



The Relationship between Medical Education and Eating Habits Along with Mental Condition in Medical Students

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ORIGINAL
INVESTIGATION

ABSTRACT

Objective: To screen the effect of medical education on eating and physical activity habits, along with mental health, in medical students.

Materials and Methods: Preclinical (n=659) and clinical (n=336) term medical students were asked to fill in an eating habits questionnaire, a physical activity inquiry, along with a general health state inquiry, and the Beck depression inventory.

Results: Seventy percent of medical students did not care about gaining weight, did not exercise to reduce excess weight, did not even care about the caloric or nutritional content of foods, and lived a sedentary life. The clinical term students (years 4 to 6) preferred all-bran bread, while the preclinical term students (years 1 to 3) had a habit of salt overuse. More clinical students than preclinical ones restricted eating when they realized weight gain. Depressive students usually ate a snack at night, skipped meals, and consumed high-calorie food. Positive eating habits and general healthy behaviors in non-depressive students were more frequent, while the opposite was typical for those who were in depression.

Conclusion: This study suggests that medical education influences eating and physical activity habits necessarily, but nevertheless, medical students show unfavorable eating and physical activity habits, besides frequent depressive symptoms.

Key words: Eating habits, medical education, depression, physical activity

INTRODUCTION

In the last two decades, a healthy lifestyle has had a growing concern in the world. There are some initiatives and identified tasks to promote health and to prevent obesity-related diseases, particularly over nutritional attitudes (1). Epidemiological studies tend toward eating habits in area of researching healthy lifestyles (2). Besides nutritional attitudes, some environmental factors, such as psychology, intelligence, income, time, and food availability, can also involve in choosing “what to eat” and getting the decision of “how much to eat” (3).

Eating habits develop in childhood and persist into adulthood (4, 5). University students, especially those living away from home, tend to develop unfavorable eating habits (6), showing a significant change towards deteriorated, globalized behaviors and habits (7).

Medical students, in the university student group, are important targets for promoting healthy lifestyles. They will provide health care to patients after an exacting and intensive medical education. To prevent obesity-related diseases and other chronic diseases, the education of medical students in nutrition field seems so critical. However, during medical education, the students are highly likely to experience a great deal of mental and emotional distress. The depression rate in the beginning years resembles that of the general population but is reported to be becoming as high as 40% in subsequent years (8).

In this study, we have three objectives. First of all, we aimed to screen general health states and eating and physical activity habits of medical students according to body mass index and depression level. Secondly, we searched the effect of medical education on eating and physical activity habits by dividing the students into two groups: preclinical and clinical term. Thirdly, we planned to investigate the association between depression levels and eating and physical activity habits among medical students.

MATERIALS and METHODS

General information

Istanbul is an intercontinental, industrialized, peninsula metropolis between Europe and Asia with a population about 14 million people (9). The socioeconomic level of the city is extremely variable when compared to other

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large cities in Turkey. The city includes 42 universities and has a cosmopolitan structure (10). Cerrahpasa Medical Faculty is one of the largest medical schools in Istanbul, and it accommodates 2500 medical students in its 6-year medical program.

Recruitment

This cross-sectional study was carried out from April to June 2010 at Istanbul University Cerrahpasa Medical Faculty. Nine hundred ninety five consecutive medical students of the total student population in faculty had accepted to enroll in the study. Students were given questionnaires and called to bring them when completed. The students were grouped into two categories: 1. preclinical (first 3 years of education) and 2. clinical (last 3 years of education) term.

Measures

The students were asked to fill the Eating Habits Questionnaire, Beck Depression Inventory, and Physical Activity Inquiry, along with the General Health State Inquiry. Body mass index (BMI) assessment was done according to self-reported weight and height values. The students were assured of complete anonymity.

Eating habits questionnaires

The Eating Habits Questionnaire consisted of 29 questions prepared by the researchers using the literature concerning diet and eating and drinking habits, as was compatible with Turkish culture and norms (11). In a Turkish adaptation study in college students, the alpha coefficient for internal consistency was found to be 0.824 for all 29 items on eating habits with the response options "always, sometimes, and never" (11). This adaptation study was performed in high school students. Thus, we have replaced with nine new questions from the literature about eating habits (12, 13). Our aim was to adapt this questionnaire for university students, and all participants were asked to answer the questions as "yes" or "no."

