

*Original Research Article***Life style Factors Influencing BMI of Females In Ha'il Region**

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Received: 14 March 2014

Received in revised form:

25 March 2014

Accepted: 14 May 2014

Available online: 15 June 2014

Keywords:BMI, Obesity,
Body fatness,
Skipping meals.**ABSTRACT**

Background: Published health promoting or health risk behaviors data in a young population is sparse for Saudi Arabia. Identifying health risk factors early in life and promoting primary prevention interventions among the youth is of utmost importance to move in a healthier direction

Objectives: The aim of this study is to identify the socio-economic factors influencing BMI in female students in University of Hail.

Methodology: A cross sectional survey was carried out to evaluate dietary behaviors in a random sample of 200 adolescent students, from UOH female campus during the winter semester. Self administered questionnaire for dietary behaviors was used for survey by following anonymity and privacy.

Results: This study was conducted to measure BMI and determine the socioeconomic factors affecting the relative weight of young adult females living in the city of Ha'il, Saudi Arabia. A total of 200 female subjects (mean \pm SD: age: 19.76 ± 1.98 years and BMI: 23.47 ± 5.58 kg/m²) participated in the present survey. 28.5 % percent of study sample were either overweight or obese. Age wise distribution indicates overweight and obesity significantly increases with age. Breakfast is frequently skipped in overweight and obese subjects while frequency of snacking less among them. Findings of the current study also suggest habit of frequent snacking behavior inverse association with BMI. The current study findings have indicated no clear impact of physical activity on obesity prevalence

Introduction

Obesity has reached threatened levels all over the world, especially in countries which witnessed an explosive economic growth and open market policy [1]. In Saudi Arabia and other Gulf countries, the remarkable economy growth has affected the population lifestyle in a negative way including dietary habits. Fat consumption has increased, fast food outlets are everywhere and processed food has become a major constituent in every meal [1]. Economic development in Saudi Arabia has been blamed for these changes in nutritional and lifestyle habits [2]. Saudi Arabia is one of the fastest growing economies of the world. The growth and prosperity, however, have brought pronounced changes in the lifestyle of

its people. Most notably, eating habits are less healthful and the level of physical activity has declined. Consequently, obesity is increasing in the Kingdom at an alarming rate. The current literature indicates that obesity is emerging as a major health problem with approximately three quarters of females and nearly two-thirds of males of adult population in the Kingdom being either overweight or obese [3]. It is well documented that obesity is associated with several chronic illnesses. Therefore, the prevalence of obesity in a population can be considered as a rough indicator for health status. Obesity is not an uncommon finding, particularly in affluent societies. In Saudi Arabia, obesity is becoming one of the

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most important public health problems¹. The available data clearly indicate a high prevalence of adult obesity particularly in women in the Kingdom [4]

Using the body mass index (BMI) for determining the nutritional status of the girls, it was found that 11% of girls were underweight, 61% were normal and 28% were overweight or obese. These findings revealed that adolescent girls in Saudi Arabia face two contrasting nutrition situations, underweight and overweight [5].

College students are highly exposed to unhealthy eating habits leading to body weight gain [6]. Over-nutrition among females in particular, has reached a high level in Saudi Arabia [7, 8] and the neighboring Gulf countries[9,10]. Two recent studies [11, 12] conducted on female medical and nursing Saudi as well Arabian Gulf students of King Faisal University, Dammam showed that nearly one-third of the women between the young ages of 17 and 25 years were over-nourished. Obesity is measured by various methods such as body mass index (BMI), waist circumference, waist-hip ratio, skin fold, and percent body fat measurements. A crude population measure of obesity is the body mass index (BMI), a person's weight (in kilograms) divided by the square of his or her height (in meters) [13]. Body Mass Index (BMI) is a number calculated from a person's weight and height. BMI is a fairly reliable indicator of body fatness for most people. BMI does not measure body fat directly, but research has shown that BMI correlates to direct measures of body fat, such as underwater weighing and dual energy x-ray absorptiometry (DXA) [14,15]. It can be considered an alternative for direct measures of body fat. Additionally, it is an inexpensive and easy-to-perform method of screening for weight categories that may lead to health problems. Calculating BMI is one of the best methods for population assessment of overweight and obesity. [16]. The BMI ranges are based on the relationship between body weight and disease and death. Overweight and obese individuals are at increased risk for many diseases and health conditions[17]. The correlation between the BMI number and body fatness is fairly strong; however the correlation varies by sex, race, and age.

