

# Eating habits among medical students in a Sudanese medical faculty

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Accepted 22 June, 2015

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## ABSTRACT

Poor nutritional habits and obesity are major public health problems among young adult who experienced transition into university life (18 to 25 years of age) as this time associated with unhealthy lifestyle characteristics. This study aimed to assess the patterns of eating habits among medical students. This is a cross sectional faculty based study was conducted among 180 medical students (66% from the 1<sup>st</sup> grade and 34% from the 5<sup>th</sup> grade) at Alneelain University Faculty of Medicine. The questionnaire was composed of close-ended questions on socio-demography, anthropometry, eating habits and knowledge assessment factors as well as their weight, height, percentage body fat and body mass index were measured. Body mass index (BMI) was used to assess students' weight status. More than half of the students had normal body BMI mean was  $22.5 \pm 3.7$ , and perform exercise (66 and 60% respectively), while the majority of the students had daily breakfast and vegetable intake of at least three times per week (76 and 71% respectively), and less than half of the students had daily water intake more than 2 L, and snack intake at least three times per week (30 and 42% respectively). There was no significant association between eating habits score (mean was  $6.7 \pm 0.96$ ) and socio-demographic variables (except for father occupation), or BMI. Lack of time was the most frequently reported as a barrier from healthy eating and physical activity. In conclusion, the majority of the students have healthy eating habit and most of them have normal body weight. In spite of the presence of educational grade deference related to some aspect of eating habits, the students eating habits score is not influencing by educational grade, and by socio-demographic variables (except for father occupation).

**Keywords:** Eating habits, body mass index, medical students.

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## INTRODUCTION

Poor nutrition and obesity are among the most important health issues facing society today not only in term of health but also health care expenses (Deshpande et al., 2009), diet related diseases including cardiovascular disease, cancer, and stroke are consistently among the top three leading cause of death (Small et al., 2012). Obesity developed an interaction of dietary and other environmental factors with genetic predisposition, and it plays a fundamental role in the development of coronary heart disease, hypertension, and diabetes mellitus (Berenson, 2012). In addition, obese children and adolescents tend to become obese adults (Nemet et al.,

2005), therefore, prevention and treatment of obesity must start during childhood. Nutrition and healthy diet are one of the main WHO and EFSA priorities (Ministry of Agriculture of the Czech Republic, 2010), and they are the basis of health, according to the findings of various scientists; dietary habits determine our health status by 25 to 30% (Škémiené et al., 2007).

Eating habits developed as a complex process influenced by many factors, the societal influence increases with age while the influence of parents and family is well established in the childhood and, to a lesser extent, adolescent (El-Gilany and Elkhawaga, 2012;

Nelson et al., 2008), eating habits has changed hugely over the last few decades, these changes were characterized by a shift in the composition of the diet towards high calorie density diets, initially these problems were limited to a few developed countries and now they are spreading to include even the developing countries (Malik et al., 2013).

Emerging adulthood (18 to 25 years of age) is a critical time during which young people establish independence and adopt lasting health behavior patterns and it is the time associated with unhealthy lifestyle characteristics, increase risk of obesity and chronic diseases (Deshpande et al., 2009; Nelson et al., 2008). The transition to college life often worsens dietary habits among students, as this period during which individuals are for the most part exposed to lack of time and stress which is associated with poor diets and inactivity (Nelson et al., 2008; Rubina et al., 2009). Getting into medical school has an impact on a student's health and quality of life because it requires adaptation and lifestyle changes (Tempski et al., 2012). Most medical students due to the demands of their studies and clinical rotations in the respective wards do not get time to exercise and eat healthier meals (Agha et al., 2011), also stress of university life and medical study load would be factors that negatively influence their diet (Ganasegeran et al., 2012). The medical students considered having a greater knowledge about healthy lifestyle and dietary habits when compared to nonmedical students, but there is no evidence to indicate that this knowledge translates into practices in terms of maintaining good health (Rubina et al., 2009). Healthy dietary habits among medical students are very important as they are future physicians and the students who personally ignore adopting healthy lifestyle are more likely to fail to establish health promotion for their patients (Agha et al., 2011). This study aimed to assess the nutritional knowledge and behavior, and to evaluate the difference between the preclinical and clinical stages of the medical students at Faculty of Medicine, Alneelain University.

