

## PREVALENCE OF OVERWEIGHT AND OBESITY AMONG MANSOURA UNIVERSITY STUDENTS

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### Abstract

**Background:** Obesity has become an important public health problem in adolescents due to rapid increase of prevalence rate associated with sever co-morbidities. **Aim:** The aim of this study was to assess the prevalence and predisposing factors of obesity among mansoura university students. **Methods:** Descriptive cross sectional design was used to carry out this study at eighteen faculties at mansoura university. The sample size was 589 students. Five tools were used for data collection including socioeconomic scale, structured interviewing questionnaires to assess students health status and dietary habits, self administered structured questionnaire to assess students knowledge and ATOP scale to assess students attitude toward overweight and obesity. **Results:** The study showed that 56.4% of university students were overweight and obese. Fifty eight percent of students showed unsatisfactory score level of dietary habits. Most of them had poor knowledge score level and 30.9% of them had negative attitude toward overweight and obesity. **Conclusion:** The study concluded that the prevalence of overweight and obesity among students at mansoura university was high and there are many factors affecting this high prevalence including dietary habits, knowledge and attitude. **Recommendations:** The study recommended that health educational programs should be directed to university students on the predisposing factors of obesity and health eating habits.

**Keywords:** Obesity, Dietary habits, Knowledge, Attitude, University Students

### Introduction:

University students are important target group of the adult population for promotion of healthy lifestyles which represents a unique period of transition between youth and adulthood. During this period, students become gradually more emotionally stable, start thinking in their purpose of life and future, so they become able to develop nutritional identity [1,2].

Poor eating habits are major public health problem concern among university age who experienced transition into university life. The growing of shopping malls, suitability stores, and vending machines have created an disturbing situation for young adults to adopt morbid eating habits. As a consequence,

overweight and obesity are increasingly observed among university students in developing nations [3].

Obesity is defined as a severe chronic medical condition which is related with a wide range of debilitating and life threatening conditions. It is defined as an irregular or excessive fat accumulation and highly body mass index (BMI) measurement that may decreased health. Obesity refers to having excessive body fat which may come from muscle, bone, fat and/or water retention. It result as a consequence of an energy imbalance which occurs when energy intake increased energy expenditure over an extended period of time [4,5].

[6] estimated that the rates of obesity and overweight in the Arab countries are high constitute 48% from total population in Egypt, 36.4 % in Saudi Arabia, 55.2% in Kuwait, 37.9 in Bahrain and Jordan, 42% in United Arab Emirates, and 27.4 % in Lebanon. Approximately 38% of university students are classified as either slightly or very overweight.

The imbalance between caloric intake and consumption are different from individual to other and affected by many factors such as: age, sex, psychological and environmental factors. Obese and overweight persons are at risk for health problems including; respiratory problems, hypertensions, coronary heart disease, dyslipidemia, osteoarthritis, stroke, sleep apnea, diabetes mellitus, cancer, and gall bladder disease[7].

Management of obesity is depend on life style and behavior modifications [8,9].

Learning healthy eating behaviors at this age and promotes positive health can enhancing actions or a protection strategy or from obesity. Therefore, the aim of this study is to assess the prevalence of overweight & obesity among Mansoura university students in addition to assess their level of knowledge, attitude, dietary habits and determine factors influencing their dietary habit.

#### **Material and methods:**

##### **Research design**

The design used in this study was a descriptive cross sectional design.

##### **Setting**

The study was conducted at all mansoura university faculty (18 faculties affiliated to Mansoura University), in Dakahlia Governorate, including both medical and non medical faculties. Medical faculties were including : Faculty of Medicine, Dentistry, Pharmacy, Veterinary Medicine and Nursing. While non medical faculties were including: Faculty of Arts, Law, Commerce, Science, Engineering, Agriculture, Tourism &

Hotels, Computing & Information, Education, Kindergarten, Fine Arts, Specific Education and Physical Education.

#### **Subjects and sampling**

##### **Subjects**

Undergraduate students attending the above mentioned faculties and fulfilling the following inclusion criteria were included in the study.

##### **Inclusion criteria:**

- Enrolled in all years of education during academic year 2016-2017.
- Age from 18 up to 25 years old.
- Both sexes (male & female).
- Agreed to participate in the study.

##### **Exclusion Criteria:**

Student who are being on a dietary regimen for diseases related to poor diet quality including (Cancer, diabetes, Cardiovascular, Hypertension).