Beck depression inventory

The Beck Depression Inventory (BDI) consists of 21 questions and assesses self-reported depressive symptoms. The BDI has been shown to be a reliable measure of self-reported depression in adolescents (14). The Turkish validation and reliability study was performed by Hisli in 1989 (15). The students were divided into three groups according to depressive symptom levels: non depressive group <9 points, mild depressive group in the range of 10-16 points, and moderate-severe depressive group in the range of 17-63 points. Mild, moderate, and severe depressive groups were accepted as depressive students, while the others were non-depressive.

Sociodemographic inquiry

The first part of the questionnaire included the students' age, gender, weight, height, habitation, and classes of medical school.

Body mass index measurement and classification

For the determination of overweightedness and obesity, body mass index (BMI) was used. BMI, computed as weight in kilograms divided by the square of the height in meters, is widely used in research and clinical practice. Students with BMI values that corresponded to a BMI <24.99 kg/m² were classified as normal weight, students with BMI values of 25.0 to 29.9 kg/m² were classified as overweight (pre-obese), and students with BMI values >30.0 kg/m² were classified as obese. In our statistical analysis, the obese group

included the overweight group to facilitate evaluation of the data, as in other studies (11).

Physical activity inquiry and general health state inquiry

We formed questions according to the literature, asking about regular physical activity. We asked them to answer whether they exercised regularly and lived a sedentary life or not and how much time they spent for physical activity per week, time for walking each day, watching TV/PC each day. We defined a sedentary life as: not participating regularly in aerobic physical exercise for at least 20 min/day, 3 days per week, for the past 6 months (16). Furthermore, habits about smoking, alcohol, sleep, and anamnesis about chronic medical/psychiatric illness and drug abuse were asked.

Statistical analysis

The data were analyzed by using Statistical Package for the Social Sciences (SPSS) 16.0.0 for Windows XP (SPSS Inc., Chicago, IL, USA). The responses were evaluated using chi-square test and percent ratios according to gender, body mass index, and depression levels. Differences were considered statistically significant at $p < 0.05$.

RESULTS

Sociodemographic status and general health status

There were 517 males (52%) and 478 females (48%) in the sample. There were 347 males (52%) and 312 females in the preclinical group (48%) and 170 males (50.5%) and 166 females (49.5%) in the clinical group, and the difference between preclinical and clinical students according to gender was not significant ($df=1$, $p=0.538$). The mean age of the students was 21.10 ± 1.88 years (range 17-32 years): 20.20 ± 1.48 for preclinical students and 22.90 ± 1.19 for clinical students ($df=2$, $p < 0.001$) and 21.25 ± 1.97 for males and 20.94 ± 1.77 for females ($df=2$, $p < 0.001$).

The mean BMI was 22.20 ± 3.02 ; there was no significant difference among preclinical and clinical students according to BMI (22.19 ± 3.06 vs 22.44 ± 2.94 , $df=2$ and $p=0.643$). The rate of preclinical and clinical students among BDI groups was as follows: 391 vs 243 non-depressive; 172 vs 62 mild depression; and 89 vs 27 moderate/severe depression ($df=2$, $p < 0.001$). The mean BDI was 8.74 ± 7.26 ; there was a significant difference among preclinical and clinical students according to BDI (9.40 ± 7.74 vs 7.45 ± 5.99 , $p < 0.001$) (Table 1).

Fifteen percent of all participants smoked, and 9.8% of them consumed alcohol regularly. Clinical students smoked ($p=0.042$) and slept regularly ($p=0.002$) significantly more than preclinical students, whereas there was no significant difference according to alcohol consumption among clinical/preclinical students ($p=0.441$). More than half of the students (59.4%) reported that "they slept regularly." Forty-one percent of the students had chronic illness (30% of them had myopia, 2% of them hypermetropia, 1% of them had hypertension, 2% of them had asthma, and 1% of them had hypothyroid). Fewer students (4.2%) mentioned that they used psychotropic drugs (antidepressant or sedative drugs).

