

Nutritional Habits and Weight Status among Jazan University Students: Eating Patterns and Healthy lifestyle Assessment

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ABSTRACT

Background: The purpose of this study is to assess the prevalence of underweight, overweight and obesity and to evaluate the nutritional habits and related factors among Jazan University students.

Methods: This cross-sectional study was carried out during the 2014/2015 academic year in Jazan University in Gizan in the southwest of the Kingdom of Saudi Arabia (KSA). A total of 436 students 19–25 years were examined. The questionnaire involved items on eating habits, lifestyle and socio-demographic characteristics; these were completed by the students. Data on weight and height were also collected. The data were analysed using descriptive statistics and a Chi-square test. The differences were considered statistically significant at p -value < 0.05 .

Results: The mean weight for males and females were 67.84 and 54.79 kg, respectively, with significant differences between males and females (p -value < 0.05). The mean BMI for all study participants was reported as 23.31 kg/m² with a significant difference according to gender. About 45% of the students were normal weight; the rate of underweight and obesity among students was very high (21.1% and 33.6% respectively). The dietary habits were unhealthy. The regularity of meals was only 16.5% and 20.4% and reported snacking during the day was 83.3% and 95.1% for males and females, respectively.

Conclusion: The results show that the prevalence of overweightness and obesity were very high among the university students. The study shows the need for health education programs to increase student's awareness towards healthy eating and lifestyle changes.

Key words: Body mass index, Cross-sectional study, underweight, overweight, Jazan

INTRODUCTION

It is well known that what a person eats has a profound effect on his/her health. The human choice of foods is a complex process involving a multiplicity of

influencing factors such as socioeconomic factors, cultural effects, access to and availability of food as well as education and a person's age [1,2]

Maintaining a healthy weight is an important way to make sure that the person will stay in good health and

reduce the likelihood of developing a number of long-term health problems. Being overweight or obese increases the risk of developing health problems including coronary heart disease, stroke, type 2 diabetes, osteoarthritis and some types of cancer [3-6]. On the other hand, being underweight is associated with increased mortality relative to the normal weight category [3,7].

The literature suggests that admission to the university is a new stage of life for students that is generally associated with independence, social activities, changes in lifestyle and behavior including changes in nutritional habits [8,9]. The nutritional habits of university students is affected by a complex web of factors involving exposure to more stress that can lead to increased or decreased food intake as well as spending more time on studying with less physical activity—especially for medical students. This can cause dependence on fast food with less nutritional value and rich in fat and sugar. Prolonged travel time including simply sitting or spending a long time in vehicles during trips to and from colleges are also important factors affecting the nutritional status of university students [10].

Many domestic and international studies have assessed the nutritional habits and weight status among university students [10-18], but until now there is no study conducted in the Jazan region in southwest Saudi Arabia. The main objective of this study was to assess the nutritional habits, weight status and associated factors among Jazan university students.

METHODS

Study design and place

This was an observational cross-sectional study conducted in Jazan University. Jazan University is a leading educational institution in Jazan region, which is located in southwest Saudi Arabia. The university was established in 2006 and is now populated by more than 50,000 students. It has 18 colleges and four research centers. All students in this study had registered for the academic year 2014/2015 and were 19 – 25 years old.

Sampling

The sample size for this study was calculated to be 450 students based on a sample size formula for cross-sectional study design [19]. Parameters used for sample size estimates: P=50%, 95% Confidence Interval (C.I.), error below 5% and a non-response rate of 10%. The sampling design was stratified random sampling where university faculties were divided into three groups—clinical, scientific and other colleges. Two colleges were randomly selected from each stratum. The selected colleges were the college of Medicine and Applied Medical Sciences College. These represent the

clinical sections. Two scientific colleges were selected to represent the scientific sector. The colleges of Engineering and Arts represented the other sectors of the university. The final sample size was distributed among the selected colleges proportionate to the actual student's size in the different colleges. Systematic random sampling was used for selecting students from each selected college.

Data collection

A standardised self-administered questionnaire was used for data collection. The questionnaire was designed after consulting a number of previous studies conducted in the same domain [12-15,18]. The final questionnaire contained approximately 40 multiple-choice questions. The questions include social and demographic information, dietary (food) habits and physical activity. Other information included anthropometric data, measurements, nutritional habits as well as student weight and height. Height and weight were measured using standardised instruments and the work was conducted by the study team.

