

Knowledge, attitude, and practices regarding dietary habits among medical and non-medical university students

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ABSTRACT

Background: Medical students even though being aware of the importance of well-balanced nutrition do tend to have laxity in practicing it themselves leading to poor nutrition. The aim of this study was to compare the awareness and knowledge of dietary habits among medical and non-medical students. **Methods:** This cross-sectional study was carried out in two universities in the Jeddah province, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) and King Abdulaziz University (KAU), Jeddah over 6 months. A self-administered online questionnaire was employed to assess the knowledge and attitude of the dietary habits among the students. **Results:** The number of students who responded positively to the survey was 386, the mean age was 21.5 ± 2.10 . 310 (80.3%) of which were males while 76 (19.7%) were females by a ratio of 4.07:1. Most of the participants were single (95.9%); 238 (87.6%) participants lived with their family and 272 (70.5%) participants were in the college of medicine. Among the medical students, 41.9% did exercise "sometimes," 57.4% identified breakfast as an important meal of the day, and 14.7% were smokers. **Conclusion:** In our study, we found that the medical students were having a higher level of awareness about the dietary and lifestyle habits but it was not reflected in their practice which needed to be taken care of.

Keywords: Behavior, diet, lifestyle, medical students, non-medical students

Introduction

In the current advanced times, the rates of diabetes, obesity, and cardiovascular diseases have significantly increased, especially

among developing countries.^[1] With other risk factors associated with such chronic diseases, bad diet and health habits are some of the main causes. Diet is one of the most important factors which serves as a pivotal indicator of the population's health.^[2] According to the Saudi Ministry of Health, the percentage of obese individuals is 28.7% and it is one of the highest worldwide.^[3]

In this context, a consensus is that medical students ought to have better knowledge and awareness about healthy dietary habits and lifestyle, but there is little evidence to support this notion. Usually,

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the translation of knowledge to effective and healthy practice is highly daunting especially in medical students who are known to live a stressful life quite contrary to maintaining good health.^[4,5]

A recent cross-sectional study about the lifestyle and eating preferences of medical students at the University of Dammam was carried out, which reported that despite being medical school students, the percentage of students consuming a large amount of fast food and soft drinks was high. On the other hand, the percentage of medical students who exercise regularly was reported to be low.^[6] The healthy eating habits of medical students are always a major concern because they usually possess more knowledge about the junk diet and its negative effects on health. In another cross-sectional study, among 200 participants, it was reported that most of the medical students were aware of the importance of healthy dietary habits, but they were not practicing it sufficiently in their routine because of the lack of time in their daily routine.^[7] Another study from Pakistan reported that there was no significant difference between medical and non-medical students in the diet and lifestyle habits. They reported that less than half (48.8%) of the students had three meals a day while only 35.6% had two meals, and breakfast was the most commonly missed meal.^[8]

The rate of obesity and college students' eating habits in Saudi Arabia was examined using a cross-sectional study which reported that 21.8% of the students were overweight and 15.7% obese.^[9] Many studies have primarily focused on studying the eating habits among medical students only. However, relatively few studies have focused on studying the eating habits among both medical and non-medical students. Additionally, the rate of different chronic diseases has increased especially among the young population. One of the main causes of this significant increase in some diseases such as diabetes, and cardiovascular diseases, is lifestyle especially eating habits.

Therefore, our main aim of the study was to evaluate whether the knowledge, awareness and attitude of medical of medical students influence their eating habits in comparison to non-medical students and try to identify the factors that lead to bad eating habits among the students.

Methods

Study design, area, and settings

This study was performed over 6 months (December 2019–May 2020) at two different universities—King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) and King Abdulaziz University (KAU) in Jeddah, the Kingdom of Saudi Arabia. The medical students were assigned from both universities whereas non-medical students were assigned from only KAU. This study was conducted in a cross-sectional method. This study was approved by the Institutional Review Board of King Abdullah International Medical Research Centre (KAIMRC), a research wing of KSAU-HS, Jeddah (reference No: SP19/417/J; Dated: 01/10/2019).

Identification of study participants

Inclusion

- Healthy students with no history of chronic and of age not less than 18 years.
- Students willing to participate.

