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Association of body mass index with breakfast in medical student.

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ABSTRACT… Objective: To find out the association body mass index (BMI) with breakfast in medical student of Karachi. **Study Design:** Descriptive Cross-sectional study. **Setting:** Public Sector Medical Institutes of Karachi. **Periods:** 1st January to 31st March 2019. **Material & Methods:** 382 medical students were enrolled after taking informed consent. Data was collected from included students of this study, having age of 18 to 24 years and all medical students having history of lactose intolerance, anorexia nervosa, and food allergies were excluded from study. Data was collected by self made structured questionnaire and anthropometric measurements were collected. Body mass index was calculated as weight (Kg)/height $(m)^2$. Collected data was analyzed by using Statistical package for social sciences version 22. **Results:** The mean age and mean Body mass index of studied samples were 20.83±1.54, and 15.53±3.5 respectively. Most of the participants were females and they belong to underweight category (BMI ≤ 18.5) of body mass index. The participants did breakfast were 81.4% and omit or skip breakfast was 18.6%. The habit of breakfast skippers was mostly in females (85.9%) and in males was 14.1%. The Body mass index (BMI) had as statistically significant ($p<0.05$) association with breakfast. **Conclusion:** The majority of medical students were females and habit of skipping breakfast most common in them, so body mass index were <18.5 kg/m2 in them and the Body mass index had as statistically significant ($p<0.05$) association with breakfast.

Key words: Body Mass Index, Breakfast, Gender, Medical Students, Skipping Breakfast.

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INTRODUCTION

The breakfast is considered as an important meal of the human body, as it follows longer duration of the fasting and contributes significantly towards achieving daily nutritional intake in the human body. So it exerts positive effects on lifestyle, behavior, stress, levels of concentration or cognitive performance or memory (short term, spatial and recall), visual or auditory pathway, and energy system of human body. The breakfast intake or consumption is considered as a marker of dietary pattern, which includes micro and macronutrients. The breakfast provides higher concentration of carbohydrates, proteins, dietary fibers, iron, calcium and vitamin C and lower concentration of fats.[1,2] The breakfast consumption and pattern of food taken is associated with decreased body mass index (BMI; kg/m^2), weight loss or maintenance of nutritional status of the human body and exerts positive effects on cardiovascular system by two distinct pathway (breakfast composition and skipping).[3,4,5] The breakfast consumption containing high concentration of protein and whole grain or fibers, is directly associated with positive effects on cardiovascular system, metabolic syndrome and overweight or obesity.[6,7] The breakfast containing the high concentration of cereal based meals will provide vitamins and an essential minerals and exerts effects as a lipid lowering agent.[8] It depends on the education level or literacy of parents or family members too.[3] The students' behavior and attitude towards unhealthy dietary habits or consumption of high energy dense nutrients (junk foods or high caloric snacks or fast foods or use of beverages), decrease intake of fresh fruits or fresh juices and habit of skipping breakfast.[9] The habit of breakfast skipping is associated with lower quality of dietary nutrients and increased intake of

concentrated foods. It is an associated with non-communicable diseases (NCD's) like increased body mass index (BMI; kg/m^2) or overweight or obesity, metabolic disorders, osteoporosis, ischemic heart disease (IHD) or congestive cardiac failure (CCF), hypertension (HTN), stroke, diabetes mellitus (type 2), mood disturbances or excessive irritability, menstrual problems, easy fatigability, impaired memory and development of stress or anxiety.[10] Non communicable diseases (NCD's) are considered as among top ten causes of morbidity and mortality in Pakistan.[11] Many factors are associated with skipping of breakfast like, age, gender, socioeconomic status, physical health, body mass index (BMI), sleeping quality and dietary habits in students.[1] Multiple studies have evaluated that the skipping of breakfast is positively correlated with the development of overweight or obesity and metabolic syndrome.[1,12] The breakfast composition in university students had poor intake of fruits, vegetables, milk, dairy products and intake of high concentration of sweets, junk foods, bakery products, chocolates, and tin packed foods[13,14,15] Nowadays overweight or obesity is increasing among the medical college students and it is due to erratic eating habits or excessive use of junk foods. These dietary habits are responsible for increasing risk factors of developing non communicable diseases (NCD's), so research related to these risk factors (Erratic eating habits or excessive use of junk foods) is an essential, considering the role of medical college students as future consultants or physicians or surgeons and acts as role models in society. The present study was conducted as to find out the association of body mass index (BMI; kg/m^2) with the breakfast in medical student of Karachi.

