NUTRITION AND EXERCISE HABITS AMONGST MEDICAL STUDENTS IN A PRIVATE UNIVERSITY IN MALAYSIA

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Abstract: Obesity is a major risk factor for various non-communicable diseases. The prevalence of obesity is on the rise, especially in younger populations. Improper eating patterns coupled with lack of physical activity have largely contributed to this problem. Medical students are exposed to social, cultural and study related stress during their course period. These factors influence their patterns of eating and physical activity. A cross sectional study was conducted among medical students of Taylors' University to study their nutrition habits and exercise pattern. A total of 159 medical students participated in the study. It was found that 69.8% of students had normal BMI, 14.5% of students were underweight and 15.7% students were overweight or obese. It was observed that the prevalence of obesity was more in male students as compared to female students. Out of 159 students, 15.7% of students skipped breakfast. The major food items in the diet was a combination of rice, egg, meat and vegetables. It was also noted that 42.1 % of the students consumed soda drink at least once a week. Majority of our students were involved in intentional physical activity of some kind and they were aware about the importance of both good nutrition and physical activity in maintaining good health.

Keywords: obesity, medical students, exercise, nutrition

Introduction

Obesity is excessive accumulation of fat in the body. The trend to become obese is now rising in the low and middle income countries especially in the urban areas. According to the national health and morbidity survey, the percentage of obesity in Malaysian adults is 29.71% (Abdull Hakim *et al*., 2012). According to WHO, by 2020, non-communicable diseases will account for 60% of the global disease burden and majority of the diseases will be linked to obesity either directly or indirectly (WHO NCD Surveillance Strategy, 2017). Physical activity and healthy diet play an important role in prevention of these non-communicable diseases and obesity.

Medical students are often exposed to academic, social and cultural stress in their early years of career (Abdus Salam *et al,*2015*)*. These factors influences their dietary and exercise patterns for the worst and if these unhealthy habits, are not detected, & corrected in time they usually persist and get exaggerated in adult life giving rise to plethora of non-communicable diseases including obesity. On the other hand medical students are supposed to have a sound knowledge of nutrition and exercise. However, in terms of maintaining their health, there is no concrete evidence to indicate that this knowledge is translated into practice among the health professionals (Wiskar K, 2012). A physically unfit junior doctor is a burden on the health system of the country as the person will find it difficult to fulfill the increasing demands of his profession. The research was designed to evaluate the nutrition pattern and exercise habits amongst medical students of a private university in Malaysia.

Materials and methods

A cross-sectional study was conducted in a private University in Malaysia amongst medical students.

The sample size was calculated using the formula given by Krejcie and Morgan (1970) was 178, out of which 159 students completed all aspects of the study giving a response rate of 89.3%.Students were invited to participate in the study after explaining the purpose of the study. Written, informed consent was obtained from the students who volunteered to participate in the study. Confidentiality of collected information and anonymity of the participants was maintained throughout the conduct of the study

Study instruments

A self- administered questionnaire was developed to assess the dietary characteristics as well as the level of physical activity amongst the participants. Students' demographic and anthropometric details were also obtained along with information on their nutrition and exercise pattern. Anthropometric measurements of weight, height and waist circumference were conducted. Weight was measured in kilograms using standard digital flat weighing scale in standing position with no shoes and rounding it to next 0.1 kg for simplicity. Height and waist circumference was measured using standard measuring tapes. Intentional physical activity was divided as light (walking etc.), moderate (swimming, jogging, cycling etc.) and heavy (weight training, running etc.) for at least 30 minutes on most of the days of the week.

The body mass index (BMI) was calculated as weight in kilograms divided by height in square meters (kg/m^2). In this study, based on the WHO BMI cut-offs for the Asian population, a BMI $< 18.5 \, kg/m^2$ was categorized as underweight, $18·5–22·9 \, kg/m^2$ as the normal range, $23.0–27.4 \, kg/m^2$ as overweight.