Results and discussion

Table No. 1: Demographic and Anthropometric Profile of the Study Population

Variables	Minimum	Maximum	Mean	Std. Deviation
Age (years)	18	26	19.76	1.98
Height (cm)	156	135	145.5	8.50
Weight (kg)	39	144	57	12.77
BMI (kg/m ²)	15.89	73.47	23.47	5.58

Table No.1 represents the demographic and anthropometric profile of the study subjects (n=200). The total mean age ± SD was 19.76 ± 1.98 years (range 18-26). The mean BMI ±

Methods

A cross sectional survey was planned to evaluate prevalence of obesity from a random sample of 200 female subjects of University of Hail. The subjects were surveyed through a previously standardized self administered questionnaire for questions related to their socioeconomic status, age, snacking and meal skipping pattern, frequency of eating outside, watching television, history of weight gain and physical activity. In addition, self reported weight and height was collected and body mass index was calculated. The prevalence of obesity was defined using the World Health Organization (WHO) cut-off values.

Design and Sample

A cross sectional study was conducted in College of Applied Medical Science, University of Hail, KSA during the spring semester 2013. A total number of 200 female students aged 19-26 years had participated in the study. All of the participants were Saudi Arabian and were chosen by the random sampling method from different departments and colleges. Therefore, the sample was representative of all the socioeconomic strata. The response rate among students was 100%.

Data collection

Self-reported questionnaire and anthropometric measurements were used for data collection. Prior to filling out the questionnaire, the students were informed about the study and were given instructions on how to fill out the questionnaire completely and truthfully. Data collection was made by student-to-student visits. BMI was calculated according to the formula (weight/height²).

Statistical Analysis

The Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) version 17 was used for data analysis. Results were expressed as means ± standard deviations for continuous variables and cross tabs and Chi-squared tests were used for categorical variables. Differences were considered statistically significant at P value < 0.05.

SD was 23.47 ± 5.58. Figure 1 presents the distribution of BMI groups in the study population which suggests that 10 % were underweight, 66 % were with normal weight while 19 %

had overweight and 5 % were obese. Given the young age of the study subjects the prevalence of 24 % obesity can be

considered as high and indicates future possible risks and complications arising out of obesity in them.

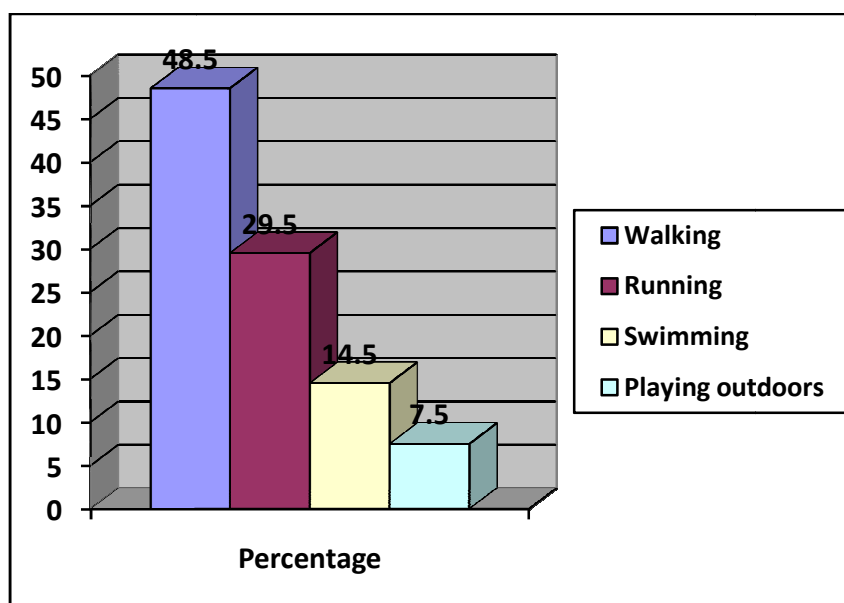
Table No.2: BMI Categories among the study population

BMI categories	Percentage
UNDER WEIGHT	9.5
NORMAL WEIGHT	61.5
OVERWEIGHT	23
OBESE	5.5

Table No.2 represents the BMI categories observed in the study population. Our findings suggested that out of 200 subjects, 19 (9.5%) were found to be underweight, 123

(61.5%) had a normal BMI, 46 (23%) were overweight and 11 (5.5%) were obese.