##### **Sampling**

The required sample size included in the study was **589** students. After reviewing registration records of Mansoura University to estimate the total number of enrolled students in each college, registration records revealed that the total numbers of students registered at Mansoura University were **135458**. The required **sample size** was calculated by using proportion allocation random method as followed:

Population size= **135458** students,  $\alpha=0.5\%$ , confidence level =95%, desired precision= 4%, expected prevalence of correct knowledge about obesity and overweight = 50% and design effect= 1 [10]. Students to be enrolled in the study were selected from each faculty according to the following equation:

$$\text{Required number} = \frac{\text{No of students /each faculty} \times \text{Number of the calculated sample size (589)}}{\text{Total number of students in the (mansoura) faculties(135458) [11].}}$$

##### **Study tools**

Data was collected by using five tools as following:

**Tool I: Socio-economic Scale:** This tool was adopted from El Gilany, El-Wehady and El-Wasify[12]. It was used to assess demographic data of students such as (age, sex, academic year, marital status and residence). The scale also used to assess socioeconomic status of students (SES). The total score was 84. It was classified into four levels depending on the quartiles of the score calculated:

- **The score** of 1-21 were considered of very low social class.
- **The score** of 22-42 were considered of low social class.
- **The score** of 43-63 were considered of middle social class.
- **The score** of 64-84 were considered of high social class.

**Tool II: Structured Interviewing Questionnaire:** It was developed by the researcher to assess the followings: students' past & present health history, family history, nutritional health problems among students, students' general health assessment.

#### **Anthropometric Measurements**

Weight and height were assessed using standardized techniques and calibrated scales. **Weight** was measured using a calibrated platform electronic scale while the students were asked to remove heavy clothes and were barefoot. Students were instructed to stand in the middle of the scale with their body equally distributed on both feet. Before weighing each student, the electronic scale was zeroed and later was calibrated after every 20th student measured by the researcher using a known weight.

**Height** was measured using stadiometer. Height measurement was then carefully read to the nearest 0.1 cm.

#### **Body Mass Index (BMI)**

Height and weight measurements were used to calculate body mass index (BMI) according to the standardized formula: **body weight (Kg)/height (m<sup>2</sup>)**. In

accordance with the World Health Organization (WHO) criteria for overweight and obesity classification, BMI values were classified into four categories:

- **Underweight** (BMI  $\leq$  18.5 kg/m<sup>2</sup>),
- **Normal weight** (BMI between 18.5 and 24.9 kg/m<sup>2</sup>),
- **Overweight** (BMI between 25 and 29.9 kg/m<sup>2</sup>),
- **Mild obesity** (BMI between 30 and 34.9 kg/m<sup>2</sup>)
- **Moderate obesity** (BMI between 35 and 39.9 kg/m<sup>2</sup>)

According to (CDC 2013) obesity was classified into three grades:

**Grad 1** (BMI=30-34.9).

**Grade 2** (BMI=35-39.9).

**Grade 3** or extreme obesity (BMI $\geq$ 40).

Blood pressure (BP) was measured after 5 minutes rest, in the sitting position from the right arm using standard mercury sphygmomanometers. Two measurements were made for all students at 2 minutes intervals with the average of the 2 measurements used in data analysis. Students were defined as having hypertension if they had BP >140/90 mmHg or were taking anti-hypertension medication. Pre-hypertension was defined as BP  $\leq$  140 /90 -  $\geq$  130/85 mmHg.

**Tool III: Structured Interviewing Questionnaire Sheet.** It was developed by the researcher to assess the following:

**Part I:** Student's dietary habits through three categories. The first category included 12 items for assessing students' food choice habits based on a three-point likert scale (always, sometimes, never). The second category composed of 6 items for assessing students' meal pattern based on a three-point likert scale (always, sometimes, rarely). The third category composed of 15 items for assessing students' dietary habits including frequency of food consumption. This category required a response on 3 point Likert- rating scale with 3 continuum

(once or more daily, once or more weekly, rarely/never). This category also included 7 multiple choice questions for assessing students' dietary habits such as breakfast skipping, fast food intake, snack intake, tea and/or coffee, milk or soft drink consumption.

The total score for all categories related to dietary habits was equal to 66 marks, that represents 100% and categorized into two levels as following:

- Satisfactory: More than or equal to 65.0% of the total score (more than or equal 42.9%).
- Unsatisfactory: Less than 65.0% of the total score (less than 42.9%).