Statistical analysis

The Statistical Package for Social Sciences (SPSS) version 21.0 was used for data analysis. The parameters of age, height, weight, BMI and waist-hip ratio were analysed using mean ± S.D. The association between BMI, gender, consumption of carbonated drinks, junk food & skipping of breakfast was determined using the Chi-square test. All reported p values were two-tailed and p values < 0.05 were considered statistically significant.

Results

Out of the 159 students who participated 58 students (36.5%) were males and 101 (63.5%) were females. As seen in table 1, the average age of male students who participated in the study was 23.2 ± 1.7 years and for female students it was 23 ± 1.5 years. The average height of the male students was 182 ± 0.5 cm and for females was 165 ± 0.9 cm. The average weight of male students was 76 ± 0.8 kg and that of the female students was 59 ± 1.2 kg. The average waist to hip ratio was 0.88 ± 0.01 in males and in females it was 0.80 ± 0.06. The average BMI for male students was 22.8 ± 0.4 kg/m^2 and that for female students was 20.9 ± 0.3 kg/m^2. The average caloric intake was 2244.6 ± 124.1 for males and 1595.2 ±42.8 for females.

Table 1   Characteristics of the respondents (n=159)

Analyzed parameters	Gender	
	Male (n = 58) Mean ± SD	Female (n = 101) Mean ± SD
Age in years	23.2 ± 1.7	23 ± 1.5
Height in cm.	182 ± 0.5	165 ± 0.9

Body weight in kg.	76 ± 0.8	59 ± 1.2
Waist hip ratio	0.88 ± 0.01	0.80 ± 0.06
BMI in kg / m^2	22.8 ± 0.4	20.9 ± 0.3
Average daily caloric intake	2244.6 ± 124.1	1595.2 ±42.8

Table 2 shows the dietary habits of the participants. Majority of the participants (134, 84.3%) consumed breakfast daily and took meals more than 3 times a day (86, 54.1%).About 30.2% had snacks less than three times per week and 69.8% took snacks daily. Many consumed junk food less than three times a week(103,64.8%) whereas 92(57.9%) consumed soda/carbonated drinks less than three times per week. Most of them took a carbohydrate rich diet including rice, bread and noodles (89,56%) while only 34(21.4%) took a variety of foods in their daily diets.

Table 2 Dietary characteristics of the respondents (n=159)

Characteristics		Number	Percentage
Daily breakfast	Yes	134	84.3
	No	25	15.7
Frequency of daily meals	Less than 3 times	73	45.9
	3 or more times	86	54.1
Frequency of consuming snacks	Daily	111	69.8
	Less than 3 times a week	48	30.2
Weekly consumption of junk food	Less than 3 times	103	64.8
	3 or more times	56	35.2
Weekly consumption of carbonated drinks	Less than 3 times	92	57.9
	3 or more times	67	42.1
Main type of food consumed	Mainly meat	28	17.6
	Rice, bread, noodles	89	56.0
	Mainly vegetables	8	5.0
	Variety of food in balance	34	21.4