## METHODOLOGY

### Study design and sampling

This descriptive cross sectional faculty based study was carried out among 180 medical students (118 from the 1<sup>st</sup> grade and 62 from the 5<sup>th</sup> grade) in Alneelain University, Faculty of Medicine by using stratified sampling technique. An ethical approval was obtained from the Institutional Review Board at Faculty of Medicine, Alneelain University and informed consent was obtained from each student.

### Data collection

We used a self-administered questionnaire composed of 47 questions about demographic data (11 questions), lifestyle factors such as smoking, alcohol intake, exercise, and perceived barriers to physical activity (7 questions), eating habits and barrier to eating a

healthy diet (15 questions), knowledge assessment and source of information (11 questions) and finally BMI (3 questions). The questions on eating habits and knowledge assessment were selected from the previous published studies (Ganasegeran et al., 2012; Roberts and Marvin, 2011). The questionnaire was pre-tested among five students who were not included in the study population to check for errors, and then the necessary modifications were applied.

### Data analysis

The collected data were analyzed using Statistical Package for Social Sciences (SPSS) version 16.00 and excel tables. The BMI was calculated as weight in kilograms divided by height in square meters ( $\text{kg/m}^2$ ). In this study, based on the (CDC) BMI cut-offs for adult (Body Mass Index, 2014), a BMI < 18.5  $\text{kg/m}^2$  was categorized as underweight, 18.5 to 24.9  $\text{kg/m}^2$  as the normal weight, 25.0 to 29.9  $\text{kg/m}^2$  as overweight, and more than 30.00  $\text{kg/m}^2$  as obese. Chi-square ( $\chi^2$ ) statistics were used to examine significant association between variables and P value  $\leq 0.04$  was considered significant, and the odd ratio was also calculated using the SPSS program.

## RESULTS

A total of 118 (65.6 %) first grade, and 62 (34.4%) fifth grade students participated in this study. The majority was female (64.4%), and aged were in the range 16 to 19 years old (61.7%). Most of them were single (98.9%), Sudanese (92.8%), and lived with their parents (63.3%). Regarding the fathers 42% had college education, 30.6% had post graduate education, only 2.2% were illiterate, and most of them were employment (52.8%). Regarding the mothers 41% had college education, 32% had high school education, only 2.2% were illiterate, and 76% were house wife. One third of the students had monthly family income of more than 3000 SDG. Most of the students perform exercise (60.6%), among those who perform exercise, 37.6% exercise once per week, and 62.4% perform walking as exercise. The majority had denied smoking (97.8%) and alcohol consumption (99.4%). Table 1 illustrated the different BMI categories among the study population, while Table 2 demonstrated the eating habits of the 1<sup>st</sup> and 5<sup>th</sup> grade students. Figure 1 showed distribution of eating habits score among students, and Figure 2 demonstrated the barriers that face students to have a healthy eating.

## DISCUSSION

Medical students are target group of many studies of health status as they are future physicians (Kolodinsky et al., 2007), however there is no extensive study done in Sudan among medical students to assess their eating habits.

The current study revealed that the majority of the participants (66.7%) had normal BMI, mean was  $22.57 \pm 3.7$  (this result based on CDC standard weight status