**Part II:** This part of the questionnaire was used to assess the factors affecting students' food choice motives requiring a response on 2 continuum (affect and don't affect). **Part III:** used to assess students' level of physical activity.

**Tool IV: Self-administered Structured Questionnaire for assessing students' Knowledge.** It was developed by the researcher to assess the students' knowledge regarding overweight and obesity. The total score for all questions related to knowledge was equal to 31 marks, that represents 100% and categorized into three levels as following:

- **Poor:** scores less than 50.0% of the total score (less than 15.5%)
- **Fair:** scores 50.0% to 65.0% of the total score (15.5% to 20.2%)
- **Good:** scores more than 65.0% of the total score (more than 20.2%)

**Tool V: Attitude Toward Obese Persons Scale (ATOP).** This scale adopted from Allison et al., (1991) [13] to assess attitudes of students toward obese and overweight persons. It consisted of 20 statements requiring a response based on a six-point likert scale with 6 continuum (Strongly agree, moderately agree, slightly

agree, strongly disagree, moderately disagree, slightly disagree).

**ATOP** score ranging from 0 to 120, therefore any score above the midpoint (score of 60) indicated that the student has positive attitudes toward obese persons. Score of 60 or less indicated that the student has negative attitude.

#### • Results

##### Demographic characteristics

Table (1) shows the distribution of the studied students according to their socio-demographic data. Results revealed that the age of the studied students ranged from 18 up to 24 years and the majority (95.8%) of them were single. Almost half of their fathers (48.2%) graduated from university and more than half of their mothers (61.4%) completed only their basic education.

Figure (1) clarified that (45.3%) of students were belonged to low socioeconomic level.

##### Health status of students

Table (2) displays that (33.1%) of the studied students complained of food allergy. More than one fourth (27.5% and 26.5%) of them complained of constipation and colic, respectively. It was also found that (22.9% and 22.4%) of them complained of fatigue and anorexia, while 18.2% of them complained of heartburn and distention. Only (10.7%, 9.3% and 2.7%) of them had history of parasites (parasitic infestation), diarrhea and vomiting, respectively.

Figure (2) clarifies that more than one third (40.6%) of the studied students had normal body mass index and only 3% of them were under weight. Regarding overweight and obesity, more than one third (33.8%) of them were overweight and 22.6% of them were obese (mild and moderate).

##### Students' Dietary Habits

Table (3) showed distribution of the studied students according to their food choice habits. It revealed that (47.9%) of

the studied students mentioned that they rarely choose low sugar foods, while only 10.5% of them always choose low sugar foods. Concerning vegetables and fruits intake, more than half (57%) of the students mentioned that they always choose high vegetables, while, only (5.3%) of them chose high fruits.

**Table (4):** displays distribution of the studied students according to their food patterns. It showed that (37.7%) of the studied students rarely took their breakfast regularly every day. Regarding dinner consumption, more than one fourth (31.5%) of them rarely took simple dinner daily. Moreover, more than two thirds (69.4%) of them mentioned that they rarely ate their lunch every day.

**Table (5):** clarifies distribution of the studied students according to their usual eating habits. It showed that (59.3%) of the studied students were eating their home meals daily. In relation to food ingredient, the majority (93.4%) of them were eating varied foods with different ingredients such as protein, sugars, salts and dairy products. Concerning milk and drinks consumption, almost one half (49.2%) of them mentioned that they never drink milk. Moreover, more than two thirds of them were drinking cola.

**Table (6):** showed that (42.6%) of the studied students were eating vegetables one or more daily, while, 36.7% of them rarely ate vegetables. Boiled egg was rarely consumed among (31.0%) of students. Concerning fast food intake, more than one third (38.4%) of them were consuming it one or more daily.

**Figure(3)** clarifies that the majority of the studied students (94.1%) showed satisfactory score level regarding food choice habits. In addition, (84.4% and 73.9%) of them had unsatisfactory score level regarding frequency of usual eating habits and food pattern. This figure summarized the total score of dietary habits among students, where more than

half of them ( 58.1%) had unsatisfactory score level.

**Table(7)** showed factors affecting students' food Choice. more than two third of them choosed their food based on it is availability. Meanwhile 82.9% , 77.8% 68.1% and 67.7% of the students mentioned some factors that did not affect their food choice including foods low in calories, food familiarity and foods rich in protein & fibers, respectively.

