

Effect of Nutritional Educational Program among overweight/obese female students at Benha UniversityHowyida, s. Abd el Hameed¹; Soad A. El Salam²; Heba, A. Aly ³and Abeer , Y. Mahdy³¹Department of Community Health Nursing, Faculty Nursing, Benha University²Department of Obstetric &Gynecological Nursing Faculty of Nursing, Benha University³Department of Medical Surgical Nursing, Faculty of Nursing, Benha UniversityElmokhtar.Mohamed@yahoo.com soad_abdelsalam@yahoo.com Serag_7000@yahoo.com polica_14@yahoo.com

Abstract: The aim of the study was to evaluate the effect of nutritional educational program on knowledge, attitude and knowledge related practice among overweight/obese female students at Benha University reflecting on their quality of life (QoL). **Aquasi experimental design** was utilized in this study. A total of 143 overweight/obese female students were selected by systematic random sample for the intervention and control groups. The study was conducted at Benha University. **Two tools were used: 1) An interviewing questionnaire** to assess knowledge, attitude and knowledge related practice. **2)An observational checklist** for observing female student body mass index ,Pre/post test which was calculated according to WHO,(2000) classification **The study results** revealed that overall female student's knowledge for post-test was significantly higher than pre-test (P -value ≤ 0.05). Statistically Significant differences between pre post- intervention were detected for participants quality of life domains (p -value ≤ 0.001). The study concluded that the nutritional educational program had positive effects on improving knowledge, practice and attitude of overweight/obesity Benha University female students, as well as their quality of life mean scores. **The study finding recommended that** guideline manual should be available for university female student to help them identify risk of obesity and correct misconceptions and bad feeding behaviors which lead to obesity. Health education about balanced diet should be conducted to all university students. More research should be done concerning nutrition, especially in adolescence stage.

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1. Introduction

Obesity is a serious chronic medical condition which is associated with a wide range, of debilitating and life threatening condition. (1). Overweight/obesity is one of the leading preventable causes of death worldwide. The World Health Organization (WHO) Predicts that overweight/obesity may soon replace more traditional public health concerns such as under nutrition and infectious diseases as the most significant cause of poor health. (2)

Although weight gain is influenced by many factors, it is clear that energy balance-related behaviors are playing a major role in the onset of overweight. Risk behaviors that are associated with excessive weight gain in adolescents are sedentary behavior (especially screen-viewing behavior), lack of physical activity, and consumption of high-caloric foods and beverages(3).

Adolescent obesity has reached epidemic levels in developed countries. Twenty five percent of adolescents in the US are overweight and 11% are obese. Overweight and obesity in adolescent are known to have significant impact on both physical and psychological health. The mechanism of obesity development is not fully understood and it is believed to be a disorder with multiple causes. Environmental factors, lifestyle preferences, and cultural environment

play pivotal roles in the rising prevalence of obesity worldwide. In general, overweight and obesity are assumed to be the results of an increase in caloric and fat intake. On the other hand, there are supporting evidence that excessive sugar intake by soft drink, and steady decline in physical activity have been playing major roles in the rising rates of obesity all around the world. Consequently, both over-consumption of calories and reduced physical activity are involved in adolescent obesity.(4)

Almost all researchers agree that prevention could be the key strategy for controlling the current epidemic of obesity. Prevention may include primary prevention of overweight or obesity, secondary prevention or prevention of weight regains following weight loss, and avoidance of more weight increase in obese adolescents, unable to lose weight. Until now, most approaches have focused on changing the behaviour of individuals in diet and exercise. It seems, however, that these strategies have had little impact on the growing increase of the obesity epidemic. While about 50% of the adults are overweight and obese in many countries, it is difficult to reduce excessive weight once it becomes established. Adolescents should therefore be considered the priority population for intervention strategies. Prevention may be achieved through a variety of interventions targeting

built environment, physical activity, and diet. Some of these potential strategies for intervention in adolescents can be implemented for influencing the diet and physical activity. All in all, there is an urgent need to initiate prevention and treatment of obesity in adolescents (5).

