Body Weight Perception and Dietary Control Methods among Egyptian University Students

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Abstract: **Background**: Most countries in the Middle East are becoming part of the global obesity pandemic, and the problem becomes significant when the trend towards a more "Western" lifestyle is considered in developing countries. Body weight and its perception play an important role in the physical and mental well-being of a person. Weight perception is found to be a better predictor of weight management behavior as compared to actual weight. A**im of the study** was to explore relationships between body weight perception, actual weight status, and weight control measure among students of Alexandria and Damanhour Universities. **Material & methods:** A cross sectional study was carried out during scholastic year 2013/2014. **Subjects**: A total of 400 faculties students from two Egyptian universities, Alexandria and Damanhour, aged 18 to 24 years, male and female students were participated in the study. **Tool:** Body weight perception structured questionnaire was used to collect data on demographic, weight perception and weight control practices history. Height, weight and waist circumference were measured, overweight and obesity was estimated according to body mass index BMI standard. **Results:** A high percentage of faculties' students consider themselves as overweight or obese, despite nearly half of them had normal BMI. More than one third of them were practicing dieting reducing measures (44.8% Female, 41.2% Male). Weight-loss behaviors were more prevalent among female, young students, living in urban and affiliated to faculty of education. Reducing fat and sugar intake, skipping meal, and practicing sports were the most commonly reported methods to lose weight. **Conclusion:** Body weight perception was poorly associated with actual weight status. Gender difference was observed in body weight perception. **Recommendations**: It worthwhile to implements health promotion program to raise awareness regarding concepts of healthy body image in relation to medical definitions of overweight might improve accuracy of weight perceptions, promote healthy realistic body weight and lead to healthier eating and promote physical activity.

Key words: Weight perceptions, dietary control methods, faculty students, Egypt

1-Introduction

Body weight and its perception play an important role in the physical and mental well-being of a person. The World Health Organization (WHO) estimates more than one billion adults to be overweight and three hundred million of them to be obese. Obesity is a well-known risk factor for cardiovascular diseases, diabetes and decreased life expectancy[1-3]. Regardless of whether a person is underweight, normal or overweight, weight perception is an important and strong determinant of nutritional habits and weight management. Failure to recognize weight correctly may perpetuate a false sense of security around health and contribute to persistence of unhealthy lifestyles. Consequently discrepancies between true weight and weight perception can have serious implications it can be associated with eating disorder tendencies [1, 4].

Body weight perception refers to the personal evaluation of one's weight as "*underweight*" or" *normal weight*" or "*overweight*" irrespective of actual body mass index. The discrepancy in body weight perception is also known as body image distortion.

Evidence supports that there is a decline in consumption of fruits and vegetables and missing breakfast among young age who perceive themselves as overweight. One's perception does not always reflect reality [5,6].

Young adult are sensitive to the effects of weight perception especially females and studies have shown that they perceive their weight incorrectly (7, 8).Unfortunately the desire to be thin creates a pressure especially on female students to lose weight continuously and this might promote unhealthy strict dieting and unhealthy weight behaviors to lose their weight. Accordingly, dieting is becoming a common phenomenon among university students to achieve their desirable perceived body weight. There is overwhelmingly evidence that body image is intrinsically linked with self-esteem and the society's emphasis on how we look also seems to affect the way people feel about themselves(9-10).

Studies in Western countries have shown that there are many socio-cultural, biological and interpersonal factors that influence body dissatisfaction

with gender difference. Earlier in the Arab culture, thinness has been regarded as socially undesirable, whereas plumpness is regarded as a symbol of fertility and womanhood with the change due to Western influences, urbanization, advanced education, and nutrition transition in rapidly developing and emerging economical countries may have led to greater dissatisfaction with one's weight and body proportions. In general, the ideal body image may be perceived as a "thin body" and now tagged with the concept of being physically fit [10-12].

The problems with weight and weight perception are universal but greatly influenced by social norms and by a number of factors including age, gender, family, peers, media, and ethnicity in which adolescents and young adults, especially university students, may be vulnerable to sociocultural influences promoting thinness. University females attach much importance on appearance and are preoccupied with their weight from a very young age. They idealize a thin physique. While, on the other hand, males value a muscular physique, which they often associate with health. To achieve their ideal, female engage in weight control behaviors which precipitated by their bodyweight perception as fasting, vomiting, non-prescribed diet pills, laxatives, cigarettes, and diuretics were reported in a substantial proportion of them[11-13].