Statistical analysis

To ensure the quality of the data collection stage, the fieldwork supervisor reviewed the questionnaires daily. Any errors or inconsistencies were reviewed and corrected immediately. At the data entry stage, data were reviewed for errors and entered into an excel database by the study team. The SPSS version 20 (SPSS Inc, Chicago, IL, USA) was used for data analysis. Statistical analysis involved descriptive statistics as well as inferential statistics. Descriptive statistics included simple tabulation, frequencies and proportion for categorical variables including cross-tabulations. Data on underweight and overweight students as well as differences in nutritional habits and other categorical variables were compared for significance using the Chi Square test. The Yates correction term was also used to ensure the accuracy of the Chi Square test. P-value less than 0.05 was used to indicate statistical significance. The Body Mass Index (BMI) was categorised according to World Health Organization (WHO). These guidelines suggest that individuals with (BMI < 16.0 kg/m²) are severely underweight, (BMI = 16.0-18.4 kg/m²) as underweight, (BMI = 18.5-24.9 kg/m²) as normal weight, (BMI = 25.0-30.0 kg/m²) as overweight, and (BMI ≥ 30.0 kg/m²) as obese [20].

Ethical aspects

Ethical approval for the current study was obtained from the college of Medicine, Jazan University. Participants

were told that they have the right to not participate in the study or to withdraw from the study if they wish at any time. The participant's privacy was respected and data were kept confidentially and utilised for study purposes only. Participants were asked to read and sign a consent form. This was before the start of data collection.

RESULTS

The response rate was 96.9% (436 out of 450) students. Table 1 provides background characteristics of the study participants including age, college name, marital status, etc. The table showed that most students (61.0%) were 22-24 years old, 83.4% were single and 60.5% live in urban areas with 39.5% in rural areas. Their academic grades ranged from 3-4 with 45.7% in the three different colleges. The mean weight for males and females were 67.84 and 54.79 kg, with significant differences between males and females (P -value <0.05). The mean BMI for all study participants was 23.31 kg/m^2 also with a significant difference between males and females (Table 1).

Figure 1 illustrates the prevalence of overweight, underweight and normal weight among the students. According to this graph, 45% were normal weight and 21% were underweight [95% C.I. 17.1%-24.7%]; 34% were overweight [95% C.I. 28.9%-37.7%]. Severe underweight students accounted for 5% and obese students were 14% of the cohort (Figure 1).

Table 2 compares weight status between males and females students and across faculties. There is a significant difference in the weight status between males and females. The men are more likely to be obese and women were more likely to be underweight. A comparison of these indicators across faculties showed no significant difference between males and females (Table 2).

Table 3 compares the nutritional habits between male and female students and across university colleges. The

results showed that males consumed energy drinks more than females and females use snacks more than males. The results showed that there is no significant difference between colleges regarding nutritional habits. Moreover, the results showed a high per cent in the consumption of soft drinks. There is little meal regulatory with many reports of fast food and snacks (Table 3).

Table 4 shows changes in the nutritional patterns and weight status after entry to the university—the results showed that 80.2% of students reported changes in their nutrition habits (8.6% improved, 71.6% worsened). Also, almost 86.2% of students reported changes in their weight (30.5% decrease, 55.7% increase) (Table 4).

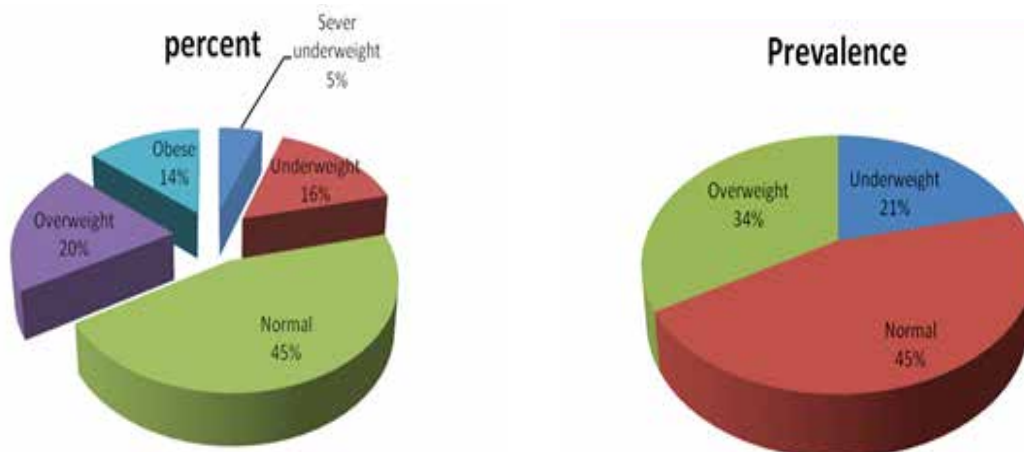
DISCUSSION

The aim of this study was to assess nutritional habits, weight status and related conditions among Jazan university students. The study provides new data on this important aspect of students' life. No similar study has been conducted in this region. It is well documented that being underweight or obese can lead to increased mortality [3,7].

