Dietary Habits and Prevalence of Underweight/ Obesity in Students of University of Gujrat, Pakistan

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ABSTRACT

OBJECTIVE: To investigate the incidence of underweight and overweight/obesity among University students and examine the dietary habits and nutritional plan with relation to Body mass index (BMI).

METHODOLOGY: University students (N = 432, mean age 21.8±2.9 years) 342 females and 90 males were selected by simple random sampling technique. BMI was calculated through anthropometry. Consumption of selected foods and eating behaviors were noted via pre-tested questionnaire.

RESULTS: Results showed that percentage of underweight students was much higher (27.1 %) while overweight and obesity ratio were moderately high (10.2% and 3.7%). From students without having breakfast in last 7 days, 35.9 % were underweight while students having regular breakfast had highest percentage in normal BMI (76.3 %) (p-value < 0.001). Consuming fruits 4-6 times /week was found highest with normal weight 59.6% while 23.9% (p-value<0.001) were underweight without fruit intake. From total of 187 participants having 4-6 times vegetable consumption, 42.9% were with normal BMI (p-value < 0.005). Students using fast food ≥ 3 times/day were overweight and obese mainly. Statistically less significant results found regarding vitamin and probiotic supplementations with their relation to BMI. From total 148 students who did daily exercise, 140 were with normal BMI. 26% of total participants never did exercise and 63.8% among them were underweight.

CONCLUSION: High numbers of students regarding underweight and overweight categories are distressing in this study. To point out determinants of underweight/obesity and poor eating practices among university students, qualitative research is necessary for future.

KEYWORDS: Overweight, underweight, Obesity, BMI, Nutritional habits.

INTRODUCTION

Weight disorders are responsible for overall health of a person. Due to imbalance of food intake and work output along with various metabolic disorders, weight fluctuation happens. Numbers of health problems arise due to weight disorders including underweight which may result in increased risk of osteoporosis and anemia. Being underweight may result in amenorrhea in female also[1-3]. While overweight and obesity are causative factor of other major diseases like hypertension, certain cancers, diabetes mellitus type-II, metabolic syndrome, arteriosclerosis, dyslipidemia, bone/joint disease and stroke[4,5].

Gujrat is fertile agricultural district in the center of Punjab Province of Pakistan where previously people consumed mainly typical Mediterranean diet. Due to fast urbanization, modernization and industrial development in the region last decade, eating trends of people are shifting from natural, hygienic to poor and unhygienic/fast foods. The situation is even worse regarding university students where there is no proper guideline regarding healthy eating. Craze of being slim and smart results in "Dieting" which ruin the health status of students. Fast foods are opted as fashion and craze in universities which ultimately affects the health of students. Along with being overweight/obesity, situation of being underweight is also observed in Pakistani university students[4]. In 2014, Global Burden of Disease Study reported Pakistan at 9th position from total of 188 countries regarding obesity[6].

In developing countries, increasing rate of underweight and obesity in youth is alarming. A research carried out on Sub-Saharan African countries revealed that increasing obesity rate is similar to developed countries while another study showed that it is higher i.e (+65%) in developing countries as compared to (+48%) in developed countries[7].

The literature reveals many of University students gain or lose weight due to lower physical activities, poor eating habits and stress[8-10]. Universities need is to promote healthy eating habits for incoming students for their good health[10]. Present study was mainly aimed to examine underweight/obesity prevalence,

nutritional habits and their relation to each other among Pakistani university students for healthy lifestyle promotion in universities.

METHODOLOGY

A "Short survey" study was conducted in spring semester of 2018 at university of Gujrat, Pakistan from April to May 2018. Through random sampling technique, total 432 students (342 females and 90 males) age 21.8±2.9 years were included in study after their written consent. All of the participants were Pakistani. Participant's response rate was 98%. The study was approved by research ethics council of University of Gujrat.

Data was collected in two steps. The questionnaires were filled by recruited students in first step and anthropometric measurements taken after awhile. Selected students were requested to fill out a questionnaire regarding their nutritional habits for past 7 days. Habits including consumption of green vegetables, breakfast, Fast food, vitamin supplements, probiotics, physical activities and watching T.V were inquired, for this purpose, Pre-tested, standardized questionnaire was used which was already published for such studies in university students[11]. Before filling of questionnaire, students were instructed to fill the information completely and truthfully. In second step, body mass index (BMI) measurements were determined by asking students to take off shoes and socks for weight and height determinations. Weight was measured by using weight scale (WestPoint Weight Scale WF-9808) and height with height measuring Wedder Burn scale (model-WM205H), taken from medical college health care centre, University of Gujrat.

BMI, a ratio of weight in kg to height in meter square, was used to estimate body weight status.