As seen in Figure 1, of the 19 students who were underweight,13(68.4%) were females and 6 (31.6%) were males. Majority of the students in the normal category were females (80,69.6%) whereas 68% (17) were males in the overweight/obese category.
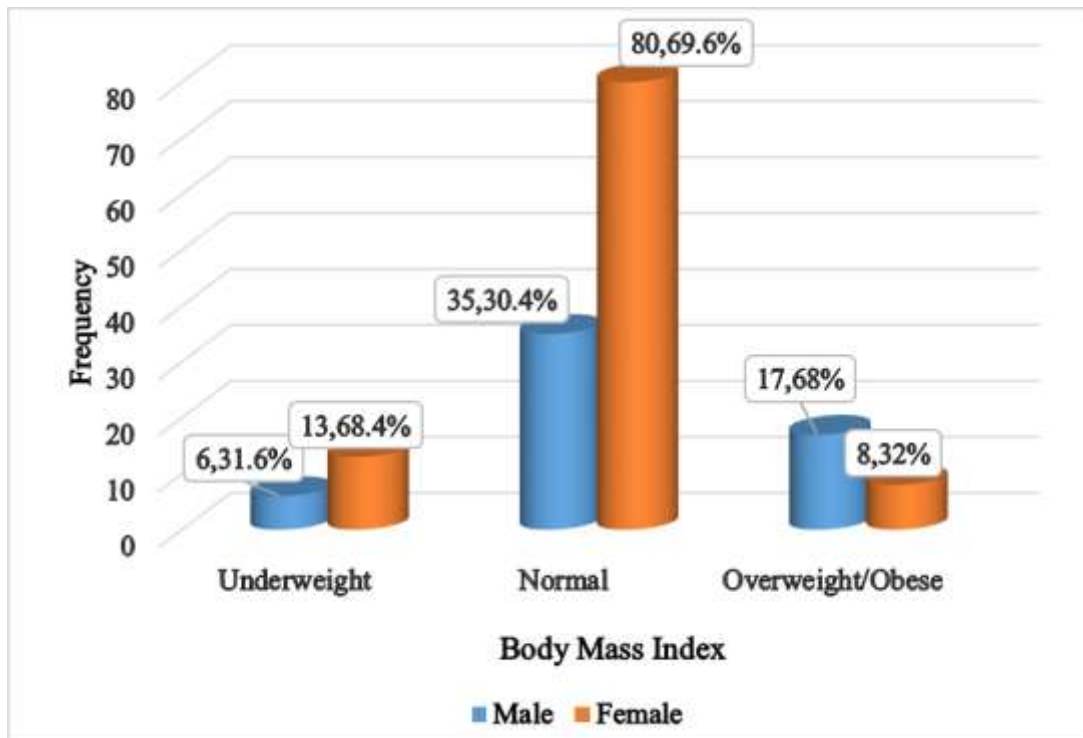
Figure 2 Body mass index distribution amongst the participants by gender

Table 3 shows the association between gender and the dietary habits of the participants. As seen in the table, more females (15, 60%) than males (10,40%) skipped breakfast every day. The consumption of carbonated drinks was significantly higher amongst females, more specifically for the frequency of more than 3 times a week (P=0.01).The consumption of junk food more than times a week was significantly higher among females. (P=0.00).

Table 3 Association of dietary characteristics of the respondents and gender (n=159)

Dietary characteristics		Gender			Chi square value	P-value	Significance
		Total	Male	Female			
Breakfast consumption	Skip everyday	25	10 (40%)	15 (60%)	1.16	0.55	NS*
	At least 3 times a week	74	25 (33.8%)	49(66.2%)			
	Consume everyday	60	23(38.3%)	37(61.7%)			
Consumption of carbonated drinks	Less than 3 times a week	92	41 (44.6%)	51 (55.4%)	6.16	0.01	S
	3 or more times a week	67	17 (25.4%)	50 (74.6%)			
Consumption of junk food	Less than 3 times a week	103	51 (49.5%)	52(50.5%)	21.5	0.00	S
	3 or more times a week	56	7 (12.5%)	49 (87.5%)			

*NS = not significant, S = Significant

The comparison of BMI with dietary habits is shown in table 4. It is observed that majority of students who consume breakfast at least 3 times a week have a normal BMI (58, 78.4%) and many of those who consume it every day have a normal BMI (49, 81.7%).Breakfast consumers have a significantly higher proportion to have normal BMI. More number of students who skip breakfast are found to be in the overweight category (11, 44%). Those students who consume carbonated drinks less than three times a week are more likely to have a normal BMI(78,84.8%).There is a significantly higher proportion of students who take carbonated drinks more than 3 times a week who are overweight/obese(20,29.9%).Similar findings are obtained for the weekly consumption of junk food.