Some studies observed that first year university students have significant weight gain, followed by ongoing slow but steady increase in weight. Moreover, university students among several African countries show high prevalence of overweight and obesity: the highest was among Egyptian as 25.3%–59.4%, followed by South Africa; 10.8%–24% and finally the rate of Nigeria; was 10% (2014) [14]

While most previous studies in the Egypt and Arab countries have focused on high prevalence of overweight and obesity among university students few studies have investigated the weight related beliefs, weight control practices and body weight perceptions amongst this population. Consequently, understanding students' dieting practices is significantly important in assessing students' need for developing appropriate educational health awareness programs to prevent unhealthy dieting behaviors among students. Besides, college age is a risky time in terms of developing body image concerns and eating disorder tendencies that may have long-term health effects.

Research aim and questions:
Aim of the study:
The aim of the study was to explore relationships between body weight perception, actual weight status, and weight control measure among students of Alexandria and Damanhour Universities.

Research questions:

1. Is there relationship between body weight perception, actual weight status, and weight control measure among students?
2. What are the measures students' uses to control their body weight?

2. Materials and Method:
Materials:
Research design:
A cross sectional descriptive research design was followed to carry out the study.
Setting
The study was conducted in two Egyptian Universities namely Alexandria and Damanhour. Two faculties were included in the study from each University as: faculty of nursing and education from Damanhour University and faculty of pharmacy and kindergarten from Alexandria University.
Sampling
Multistage random sampling technique was followed as the study was carried out in two Egyptian universities, Alexandria and Damanhour. Using the proportional allocation method two faculties were chosen from each university by random sample.
Subjects
Subjects of the study included students aged from 18 to 24 years male and female enrolled in third and fourth year from each previous mentioned faculty. Convenient sample of 10 %of students were selected randomly from each faculty as follow:
In each faculty according to total number of the third and fourth year 10% of students from each scholastic year in each faculty were taken.
In Damanhour University:
60 students from Nursing Faculty were selected as follow 38 students from third year and 22 students from the fourth year. While 140 students (90 and 50) students from third and fourth scholastic year respectively were chosen from Education faculty given a total sample of 200 from Damanhour University.
In Alexandria University:
42 students were selected from kindergarten faculty as 21 students from third and 21 from fourth scholastic year and 158 students were chosen randomly from faculty of pharmacy as follow 114students representing third year and 44 from fourth scholastic year with total sample of 200 students. The total sample of the study was 400 students.
Tool for data collection:
In order to fulfill the objectives of the study one tool was used to collect necessary data.
A body weight perception structured questionnaire was developed by researchers to collect necessary data from students:
Each questionnaire consists of four sections compromising:

First part: students' personnel and socio demographic data: it included age, sex, and scholastic year, place of residence, and father and mother education.

Second part: it included past health history of students (physical disease), their anthropometric measurements: **waist circumference** were measured at the level of the umbilicus and the superior iliac crest using a normal tailoring tape The measurement was made with the subject standing upright, feet together and arms hanging freely at the sides and it was compared to the Arab references of Waist circumferences (WC) the cutoff points for men is 93.5 cm and 91.5 cm for women [15]. Also weight and Height were measured and used to calculate the Body Mass Index (BMI) with the formula (BMI= body weight (kg) / height (m)), diagnosed based on the criteria recommended by the World Health Organization to WHO standard [16].

Third part: Students' body weight perception, different weight control measures, frequency of conducting these measures, question about sources of pressure to be a certain weight and reasons for discontinuation of losing weight practices.

Fourth part: Visual body image perception using illustrated figure to differentiate between perceived actual body image shape and wanted. This tool was tested for validity and reliability in different population. **Stunkardet.al** [11, 17] It is a simple visual tool to assess body image and perceived body size. It comprises a series of nine gender specific body figure drawings of increasing body size ranging from very thin (value =1) to very big (value =9). Students were asked to choose the figure that best described their current shape and their ideal shape.**(fig1)**
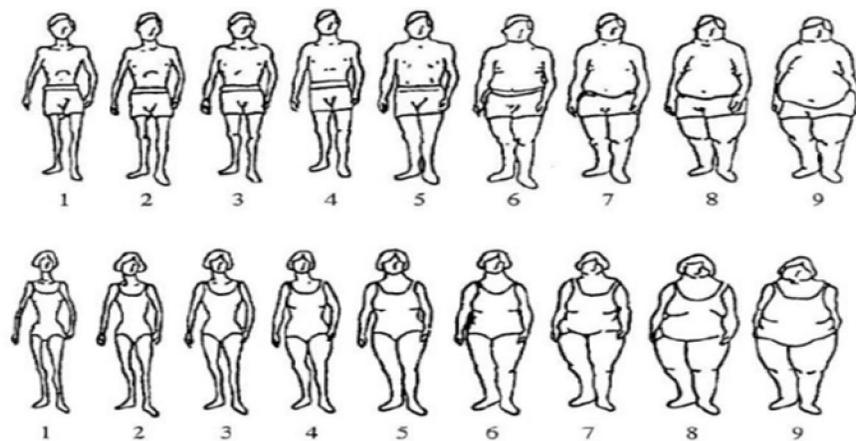
(Fig 1) body image perception [11, 17]

Methods

Administrative process:

Approval from the responsible personnel from four faculties was obtained after explanation of the purpose of the study.