Eating habits status

Nearly 70% of all students had tea or coffee at breakfast instead of milk or juice, did not eat fish at least once per week, did not take care

Table 1. The socio-demographic characteristics of the participants according to term

Characteristics	Preclinical n (%)	Clinic n (%)	Total n (%)	X ² /df/P
Participants	659 (66.2)	336 (33.8)	995 (100.0)	
Age Groups				3.68/2/0.000**
17-22	606 (95.3)	130 (40.2)	736 (76.7)	
23-25	26 (4.1)	189 (59.5)	215 (22.4)	
≥26	4 (0.6)	4 (1.2)	8 (0.9)	
BMI (kg/m ²)				0.88/2/0.643
Underweight (<18.5)	48 (7.7)	20 (6.3)	68 (7.2)	
Normal weight (≥18.5-24.99)	468 (75.2)	247 (77.7)	715 (76.1)	
Overweight/obese (≥25.00)	106 (17.0)	51 (6.0)	157 (16.7)	
BDI				17.14/2/0.000**
Non-depressive	391 (60.0)	243 (73.2)	634 (64.4)	
Mild depressive	172 (26.4)	62 (18.7)	234 (23.8)	
Moderate/Severe depressive	89 (13.6)	27 (8.1)	116 (11.8)	
Hometown				0.29/1/0.589
İstanbul	164 (25.1)	88 (26.7)	252 (25.6)	
Out of İstanbul	490 (74.9)	242 (73.3)	732 (74.4)	
Habitation				17.90/2/0.000**
By family	182 (27.9)	110 (33.5)	292 (29.8)	
Dormitory	199 (30.5)	59 (17.9)	258 (26.3)	
Student house	271 (41.6)	160 (48.6)	431 (43.9)	
Daily main meal number				0.96/1/0.325
<3	219 (33.3)	101 (30.2)	320 (32.3)	
≥3	438 (66.7)	233 (69.8)	671 (67.7)	

*p<0.05, **p<0.001
 BMI: Body mass index; BDI: Beck depression inventory

not to gain excess weight, did not avoid foods with sugar and fat in them, and were not aware of the calorie contents of foods they eat, whereas more than 70% of all students did not skip meals, did not prefer fast food, like hamburgers, to meals, and consumed at least one animal product such as meat, milk, or eggs, every day (Table 2).

Eating habits according to term

Preclinical students versus clinical students were significantly picky with food ($p=0.014$) and usually added salt to their dishes ($p=0.007$), whereas more clinical students usually had a snack at breakfast ($p=0.009$), preferred bread containing bran to white bread ($p=0.005$), and reduced eating if they felt that they were gaining weight ($p=0.003$).

Eating habits according to BDI

Significantly more non-depressive students than depressive ones had mentioned that "I usually have breakfast" ($df=2$, $p<0.001$). Non-depressive students did not usually skip the meals ($df=2$, $p<0.001$), and

they did not consume mainly cola-type beverages or tea but consumed juice or milk ($df=2$, $p<0.001$). They also mentioned that they did not consume fast food, like hamburgers ($df=2$, $p<0.001$), but they consumed fish and fruit at least once in a week ($df=2$, $p=0.018$; $df=2$, $p=0.004$, respectively). The attitude of finishing the food on plates was more frequent in non-depressive students ($df=2$, $p=0.017$); they cared about what and how much they ate ($df=2$, $p=0.004$) and cared about the caloric content of foods they ate ($df=2$, $p=0.037$).

Physical activity status

Seventy percent of all participants did not exercise regularly and lived a sedentary life (73%). Thirty two percent of all participants did not spend any time for exercise, while 45.7% of them spent 1-3 hours per week.

Physical activity status according to term and BDI

Preclinical students spent significantly more time for walking than clinical students ($p=0.012$). Non-depressive students versus de-