**Students' Knowledge Regarding Healthy Diet and Obesity**

**Figure(4)** summarized the total score of knowledge among students, where more than three fourth of them (75.6%) had knowledge score level poor.

**Students' Attitudes Toward Obesity.**

**Figure(5)** elaborates that more than two third (69.1%) of the studied students had positive attitude toward over weight and obesity, while, more than one forth (30.9%) of them had negative attitude

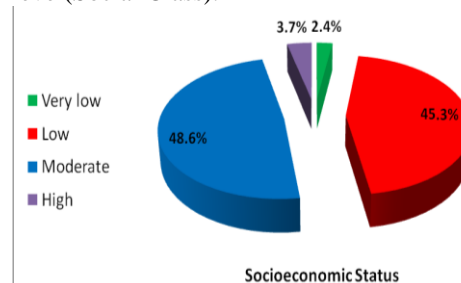
**Table (1):** Distribution of the studied students according to their socio-demographic characteristics.

Socio-demographic characteristics	N=(589)	%
<b>Age</b>		
18 less than 20 years	285	48.4
20 – 23 years	244	41.4
>23 years	60	10.2
<b>Marital Status</b>		
Single	564	95.8
Married	24	4.1
Divorced	1	0.1
<b>Father Education</b>		
Illiterate	8	1.4
Read & write	46	7.8
Essential	251	42.6
High	284	48.2
<b>Mother education</b>		
Illiterate	6	1.1
Read & write	137	23.2
Essential	362	61.4
High	84	14.3

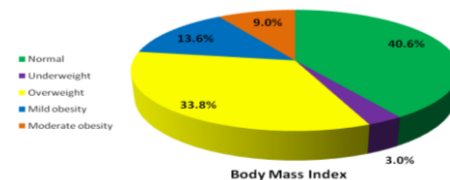
**Table (2):** Distribution of the studied students according to their current health complains(nutritional problems).

Current Health Complains	N(589)	%
Food allergy	195	33.1
Constipation	162	27.5
Colic	156	26.5
Fatigue	135	22.9
Anorexia	132	22.4
Heart burn	107	18.2
Distention	107	18.2
Dizziness	99	16.8
Parasites	63	10.7
Diarrhea	55	9.3
Vomiting	16	2.7

**Figure (1):** Distribution of the studied students according to their socioeconomic level(Social Class).



**Figure (2):** Distribution of the studied students according to their body mass index.



N.B: \* "Answers were not mutually exclusive".

**Table (3)** Distribution of the studied students according to their food choice habits(N=589)

Food choice habits	Rare		Sometimes		Always	
	N	%	N	%	N	%
Low sugar foods	282	47.9	245	41.6	62	1.5
High vegetables	64	10.9	189	32.1	336	57.0
High fruits	8	1.3	550	93.4	31	5.3
Low salt diet	212	36.0	64	10.9	313	53.1
Cereals	251	42.6	214	36.3	124	21.1
Toast bread	375	63.7	181	30.7	33	5.6
Small meals	157	26.7	306	52.0	126	21.3
No colored foods	492	83.5	64	10.9	33	5.6
Low fat diet	314	53.3	210	35.7	65	11.0
Drinks without sugar	127	21.6	188	31.9	274	46.5
Low adipose milk	488	82.8	93	15.8	8	1.4
Boiled rather frizzed foods	95	16.1	461	78.3	33	5.5

**Table (4):** Distribution of the studied students according to their food patterns(N=589).

Food Patterns	Rare		Sometimes		Always	
	N	%	N	%	N	%
Take breakfast regularly every day	313	53.1	216	37.7	60	10.9
Avoid nuts frequently	187	32.7	256	43.5	146	24.8
Simple dinner daily	155	31.5	251	42.6	183	26.3
Avoid sweets frequently during the day	87	14.8	346	58.7	156	26.5
Take launch regularly every day	87	69.4	409	14.8	93	15.8
Avoid pickles or spicy food frequently during the day	367	62.3	129	21.9	93	15.8

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**Table (5):** Distribution of the studied students according to their usual eating habits.