Exclusion

- Students who had health-related problems, e.g. diabetes, hypertension, Crohn's disease.
- Premedical students or first-year non-medical students.

Sample size

The sample size was calculated by using the Raosoft software by the website www.raosoft.com/sample_size.html. The total number of medical and non-medical students in KSAU-HS and KAU in Jeddah whose ages were around 20–23 was roughly estimated to be around 13,800. The required sample size was estimated at 95% CI with an estimated 32.1 prevalence of unhealthy dietary habits leading to overweight students and a margin of error of 5%. The required minimum sample size was determined to be 327.

Data collection process

Medical and non-medical students of KSAU-HS and KAU were given a self-administered, predesigned questionnaire. The questionnaire consisted of three sections. In the first section, demographic information was included to assess the socioeconomic status of the participants. The second section contained questions about diet, exercise, smoking, and sleeping habits. The last section focused on the associated factors that affect dietary habits. The questionnaire was distributed online using Google Forms (questionnaire available on request). None of the identifications were taken from the participants.

Data analysis

The MS Excel program was used to store the survey data, and then, the data were analyzed by the SPSS software. Descriptive statistics (e.g. mean and standard deviation) were used to describe continuous variables while categorical variables were presented in frequencies and percentages. The results of this study were expressed in frequencies and percentages for qualitative variables. For comparing between qualitative and quantitative, Chi-squares and t tests were used. *P* value ≤ 0.05 was kept as statistically significant.

Results

Demographics

The number of students who responded to the survey positively was 386, the mean age was 21.5 ± 2.10 ; 310 (80.3%) were males, while 76 (19.7%) were females in a ratio of 0.24:1. Most of the participants were single (95.9%); a few were divorced (1%); 238 (87.6%) participants lived with their family; 272 (70.5%) participants were in the college of medicine, while the others were in different non-medical colleges. Furthermore, 154 (39.9%)

participants in the college of medicine were from the fourth year. The mean of Body mass index (BMI) that the participants showed is 26.0 ± 5.82 [Table 1].

Diet

The dietary habits among the students were assessed by questions regarding dietary component, whether it was healthy or not. In a question about the importance of having breakfast as a component of their diet, 57.4% of the medical students answered with a Yes. On the other hand, 65% of the non-medical students answered No, which shows a significant difference between the two groups ($P < 0.001$). When asked about vegetable consumption in a week, 34.6% of the medical students said Always in comparison with 25% non-medical students. A question about including meat in the diet (53.7% medical students) and (50% non-medical students) answered with Always, however, 2.2% of the medical students said Never and 10.5% of the non-medical students said Never, which shows a significant difference ($P < 0.038$). On asking about fast food consumption in a week, 53.7% of the medical students said Sometimes in contrast to 42.5% of the non-medical students with the same answer. When asked about the frequency of having soft drinks in a week, 18.4% of the medical students said Always as opposed to 35% of the non-medical students, which shows a significant difference ($P < 0.011$) [Table 2].

Exercising

Regarding exercise, the medical and non-medical students found some time to exercise as 41.9% of the medical

students and 47.5% of the non-medical students answered with “Sometimes” to the question “Do you exercise?” When asked about the sports activities that the students often participate in, aerobics was the most chosen by both the medical students (43.7%) and non-medical students (56.3%), followed by ball sports. Also, 39% of the medical students and 55% of the non-medical students answered Sometimes to whether they find time for exercising. The final question regarding exercising in the questionnaire was about the total time spent daily on walking, and 10–20 min was the most chosen answer—39% by the medical students and 47% by the non-medical students [Table 3].

Sleeping habits

As for the sleeping habits of the students, they were asked a number of questions. Among them was at what time they went to bed. It was found that the majority of the students (42%) went to bed between 11 pm and 12 am, 45.6% being medical students compared to 30% non-medical students, thus, showing a significant difference between the two groups ($P < 0.011$). When asked whether they go to bed on time every day, 54.5% of the students answered “Sometimes” with the medical students being 57.4% compared to 45% non-medical students. resulting in a large difference between the two groups of students ($P < 0.014$). And in a question on how many hours do they sleep daily, 56.3% of the students answered that they slept 4–6 h daily, with the medical students equaling 57.4% compared to 52.4% in non-medical students [Table 4].