**Table 1.** Body Mass Index (BMI) categories among the study population.

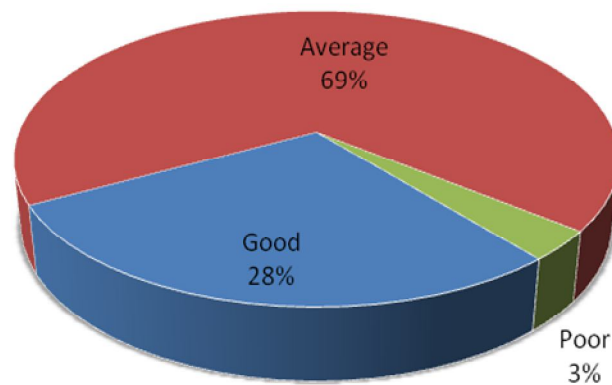
Weight status categories	First grade			Fifth grade			Total		
	n	%	Mean $\pm$ SD	n	%	Mean $\pm$ SD	n	%	Mean $\pm$ SD
Under weight	18	15.3	22.4 $\pm$ 3.8	5	8.1	22.8 $\pm$ 3.7	23	12.8	22.57 $\pm$ 3.7
Normal weight	74	62.7		45	72.6		120	66.7	
Overweight	22	18.6		9	14.5		30	16.7	
Obese	4	3.4		3	4.8		7	3.9	

**Table 2.** Eating habits of the 1<sup>st</sup> and 5<sup>th</sup> grade students.

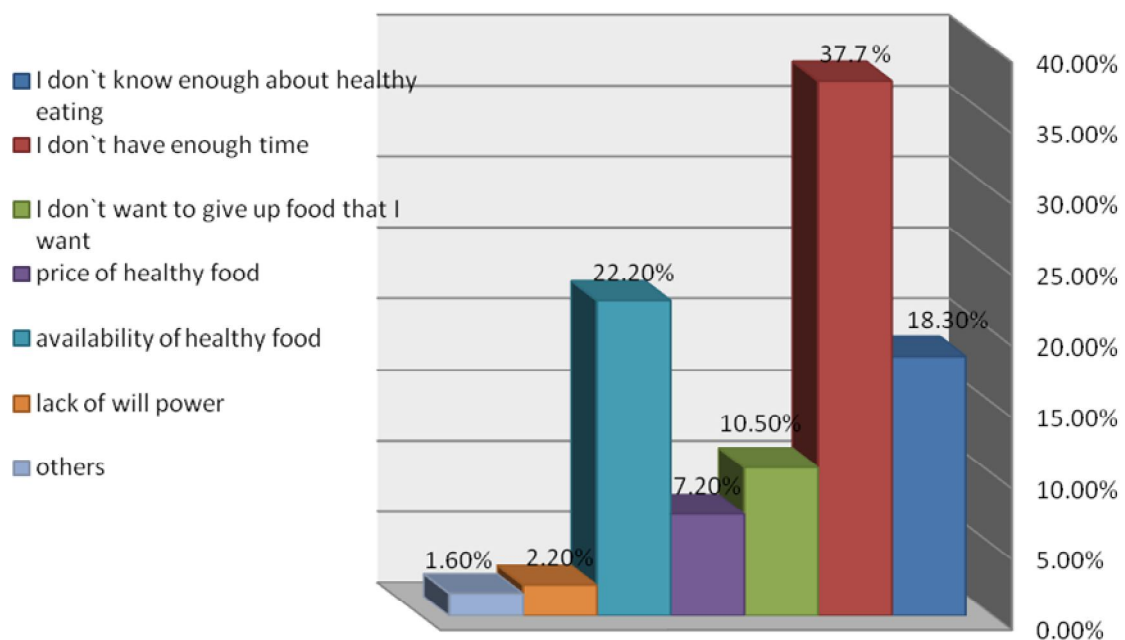
Parameter	First grade		Fifth grade		Total		P value	OR
	N	%	N	%	N	%		
Regularity of meals:								
Yes	67	56.8	34	54.8	101	56.1	0.46	1.08
No	51	43.2	28	45.2	79	43.9		
Daily breakfast:								
Yes	93	78.8	44	71	137	76.1	0.16	1.5
No	25	21.2	18	29	43	23.9		
Daily number of meals								
Less than three times	40	33.9	27	43.5	67	37.2	0.41	0.66
Three times	62	52.5	29	46.8	91	50.6		
More than three times	16	13.6	6	9.7	22	12.2		
Weekly number of snack:								
Less than three times	59	50	44	71	103	57.2	0.02	0.4
Three times	19	16.1	6	9.7	25	13.9		
More than three times	40	33.9	12	19.4	52	28.9		
Weekly consumption of meats:								
Less than three times	60	50.8	23	37.1	83	46.1	0.01	1.7
Three times	27	22.9	9	14.5	36	20		
More than three times	31	26.3	30	48.4	61	33.9		
Weekly consumption of vegetables:								
Less than three times	45	38.1	7	11.3	52	28.9	<0.001	4.8
Three times	35	29.7	11	17.7	46	25.6		
More than three times	38	32.2	44	71	82	45.6		
Weekly consumption of fruits:								
Less than three times	50	42.4	28	45.2	78	43.3	0.35	0.89
Three times	36	30.5	13	21	49	27.2		
More than three times	32	27.1	21	33.9	53	29.4		
Weekly consumption of diary food:								
Less than three times	55	46.6	26	41.9	81	45	0.08	1.2
Three times	40	33.9	15	24.2	55	30.6		
More than three times	23	19.5	21	33.9	44	24.4		
Weekly consumption of fried food:								
Less than three times	61	51.7	24	38.7	85	47.2	0.23	1.6
Three times	31	26.3	19	30.6	50	27.8		
More than three times	26	22	19	30.6	45	25		