Fig No.1 Type of physical activity among the subjects



The above figure illustrates the different types of physical activity taken up by the subjects. 48.5% involved in walking while 20.5% involved in running; 14.5% in swimming and 7.5 % in playing outdoor games.

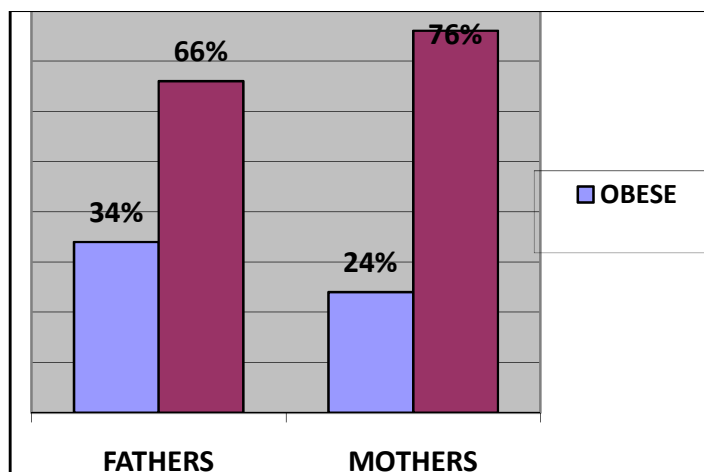
Table No. 3 History of frequent weight gain by age in the study population

Age Groups	History of Weight gain		Chi- Square Significance
	Yes	No	
18-21 yrs	18.8%	81.3%	P=0.78
22-26 yrs	21.1%	78.9%	

Table No.3 depicts the history of frequent weight gain irrespective of their current weight status in the study population according to age groups. It was observed that older

subjects(22-26yrs) had a higher weight gain(21.1%) compared to younger subjects(18.8%).

Fig No.2: Comparison of percent obesity of subjects' parents



The comparison of results of percent obesity of the subjects fathers and mothers revealed that there was a higher incidence of obesity among fathers (34%) than mothers (24%) of the subjects. Whereas 76% of the mothers were found to be non-

obese and that of the fathers was 66%. These results displayed a high significance level of 0.007.

Table No.4 Dietary Profile and BMI in Study Population (%)

Variables		BMI Classification	
		Non Obese	Obese
Watching TV	Yes	75.3	24.7
	No	81.8	18.2
Eating Outside	Yes	75.9	24.1
	No	76.5	23.5
Frequency of Eating Outside	Once	80.0	20.0
	Twice	76.0	24.0
	More	69.2	30.8
Frequency of skipping meals	Daily	100.0	.0
	Weekly	81.2	18.8
	Rarely	67.7	32.3
Frequency of Snacking	Once	83.3	16.7
	Twice	78.6	21.4
	More	70.0	30.0

An analysis of the dietary profile of the subjects in comparison with obesity status, Table No.4, indicated that obese subjects had increased frequency of television viewing(24.7%); higher frequency of eating outside(24.1%); less frequency of skipping meals(32.3%); higher frequency of snacking(30%).

While Non-obese subjects were found to have lower rate of television viewing (75.3%), lesser frequency of eating outside (75.9%); lesser frequency of snacking more number of times per week(70%); however no trend was observed in frequency of skipping meals.

Table No.5 Dietary profile and history of weight gain in Study Population (%)

Variables		History of Weight gain	
		Yes	No
Physical Activity	Yes	19.8%	80.2%
	No	14.9%	85.1%
Watching TV	Yes	19.6%	80.4%
	No	12.8%	87.2%
Eating Outside	Yes	18.4%	81.6%
	No	16.7%	83.3%
Frequency of Snacking	Once	16.9%	83.1%
	Twice	18.2%	81.8%
	More	19.2%	80.8%
Type of Meal Skipped	Breakfast	17.4%	82.6%
	Lunch	19.2%	80.8%
	Dinner	16.7%	83.3%
Frequency of skipping Meal	Daily	20.0%	80.0%
	Weekly	13.3%	86.7%
	Rarely	19.0%	81.0%
Father Obesity	Yes	25.0%	75.0%
	No	15.8%	84.2%
	Yes	22.1%	77.9%
Mother Obesity	No	15.9%	84.1%

Cross tabulation results of history of weight gain among the subjects with different life style factors (TableNo.5) revealed a direct correlation between weight and negative lifestyle behaviors such as less television viewing(19.6% reported weight gain),higher frequency of snacking (19.2% weight gain), higher frequency of meal skipping(20% weight gain),

hereditary obesity(25% and 22% respectively for maternal and paternal history of obesity). However, no correlation could be established between indulgence in physical activity and history of weight gain.