The chance of admission to higher education is an outstanding opportunity for students and is usually associated with psychosocial development in young students where new behavior patterns are adopted [8]. The period of undergraduate study usually represents the first occasion for students to begin taking responsibility for their own eating behavior and behave independently regarding his/her personal affairs [9].

Our results showed that the prevalence of normal weight was 45%—21% were underweight and 34% were overweight. The rate of underweight is considered very high versus international studies [12,13]. The prevalence of being overweight is similar to national studies conducted in KSA [11,21], but higher than many international studies

FIGURE 1. Prevalence of the overweight, underweight and normal students.



conducted in Turkey and Serbia [16,17].

When using female BMI values, 25.5% were underweight and 15.6% were overweight. This rate of underweight is high versus international and national studies conducted among university female students [9, 21].

Regarding nutritional habits, the percentage of students consuming fast food was 29.6% for males and 20.5% for

females—this pattern is similar to other international studies [22, 23]. Also there is a high rate of consumption of energy drinks (55.6% and 35.5%) in men and in women, respectively—this is similar to other studies in KSA [24] and other Arabian countries [25].

One potential limitations of this study is that it was based on a cross-sectional survey design. The direction of

TABLE 1. Background characteristics of study population.

CHARACTERISTICS	GENDER		TOTAL
	FEMALE	MALE	
Age			
19-21	103(46.8)	59(27.3)	162(37.2)
22-24	112(50.9)	154(71.3)	266(61.0)
25-27	5(2.3)	3(1.4)	8(1.8)
Colleges			
Medical Colleges	80(35.7)	74(34.3)	154(35.0)
Sciences colleges	74(33.0)	71(32.9)	145(33.0)
Other Colleges	70(31.3)	71(32.9)	141(32.0)
Marital Status			
Single	160(71.4)	207(95.8)	367(83.4)
Married	58(25.9)	7(3.2)	65(14.8)
Divorced	5(2.2)	2(0.9)	7(1.6)
Mode of Living			
Urban	159(71.0)	107(49.5)	266(60.5)
Rural	65(29.0)	109(50.5)	174(39.5)
Grade Points Average (GPA)			
4.5 -5	25(11.4)	16(7.6)	41(9.5)
4-4.5	49(22.3)	27(12.8)	76(17.6)
3.5 - 4	56(25.5)	48(22.7)	104(24.1)
3 -3.5	44(20.0)	49(23.2)	93(21.6)
Less than 3	46(20.9)	71(33.6)	117(27.1)
Anthropometric variables (Mean ± SD), Median			
Weight (kg)	(67.84±17.1), 65	(54.79±14.5), 52	(61.20±17.2), 57*
Height (cm)	(168.31±7.6), 168	(154.89±5.9), 155	(161.48±9.5), 160*
BMI (kg/m ²)	(23.86± 5.4), 23	(22.78±5.7), 22	(23.31±5.6), 22.5*

*P*value < 0.05

TABLE 2. Weight status according to students' gender and college.

BMI _CATEGORY	GENDER		p-value	COLLEGES			p-value
	MALES	FEMALES		MEDICAL	SCIENCES	OTHER	
Severe underweight	4(1.9)	19(8.5)	0.04	6(3.9)	8(5.5)	9(6.4)	0.914
Underweight	32(14.8)	38(17.0)		25(16.2)	24(16.6)	21(14.9)	
Normal	99(45.8)	100(44.6)		65(42.2)	65(44.8)	69(48.9)	
Overweight	53(24.5)	35(15.6)		34(22.1)	28(19.3)	26(18.4)	
Obese	28(13.0)	32(14.3)		24(15.6)	20(13.8)	16(11.3)	

TABLE 3. Nutritional status of study participants according to gender and college.