Table 4 Comparison of dietary characteristics with the body mass index of the respondents (n = 159)

Dietary characteristics		Body mass index			Chi square value	P-value
		Underweight	Normal	Overweight / obese		
Breakfast consumption	Skip everyday	6 (24%)	8 (32%)	11 (44%)	25.6	0.00
	Atleast 3 times a week	8(10.8%)	58 (78.4%)	8(10.8%)		
	Consume everyday	5(8.3%)	49(81.7%)	6(10.0%)		
Consumption of carbonated drinks	Less than 3 times a week	9(9.8%)	78 (84.8%)	5 (5.4%)	20.2	0.00
	3 or more times a week	10 (14.9%)	37 (55.2%)	20(29.9%)		
Consumption of junk food	Less than 3 times a week	11(10.7%)	84 (81.6%)	8(7.8%)	15.6	0.00
	3 or more times a week	8(14.2%)	31 (55.4%)	17 (30.4%)		

Figure 2 depicts the status of physical activity amongst the respondents. Out of the 159 participants, 110(69%) are involved with some or other form of physical activity. However, 49(31%) students were not physically active.
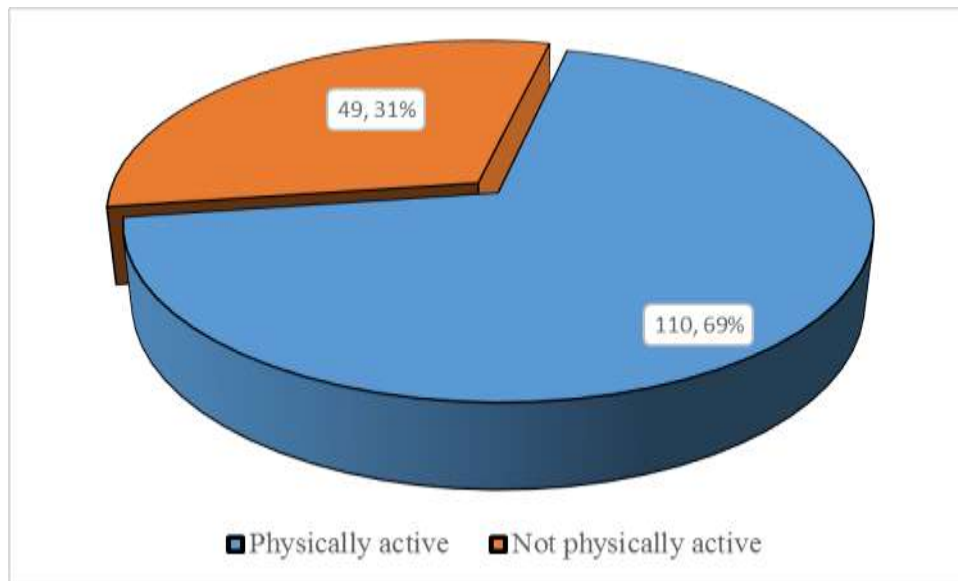
Figure 3 Status of physical activity amongst the participants (n = 159)

Of the 110 students who were physically active, majority (69.1%, 76) practiced light activity exercises. Moderate activity was practiced by 20.9% (23) students. Only 10% (11) of the students reported the performance of heavy activity.

Table 5 shows the relationship between the status of physical activity and the BMI of the participants. For comparison, students were categorized in to two categories, those with BMI < 23 kg / m^2 and those with BMI ≥23 kg / m^2.

Table 5 Association of physical activity status and the BMI (n=159)

Status of physical activity	Body mass index (kg / m^2)		Chi square value	P-value
	< 23	≥ 23		
Active	94 (70.1%)	16 (64.0%)	0.37	0.54
Not active	40 (29.9%)	9 (36.0%)		

As seen in the table, amongst the students with BMI < 23 kg / m^2, majority (70.1%, 94) are physically active and the same is true for those with a BMI ≥23 kg / m^2.There is no association found between the physical activity status and the BMI of the participants.