Study tool:

- The tool was adopted and developed by researchers after reviewing of the related recent relevant literature [4,9,11] and was validated by expert in the field of nutrition and community health nursing to check content validity. Necessary modifications were carried out accordingly.
- Cronbach's alpha coefficient was used to test the tool reliability (r=0.84)

Pilot study:

Pilot study was conducted on 20 (5 %) of students and they were excluded from the total number of students to insure the clarity and comprehensiveness of the tool.

Data collection:

The data was collected over a period of four months from February till June during the scholastic year 2013-2014.

Ethical considerations:

- ➢ All students in different faculties were informed about the purpose of the study and given brief explanation; consequently oral informed consent was obtained from each of them.
- ➢ The right to refuse to participate or withdraw from the study was assured.
- ➢ Data anonymity and confidentiality were considered.

Statistical Analysis:

1. The data collected from the questionnaires were imputed and analyzed using Statistical Package for Social Sciences (SPSS) statistical editor (version 20).
2. Results were represented using cross tabulation of perception of weight versus actual weight. Other results consist of frequencies, percentages and

means. Statistically significant difference of demographics like gender, residence and actual weight and their weight perception were analyzed with chi-square tests.

3.   Descriptive statistics included means, standard deviations, and frequency.

4.   Pearson test used to measure the significance and the cutoff point for statistical significance was $P \leq 0.05$.

3. Results:

More than half of the students aged between 20 to 25 years old and lived in Urban residence, the majority of them was female. More than half of them residing in Urban area. The students who were affiliated to the University of Damanhour included nearly one third of the participants were enrolled in faculty of education and 15.5% were nursing students. Concerning Alexandria University, 39.5% were pharmacy students, and only 10.5 % were enrolled in Kindergarten faculty. 55.8% of them were in the third level, and the rest are in the fourth level. Nearly one third of the total students reported that they suffer from Anemia **(Table 1).**

Table (2) revealed that mean weight of male students were 74.9±10.3kg, while the female mean weight were 66.04+ 11.5kg, regarding their height it was 162.9 ±6.52, 171.08±8.7 for the female and male students respectively. After calculating their body mass index, nearly half (55.9% Females, and 49.4% Males) of them were within normal body weight, while 34.3% of females and 43.5% of males were overweight respectively. Concerning the measured waist circumferences of students, the table shows that the mean circumference for female was 78.56 ±6.9 cm, and for male was 84.04±7.36 cm and considered within normal range according to the Arab references of waist circumferences (WC) cutoff points. Whereas, 4.1% of females and 8.2% of males from the studied students were considered over weight.

Graph (1) shows that the majority of male students who perceived themselves as underweight were actually normal weight. While those who perceive that they are normal weighted one quarter of them where actually overweight. Nearly one quarter of students who perceive themselves as overweight are actually obese. Finally half percent of those students who perceived themselves obese are actually overweight.

Graph (2) shows that the majority of female students who perceive themselves as underweight are actually normal weighted, however 18.5% of female students who perceived themselves as normal were over weighted. On the other hand 22.1% of female who perceive themselves as overweight have actual normal weight. Finally one third of students perceiving themselves as obese are actually overweight, and 22% of them are actually normal weight. Highly significant

difference was found between the actual and perceived weight in the both groups (female and male) using Pearson chi-square test (χ) = 0.001.

Relation between body mass index categories and use of dietary regimen among the studied sample is displayed in **graph 3**. It is clear that 14.7% of students who follow the dietary regimen were normal weighted according to their body mass index. Highly significant difference was found between the body mass index and the use of dietary regimen using Pearson chi-square test (χ) = 0.001.

Graph(4) shows the relation ship between studied students male and female perception of their actual shape and their desired shapeaccording to the nine figure silhouette for males and females, 30.8% of female students perceived their actual shape as normal (4th level) followed by 18.4% of female students who perceived that their actual shape were 2nd or 3rd level, 15.9% of them perceived that their actual shape is 5th level, and nearly one tenth perceived that they fit in the 6th level. Compared to their desired shape, nearly one quarter of female students desire being the 2nd shape, and nearly two third desire having the 3rd and the 4th shape.

