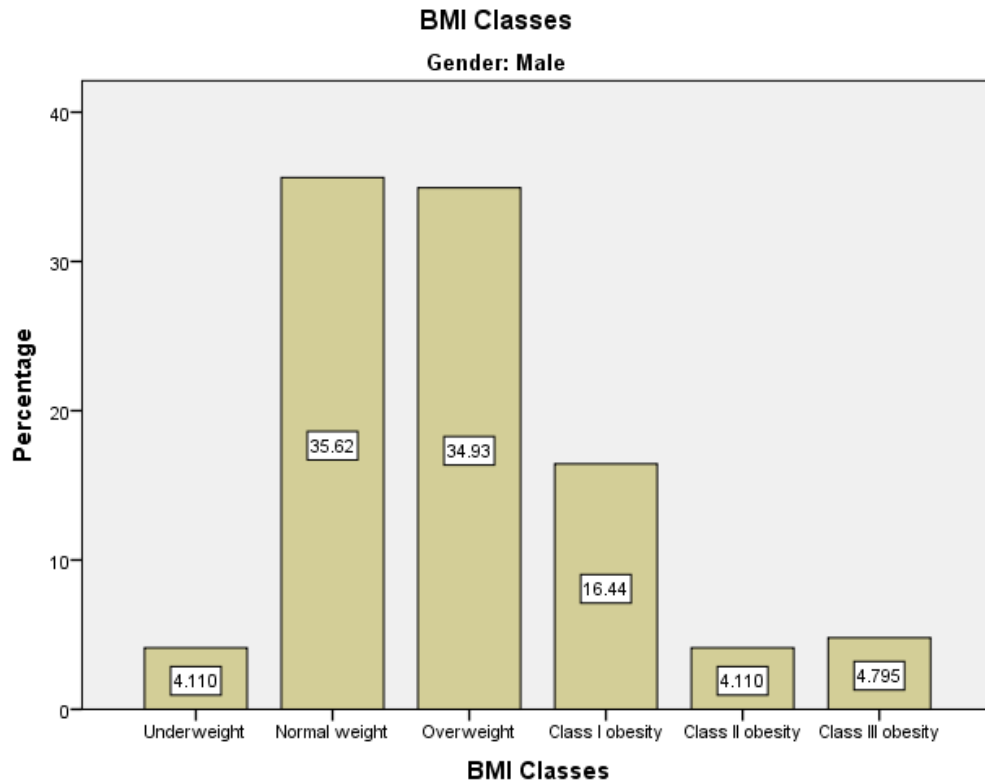|			BMI Group		Total
			Non-obese	Obese	
Chronic diseases	No	Count	241	31	272
		% within Chronic diseases	88.6%	11.4%	100.0%
		% within BMI Group	95.6%	77.5%	93.2%
	Yes	Count	11	9	20
		% within Chronic diseases	55.0%	45.0%	100.0%
		% within BMI Group	4.4%	22.5%	6.8%
Total		Count	252	40	292
		% within Chronic diseases	86.3%	13.7%	100.0%
		% within BMI Group	100.0%	100.0%	100.0%