The comparison of the type of physical activity with the BMI of the respondents is seen in table 6.There is a significant difference in the BMI amongst the different types of activity (P = 0.01)

Table 6 Association of type of physical activity and the BMI (n=110)

Type of physical activity	Body mass index (kg / m^2)		Chi square value	P-value
	< 23	≥ 23		
Low activity	68(89.5%)	8(10.5%)	9.17	0.01
Moderate activity	18(78.3%)	5(21.7%)		
Heavy activity	6(54.5%)	5(45.5%)		

Discussion

Majority of medical students who participated in the study had normal BMI. Few students were in both obese and underweight category. This is similar to findings of a study done by N.H.Abdull Hakim *et al.* (N.H.Abdull Hakim *et al.,* 2012) on nutritional status of students in various universities in Selangor, Malaysia. The overweight cum obese category comprised of 15.72 % of student population under study and underweight category measured around 12 % of the participants. These findings were comparable to results of the study done by N.H.Abdull Hakim *et.al.* (N.H.Abdull Hakim *et al.,* 2012*)* on nutrition status of students in various universities in Selangor, Malaysia.

We wanted to explore nutritional & eating habits of the medical students and for which we considered skipping of breakfast as an important tool for assessment. Breakfast is an important meal of the day and is usually consumed during the rush hour of morning. A student who consumes regular breakfast values the importance of eating food at the right time and in general shows the attributes of good nutritional & eating behaviour.A significant number of students in our study either skipped or were irregular at eating breakfast. Our findings were similar to study done by N.H.Abdull Hakim *et.al.* (N.H.Abdull Hakim *et al.,*2012) on nutritional status of students in various universities in Selangor, Malaysia. Within the category of the students who skipped breakfast the association with overweight and obesity was clearly established in our study. Similar findings were previously observed by Yoko Watanabe *et.al (*Yoko Watanabe *et al.,*2014) in which skipping breakfast was correlated with obesity.

Consumption of carbonated drinks is increasing day by day. Easy availability of carbonated drinks at a relatively inexpensive price is the trend these days. Carbonated drinks are known to contain a lot of sugar in it and frequent consumption is a major risk factor for obesity and related disorders. In our study, we found out that a significant number of number students were drinking carbonated drinks on a daily basis and it was also observed that female students were consuming carbonated drinks significantly more than male students on an average within a week. This finding of our study is in line with the study done by Likus W *et al*. (Likus W *et al*., 2013) on dietary habits and physical activity in students from the medical university of Silesia in Poland where 39 % of the students consumed carbonated drinks on a daily basis. We also found an association between drinking of carbonated drinks frequently and obesity. Our findings are in contrast to the findings observed by Katzmarzyk P T *et.al. (*Katzmarzyk P T *et.al.,*2016) in a multinational study about relationship between soft drink consumption and obesity in 9–11 years old children.

Eating junk food either regularly in a week was more common in medical students of our university. This finding is similar to findings of a study done by Abdel-Hady Abel Fattah El-Gilany *et al*.(Abdel-Hady Abel Fattah El-Gilany *et al*., 2016) on consumption and knowledge of fast/junk foods among medical students in Egypt where more than half of students (51.0%) prefer junk food to save time and save money and find such foods more tasty to eat. In our study it was also noticed that male students preferred to eat junk food more as compared to female students. Students on an average maintained their BMIs in normal limits in spite of consuming junk food frequently. There are other factors associated with obesity like genetic makeup and activity levels of an individual. Eating junk food is only the tip of the iceberg as one needs to take into account many other factors related to the disease when any association needs to be proven.

Exercise is one of the important determinant of healthy and disciplined life style. Exercise also leads to a disease- free life for an individual. It was observed that majority of students were involved in some level of intentional physical activity and they had a normal BMI. Paradoxically, few students despite of being physically active were having a higher BMI and physically non active ones were observed to have normal BMI. These findings were similar to findings by Riyaz Shaik Shaik *et al.*in a study among school going adolescents in Hyderabad (Riyaz Shaik Shaik *et al.*2016). These findings of our study suggest that obesity is a multifactorial causation and though direct association between sedentary life style and obesity is established long ago the approach to understanding obesity must be holistic.

Conclusion

Our study concludes that the medical students at our University are finding it challenging to maintain a balanced nutritional pattern. However, majority of the students are involved in intentional physical activity in spite of heavy work load and academic commitment. Our study could establish the relation between skipping of breakfast and obesity. Majority of our medical students were aware about the importance of healthy nutritional, eating habits and regular exercise in maintaining good health but failed to adopt healthy lifestyle given the commitment towards medical course.

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