Concerning the male students perception of their actual shape, 28.2% of reported that they are at the 4th level, followed by 21.2 % are in the 3rd level, equal percentage 10.6 % are either 2nd or 6th level. While regarding the students desired shape, the highest percentage was 38.8% desire the 3rd shape, followed by 32.9 % desired the 4th shape, and 17.6 % desire the 2nd shape. In general, female students were more likely to select thinness figures than male students.

The dietary control measures adopted by male and female students and their causes are displayed in **table 3**. 44.8%, 41.2% of female and male students tried to decrease their weight respectively. The most prevalent cause for females who tried to decrease weight was to find suitable clothes to fit (77.3%), while, to be physically fit and better self-feeling were mentioned by 68.1% and 57.5% of female respectively. As compared to 71.4% of male students stated better practice of exercise, and being physically fit are there causes for adopting dietary control measures respectively. While 51.8% of female students compared to only 17.1% of male students mentioned family pressure is another cause respectively.

Regarding the frequency of conducting dietary control measures 30.5% of female students compared to 28.5% of male tried it several times. 100% of female and almost all of male students mentioned reducing fatty meal intake as one of the dietary control methods used. While, eating fruits and vegetables were mentioned by 60.2% of female compared to less than half (45.7%) of male students respectively. Whereas, skipping meals (breakfast) and practicing sport were

reported by 46.8% and 52.4% of female students compared to 40% and majority (85.7%) of male students respectively. Also, reduce intake of carbohydrates was mentioned by more than half (58.8%) of female students compared to 54.3% of male. Though, 16.3% and 12.7% of female students used either regimen pills or herbal remedies (green tea) to reduce their weight compared to only 8.6% and 11.4% of males. Skipping meal, taking un prescribed regimen pills and using herbal remedies is considering unhealthy method of dieting.

Graph(5) shows distribution of the study subjects who follow dietary regimen according to their socio demographic characteristics, it is clear that female, young students tried to reduce their weight 44.8%, 48.9% respectively. 47.2% of students' who reside in urban area and 51.4% of students in faculty of education tried to reduce their weight using different dietary regimen. Significant difference was only found between age and the use of dietary regimen (f= 0.017).

The percentage of Students with normal BMI who are following dietary control measures was illustrated in **graph 6** were as 17% of female students compared to only 4.8% of male students were following dietary regimen. While it was clear from the figure that 23% of older students who are normal weighted on diet control measures, compared to only 4.2% of younger students aged less than 20 years old.

Table 1: Distribution of the participants according to their socio demographic characteristics:

Students characteristics	N=400	
	No	%
Age		
- < 20 years	177	44.3
- 20-25 years	223	55.7
Gender		
- Female	315	78.8
- Male	85	21.2
Residence		
- Urban	235	58.8
- Rural	165	41.3
Faculties		
- Nursing	62	15.5
- Education	138	34.5
- Kindergarten	42	10.5
- Pharmacy	158	39.5
Scholastic year		
- Third year	223	55.8
- Fourth year	177	44.3
Physical disease		
- Anemia	144	36.1%
- Diabetes	3	0.8%
- Renal disease	8	2%
- Heart disease	1	0.3%
- Free from physical disease	244	61%

Table 2: Anthropometric measurements of studied students.

Anthropometric measurement	Students			
	Female N=315		Male N=85	
	No	%	No	%
BMI Categories				
- Under weight	2	0.6%	0	0%
- Normal weight	176	55.9%	42	49.4%
- Over weight	108	34.3%	37	43.4%
- Obese	29	9.2%	6	7.1%
Weight in kg (Mean)	66.04 ± 11.5		74.9 ± 10.4	
Height in cm (Mean)	162.9± 6.5		171.1±8.7	
Waist Circumference				
Above normal range of WC	24	7.6%	7	8.2%
WC Mean	78.7± 6.9		84± 7.36	