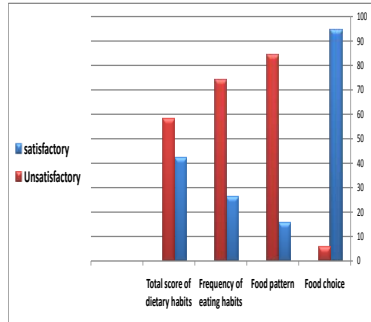
Usual eating habits	N(589)	%
<b>Frequency of home meals</b>		
Daily	349	59.3
One time/ week	178	30.2
Three or more times/week	62	10.5
<b>Milk consumption</b>		
Full cream	153	26.0
Skimmed	10	1.7
Half cream	136	23.1
Never drink milk	290	49.2
<b>*Types of food ingredients</b>		
High starchy	274	46.5
High protein	218	37.0
Milky	91	15.4
Sugary	181	30.7
Salted foods	62	10.5
Varied foods	550	93.4
<b>*Types of drinks</b>		
Juices	589	100
Cola	396	67.2
Coffee/Tea	185	31.4
<b>Frequency of water consumption</b>		
One cup	159	27.0
Two cups	333	56.5
Three cups	97	16.5

**N.B:** \* "Answers were not mutually exclusive".

**Table (6):** Distribution of the studied students according to frequency of their usual eating habits(N=589).

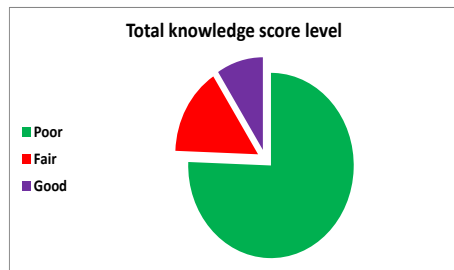
Eating habits	Rare		One or more daily		One or more Weekly	
	N	%	N	%	N	%
<b>(A)good eating habits</b>						
Vegetables	216	36.7	251	42.6	122	20.7
Fruits	39	6.6	488	82.9	62	10.5
Beans	39	6.6	62	10.5	488	82.9
Red meats	0	0.0	146	24.8	443	75.2
Smoked fish	0	0.0	39	6.6	550	93.4
Boiled eggs	183	31.0	191	32.4	215	36.5
Yogurt	101	17.1	426	72.3	62	10.5
<b>(B)Poor eating habits</b>						
Fast foods	226	25.8	152	38.4	211	35.8
Sugary foods	218	37.0	89	15.1	282	47.9
Adipose meat	39	6.6	488	82.9	62	10.5
Fried fish	0	0.0	154	26.1	435	73.9
Fried eggs	94	15.0	425	72.2	70	11.9
Cola	365	62.0	100	17.0	124	21.0

**Figure 3: Dietary habits score levels among the Studied Students**

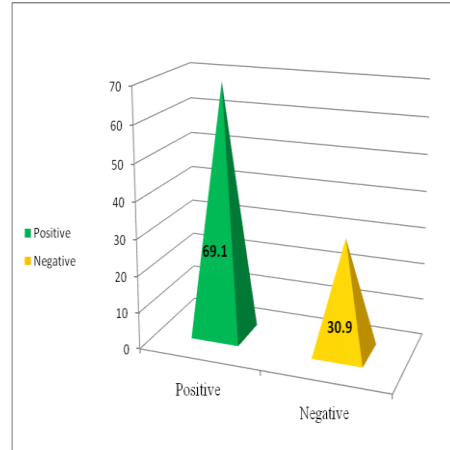


**Table(7)** Distribution of the studied students according to factors affecting their food choice (N=589).

Factors	Affect		Not affect	
	N	%	N	%
Availability	404	68.6	185	31.4
Reasonable Price	527	89.5	62	10.5
Attractive	589	100	0	0.0
Good smell	589	100	0	0.0
Tasty	589	100	0	0.0
Low calories	101	17.1	488	82.9
Familiar	131	22.2	458	77.8
Natural components	194	33.0	395	67.0
No additives	316	53.7	273	46.3
High protein	188	31.9	401	68.1
High fibers	190	32.3	399	67.7



**Figure 4: Total knowledge score level**



**Figure 5: Total attitude score level**

**Discussion:**

Establishing healthy eating habits can have a significant effect on many of adolescents' main concerns by contributing to maintaining a healthy weight, improve physical and intellectual performance, optimize growth and improve skin health. An unbalanced diet with a reliance on energy-rich, nutrient-poor foods is an important factor in the current epidemic of obesity[14].