Smoking habits

The study revealed that 60 out of 352 (17%) of the medical and non-medical students were smokers, where 14.7% of the medical students and 25% of the non-medical students were smokers. In a question about sitting with smokers, 44.1% of the medical students answered Yes while 40% of the non-medical students answered No. On the basis of daily cigarette consumption, smokers were defined as follows: smoking (<3 cigarettes/day); (3–10 cigarettes/day); (1 pack or more/day). Of the 352 students who answered the question, 36.7% smoked up to 3 cigarettes daily, 30% smoked from 3 to 10 cigarettes daily, and 33.3% smoked 1 pack or more. On the duration of smoking, 13.8% of the smokers started smoking in less than a year, 17.2% from 1–2 years, and 69% for more than 2 years. When asked about the main reason for smoking, 43.3% of the smokers smoked because of stress, 26.7% because of friends, 16.7% because of self-esteem, and 6.7% because of relatives. When asked about the awareness of the bad effects of smoking on health, 100% of the medical students answered Yes, while 80% of the non-medical students answered No showing a significant difference between the two groups. Furthermore, when asked about experiencing the bad effects of smoking, 70% of the medical students had experienced these effects while only 11.1% of the non-medical students experienced the effects. Of the medical students, 85% expressed willingness to quit smoking, as did 70% of the non-medical students [Table 5].

Table 1: Demographic characteristic of the participants

Variables	n	Mean	Std. Dev
Age	386	21.5	2.10
BMI	386	26.0	5.82
		n	%
Gender	Male	310	80.3
	Female	76	19.7
	Total	386	100
Marital status	Single	370	97.9
	Married	8	2.1
	Total	378	100
Do you live with your family?	Yes	338	87.6
	No	48	12.4
	Total	386	100
Which college are you in?	College of Medicine	272	77.3
	Others	80	22.7
	Total	352	100
In which academic year?	First year	24	6.2
	Second year	68	17.6
	Third year	94	24.4
	Fourth year	154	39.9
	Fifth year	22	5.7
	Sixth year	24	6.2
	Total	386	100
Do you have any chronic diseases?	No	358	92.7
	Yes	28	7.3
	Total	386	100

Table 2: Comparisons of answers between students of medical and other colleges for diet related questions

Diet		College of Medicine n (%)	Other colleges n (%)	Total	P
How many meals does your daily diet contain?	1 meal	14 (5.1)	4 (5)	18 (5.1)	0.640*
	2 meals	114 (41.9)	36 (45)	150 (42.6)	
	3 meals	118 (43.4)	36 (45)	154 (43.8)	
	>3 meals	26 (9.6)	4 (5)	30 (8.5)	
	Total	272	80	352	
Is breakfast an important component in your diet?	No	116 (42.6)	52 (65)	168 (47.7)	<0.001*
	Yes	156 (57.4)	28 (35)	184 (52.3)	
	Total	272	80	352	
How often do you have snacks between meals (chips, chocolate, sweets)?	Never	30 (11)	6 (7.5)	36 (10.2)	0.780*
	Rarely	60 (22.1)	20 (25)	80 (22.7)	
	Sometimes	124 (45.6)	38 (47.5)	162 (46)	
	Always	58 (21.3)	16 (20)	74 (21)	
	Total	272	80	352	
How often do you have stimulants (tea, coffee) in a week?	Never	40 (14.8)	12 (15)	52 (14.9)	0.185*
	Rarely	16 (5.9)	10 (12.5)	26 (7.4)	
	Sometimes	74 (27.4)	24 (30)	98 (28)	
	Always	140 (51.9)	34 (42.5)	174 (49.7)	
	Total	270	80	350	
How many cups of milk do you have in a week?	Never	64 (23.7)	20 (25)	84 (24)	0.086*
	Rarely	62 (23)	24 (30)	86 (24.6)	
	Sometimes	102 (37.8)	32 (40)	134 (38.3)	
	Always	42 (15.6)	4 (5)	46 (13.1)	
	Total	270	80	350	
How many fish meals does your diet contain in a week?	Never	24 (8.8)	14 (17.5)	38 (10.8)	0.134*
	Rarely	76 (27.9)	20 (25)	96 (27.3)	
	Sometimes	140 (51.5)	40 (50)	180 (51.1)	
	Always	32 (11.8)	6 (7.5)	38 (10.8)	
	Total	272	80	352	
How often do you have vegetables in a week?	Never	12 (4.4)	10 (12.5)	22 (6.3)	0.038*
	Rarely	38 (14)	10 (12.5)	48 (13.6)	
	Sometimes	128 (47.1)	40 (50)	168 (47.7)	
	Always	94 (34.6)	20 (25)	114 (32.4)	
	Total	272	80	352	
How often do you have meat in a week?	Never	6 (2.2)	8 (10.5)	14 (4.1)	0.021**
	Rarely	6 (2.2)	2 (2.6)	8 (2.3)	
	Sometimes	112 (41.8)	28 (36.8)	140 (40.7)	
	Always	144 (53.7)	38 (50)	182 (52.9)	
	Total	268	76	344	
How often do you have fast food in a week?	Never	12 (4.4)	10 (12.5)	22 (6.3)	<0.001*
	Rarely	54 (19.9)	6 (7.5)	60 (17)	
	Sometimes	146 (53.7)	34 (42.5)	180 (51.1)	
	Always	60 (22.1)	30 (37.5)	90 (25.6)	
	Total	272	80	352	