Graph1: Male students perceived and actual body weight
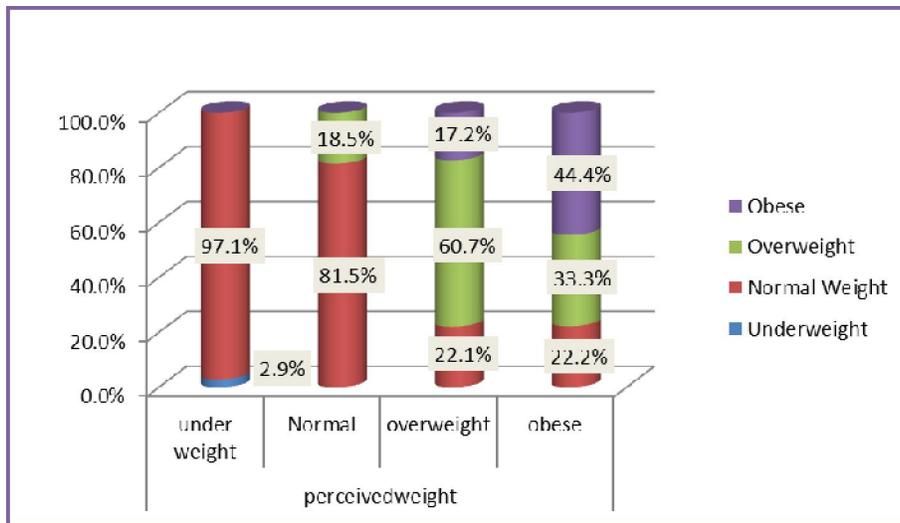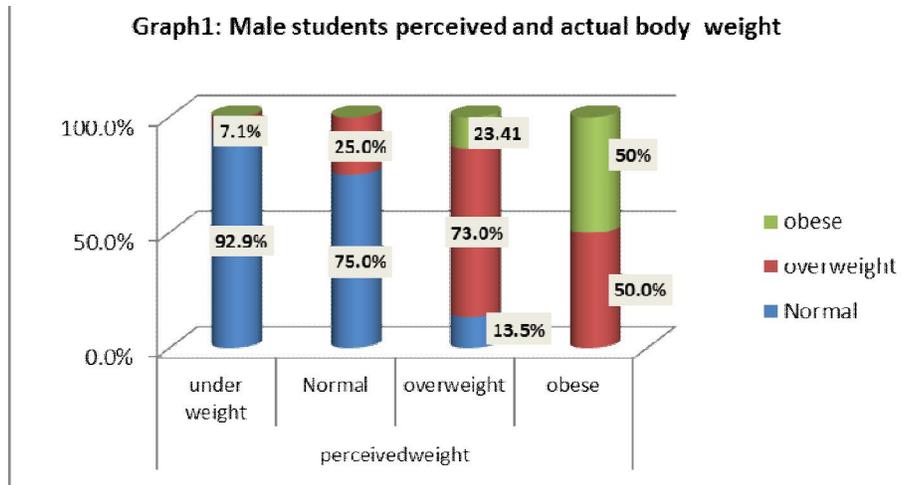
Graph2: Female students perceived and actual bodyweight
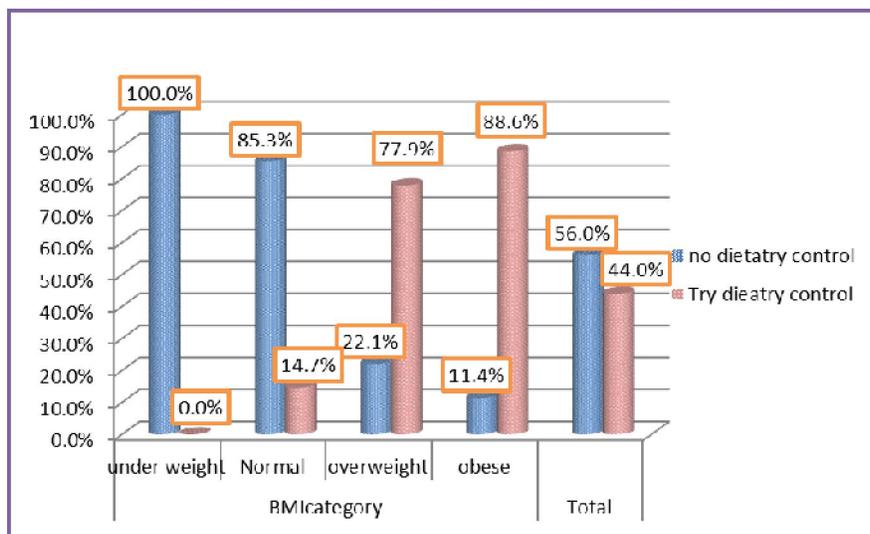
Graph 3: Relation between body mass index categories and use of dietary regimen among the study sample
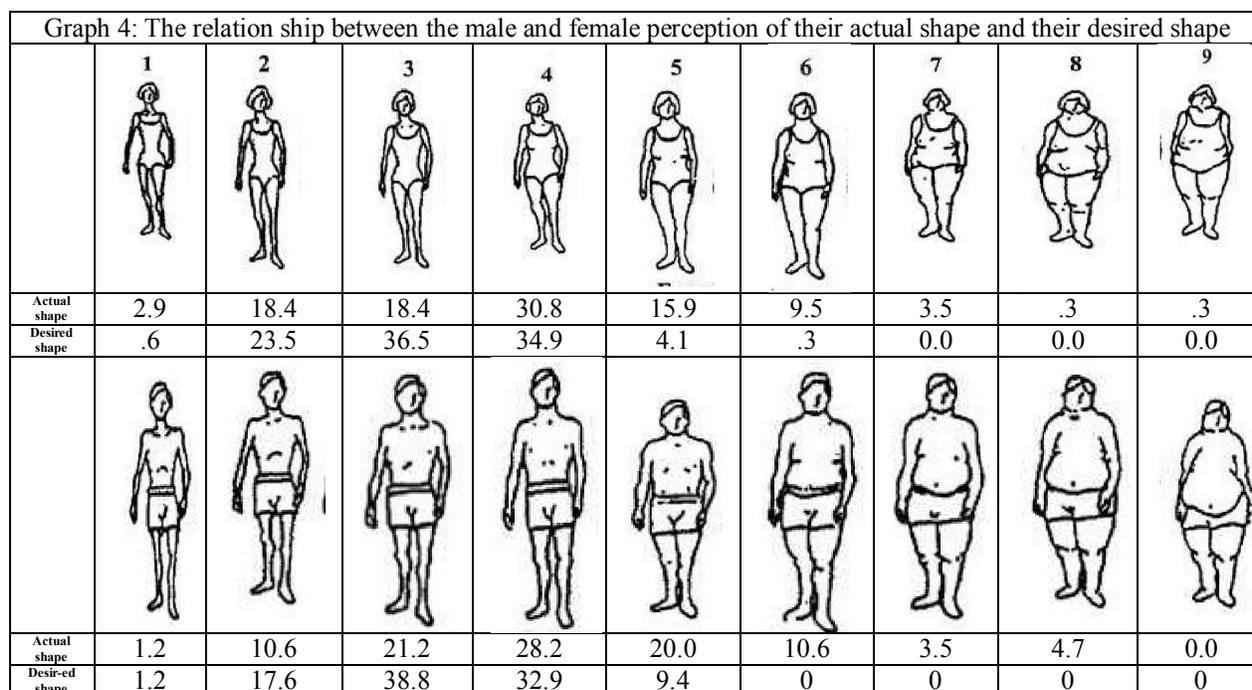
Graph 4: The relation ship between the male and female perception of their actual shape and their desired shape								
	1	2	3	4	5	6	7	8	9