Quality of life is the degree to which a person enjoys the important possibilities of his or her life. Possibilities, result from the opportunities and limitation. Each person has possibilities in his or her life and reflect the interaction of personal, and environmental factors (3).

Role of nurse while focusing on health education, disseminates healthy lifestyle information and counseling, develops and delivers regular training on healthy lifestyles as nutrition, healthy eating, physical activity and weight management for adults at risk of overweight/obesity. As a role model, The nurse participates in health planning for controlling and prevention of overweight/obesity and enhancing service points for monitoring BMI and providing weight management advices and services in primary care.(6)

Significance of study:-

In the Eastern Mediterranean Region (EMR) the status of overweight/obesity has reached an alarming level. A marked increase in obesity generally, has been noted among adolescents, ranging from (15 - 45%). In adulthood, women showed higher prevalence of obesity (35 - 75%) than men (30 -60%) According to The WHO (2003) regional facts, the prevalence of obesity in college university students, in some selected EMR countries as in Bahrain (76%), in Kuwait (female) 7.2%, in Saudi Arabia (male) 18% and in united Arab Emirate for (females 7.5%) (7).

Adolescent's obesity has reached epidemic levels in developed countries.(8)The prevalence of obesity is in increasing since 1971 in developed countries..(9)The highest prevalence rates of obesity have been observed in developed countries, however, its prevalence is increasing in developing countries as well. The prevalence of adolescents' obesity is high in the Middle East, Central and Eastern Europe.(10) The prevalence of BMI (in percentage) between 85th and 95th percentile in girls was significantly higher than that in boys. (11) In Saudi Arabia, one in every six children aged 6 to 18 years old is obese.(12) Furthermore, in both developed and developing countries there are proportionately more girls overweight than boys.(13)

Overweight and obesity have significant impact on both physical and psychological health; for example, overweight and obesity are associated with hyperlipidaemia, hypertension, abnormal glucose tolerance, and infertility. In addition, a psychological disorder such as depression occurs with increased frequency in obese children (14). Overweight children

followed up for 40 and 55 years were more likely to have cardiovascular and digestive diseases, and die from any cause as compared with those who were lean(15).

So, this research study would be of great value for nursing practice by testing a nutritional educational program of obesity by the university female students as an important strata target from the university population students' knowledge practices of overweight /obesity and their quality of life.

Aim of the study:

The study aimed to evaluate the effect of nutritional educational program on knowledge, attitude and knowledge- related practice among Female overweight/obese Benha University students reflecting on their quality of life (QoL).

Research Hypothesis:

1- The overweight, obese university Female students who attended the nutritional program have a better improvement of their knowledge, attitude and knowledge related practice.

2-The mean scores of quality of life among overweight/obese university Female students intervention group who were exposed to the nutritional educational program will be higher than mean scores of the control group who were not exposed to the nutritional educational program.

2. Subject and Methods

Study design:

A quasi experimental design was utilized in this study.

Setting:

This study was conducted in seven different theoretical and practical faculties at Benha university (i.e. Education, Commerce, Law, arts, Nursing, Engineering and Science) which considered the faculties of largest numbers of Female students and also it's represents a humanistic and scientific branches.

Sample:

A systematic random sample was been chosen from each college (Female student's lists) in proportion to the number of students (5%). The total number of the selected students was 1032 representing 5% of the university Female students' weight, height and other relevant data were obtained. Among the selected 1032 university female students; 155 university female students were overweight/obese and were included in the study group, 79 university female students were included in the intervention group and 76 university female students in the control group, both the control and the intervention groups were compared however, the groups were chosen and assigned out of convenience rather than through randomization. Five female students from the intervention group dropped out from the study due to their concern for the university exams, therefore the

number of female students in the intervention group was became 74 and seven female students from the control group also were withdrew for several reasons as lacking of response and not having enough time. Therefore, the total number of control group at the end of the study was 69 female students. Thus, 143 female students completed the study procedure with a response rate of 92.3%(143\155). The inclusion criteria for both groups were; female students with BMI ≥ 25 (cut-off point BMI ≥ 25), female students with no medical history, female students with no medication and no current diseases and accept to participate in the study.