Table No. 6: Prevalence of obesity by meal patterns in the study population

Variables		BMI Classification (%)				Chi- Square Significance (*sig P<0.05)
		Underweight	Normal Weight	Over weight	Obese	
Meal Skipped	Breakfast	8.2%	58.8%	25.9%	7.1%	P=0.026*
	Lunch	9.0%	66.7%	19.2%	5.1%	
	Dinner	13.9%	58.3%	25.0%	2.8%	
Freq skip meals	Daily	8.2%	71.4%	16.3%	4.1%	P=0.796
	Weekly	6.7%	62.2%	24.4%	6.7%	
	Rarely	11.4%	57.1%	25.7%	5.7%	
Freq snack	Daily Once	10.0%	52.9%	30.0%	7.1%	P=0.05*
	Daily Twice	6.5%	71.4%	16.9%	5.2%	
	More than thrice Daily	13.5%	59.6%	23.1%	3.8%	

Cross tabulation results of prevalence of obesity with different meal pattern did not indicate a direct correlation between

skipping meals or higher frequency of snacking, and were not statistically significant.

Table No.7: Prevalence of obesity by genetics, physical and leisure activities in the study population

Variables	BMI Classification (%)				Chi- Square Significance (*sig P<0.05)
	Underweight	Normal Weight	Over weight	Obese	
History of obesity - Father	Yes	0.00	66.67	28.57	P=0.670
	No	11.39	54.43	26.58	
History of obesity - Mother	Yes	9.38	50.00	25.00	P=0.166
	No	8.82	60.29	27.94	
Exercise	Yes	9.30	55.81	30.23	P=0.284
	No	8.11	62.16	29.73	
Watching TV	Yes	7.81	57.81	28.12	P=0.913
	No	11.11	55.56	25.00	

Table No.7 presents the distribution of BMI groups in the study population according to genetics and exercise patterns. The trend indicates genetics of mother being obese can have a positive impact on the weight status of the present subjects; however the differences were statistically not significant. There were no statistical differences for exercise behaviours with BMI groups.

Discussion

Body mass index (BMI) is a commonly used anthropometric measurement to estimate the level of nutritional indices (underweight/overweight) of adolescents and adults.

Obesity is currently the major public health concern. Lifestyle changes across the world primarily in dietary habits and physical activity patterns were linked with this epidemic of obesity. However, easy solutions are unlikely given the complex interactions of lifestyle factors in the etiology of the obesity. Prevention, especially from younger ages onwards, is always the effective strategy to combat the consequences of obesity in communities.

The present study indicates the prevalence of overweight and obesity in the university students as 34 %. These results are in acceptance with previous studies done on university students from Saudi Arabia . A more recent study on Saudi female university students reported an overweight of 31.4% and obesity of 16.5% [18]. The Kingdom's National Nutrition Survey indicated the changing dietary preferences of the Saudi population towards eating non-nutritional and high calorie snacks like fried foods and carbonated drinks commonly in day to day life[8]. These changes reflect the shifting socio-environmental conditions of increasing sedentary lifestyle and fast food culture which can predispose young adults to obesity.

Higher trend has been identified with advancing of age with the history of frequent changes in weight which can be an indicator of dieting practice in the study population.

The reason could be exercise behavior is not fully explored and only was checked whether they have a habit or not. Future research should include questions related to intensity and duration of physical exercise which can throw more light on this relationship.

Breakfast skipping behavior has shown significant association with high obesity prevalence. Findings of the current study also suggest habit of frequent snacking behavior inverse association with BMI. A recent study[19], also indicated similar relationship for snacking with BMI proving positive effect of nibbling behavior in avoidance of obesity. Higher trend of skipping of meals had a direct correlation with increased frequency of snacking among the subjects. It can be attributed to the idea that young girls who avoid timely food intake also avoid snacking possibly due to weight and body image issues and probable eating disorders.

This suggested that though obese subjects did not skip meals or snacked as frequently as compared to other categories of BMI, which are supposedly good nutritional behaviours, probably indicated that genetic factors had a stronger role to play for higher BMI. Khashoggi *et al* suggested a significant relationship between age, social status, daily dietary intakes of energy, fat and carbohydrate as independent variables, with obesity as a dependent variable [20].