Actual shape	2.9	18.4	18.4	30.8	15.9	9.5	3.5	.3	.3
Desired shape	.6	23.5	36.5	34.9	4.1	.3	0.0	0.0	0.0

Actual shape	1.2	10.6	21.2	28.2	20.0	10.6	3.5	4.7	0.0
Desir-ed shape	1.2	17.6	38.8	32.9	9.4	0	0	0	0

Table 3: The dietary control measures adopted by male and female students and their causes:

Conducting dietary control measures	students				Total	
	Female N= 315		Male N= 85			
	No	%	No	%	No	%
Tried to reduce weight:						
	141	44.8%	35	41.2%	176	44.0%
Intentions for reducing weight*	N= 141		N=35		176	
- Better practice of exercise	56	39.7%	25	71.4%	81	46%
- Family pressure	73	51.8%	6	17.1%	79	44.9%
- Better self-feeling	81	57.5%	23	65.7%	104	26.0%
- Physically fit	96	68.1%	25	71.4%	121	30.2%
- To be more active	54	38.3%	17	48.6%	71	17.8%
- To fit clothes	109	77.3%	9	25.7%	118	70.6%
Frequency of conducting dietary control measures						
- Never	6	4.3%	3	8.6%	9	5.1%
- Sometimes	92	65.2	22	62.9%	114	64.8%
- Several time	43	30.5%	10	28.5%	53	30.1%
Methods used to reduce weight *						
- Reduce fatty meal	141	100%	34	97.1%	175	99.4%
- Increase intake of Fruits, vegetables	85	60.2%	16	45.7%	101	57.3%
- Reduce intake of carbohydrates (sugar)	83	58.8%	19	54.3%	102	57.9%
- Practicing exercise	74	52.4%	30	85.7%	104	59.1%
- Skipping meal (breakfast)	66	46.8%	14	40%	80	45.4%
- Chemical regimen	37	26.2%	9	25.7%	46	26.1%
- Herbal remedies (green tea)	18	12.7%	5	11.4%	23	13%
- Regimen pills	23	16.3%	3	8.6%	26	14.8%