**Table 2.** Continues.

Weekly consumption of juice:								
Less than three times	49	41.5	17	27.4	66	36.7		
Three times	23	19.5	14	22.6	37	20.6	0.17	1.8
More than three times	46	39	31	50	77	42.8		
Weekly consumption of soft drink:								
Less than three times	48	40.7	29	46.8	77	42.8		
Three times	19	16.1	8	12.9	27	15	0.70	0.78
More than three times	51	43.2	25	40.3	76	42.2		
Daily water intake:								
<4 cups	21	17.8	6	9.7	27	15		
4-8 cups	57	48.3	42	67.7	99	55	0.04	2.00
>8 cups	40	33.9	14	22.6	54	30		



**Figure 1.** Eating habits score.



**Figure 2.** The barriers that face students to have a healthy eating.

categories) (Body Mass Index, 2014), this finding was higher than Chinese study (mean was  $20.6 \pm 2.2$ ) (Sakamaki et al., 2005), the prevalence of overweight and obesity in our study were 16.7 and 3.9% respectively, this finding was also higher than previous Chinese study (2.5 and 0.4% respectively) (Sakamaki et al., 2005), this high frequency of overweight and obesity may be due to increasing consumption of high calorie diets and shift of lifestyles towards sedentariness, in the developing countries (Malik et al., 2013).

In this study, we found that 60.6% of the students perform exercise this finding was higher than Iranian medical students response (7.1% always exercise and 30% rarely exercise) (Alizadeh and Ghabili, 2008), however it should be noted that exercise intensity was not defined. One of the most important barriers that interfere with exercise performing reported by the students in this study and by Rubina et al. in Pakistan was lack of time (Rubina et al., 2009).

Eating at the same time every day is important because at that time stomach secretes more gastric juice, appetite increases, and the food is rapidly digested (Škémienė et al., 2007), also more frequency of meals intake, associated with lower BMI (Toschke et al., 2005). We found that more than half of the students 56% had regular meals and 62.8% had at least three meals per day, in contrast to study conducted in Malaysian medical school 57.6% of students had regular meals and 40.2% had at least three meals per day (Ganasegeran et al., 2012).

Moreover, regular breakfast is associated with lower prevalence of fatigue which important in medical students due to busy learning schedule (Tanaka et al., 2008), according to our finding 67% of the students had daily breakfast and this finding was higher comparing to Malaysian medical school in which 43.9% had daily breakfast (Ganasegeran et al., 2012).

The frequent consumption of snacks is a recognized aspect of teenage food behavior (Musaiger et al., 2011), however in this study only 42% of the students consumed snacks at least three times per week, and it negatively associated (OR was 0.4, and P was 0.02) with studying in medical field, this finding was in accordance with Malaysian medical school study (42%) consumed snacks at least three times per week (Ganasegeran et al., 2012).