Table 2. Eating habits in medical students

Eating Habits Questionnaire	Yes (n;%)	No (n;%)
1) I usually have breakfast.	638 (64.2)	356 (35.8)
2) I usually have tea or coffee at breakfast instead of milk or juice.	739 (74.6)	251 (25.4)
3) I usually have a snack at breakfast.	497 (50.1)	496 (49.9)
4) I seem to lack concentration if I do not have breakfast.	641 (64.9)	346 (35.1)
5) I usually consume ready-made foods, like hamburgers, at lunch.	135 (13.6)	857 (86.4)
6) I usually consume ready-made foods (such as pizza), at dinner.	166 (16.7)	827 (83.3)
7) I usually have a snack at night.	580 (58.4)	413 (41.6)
8) I usually skip meals.	276 (27.9)	714 (72.1)
9) I usually have dessert after any meal.	369 (37.5)	616 (62.5)
10) I usually eat sauces and well-dressed food.	510 (51.6)	478 (48.4)
11) I usually add salt to my dishes.	490 (49.6)	498 (50.4)
12) I consume mainly cola-type beverages or tea, not juice or milk, to satisfy my daily fluid intake needs.	547 (55.2)	444 (44.8)
13) I prefer fast food like hamburgers to meals.	177 (17.9)	814 (82.1)
14) I eat fish at least once per week.	303 (30.6)	687 (69.4)
15) I have at least one portion of fruit in my diet every day.	501 (50.5)	491 (49.5)
16) I prefer bread containing bran to white bread.	388 (39.2)	602 (60.8)
17) I consume at least one animal product, such as meat, milk, or eggs, every day.	834 (84.2)	157 (15.8)
18) I prefer boiled or cooked foods to fried food.	499 (50.3)	493 (49.7)
19) I have at least one portion of vegetables or salad in my daily menu.	636 (64.4)	352 (35.6)
20) I completely finish my meal, clearing the plate.	592 (59.9)	396 (40.1)
21) I am picky with food.	530 (53.5)	461 (46.5)
22) I usually care of what and of how much I eat.	569 (57.4)	422 (42.6)
23) I take care not to gain excess weight.	289 (29.3)	699 (70.7)
24) I reduce eating if I feel that I am gaining weight.	473 (47.7)	518 (52.3)
25) I do physical exercise if I feel that I am gaining weight instead of cutting on food.	324 (32.8)	663 (67.2)
26) I am aware of the calorie content of foods I eat.	233 (23.6)	753 (76.4)
27) I usually avoid foods with high carbohydrate content (e.g., bread, rice, potatoes, etc).	176 (17.8)	811 (82.2)
28) I usually avoid foods with sugar and fat in them.	297 (30.0)	693 (70.0)
29) I think that I have a fit and balanced diet.	468 (47.3)	521 (52.7)

pressive students spent significantly more time for physical activity ($p=0.001$), exercised regularly ($p<0.001$), and spent more than 30 min per day for walking ($p=0.044$). Depressive students versus non-depressive students stared significantly more than 2 hours/day at the TV/PC ($p=0.006$) and lived a sedentary life ($p=0.023$).

DISCUSSION

In the current study, we revealed that approximately 7 in 10 medical students did not care about gaining weight, did not exercise to reduce excess weight, did not care about the caloric or nutritional content of foods, did not exercise regularly, and lived a sedentary life. In addition, more clinical students ate a snack at breakfast and preferred bread containing bran, while more preclinical students added salt to their dishes. Non-depressive students usually ate fish

at least once a week and consumed fruit, salad, and animal products daily, whereas depressive students usually at a snack at night and skipped meals.

According to nutrition centers, a healthy breakfast should be eaten every day (17). Breakfast consumption reduces the risk of compensation for consuming unhealthy snacks during the day (18). However, "breakfast skipping" is highly reported in adolescents both in Europe and the USA (10%-30%) (17). In our study, we have found the rate of skipping breakfast to be 35% in medical students.

Frequent snacking or consuming fried foods (high fat/carbohydrate ingredients, high-calorie) might adversely influence students' health. In a recent study in medical students, the frequency of snacking and fried food consumption was high (30% and 70%),

and the preponderance of fast food consumption was higher in males than females (19). In addition, these rates were similar in an adolescent survey from Turkey (11). We have found snacking at a rate of 18% and 50% for fried food consumption in medical students. These rates were lower than a study of medical students from Greece. Although Greece and Turkey are both Mediterranean countries, Turkey is still a transitional country between Asian tradition/culture and Europe. Main meal habits still carry importance for nutrition in Turkey. Thus, fewer medical students seem to have snacking habits and eat fried food. However, our findings were more favorable than the results of the high school study in Turkey, and this difference is likely to be due to studying health sciences, although there are no specific lectures in nutrition in our medical education curriculum.

In this study, we have searched medical education effects on eating habits. Significantly more preclinical students added salts to their dishes than clinical students. In two studies, the rates of adding salt to dishes were 20% and 47% (11, 12). However, in the first study, the question was "adding salt without tasting them;" thus, the question was a little bit different than ours. We have found that half of medical students add salt to their foods, although significantly more clinical students did not add salt. In addition, significantly more clinical students preferred bread containing bran to white bread.