*multiple response
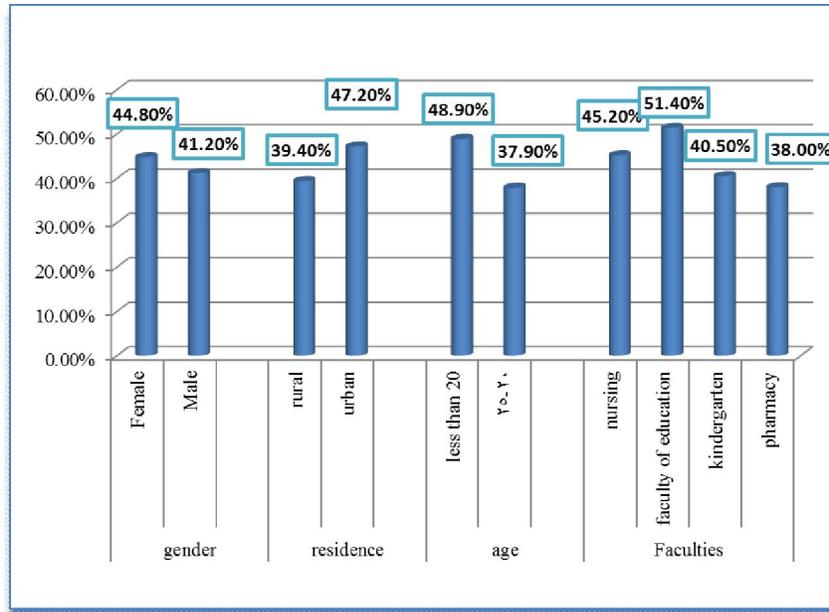
Graph 5. Distribution of the study sample who follow dietary regimen according to their socio demographic characteristics
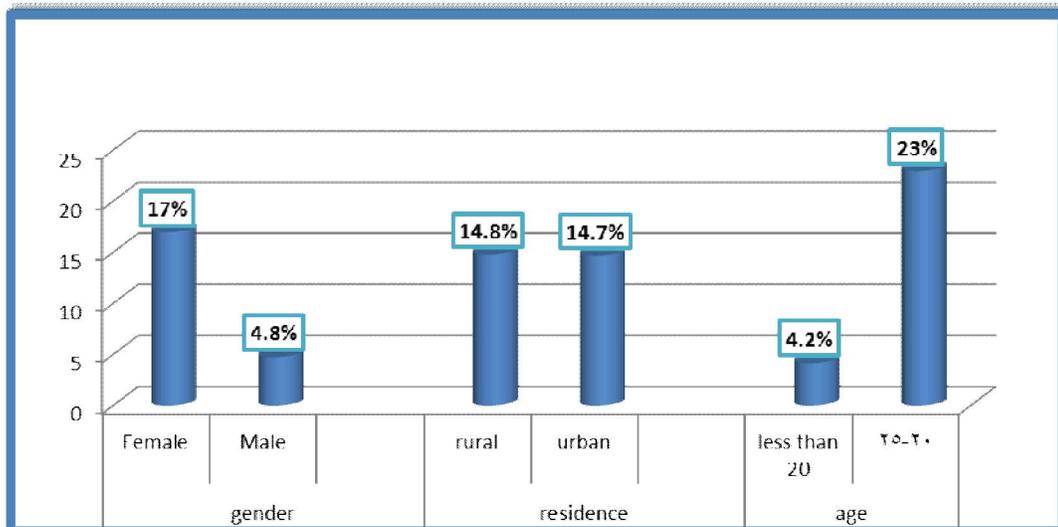
Graph 6. Percentages of students with normal BMI who are following dietary control measures

4. Discussion:

Weight perception is one of the motivating factors for weight control behaviors and is a better predictor than actual weight for adolescents to diet or exercise. In the current study, nearly half of the study sample had normal body mass index (female and male), while 34.3% and 43.5%of female and male students were overweight respectively. The result of study was congruent with **Musaiger 2011**[18] who mentioned that the prevalence of overweight and obesity among adult ranged from 25% to 81.9% in Arab region. While the result is different than a study conducted in China as about majority of their students

have a normal BMI**,** and with other study conducted on Saudi female students that more than three quarters were of normal or underweight, compared to 10.9% who were overweight and 1.9% who were obese[19,20].

Also, in an Egyptian study conducted in 11 faculties in 2013 the results showed that one quarter of males and nearly one third of females were either overweight/obese [21]. This inconsistency may be explained by the rapid change in the Egyptian community currently and nutrition transition, inactivity, urbanization, skipping breakfast, an increase in eating outside the home, inappropriate perceived body image and cultural elements.