Discussion

This study was aimed to gauge the knowledge, attitude, and practice of the medical students in comparison to non-medical ones in their dietary and lifestyle habits in the western region of the Kingdom of Saudi Arabia. We found some intriguing and unique findings which have been discussed here.

Diet

The results showed some similarities between the two groups but there were some differences also. The medical students had

an upper hand in comparison to the non-medical students when it came to considering breakfast as an important meal, which shows that the medical students had a better idea regarding the importance of a healthy breakfast. Furthermore, the results showed that the medical students had more vegetables and meat components in their diet than the non-medical students which indicated that the medical students knew about the benefits of a balanced diet. However, going through the results about the consumption of fast food, the medical students had a higher percentage than the non-medical students. Overall, the medical students were eating more than the non-medical students, whether it was a healthy dietary component or not.

Table 3: Comparisons of answers between students of medical and other colleges for exercise related questions

Exercise		College of Medicine, n (%)	Other colleges n (%)	Total	P
Do you exercise?	Never	34 (12.5)	10 (12.5)	44 (12.5)	0.780*
	Rarely	64 (23.5)	18 (22.5)	82 (23.3)	
	Sometimes	114 (41.9)	38 (47.5)	152 (43.2)	
	Always	60 (22.1)	14 (17.5)	74 (21)	
	Total	272	80	352	
Which of these sport activities do you often participate in?	Aerobics	118 (43.7)	45 (56.3)	163 (46.6)	0.025**
	Ball sports	58 (21.5)	23 (28.8)	81 (23.1)	
	Aerobics+Yoga	8 (3)	0 (0)	8 (2.3)	
	Aerobics+Ball sports	28 (10.4)	8 (10)	36 (10.3)	
	Resistance training and others	48 (17.8)	4 (5)	52 (14.9)	
	Martial arts and others	4 (1.5)	0 (0)	4 (1.1)	
	Walking and others	4 (1.5)	0 (0)	4 (1.1)	
	None	2 (.7)	0 (0)	2 (.6)	
Total	270	80	350		
Do you find the time for exercising?	Never	40 (14.7)	8 (10)	48 (13.6)	0.087*
	Rarely	74 (27.2)	16 (20)	90 (25.6)	
	Sometimes	106 (39)	44 (55)	150 (42.6)	
	Always	52 (19.1)	12 (15)	64 (18.2)	
	Total	272	80	352	
What is the total time that you spend in walking daily?	Nothing	60 (22.1)	4 (5)	64 (18.2)	0.007*
	10-20 min	106 (39)	38 (47.5)	144 (40.9)	
	30-40 min	82 (30.1)	30 (37.5)	112 (31.8)	
	>50 min	24 (8.8)	8 (10)	32 (9.1)	
	Total	272	80	352	