Previous researchers recommended that more attention should be given to nutritional education for university students regarding the selection of a balanced diet. Interestingly enough, the present study has shown weight-related beliefs and attitudes at the two ends of the spectrum – a tolerance of obesity at one end and an exaggerated concern for its occurrence at the other.

Conclusion

In summary, our findings were consistent with previous studies indicating a high prevalence of overweight and obesity defined on the basis of BMI among female university students in KSA. The study findings emphasize the need to reduce the epidemic of obesity and safeguard the future health of young people and adults in Saudi Arabia.

Conflict of interest statement

We declare that we have no conflict of interest.

References

1. Al Shammari SA. Help seeking behavior of adults with health problems in Saudi Arabia. *Fm Pract Res J.* 1992; 12: 75-82.
2. Al Qauhiz NM. Obesity among Saudi Female University Students: Dietary Habits and Health Behaviors. *J Egypt Public Health Assoc* 2010; 85: 45-59.
3. Al-Nozha MM et al. Obesity in Saudi Arabia. *Saudi Med J* 2005, 26, 824-29
4. Madani KA et al 1`The state of nutrition in Saudi Arabia. *Nutrition and Health* 2000;14:17-31.
5. Abahussain NA et al. Nutritional status of adolescent girls in the eastern province of Saudi Arabia. *Nutr Health* 1999;13:171-7.
6. Al Shammari SA. Help seeking 72ehaviour of adults with health problems in Saudi Arabia. *Fm Pract Res J.* 1992; 12: 75-82.
7. Al Qauhiz NM. Obesity among Saudi Female University Students: Dietary Habits and Health Behaviors. *J Egypt Public Health Assoc* 2010; 85: 45-59.
8. Huang TT, Harris KJ, Lee RE, Nazir N, Born W, Kaur H. Assessing overweight, obesity, diet and physical activity in college students. *J Am Coll Health* 2003; 52: 83-86.
9. Ogbeide DO, Karim A. The prevalence of overweight and obesity and its correlation with chronic diseases in Al-Kharj adult outpatients Saudi Arabia. *Saudi Med J.* 1996;17:327–332.
10. Al-Nuaim AR. Population based epidemiological study of the prevalence of overweight and obesity in Saudi Arabia. Regional Variation. *Ann Saudi Med.* 1997;17:195–9.
11. Al-Isa AN. Changes in Body Mass Index and prevalence of obesity among Adult Kuwaiti Women attending Health Clinics. *Ann Saudi Med.* 1997;17:307–11.
12. Musaiger AO. Nutritional disorders associated with affluence in Bahrain. *Family Practice.* 1990;7:9–13
13. Waist Circumference and Waist-Hip Ratio. Report of a WHO Expert Consultation, Geneva, 8–11, Dec, 2008 http://whqlibdoc.who.int/publications/2011/9789241501491_eng.pdf Accessed on 18th, January, 2012.
14. Mei Z, Grummer-Strawn LM, Pietrobelli A, Goulding A, Goran MI, Dietz WH. Validity of body mass index compared with other body-composition screening indexes for the assessment of body fatness in children and adolescents. *American Journal of Clinical Nutrition* 2002;75:97–985.
15. Garrow JS and Webster J. Quetelet's index (W/H²) as a measure of fatness. *International Journal of Obesity* 1985;9:147–153
16. World Health Organization. Physical status: The use and interpretation of anthropometry. Geneva, Switzerland: World Health Organization 1995. WHO Technical Report Series.
17. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults
18. Prentice AM and Jebb SA. Beyond Body Mass Index. *Obesity Reviews.* 2001 August; 2(3): 141–7.
19. Gallagher D, et al. How useful is BMI for comparison of body fatness across age, sex and ethnic groups? *American Journal of Epidemiology* 1996;143:228–239.
20. Khashoggi R, Madani K, Ghaznawi H, et al. Socioeconomic factors affecting prevalence of obesity among adult females in Saudi Arabia. *Ecol Food Nut* 1994; (9)31:277-83

Cite this article as: S B Fatima, SB Shamsuddeen, N.E.M Alshammari, F.L.H Alshammari, H.E.M AlShammari. Life style Factors Influencing BMI of Females In Ha'il Region. *Indian J. Pharm. Biol. Res.*2014; 2(2):66-72.

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