The majority of the students (71%) in this study consumed vegetables at least three times per week, this finding was statistically significant  $P < 0.001$ , and OR was 4.8) with fifth grade students had higher frequency (88.7%), this finding was lower than Malaysian medical school study (81.8%) (Ganasegeran et al., 2012). Previous studies showed that the frequently intake of vegetable associated with low risk of cardiovascular disease and low BMI (Perez, 2002).

Frequent consumption of fried food is associated with high BMI (Taveras et al., 2005), we found that 52.8% of the students in this study consumed fried food at least three times per week, and the frequent consumption of

fried food is positively associated with studying in medical field (OR = 1.6), this finding was lower than Malaysian medical school study (73.5% of the students consumed fried food at least twice per week) (Ganasegeran et al., 2012).

Frequently intake of soft drinks is associated with obesity and type 2 diabetes mellitus (Malik and Hu, 2012) according to this study more than the half (57%) of the students consumed soft drinks at least three times per week, this finding was high in comparing to California State University survey (51.8% of the students consumed soda or other sugared beverages at least few times per week (Small et al., 2012).

Daily water intake varies according to the physical activity and weather, for active adults living in warm environment daily needs is about 6 L (Sawka et al., 2005). 30% of the students in this study drank more than 8 cups of water per day; this finding was lower than Malaysian medical school study (40%) had two or more liters of water (Ganasegeran et al., 2012).

The mean score of the eating habits in this study was 6.7 (SD  $\pm$  .96) which was slightly higher than Malaysian medical school mean score 6.3 (SD  $\pm$  1.8) (Ganasegeran et al., 2012), there was no educational grade difference (P was 0.18), and no association between eating habits score and socio-demographic variables except for father occupation, unlike the Malaysian medical school study in which significant difference reported in age, smoking, and alcohol consumption (Ganasegeran et al., 2012). Medical students have high level of knowledge, yet there is no evidence of convert this knowledge into practice and this is may be due to the lack of time which reported by 37.8% of the students as barrier from healthy eating

## Conclusion

The majority of the students have healthy eating normal body weight. In spite of the presence of deference related to some aspect of eating habits (snack, meats, and vegetable intake and daily water intake), the students eating habits score is not influencing by educational grade, and by socio-demographic variables (except for father occupation). Lack of time due to busy lifestyle seems to be the most important barrier that interferes with healthy eating and physical activity. Nutritional knowledge is recommended in order to be able to give good advices to the patient in the future.

## REFERENCES

- Agha SA, Agha MA, Usman G, Agha Z, 2011. Assesment of the perceptions of health among medical students. *Gomal J Med Sci*, 9(2):219-222.
- Alizadeh M, Ghabili K, 2008. Health related lifestyle among the Iranian medical students. *Res J Biol. Sci*, 3(1):4-9.
- Berenson GS, 2012. Health consequences of obesity. *Pediatr Blood Cancer*. 58(1):117-21.
- Body Mass Index, 2014. About BMI for Adults [Online]. [cited 2014