Concerning students' socio- demographic characteristics, findings of the present study showed that the majority of them were single. This finding was in the same line with findings stated by similar studies, which reported that 52.6% of students were female and 69.7% of them were single. In relation to students' socioeconomic level, slightly less than half of the studied student were belonged to moderate socioeconomic level and more than one third of them were belonged to low socioeconomic level. These findings were supported by similar studies, who found that 49.1% of students were belonged to moderate socioeconomic level[15,16].

Concerning nutritional problems, more than one quarter of the students reported food allergy, constipation, colic , fatigue



and anorexia. These findings could be attributed to many unhealthy dietary behaviors among students who might receive unbalanced diet or nutrients. These findings are in accordance with similar studies who found that food allergy, constipation, anorexia, and distention are the most frequent problems among students [16,17].

In relation to students' body mass index, more than one third of students were overweight, while more than one fifth of them were obese (mild and moderate obesity). The high prevalence of overweight and obesity in this study could be explained by several unhealthy dietary habits within the university campus including the higher consumption of fast food which are high in calories, salt, saturated fats and carbohydrates. On the other hand, Delta region is characterized by its rural and suburban nature. The lower socioeconomic status, the limited recreational facilities, and opportunity for physical activity may explain the increase in prevalence of overweight and obesity. These findings agreed to some extent with similar studies who reported that 27.9% of university students were overweight [18].

The prevalence of overweight and obesity in this study were higher than what reported by another study who revealed that the overall prevalence of obesity was 12.5% and overweight was 32.7%. Moreover, similar study found that the prevalence of obesity among Lebanese adults was 24.1% [19,20].

Dietary habits have a considerable long term effect on humans' health condition. The present study findings showed different food choice habits among students. Concerning vegetables and fruits consumption, the majority of them and more than one third of them didn't consume fruits and vegetables on regular basis, respectively. Only, 42.6% of students reported daily vegetables

consumption. Lower rates in this study was supported by similar study who revealed that one half of students never consumed fruits and vegetables daily [21,22].

The present study sheds light on the dietary behavior and lifestyle of the students. Concerning meal pattern, it was found that more than half of students skipped breakfast frequently. This could be attributed to many reasons such as lack of time, early university activities, dislike of food served at home, or a poor appetite first thing in the morning. This was in accordance with similar studies which revealed that almost one half of the studied students skipped their breakfast. Moreover, another study showed a significant association between breakfast skipping and overweight as well as obesity. This could be explained as breakfast skipping leads to eating energy dense, less nutritious snacks and fast foods to compensate this lost meal [23,24].

Fast foods are a way of life for many university students. More than one third of the studied students reported daily intake of snacks within university campus as a part from regular meals per day such as pizza, fried foods, and sweets. These results come in agreement with similar studies which revealed that unhealthy eating habit of university students was noticed in high intake of fast food and frequent snacking. [25,26,27].

The higher consumption of fast foods could be attributed to that university students often select fast food due to its palatability, availability and convenience. They usually do not follow (ADA) indicates that obesity or overweight is a fast food related issue. Poorly timed snacks that are high in calories and low in nutrients may blunt the adolescent's mealtime appetite and replace nutritious foods [28].

According to the presented study findings, the majority of the studied students had

unsatisfactory dietary habit's score level in relation to food pattern, frequency of eating habits and total dietary habits. This could be attributed to that are faced with many different food choices that result in poor eating habits. These findings are supported by similar study which showed an alarming adoption of unhealthy eating patterns and lifestyle habits among university students. Moreover, similar study showed unsatisfactory score level of dietary habits among (99%) of students in relation to meal pattern, frequency of eating habits, and total dietary habits score level [23,29].

This study revealed that the total score of students knowledge was low. The current results showed that more than three fourths of students had poor level of knowledge regarding healthy diet, caloric content of food stuff, types of food elements, sources of nutrients, factors leading to obesity and diet related disease. This could be attributed to the minor role that educational curriculum played in covering this area of nutritional knowledge [30,31,32,33].

Regarding students attitude towards overweight and obesity, more than two thirds of the studied students had positive attitude toward over weight and obesity. This could be attributed to that students had more education and expertise about obesity than the general population, which may lead to less negative attitudes and reduced prejudice. Moreover, more frequent contacts with obese people could lead to a positive influence on the attitude towards obese people. This finding comes in the same line with finding of *Manalathil et al.,2014* who found that more than three fourths of the studied students had positive attitude toward obese people.

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