According to world health organization (WHO) and National Institutes of Health guidelines, weight status was categorized into four classes: Obese (BMI ≥ 30), Overweight (BMI range 25-29.9), Normal weight (BMI range 18.5-24.9) and Underweight (BMI ≤ 18.5)[12,13].

Statistical analyses were executed by Statistical Package for Social Sciences (SPSS) (version IBM SPSS Statistic 20). *T-test* was used for analysis of parametric variables, while for non-parametric variables; chi-squared analyses were done. All reported *P* values were made on the basis of 2-sided tests and compared to a significance level of 5%; differences were considered statistically significant at P < 0.05.

RESULTS

Distribution of selected students regarding Area, Body Mass Index (BMI), Hostilities/Day scholar and age

group is given in Table I. Out of total 432 participants, 58.8% were from urban area and 45.6% from rural areas. Hostelized and day scholars ratio was 17.6% and 82.4% respectively. Regarding body mass index (BMI), 117 (27.1%) of total recruited students were underweight where female proportion (28.9%) was higher than male (20%) in this category. Only (255) 59% of total subject participants were with normal weight. Significant Overweight and obesity ratio was found as 10.2% and 3.7% respectively where male ratio was higher than female in contrary to underweight categories where female were more underweight (Table I). No significant association was found between BMI and area of residence or being Hostelite/day scholar.

Nutritional habits of participants were evaluated for past seven days and detailed result of descriptive statistics is given in Table II. Some of the questions were not answered by some participants, 10.2% of the total participants did never breakfast in last 7 days and almost all of them were underweight while with regular breakfast were found with highest percentage in normal BMI (76.3 %) (p-value = 0.000). 6.5% of total subject students never used fruits and all were

TABLE I: DISTRIBUTION OF SELECTED STUDENTS REGARDING AREA, BODY MASS INDEX (BMI), HOSTILITIES/DAY SCHOLAR AND AGE GROUP

Variable	Female (%)	Male (%)	Total(%)
Area			
Urban	205 (59.9)	49 (54.4)	254 (58.8)
Rural	137 (40.1)	41 (45.6)	178 (45.6)
Hostelite			
Day Scholar	279 (81.6)	77 (85.6)	356 (82.4)
Hostelized	63 (18.4)	13 (14.4)	76 (17.6)
BMI			
Under Weight	99 (28.9)	18 (20)	117 (27.1)
Normal Weight	207 (60.5)	48 (53.3)	255 (59)
Over Weight	27 (7.9)	17 (18.9)	44 (10.2)
Obesity	9 (2.6)	7 (7.8)	16 (3.7)
Age			
18-21 years	196 (57.1)	33 (37.1)	229 (53.0)
22-25 years	127 (37.0)	39 (43.8)	166 (38.4)
26-29 years	12 (3.5)	11 (12.3)	23 (5.3)
30-33 years	7 (2.3)	6 (6.7)	13 (3.0)