- May 20]; Available from, URL: <http://m.cdc.gov/en/HealthSafetyTopics/HealthyLiving/HealthyWeight/AssessingYourWeight/BodyMassIndex/AboutBMIAdults>.
- Deshpande S, Basil MD, Basil DZ, 2009.** Factors influencing healthy eating habits among college students: An application of the health belief model. *Health Marketing Quart*, 26(2):145–164.
- El-Gilany A, Elkhawaga G, 2012.** Socioeconomic determinants of eating pattern of adolescent students in Mansoura, Egypt. *Pan Afr Med J*, 13:22-32.
- Ganasegeran K, Al-Dubai SAR, Qureshi AM, Al-abed AAA, Rizal AM, Aljunid SM, 2012.** Social and psychological factors affecting eating habits among university students in a Malaysian medical school: a cross-sectional study. *Nutr J*, 11:48-55.
- Kolodinsky J, Harvey-Berino JR, Berlin L, Johnson RK, Reynolds TW, 2007.** Knowledge of current dietary guidelines and food choice by college students: better eaters have higher knowledge of dietary guidance. *J Am Diet Assoc*, 107(8):1409-1413.
- Malik VS, Hu FB, 2012.** Sweeteners and risk of obesity and type 2 diabetes: The role of sugar-sweetened beverages. *Curr Diab Rep*, 12(2):195-203.
- Malik VS, Willett WC, Hu FB, 2013.** Global obesity: trends, risk factors and policy implications. *Nat Rev Endocrinol*. 9(1):13-27.
- Ministry of Agriculture of the Czech Republic, 2010.** Food Safety and Nutrition Strategy for 2010 – 2013. Prague, January 2010.
- Musaiger AO, Bader Z, Al-Roomi K, D'Souza R, 2011.** Dietary and lifestyle habits amongst adolescents in Bahrain. *Food Nutr Res*, 55:7122.
- Nelson MC, Story M, Larson NI, Neumark-Sztainer D, Lytle LA, 2008.** Emerging adulthood and college-aged youth: An overlooked age for weight-related behavior change. *Obesity*, 16(10):2205–2211.
- Nemet D, Barkan S, Epstein Y, Friedland O, Kowen G, Eliakim A, 2005.** Short- and long-term beneficial effects of a combined dietary-behavioral-physical activity intervention for the treatment of childhood obesity. *Pediatrics*, 115(4):443-449.
- Perez CE, 2002.** Fruit and vegetable consumption. *Health Reports*, 13(3):23-31.
- Roberts K, Marvin K, 2011.** Knowledge and attitudes towards healthy eating and physical activity: what the data tell us. Oxford: National Obesity Observatory.
- Rubina A, Shoukat S, Raza R, Shiekh MM, Rashid Q, Siddique MS, Panju S, Raza H, Chaudhry S, Kadir M, 2009.** Knowledge and practice of healthy lifestyle and dietary habits in medical and non-medical students of Karachi, Pakistan. *J Pak Med Assoc*, 59(9):650–655.
- Sakamaki R, Toyama K, Amamoto R, Liu CJ, Shinfuku N, 2005.** Nutritional knowledge, food habits and health attitude of Chinese university students: a cross sectional study. *Nutr J*, 4(4):1475-1489.
- Sawka MN, Chevront SN, Carter R, 2005.** Human water needs. *Nutrition Review*, 63(6):S30–S39.
- Škėmienė L, Ustinavičienė R, Piešinė L, Radišauskas R, 2007.** Peculiarities of medical students' nutrition. *Medicina (Kaunas)*, 43(2):145-152.
- Small M, Bailey-Davis L, Morgan N, Maggs J, 2012.** Changes in eating and physical activity behaviors across seven semesters of college: living on or off campus matters. *Health Educ Behav*, 40(4):435-41.
- Tanaka M, Mizuno K, Fukuda S, Shigihara Y, Watanabe Y, 2008.** Relationships between dietary habits and the prevalence of fatigue in medical students. *Nutrition*, 24:985–989.
- Taveras EM, Berkey CS, Rifas-Shiman SL, Ludwig DS, Rockett HRH, Field AE, Colditz GA, Gillman MW, 2005.** Association of consumption of fried food away from home with body mass index and diet quality in older children and adolescents. *Pediatrics*, 116(4):518-524.
- Tempski P, Bellodi PL, Paro HBMS, Enns SC, Martins MA, Schraiber LB, 2012.** What do medical students think about their quality of life? A qualitative study. *BMC Med Educ*, 12:106.
- Toschke AM, Küchenhoff H, Koletzko B, Von Kries R, 2005.** Meal frequency and childhood obesity. *Obesity*, 13(11):1932–1938.

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**Citation:** Al-Haj MEA, Awooda HA, Elnimeiri MKM, 2015. Eating habits among medical students in a Sudanese medical faculty. *Int Res J Med Med Sci*, 3(3): 64-69.

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