	GENDER		p-value	COLLEGE			p-value
	MALE	FEMALE		MEDICAL	SCIENCES	OTHER COLLEGES	
Regularity of meals							
Yes	44(20.4)	37(16.5)	0.297	28(18.2)	28(19.3)	25(17.7)	0.939
No	172(79.2)	187(83.5)		126(81.8)	117(80.7)	116(82.3)	
Soft drink							
Yes	191(88.4)	188(83.9)	0.172	131(85.1)	125(86.2)	123(87.2)	0.865
No	25(11.6)	36(16.1)		23(14.9)	20(13.8)	18(12.8)	
Fruits/ per day							
One or less	170(78.7)	172(76.8)	0.403	126(81.8)	113(77.9)	103(73.0)	0.735
1-3	38(17.6)	44(19.6)		24(15.6)	26(17.9)	32(22.7)	
4-6	7(3.2)	4(1.8)		3(1.9)	4(2.8)	4(2.8)	
7 or more	1(0.5)	4(1.8)		1(0.6)	2(1.4)	2(1.4)	
Eating breads and cereals							
One or less	23(10.6)	26(11.6)	0.191	19(12.3)	15(10.3)	15(10.6)	0.038
1-3	49(22.7)	61(27.2)		31(20.1)	44(30.3)	35(24.8)	
4-6	75(34.7)	56(25.0)		37(24.0)	40(27.6)	54(38.3)	
7 or more	67(30.0)	81(36.2)		66(42.9)	45(31.0)	37(26.2)	
Eating breakfast							
Always	32(14.8)	30(13.4)	0.603	18(11.7)	22(15.2)	22(15.6)	0.175
Sometimes	134(62.0)	133(59.4)		89(57.8)	96(66.2)	82(58.2)	
Never	50(23.1)	61(27.2)		47(30.5)	27(18.6)	37(26.2)	
Eating fast food in restaurants							
Always	64(29.6)	46(20.5)	0.086	42(27.3)	42(29.0)	26(18.4)	0.105
Sometimes	141(65.3)	164(73.2)		102(66.2)	93(64.1)	110(78.0)	
Never	11(5.1)	14(6.3)		10(6.5)	10(6.9)	5(3.5)	
Energy drinks							
Yes	120(55.6)	79(35.3)	0.000	61(39.6)	72(49.7)	66(46.8)	0.197
No	96(44.4)	145(64.7)		93(60.4)	73(50.3)	75(53.2)	
Milk/ daily							
One or less	74(34.4)	92(41.3)	0.031	50(32.5)	63(44.1)	53(37.6)	0.301
1-3	93(43.3)	67(30.0)		56(36.4)	52(36.4)	52(36.9)	
4-6	29(13.5)	34(15.2)		27(17.5)	14(9.8)	22(15.6)	
7 or more	19(8.8)	30(13.5)		21(13.6)	14(9.8)	14(9.9)	
Eating snacks							
Yes	180(83.3)	213(95.1)	0.000	134(87.0)	134(92.4)	125(88.7)	0.304
No	36(16.7)	11(4.9)		20(13.0)	11(7.6)	16(11.3)	

TABLE 4. Student's perceptions about their nutritional pattern and weight status after university admission.

Student's Nutritional Pattern	%	Student's weight change after university	%
No change	18.9	No change	13.6
Change to worse	71.6	Increase	55.7
Change to better	8.6	Decrease	30.5

relationships and causal relationships cannot be determined. In addition, the use of a self-administered questionnaire on dietary assessment may produce subjective measurements that are less reliable than objective methods. Finally eating behaviour was investigated as a whole with no possibility to establish specific nutritional risks in these university students. Despite these limitations, the study updated our knowledge about the nutritional status of university students in the Jazan region and highlights the role of health education in improving food consumption patterns in this population.

CONCLUSION

The results of this study showed the importance of promoting healthy nutrition among the college students. It underscores the importance of regular follow-up and training in healthy eating to remove unhealthy nutritional habits. The study emphasised the need for health education programs in nutritional education to increase awareness of healthy lifestyle and healthy eating habits. Better awareness may motivate them to practice healthy lifestyles and recognise the importance of preserving their own health. Finally, the university administration should confirm that appropriate healthy food is available in the college's cafeteria and incorporate courses on healthy lifestyle and nutrition.

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Conflicts of Interest

The authors declare no conflict of interest.