P value = 0.00, which is significant

Fig. No. (4) shows the WHO classification of obesity among male students of KSU health colleges in Riyadh during the period from Dec 2012 to March 2013(n=146)
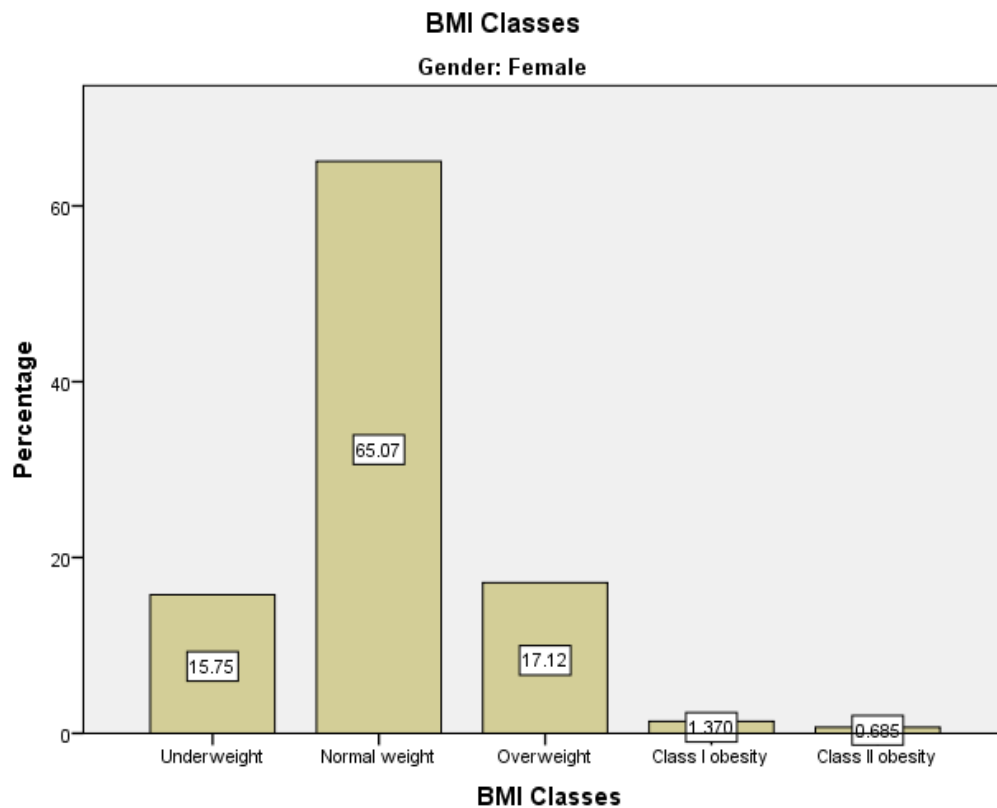

Fig. No. (5) Shows the WHO classification of obesity among female students of KSU health Colleges in Riyadh during the period from Dec 2012 to March 2013(n=146)

4.   DISCUSSION

The age of participants was found to be between 18 – 24 and the age group of twenty one was the highest group of volunteers with 36 %. The majority of our participants were Saudi Arabian, while the percentage of non-Saudis is 3.8%. The histogram shows the distribution of the participant ages which is not skewed or deviated with a mean of 21.24, standard deviation 1.159, median and mode of twenty).

In the present study, the prevalence of obesity was estimated among university students, studding at health colleges of King Saud University, Saudi Arabia. The prevalence of obesity was estimated to be 13.7%. .The prevalence of obesity in male was higher than in female which agrees with other studies. A study was done in Kuwait showed that Obesity was more frequently encountered in males than in females [28].also another study was done in the Australian National University showed that obesity is stronger in men than in women [6]

We studied the relationship between Gender and BMI of the participants. We found that the obesity among males was higher than females (Male (92.5%) and female (7.5%). The prevalence of obesity among male gender was 12.67% while female gender was 2.1% which is considered low as compared to males. So we can say that the males are at high risk at this stage of life. It has been postulated that females are more prone to get obesity than male but our study showed that males are more prone to get obesity at this stage of life. Many studies showed that females were at high risk to get obese more than males but at different age group other than the age group we studied such as menopausal females and married women (post pregnancy and hormonal changes). Previous studies showed that males are at high risk to get obese than females as we found in our study. (P value = 0.000)

As we mentioned, the prevalence of obesity among KSU health colleges in Riyadh was 13.7% of the participants classified into three classes according to World Health Organization classification. Most of obese participants were Class I obesity with a percentage of 8.9%, Class II and class III were the same, which were approximately 2.4%. Also we found that overweight participants were approximately 26%. Those overweight participants are at high risk to get class I obesity. It also shows the underweight participants which was approximately 9.9%. The rest of the participants were normal weight (50%). (P value = 0.000)

In a previous study done in the West Bank showed that there is a relationship between chronic disease and obesity, such as hypertension which is a dangerous risk factor causing a lot of diseases[7] Our study agreed with this research. 45.0% of people with chronic disease are obese. Also in previous study in United States shows the physical activity is more in male than female [8]. The same result was shown in our study, 61.8% of people doing physical activity were males.

5.   CONCLUSION

The overall prevalence of obesity was estimated to be 13.7%. .which was higher in male than in female.

Conflict of interest:

All authors have declared that they have no conflict of interest.

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