Researchers believe that ethnic and racial variation among population from different regions might need different cut-off points and/or use of different anthropometric measurement to diagnose obesity, so the study utilize the Arab references of Waist circumferences (WC) [15] in interpreting the waist circumferences of the study sample showing accordingly 4.1% of female and 8.2% of male was considered over weight.

In the present study over all of the students had wrong perceptions of their weight compared to their BMI as the majority of male students who perceived that they are underweight were actually normal weight. While those who perceive that they are normal weighted one quarter of them where actually overweight. Also regarding female students the majority who perceived themselves as underweight are actually normal weighted, less than one fifth of over weighted female perceived as having normal weight. On the other hand around half of female students who perceived themselves either overweight or obese are actually normal weighted. These results were in agreement with **Olaoye et al., 2012**[22]who mentioned nearly half percent of his subject had wrong perception regarding their body weight.

Moreover**,** It was clear from the results of the current study that there was a tendency for students especially female is to overestimate /underestimate their body weight as evident by normal weight perceiving themselves as obese or thin than in males. This study supports the finding of previous studies among Bahrain and UAE young adulthood have reported similar existence of a distorted body image. Also was evident from the Heather et.al 2003 [19, 23, 24].This preference for western thin body image as obvious in this study has also been made among other Arab women in the region (Lebanon). In contrast male students preferred heavier weight as muscularity, rather than lose weight as their ideal[9].Studies indicate that young male although are concerned about body weight and shape, wish to increase weight and thereby muscularity, rather than lose weight.[25]

Furthermore, nearly less than half of studied students tried to decrease their weight. This result was in the line with **Thakkar et al., 2013**[26]who found that more than one third of his subjects were trying to lose weight. While the most prevalent causes for females was to find clothes to fit in, better health, better self-feeling as compared to the male causes, better practice of exercises and to be physically fit. Regarding the frequency of conducting dietary regimen female tried it several times last year more than the male students.

The most common methods used by female to control weight were reducing fat intake, eating fruits and vegetables, reduce intake of high sugar food all of this considered health ways while, around quarter of them were using unhealthy methods as skipping meals as breakfast, taking un prescribed diet regimen pills or drinking herbal tea as green tea compared to minimal percent of male student. Whereas the majority of male, reduce fat intake or sugary food, practicing exercise were their most reported ways of reducing weight. This result was incongruent with **Yahia et al., 2012**[9]that female student tend to use unhealthy diet practices more than male and with **Thakkar *et al.,* 2013**[26] & **Olaoye *et al.,* 2012**[22] who mentioned that in their studies female tend to use these health methods in reducing weight as reducing fat and carbohydrates. This may be because female students more occupied with her body and want fast decrease in her weight and are not aware of the adverse effect on health of using these measures frequently.

Students with normal BMI who are following dietary control measures were less than one tenth of female students compared to only minority of male students, nearly one quarter of older students who are normal weighted follow the dietary control measures, compared to only 4.2% of younger students aged between 15-20 years old. These results are nearly similar to a study conducted in Mauritius in 2013[27] were, less than half of respondents reported trying to lose weight. Weight-loss behaviors were more prevalent among girls. Among the weight-loss teens, majority of students perceived themselves as overweight even though only 19.2% were overweight. The majority of them use reducing fat intake, exercising and nearly two quarters of them use increasing intake of fruits and vegetables and decreasing intake of sugar were the most commonly reported methods to lose weight [27.]

It is suggested that health education related to an awareness of a healthy body weight, appropriate eating and exercise behavior should be integrated within the current health education curriculum, to minimize risk of developing distorted body image concerns in young adult and beyond[22].

Conclusion:

Based on the findings of the current study it could be concluded that there was a tendency for female students to overestimate / underestimate their body weight as evident by normal weight perceiving themselves as obese or thin. Also, a greater concern with body shape and a desire to be thin in females compared to males was evident. Also female student disposed to use unhealthy method of weight control which considers a causal risk health factor later.

Recommendations:

In the light of the findings the following recommendations are suggested:

1- It worthwhile to implements health promotion program to raise awareness regarding concepts of healthy body image in relation to medical definitions of overweight might improve accuracy of weight perceptions, promote healthy realistic body weight and lead to healthier eating and increased physical activity.

2- Young adult should be reached should be reached through different channel of mass and social media to increase their awareness.

3-Empowering students with related knowledge about importance of well-balanced diet, practicing regular physical exercise and appropriate seeking professional help are important keys for health promotion.

4- Further research is required to investigate specific dieting practices among young's to promote and maintain healthy weight.

Acknowledgment:

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