In the literature, we are unaware of education effects in medical students on eating habits. This lack brought us to make a proposal about the difference between preclinical and clinical term students' attitudes. These positive but insufficient eating habits towards grading terms might be an outcome of medical education. More clinical students have snacks at breakfast and reduce eating to cope with excess weight. Some evidence suggests that self-regulatory skills are particularly important for regulating food choices and that self-efficacy, outcome expectations, and social support are associated with maintenance of healthy dietary patterns during the college years (20). However, medical students in our study chose a more passive way to cope with excess weight instead of exercising. Therefore, in medical education, nutrition and struggling ways with obesity should be emphasized according to scientific findings, such as: behavior change programs, enhancing self-regulatory skills (i.e., not to clean our plates), decreasing portion size, and behavioral weight loss attitudes to take more care to the internal cues of satiation (hunger or taste), all of which might be called trends to mindless eating to mindful eating, and other physical modalities (including stress management) (3, 21-26).

The prevalence of depression differs across studies and countries (27). Medical education is stressful training, and students likely experience mental and emotional distress (28, 29). A high level of depression (23.5%) among undergraduate medical students using the Beck Depression Inventory was reported (30). Furthermore, the depression rate in beginners of medical education was similar as the general population and reached as high as 40% in subsequent years (8). The prevalence of depression was 21.8% among Turkish university students but reported to be varied between 10%-40% (31). Our finding supports these outcomes, which was 35.6% in medical students using the Beck Depression Inventory. On the contrary, in this study, preclinical students were detected to be more

depressive than clinical students. This discrepancy might be due to adaptation to medical education, immigration, and adjusting to a metropolis, living without family and unavailability to find scholar.

Coexistence with depression and disturbed eating habits and a strong association between abnormal eating habits and depression in college students were revealed in some studies (32- 35). Some theoretical models propose depression as an outcome of eating disorders or vice versa or a pathway to problematic eating behaviors (36, 37). In addition, change in appetite is one of the main diagnostic criteria for depression (38). In our study, the depressive students had unhealthy eating habits, while non-depressive students had more accurate eating habits. Depressive students had a snack at night, skipped meals, ate sauce and well-dressed food, and consumed high-calorie beverages and fast food. In addition, healthy eating habits, such as eating fish, fruit salad, or vegetables; taking care of calorie intake and what they are eating; and preferring exercise to cope with excess weight were present in non-depressive medical students in the current study. Thus, we considered a strong reciprocity between depression and eating behaviors. The higher incidence of depression in preclinical students can influence the results about medical education effects on eating habits of students as coexisting with depression and disturbed eating habits.

Physical exercise seems to individually enhance the physical, emotional, mental, and spiritual awareness of each person (39). In this survey, 70% medical students mentioned that they do not exercise regularly. In a study, 40% of Greeks were reported to not engage in leisure time physical activity (19). Nevertheless, our physical inactivity rate was greater than Greeks, which might be due to transitional features of our country, not perceiving the importance of exercise, and unavailability of the appropriate environment and time for exercise.

Our study has some limitations: first, the cross-sectional design of the study does not allow us to generalize our findings throughout the education life span of medical students. Thus, further longitudinal studies are needed. Secondly, we did not assess the knowledge of medical students about dietary intake. Thirdly, investigating the influences of healthy dietary intake lectures on the attitudes of medical students would be more explanatory. Lastly, as this was a self-report inquiry, some information given by students might be incomplete or inexact. Adding a control group from other faculties might strengthen our findings while searching the effects of medical education.

CONCLUSION

As we are unaware of education effects in medical students on eating habits, we want to make a proposal about the difference between preclinical and clinical eating attitudes. Although it might be concluded from this study that medical education affects eating and physical activity habits necessarily, the general pictures show that medical students have unfavorable eating and physical activity habits. Consistent with previous findings, depression level and sedentary lifestyle are too high among medical students. To prevent obesity and obesity-related diseases, it can be concluded from this study that effective healthy nutrition and lifestyle lectures should be placed in the medical curriculum for physicians of the future. Further studies are needed to evaluate eating and physical activity habits during medical education.

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Informed Consent: Participants were assured of the confidentiality of their responses and provided informed consent. All students signed informed consent before their inclusion in the study.

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