Table 4: Comparisons of answers between students of medical and other colleges for sleeping habit questions

Sleeping Habit		College of Medicine n (%)	Other colleges n (%)	Total	P
What time do you go to bed?	8-10 pm	32 (11.8)	6 (7.5)	38 (10.8)	0.011*
	11 pm-12 am	124 (45.6)	24 (30)	148 (42)	
	1-3 am	104 (38.2)	42 (52.5)	146 (41.5)	
	After 3 am	12 (4.4)	8 (10)	20 (5.7)	
	Total	272	80	352	
Do you go to bed on time every day?	Never	34 (12.5)	12 (15)	46 (13.1)	0.014*
	Rarely	26 (9.6)	18 (22.5)	44 (12.5)	
	Sometimes	156 (57.4)	36 (45)	192 (54.5)	
	Always	56 (20.6)	14 (17.5)	70 (19.9)	
	Total	272	80	352	
How many hours you sleep daily?	4-6 h	156 (57.4)	42 (52.5)	198 (56.3)	0.002*
	7-8 h	108 (39.7)	28 (35)	136 (38.6)	
	9-10 h	8 (2.9)	6 (7.5)	14 (4)	
	>10 h	0 (0)	4 (5)	4 (1.1)	
	Total	272	80	352	
Do you think your sleep duration is enough?	No	152 (55.9)	52 (65)	204 (58)	0.146*
	Yes	120 (44.1)	28 (35)	148 (42)	
	Total	272	80	352	
Do you take a nap during daytime?	Never	56 (20.6)	14 (17.5)	70 (19.9)	0.068*
	Rarely	42 (15.4)	22 (27.5)	64 (18.2)	
	Sometimes	120 (44.1)	34 (42.5)	154 (43.8)	
	Always	54 (19.9)	10 (12.5)	64 (18.2)	
	Total	272	80	352	
Do you find a relationship between your sleep duration and your energy during the next day?	No	34 (12.5)	12 (15)	46 (13.1)	0.560*
	Yes	238 (87.5)	68 (85)	306 (86.9)	
	Total	272	80	352	

Table 5: Comparisons of answers between students of medical and other colleges for smoking related questions

Smoking		College of Medicine, n (%)	Other colleges n (%)	Total	P
Are you a smoker?	No	232 (85.3)	60 (75)	292 (83)	0.031*
	Yes	40 (14.7)	20 (25)	60 (17)	
	Total	272	80	352	
Do you usually sit with smokers while they are smoking?	No	152 (55.9)	32 (40)	184 (52.3)	0.012*
	Yes	120 (44.1)	48 (60)	168 (47.7)	
	Total	272	80	352	
How often do you smoke daily?	Up to 3 cigarettes daily	16 (40)	6 (30)	22 (36.7)	0.683*
	3-10 cigarettes daily	12 (30)	6 (30)	18 (30)	
	1 pack or more	12 (30)	8 (40)	20 (33.3)	
	Total	40	20	60	
You have been smoking for	< a year	8 (20)	0 (0)	8 (13.8)	0.116**
	1-2 years	6 (15)	4 (22.2)	10 (17.2)	
	>2 years	26 (65)	14 (77.8)	40 (69)	
	Total	40	18	58	
What is the main reason that led you to smoking?	Friends	14 (35)	2 (10)	16 (26.7)	0.251**
	Self-esteem	6 (15)	4 (20)	10 (16.7)	
	Relatives	2 (5)	2 (10)	4 (6.7)	
	Stress	16 (40)	10 (50)	26 (43.3)	
	Others	2 (5)	2 (10)	4 (6.7)	
	Total	40	20	60	
Are you aware of its bad effect on your health?	No	0 (0)	4 (20)	4 (6.7)	0.010**
	Yes	40 (100)	16 (80)	56 (93.3)	
	Total	40	20	60	
Did you experience any of these bad effects?	No	12 (30)	16 (88.9)	28 (48.3)	<0.001*
	Yes	28 (70)	2 (11.1)	30 (51.7)	
	Total	40	18	58	
Do you wish to quit smoking?	No	6 (15)	6 (30)	12 (20)	0.189**
	Yes	34 (85)	14 (70)	48 (80)	
	Total	40	20	60	