TABLE II: PARTICIPANTS RESPONSE TO EATING HABITS WITH DESCRIPTIVE STATISTICS

Statement	Under(%)	Normal(%)	Over(%)	Obesity(%)	Total(%)	X^2 (p-value)
During the PAST 7 days, how many times did you eat breakfast in the morning?						
0 Times	42 (35.9)	6 (2.4)	5 (11.4)	0 (0)	53 (12.3)	427.18 (0.000)
1-3 times	53 (45.3)	5 (2)	3 (6.8)	0 (0)	61 (14.2)	
4-6 times	16 (13.7)	34 (13.4)	4 (9.1)	0 (0)	54 (12.6)	
1-2 times per day	5 (4.3)	193 (76.3)	9 (20.5)	3 (18.8)	210 (48.8)	
3 or more times per day	1 (0.9)	15 (5.9)	23 (52.3)	13 (81.3)	52 (12.1)	
During the PAST 7 days, how many times did you eat fruit?						
0 Times	28 (23.9)	0 (0)	0 (0)	0 (0)	28 (6.5)	524.92 (0.000)
1-3 times	77 (65.8)	17 (6.7)	10 (22.7)	1 (6.3)	105 (24.3)	
4-6 times	5 (4.3)	152 (59.6)	2 (4.5)	1 (6.3)	160 (37)	
1-2 times per day	6 (5.1)	86 (33.7)	26 (59.1)	2 (12.5)	120 (27.8)	
3 or more times per day	1 (0.9)	0 (0)	6 (13.6)	12 (75)	19 (4.4)	
During the PAST 7 days, how many times did you eat a green salad?						
0 Times	99 (84.6)	62 (30)	17 (53.1)	9 (56.3)	187 (50.3)	95.76 (0.000)
1-3 times	4 (3.4)	29 (14)	5 (15.6)	1 (6.3)	39 (10.5)	
4-6 times	11 (9.4)	79 (38.2)	6 (18.8)	5 (31.3)	101 (27.2)	
1-2 times per day	2 (1.7)	32 (15.5)	3 (9.4)	0 (0)	37 (9.9)	
During the PAST 7 days, how many times did you eat other vegetables? (Except green salad)						
0 Times	17 (14.5)	31 (12.2)	12 (27.3)	4 (25)	64 (14.8)	23.826 (0.005)
1-3 times	11 (9.4)	51 (20.1)	13 (29.5)	1 (6.3)	76 (17.6)	
4-6 times	56 (47.9)	109 (42.9)	13 (29.5)	9 (56.3)	187 (43.4)	
1-2 times per day	33 (28.2)	63 (24.8)	6 (13.6)	2 (12.5)	104 (24.1)	
During the PAST 7 days, how often did you eat fast food?						
0 Times	95 (81.2)	47 (18.4)	1 (2.3)	1 (6.3)	144 (33.3)	521.15 (0.000)
1-3 times	18 (15.4)	93 (36.5)	1 (2.3)	1 (6.3)	113 (26.2)	
4-6 times	4 (3.4)	109 (42.7)	0 (0)	0 (0)	113 (26.2)	
1-2 times per day	0 (0)	1 (0.4)	20 (45.5)	4 (25)	25 (5.8)	
During the PAST 7 days, how many times did you drink a can, a bottle or a glass of soda or pop, such as coke, pepsi, sprite or Dr. Pepper?						
0 Times	19 (16.4)	44 (17.3)	5 (11.4)	3 (18.8)	71 (16.5)	68.12 (0.000)
1-3 times	58 (50)	119 (46.7)	11 (25)	4 (25)	192 (44.5)	
4-6 times	14 (12.1)	11 (4.3)	19 (43.2)	3 (18.8)	47 (10.9)	
1-2 times per day	20 (17.2)	69 (27.1)	9 (20.5)	4 (25)	102 (23.7)	
3 or more times per day	5 (4.3)	12 (4.7)	0 (0)	2 (12.5)	19 (4.4)	
During the PAST 7 days, how many days were you physically active for ATLEAST 60 MINUTES per day?						
0 Day	74 (63.8)	10 (3.9)	19 (43.2)	9 (56.3)	112 (26)	237.37 (0.000)
1 Day	23 (19.8)	23 (9)	14 (31.8)	6 (37.5)	66 (15.3)	
2 Days	13 (11.2)	82 (32.2)	9 (20.5)	1 (6.3)	105 (24.4)	
3 Days	6 (5.2)	140 (54.9)	2 (4.5)	0 (0)	148 (34.3)	

Is physical activity enjoyable for you?						
Never	13 (11.1)	13 (5.1)	4 (9.1)	3 (18.8)	33 (7.6)	
Sometimes	49 (41.9)	104 (40.8)	17 (38.6)	7 (43.8)	177 (41)	8.65 (0.469)
Usually	30 (25.6)	70 (27.5)	13 (29.5)	3 (18.8)	116 (26.9)	
Always	25 (21.4)	68 (26.7)	10 (22.7)	3 (18.8)	106 (24.5)	
On an average day, how many hours do you watch T.V?						
0 Times	46 (39.3)	73 (28.6)	15 (34.1)	4 (25)	138 (31.9)	
0-1 Hours	28 (23.9)	46 (18)	6 (13.6)	4 (25)	84 (19.4)	
1-2 Hours	19 (16.2)	54 (21.2)	10 (22.7)	3 (18.8)	86 (19.9)	17.74 (0.124)
2-3 Hours	13 (11.1)	62 (24.3)	11 (25)	2 (12.5)	88 (20.4)	
4+ Hours	11 (9.4)	20 (7.8)	2 (4.5)	3 (18.8)	36 (8.3)	
On an average day, how many hours do you play video or computer games or use a computer/tablet for something that is not university work?						
0 Times	11 (9.4)	35 (13.7)	7 (15.9)	3 (18.8)	56 (13)	
0-1 Hours	14 (12)	41 (16.1)	6 (13.6)	2 (12.5)	63 (14.6)	
1-2 Hours	25 (21.4)	37 (14.5)	5 (11.4)	4 (25)	71 (16.4)	7.15 (0.807)
2-3 Hours	30 (25.6)	70 (27.5)	13 (29.5)	3 (18.8)	116 (26.9)	
4+ Hours	37 (31.6)	72 (28.2)	13 (29.5)	4 (25)	126 (29.2)	

underweight while students consuming fruits 4-6 times/ week was found highest with normal weight 59.6% (p-value=0.000).

About 14.8% of total participants never used vegetables, 78.5% never used vitamin supplements, 52.4% used fast food 1-6 time/week, 23.1% never used probiotics (Yogurt/Lassi etc) and 44.5% used soda drinks 1-2 times/week.