References

- Cheli Vettori J, Covolo N, Savegnago Mialich M, Jordao Junior AA. Nutritional status, weight evolution and eating behavior in university students of health careers in Ribeirao, Preto, Sao Paulo, Brazil. *Nutr Clin Diet Hosp* 2014;34(2):52-62.
- Maciel ES, Sonati JG, Modeneze DM, Vasconcelos JS, Vilarta R. Consumo alimentar, estado nutricional e nível de atividade física em comunidade universitária brasileira. *Rev Nutr* 2012;25(6):707-18.
- Nicklas TA, Baranowski T, Cullen KW, Berenson G. Eating patterns, dietary quality and obesity. *J Am Coll Nutr* 2001;20(6):599-608.
- Bup's health information team, health weight for adults. Available from: <http://www.bupa.co.uk/individuals/health-information/directory/h/healthy-weight>. [Accessed 2014].
- Kopelman P. Health risks associated with overweight and obesity. *Obesity reviews* 2007;8(s1):13-7.
- National Institute of Health, US department of Health and Human Services What Are the Health Risks of Overweight and Obesity? Available from: <http://www.nhlbi.nih.gov/health/health-topics/topics/obe/risks>.
- Tukker A, Visscher T, Picavet H. Overweight and health problems of the lower extremities: Osteoarthritis, pain and disability. *Pub Health Nut* 2009;12(03):359-68.
- Flegal KM, Graubard BI, Williamson DF, Gail MH. Excess deaths associated with underweight, overweight, and obesity. *JAMA* 2005;293(15):1861-7.
- Wagner GA, Andrade AG. Uso de álcool, tabaco e outras drogas entre estudantes universitários brasileiros. *Rev Psiquiatr Clín* 2008;35(1):48-54.
- Costa LDCF, Vasconcelos FDAG. Prevalência e fatores associados ao estado nutricional de universitárias ingressantes em Florianópolis, SC. *Revista Brasileira de Cineantropometria e Desempenho Humano* 2013;15(3).
- Abdel-Megeid FY, Abdelkarem HM, El-Fetouh AM. Unhealthy nutritional habits in university students are a risk factor for cardiovascular diseases. *Saudi Med J* 2011;32(6):621-7.
- Plotnikoff RC, Costigan SA, Williams RL, et al. Effectiveness of interventions targeting physical activity, nutrition and healthy weight for university and college students: A systematic review and meta-analysis. *Int J Behav Nutr Phys Act* 2015;12:45.
- Alam, P. Nutritional status and eating practices among university students in selected universities in Selangor, Malaysia. *Asian J Clin Nut* 2012;4(3):77-87.
- Ganasegeran K, Al-Dubai SA, Qureshi AM, Al-Abed AAA, Aljunid SM. Social and psychological factors affecting eating habits among university students in a Malaysian medical school: A cross-sectional study. *Nutrition J* 2012;11(1):1-7.
- Van den Berg VL, Okeyo AP, Dannhauser A, Nel M. Body weight, eating practices and nutritional knowledge amongst university nursing students, Eastern Cape, South Africa: Original research 2012;4.1
- Gunes FE, Bekiroglu N, Imeryuz N, Agirbasli M. Relation between eating habits and a high body mass index among freshman students: a cross-sectional study. *Journal of the American College of Nutrition* 2012;31(3):167-74.
- Gazibara T, Tepavcevic DBK, Popovic A, Pekmezovic T. Eating habits and body-weights of students of the University of Belgrade, Serbia: A cross-sectional study. *J Health Pop Nut* 2013;31(3):330.

18. Mani G. Assessment of body mass index and its associated nutritional factors among undergraduate medical students in Tamil Nadu, India: A cross-sectional study. *J Pioneering Med Sci* 2014;4(3).
19. Lwanga SK, Lemeshow S. (1991) Sample size determination in health studies: a practical manual Available from: <http://apps.who.int/iris/handle/10665/40062> [Accessed January 2015].
20. World Health Organization. Obesity: Preventing and managing the global epidemic. Report of a WHO Consultation on Obesity. Geneva: WHO/NUT/NCD, 1998.
21. Allam AR, Taha IM, Al-Nozha OM, Sultan IE. Nutritional and health status of medical students at a university in Northwestern Saudi Arabia. *Saudi Med J* 2012;33(12):1296-303.
22. Yilmaz Y, Vural E, Toprak DE, et al. The relationship between medical education and eating habits along with mental condition in medical students. *Erciyes Med J* 2014;36(2):75-81.
23. Ayranci U, Erenoglu N, Son O. Eating habits, lifestyle factors, and body weight status among Turkish private educational institution students. *Nutrition* 2010;26(7): 772-8.
24. Alsunni AA, Badar A. Energy drinks consumption pattern, perceived benefits and associated adverse effects amongst students of University of Dammam, Saudi Arabia. *J Ayub Med Coll Abbottabad* 2011;23(3):3-9.
25. Itany M, Diab B, Rachidi S, et al. Consumption of energy drinks among Lebanese youth: A pilot study on prevalence and side effects. *Int J High Risk Behav Addict* 2014;3(3):e18857.