Our results were in line with other similar studies in this aspect—low consumption of vegetables and fruits (26.2%) and a high consumption of fast food.^[6,10-12]

Exercise

The results for the questionnaire regarding exercise between the medical and non-medical students showed that the two groups were similar in every aspect. Both medical and non-medical students exercise sometimes with aerobics and ball sports being the two most often practiced sports activities by the two groups. Despite differences in the medical and non-medical curriculum, difficulty, and the time spent on studying, both the medical and non-medical students sometimes found the time for exercising. In addition, students from the two groups spent 10–20 min in walking daily. These results are in concordance with other studies which identified lack of exercise as one of the common barriers to obesity.^[10,13,14]

Sleeping habits

The results showed both similarities and differences between the medical and non-medical students in their sleeping habits. The study showed that the medical students went to sleep earlier than the non-medical students. The study also showed that both the medical and non-medical students similarly answered with

“Sometimes” on whether they go to bed on time every day. Regarding the students’ amount of sleep, the study showed that the majority of both medical and non-medical students slept 4–6 h per day. Our results were similar to what Al-Shehri *et al.*^[13] had reported in their study.

Smoking

The results showed a difference in smoking prevalence between the medical and non-medical students where the medical students as expected had a lower smoking percentage. On the reason for smoking, contrary to the common idea that friends are the main factor for students to smoke, the results showed that the main reason was stress as both groups were university students and stress plays a major role in their life. Furthermore, all medical students were aware of the bad effects of smoking and a majority of them experienced these effects. On the other hand, some non-medical students were not aware of these effects and only a small percentage experienced these effects which shows the difference of awareness between the two groups. The medical students also showed a higher percentage than the non-medical students on the willingness to quit smoking. These results are similar to the ones reported by the other researchers as well.^[10,13,14] Alowais *et al.*^[15] in their study reported that individuals who used dietary supplements in

their diet were more likely to make a positive effort to improve their dietary habits.

To our knowledge, this is the first study to evaluate the eating habit awareness between medical and non-medical students in Jeddah. We believe that this study can provide more insight into the awareness of the medical students' eating habits that would indirectly reveal more about their quality of life that ultimately can affect their professional life. Since this study was carried out primarily to gauge the awareness and practice of the dietary habits of medical students who are going to be the primary-care physicians or general practitioners (GPs) in the future, this study has an important bearing on the healthcare system in reflecting the attitudes of the future physicians toward nutrition care and the effective practice of it.^[15-17]

Conclusion

The awareness and knowledge of the medical students suggest that there was a higher level of awareness about the dietary and lifestyle habits but that is not necessarily conferred into being followed to the letter and spirit.

Study Limitations

The primary limitation of this study is the relatively small size of the sample of which most of the participants were males (80.3%). It may be because the male students were more enthusiastic about the research related to health and dietary issues as the participation was solely voluntary. Second, the participants represented only two universities in the Kingdom. Thus, our findings and observations are limited in their generalizability to the whole population.

Knowledge available on this topic

- Prevalence of poor eating habits, high consumption of fast food, lack of sleep, and a high prevalence of smoking among the university students
- Direct relationship between eating habits, exercise, and BMI
- High BMI and smoking being the important risk factors for diabetes mellitus.
- Eating habits and the disparity according to the socioeconomic status of the college students.

What our study adds

- The medical students even though had a high awareness about the healthy lifestyle were not practicing it.
- Students' practice regarding healthy diet and nutrition should be a cause of concern as it is the index of the health of the future primary-care physicians.
- A mitigation to bridge the gap between the knowledge and the effective practice of it among the students is necessary and demand of the time.

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Ethical clearance

This study was approved by the Institutional Review Board of King Abdullah International Medical Research Centre (KAIMRC), a research wing of KSAU-HS, Jeddah (Reference No: SP19/417/J; Dated: 01/10/2019).

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Conflicts of interest

There are no conflicts of interest.

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