Even at university level, 16.7% of total participants "Never focused" on healthy eating choices while 46.2% consider it "Sometime", 45.8 % of total students consider them with ideal weight but anthropometric measurements revealed 14.5% of that fraction was underweight, 48.6% of total students watched Television 1-4 hours/day, an alarming habit of sedentary life style.

From total 187 participants which never used salad, a majority 99(84.6%) students were underweight (p-value<0.001). From total of 187 participants having 4-6 times vegetable consumption, 109(42.9%) were found with normal BMI (p-value<0.005).

Out of total 37 student using fast food ≥3 times/day, majority were overweight and obese i.e. 22 and 10 respectively. Statistically less significant results found regarding vitamin and probiotic supplementations (p-value ≥0.05). About 23.7% participants used soda drinks 1-2 time/day. From total 148 students which did daily exercise (at least 60 minutes) 3 days/week, 140 were with normal BMI. 26% of total participants did never exercise and among them 63.8% were underweight (p-value <0.001). Frequency and effect of Television watching and computer game playing was also studied in present study where results were not significant as p-value was more than 0.05. Majority (31.9%) of total student reported zero time "Television watching" in last seven days (p-value =0.124). On contrary highest percentage (29.2%) reported 4+hours playing computer games (p-value=8.07). while responding the affording of proper food, more than half (59.3%) participants were of the point of view that this had never been problem with them while only 5.1% reported to never afford proper food (p-value =0.289)

DISCUSSION

The purpose of this study was to evaluate the underweight, overweight and obesity ratio in university student along with their eating patterns. In contrast to many of the studies relating this topic where overweight and obesity was declared alarming[13], underweight category (27.1% of total) was found more shocking in this study with female more underweight 28.9% than male student 20% (Table I). Our study showed opposite result from university students in urban Cameroon where female were more overweight than males[3]. Influence of fashion models and desire of smart look diverts females to restricted foods which ultimately ruin their health[14]. Finding of this study indicate 59% of total participants were with normal weight (based on BMI calculation), which was almost similar to Lebanese university students[11]. our study revealed significant % of overweight and obese i.e.10.2% and 3.7% respectively but much lower than college student of Saudi Arabia where the ratio was 21.8% and 15.7% respectively[2]. The reason behind this factor is that Saudi students mainly consume junk

food[15] as compared to our study. In Kuwaiti university students the said ratios were thirty two % and 8.9%, whereas in United Arab Emirates the percentage for male overweight students was 35% and almost similar ratio was observed in USA[16-18].

Prevalence of underweight in this study is higher than many of other reported studies. Underweight ratio was found 10.2% in females and 1.1% in males from university of Spain (Muracia)[19]. Underweight (UW) ratio was 14.3% and 22.4% in male and female respectively in Malaysian university students[20]. UW was noticed 6.4% in female students and 1% in male in Lebanese university student[11]. More underweight students in this study are possibly due to fast urbanization in the region. The craze of being slim may result in limited food intake. Also, about 82.4% of the students were day scholar in the study; traveling long distance to reach university early morning may be another possible factor for skipping of breakfast and physical activities which results in UW.

In this study, eating habits of recruited students are worrying as shown in Table II. About 10.2% of the total participants did never breakfast in last 7 days and almost all of them were underweight while with regular breakfast were found with highest percentage in normal BMI. Our study was consisting with other studies where students with regular fruits and vegetable intake are with normal weight and health[21]. Vitamin supplementations for adults are much important as they impart vital role in healthy metabolism, about 80% of our total students never used them in past seven days. Probiotics are very important for healthy life with magical benefits[22] while 23.1% of our participants never used yogurt or any other probiotics. Above said factors are important regarding healthy BMI of students which is not in our case. About healthy food choices, 62.9% participants consider it sometime or frequently while 16.7% of total give never attention to healthy eating. However applied statistics revealed them as less significant result (Table II). Twenty six percent of total participants did never exercise and among them 63.8% were under weight, this was consistent with college aged female students of USA[23].

CONCLUSION

Coexistence of underweight and overweight burden was noticed in university students. Surprisingly, in contrast to many other studies underweight prevalence was higher than overweight and obesity in this study. Policies and intervention are necessary at university level for healthy eating education for coming students. Universities should endorse their commitment to health promotion. Qualitative studies are required in future to unearth the determinants that affect eating practices of university students. Healthy eating awareness programs are needed at University level.

LIMITATIONS

Increased sample size may result in more accurate findings as this study was consist of less number of participant. Moreover this study focused on specific region students which may deviate from the universities from other parts of country. Another limitation is that except anthropometric measurements, findings are based solely on participants' response to questions which may be not been accurately provided.

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