MATERIAL & METHODS

Ethical review board (ERB) of Karachi medical and dental college (KMDC) had given an ethical approval of research and this descriptive cross-sectional study was done. In this study medical and dental students were enrolled from the public medical institutes of Karachi. This study was conducted in Dow University of health sciences (DUHS), Jinnah Sindh medical university (JSMU), and Karachi medical and dental college (KMDC) of Karachi. A total 382 medical and dental students were enrolled or taken after calculation of sample size by Raosoft with alpha level 5% and 95% confidence level in this study and having 18-24 years of age. The participants of this study were briefed and explained about its importance of research. This study was extending over duration of two months, from 1st January to 31st March 2019. Sampling technique of this descriptive study was Non probability; convenience sampling. All included students of medical and dental were taken from class first year to fourth year of public medical institutes of Karachi with written consent. The students having history of anorexia, nausea, vomiting, lactase deficiency, gluten sensitivity, hormonal disorders or uncontrolled sugar, anorexia nervosa and fasting of Ramadan were excluded from the study. Demographic data (age, gender, and body weight (Kg) and height (m^2) and breakfast habits were collected and gathered from the participants of public medical institutes with the pre-tested questionnaire. The permission before entering in the medical institutes was granted before the start of data collection. Short announcement was done before the start of first class as to inform the salient features of this study; pre-tested questionnaire was distributed to students and collected back after second lectures. The weight (Kg) and height (m^2) of all included medical and dental students were measured. The Body mass index (BMI; kg/m^2) was calculated by using self-reported weight and height. Body mass index (BMI; kg/m^2) was categorized on bases of international classification into four groups; 1) underweight (BMI $\leq$ 18.5), 2) normal weight (BMI $<$ 25), 3) overweight (BMI between 25 and 30) and 4) obese (BMI $\geq$ 30).[16] All demographic data was double checked, verified for missing or incomplete entries and then entered and analyzed through Statistical Package for Social Sciences (SPSS) version 22. Frequency, percentage (%) and mean $\pm$ standard deviation for assessment of numerical variables. Statistical comparisons of mean scores were performed using independent sample t-test. For qualitative variables, Chi-square test (X^2) was applied. Tables were generated by using Microsoft word and Excel sheets in this study. The Pearson Chi Square test was used for evaluating the association of breakfast practices with studied variables ((BMI; kg/m2, gender) of

studied samples. The $p<0.05$ was considered as a statistical significant difference and $p>0.05$ was considered as statistical non-significant differences in this study.

RESULTS

Table -I report the baseline characteristics of studied samples, in this present study there were 382 medical students. KMDC, DUHS and JSMU students were included 45.3%, 30.9% and 23.8% respectively. Females were 84.8% and males were 15.2% in this study, 29.8% were from 4th year students and majority of participants were found underweight (79.6%) with only 3.7% were overweight or obese students. Gender based comparison of demographic parameters of the participants like mean age of participants was 20.83±1.54 years, mean age of male & females were 20.71±1.545:20.85±1.543 respectively showed statistically non-significant ($p>0.05$) differences, mean weight was 55.78±10.81kg, mean weight of male & females were 69.48±12.365: 53.32±8.444 respectively showed statistically significant ($p<0.05$) differences, mean height was 1.90±0.11 meters, mean height of male & females were 1.9107±.10047: 1.9027±.11664 respectively showed statistically non-significant ($p>0.05$) differences, mean Body mass index (BMI) was 15.53±3.5 kg/m2, mean body mass index of male & females were 19.2215±4.20181: 14.8783±2.92753 respectively showed statistically significant ($p<0.05$) differences (Table-II). The participants did breakfast 81.4% and omit or skip breakfast was 18.6%. The breakfast skippers, females and males were 85.9%: 14.1% respectively (Table-III). Table-IV showed the association of breakfast (yes done and omit or skip breakfast) with studied variables. Only body mass index (underweight, normal weight, and overweight/obese) had as statistically significant ($p<0.05$) association with practices of breakfast, while gender based comparison and various institute (DUHS, JSMU & KMDC) comparison did not showed significant ($p>0.05$) association with breakfast in medical students.

Characteristics		N	%
Name of Institute	DUHS	118	30.9
	JSMU	91	23.8
	KM&DC	173	45.3
Gender	Male	58	15.2
	Female	324	84.8
Year of Study	1st year	96	25.1
	2nd year	73	19.1
	3rd year	99	25.9
	4th year	114	29.8
BMI	Underweight	304	79.6
	Normal	64	16.8
	Overweight/obese	14	3.7

Table-I. Baseline characteristics of studied samples (n=382).

	Gender	Mean± S. Deviation	Mean± S. Deviation	P-Value
Age (years)	Male	20.83 ± 1.54	20.71 ± 1.545	0.52
	Female		20.85 ± 1.543	
Weight (kg)	Male	55.78 ± 10.81	69.48 ± 12.365	0.000*
	Female		53.32 ± 8.444	
Height (m)	Male	1.90 ± 0.11	1.9107 ± .10047	0.625
	Female		1.9027 ± .11664	
BMI (kg/m2)	Male	15.53 ± 3.5	19.2215 ± 4.20181	0.000*
	Female		14.8783 ± 2.92753	

Table-II. Gender based comparison of demographic parameters of the participants (n=382)

Statistical comparisons of mean scores were performed using independent sample t-test, *$p<0.05$ was considered significant.

Questions		N			Percentage %
Do you have breakfast in the morning?	Yes	311			81.4
	No/Skip/omit	71	Male	10 (14.1%)	18.6
			Female	61(85.9%)	

Table-III. Breakfast practices in studied participants.

Characteristics		Do you have breakfast in the morning?				P-Value
		Yes		No		
		N	%	N	%	
Name of Institute	DUHS	98	31.5	20	28.2	0.84
	JSMU	74	23.8	17	23.9	
	KM&DC	139	44.7	34	47.9	
Gender	Male	48	15.4	10	14.1	0.77
	Female	263	84.6	61	85.9	
BMI	Underweight	255	82.0	49	69.0	0.036*
	Normal	47	15.1	17	23.9	
	Overweight/obese	9	2.9	5	7.0	

Table-IV. Association of breakfast with studied variables
***p<0.05 was considered significant using Pearson Chi Square test**

DISCUSSION

The present study aimed to find out the association of body mass index (BMI; kg/m^2) with the breakfast in medical students of Karachi. The mean age of participants was 20.83±1.54 years in our study results, similar to study reported in Malaysian study.[17]

The total number of study participants was 382 and majorities were females 324 (84.8%). It is like other studies in which mostly participants were females and sample was range from 300 to 600.[18,19] According to our study results, the majority of medical students were found in underweight or Thinness category (79.6%) and only 3.7% were overweight/ obese in different medical institutes of Karachi. Similar to our findings of higher frequency of thinness was observed by Cusick and Kuch in their study.[20] The gender based comparison of weight (Kg) and body mass index (BMI; kg/m^2) showed statistically significant ($p<0.05$) differences in our study, like our results. Similar study was done in Kuwait University by Dalal Alkazemi.[21] This supports our results. Under weight or thinness was expressed as low body mass index (BMI ≤ 18.5) for age in individual. The weight is considered as an indicator of age not for height and it was more prevalent in the Southeast Asian region.[22] Many factors affect the weight but genetic factors mainly determine the height and it exerts adverse effects on human body like disturbed menstrual cycle, disturbed cognition, emotional disturbances or stress, increased absentees from class or poor performance in academics and delayed maturation and decreased muscle strength or decreased bone mineral density, so these disturbances affects the adolescents health by physically and mentally.[20,22] Underweight or thinness and overweight or obesity are considered as a double burden. These can be due to heterogeneity of malnutrition in adolescents.[22] According to our study results, the participants did breakfast 81.4% and omit or skip breakfast was 18.6%. Among breakfast skippers, females were 85.9% and males were 14.1% respectively. Similar to our findings, prevalence of doing breakfast observed in western countries like United States of America, in France and in Australia (80%, 90%, and 72.5% respectively) and breakfast skipper similar to our results in India, America, in France, and in Australia (14.8%, 20%, 10%, and 27.5% respectively.[23,24] In our study results, mostly females were skipping breakfast as compared to males. Like our results, study was done in Alexandria University, Egypt.[25] It is due to over thinking about being overweight as compared to normal or ideal weight. Hence mostly girls adopt the habit of skipping breakfast. According to our study results body mass index (underweight, normal weight, and overweight/ obese) had as statistically significant ($p<0.05$) association with breakfast (done and skipped or omit), while gender based comparison did not showed significant ($p>0.05$) association with breakfast practices in medical students. Similar to our results, an Egyptian study supported our findings.[25] The habit of breakfast skipping was one of the leading factor for development of overweight

or obesity in adolescents. It results with decrease intake of fiber diet iron, and calcium, increased concentration of insulin level after meal or higher insulin resistance level or metabolic syndrome (MetS), lack of satiety and disturbed circadian rhythm of glucose homeostasis, increased breakdown of fat with low grade of inflammation and consumption of junk foods or fast foods.[25] These factors are considered as leading factors for development of non communicable diseases (NCD's) or chronic disorders in future.

CONCLUSION

According to our study findings, this can be concluded that the majority of participants were females, and habit of skipping breakfast most common in them, so body mass index were <18.5 kg/m2 in them and the Body mass index had as statistically significant ($p<0.05$) association with breakfast.

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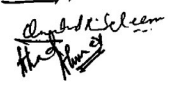
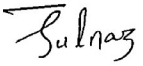
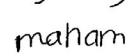
1	Saleemullah Abro	Preception writing up, Proof reading.	
2	Qurratulain Saleem	Data analysis & Proof reading.	
3	Ahad Ahmar Noor	Critical review, Proof readiang.	
4	Ghulnaz Khalid	Concept & Drafting study.	
5	Maham Khan	Data collection	
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