Tools of Data collection:

Two tools were used to collect data:

1- **An interviewing questionnaire** was developed by the researchers, which covered three parts. **The first part** was concerned with collection data about studied participants, characteristics (as faculty type, grade, residence, study hours/day, family number and family history about obesity); health habits of the studied subjects(as nutritional and sleeping patterns, exercises, follow up and regime program). **The second part** was designed to assess the student's knowledge, attitude, and knowledge related practice related to overweight/obesity before and after administering the nutritional educational program. The test with (14) questions was used to assess student's knowledge: 8 items as definition, classification, causes, danger signs, BMI meaning, types of diseases associated with obesity, overweight, ideal weight to assess the knowledge related practice, and 4 items as: check-up of weight, healthy nutritional meals, follow up exercises, benefits of weight reduction, and 2 items as: its effect on quality of life and to assess the student's attitude **The third part** was developed to assess the improvement of the studied subjects quality of life. According to World Health Organization (WHO-QoL, 2007) which consists of brief is 26 items, instrument consisting of four domains; physical health (7 items), psychological health (6 items), social relationships (3 items), and environmental health (8 items); and two overall QoL and general health items. Each domain was assigned a score using a 5 point scale for each item, The student; circles the number her best represents their opinion, based on her life. The 5 point scale ranges from "Not at all" (a score of 1) through to completely (a score of 5). Higher scores indicate a better quality of life.

2- **An observational checklist**, it was designed to observe the study participants practices regarding their weight reduction. It comprised anthropometric measurements. The participants were weighed at baseline and six months later. Weight was measured to nearest 0.1 kg using a calibrated and certified balance beam scale and this scale was standardized daily by using standard 5 kg weight. For each weighting, the

female student was wearing a light indoor clothing with no shoes. At the time of weighing, each participant's height was also measured and recorded using metallic meter scale measuring to nearest 0.5 cm, fixed on the wall. The researchers measured the height of the student without shoes, taking into account that heels buttocks, shoulders and head closed to vertical wall surface, and ruler used horizontally to take height. These weights and heights were used to compute each participant's body mass index (BMI).

3. The scoring and interpretation for BMI was calculated by dividing weight in kilograms (kg) by the square of height in meters (m^2) according to WHO (2000) scale:

*-BMI: 18.5-24.9= (normal weight).

*-BMI: 25-29.9 =(overweight).

*-BMI: ≥ 30 = obesity (cut off point for obesity)

Study procedure (educational program):

Based on relevant literature, a nutritional educational program was developed. Sessions were given to the intervention group of overweight/ obese university female students in five sessions of thirty minutes each: **First session**, about overweight/obesity definition and classification ect., **second session**, about effect of obesity on health; **third session**, about general causes of overweight/obesity **fourth session**, about epidemiology and public health impact; and fifth session, about general management of overweight /obesity reduction(as regime diet, physical exercises programs). The educational sessions started at the first month for the intervention groups of students, each consisted of 15-20 university students. Each educational session was 30 minute duration followed by ten minute revision and the implementation of The educational program was covered in one month duration. After six months, the impact of the nutritional educational program was evaluated through the pre-post-test of both groups (intervention & control groups). During program implementation, The researchers were complied with the distribution of the educational booklets and hand-outs on the program sessions, The duration of study was seven months, started from beginning of October 2011 to the end of May 2012.

Pilot study:

A pilot study was carried out on 5% of students (seven students) recruited to test the tools content applicability, and validity and to determine the needed time for filling in application to tools and educational program .Necessary modifications have been considered. The content validity of the tools was revised by six consultants in the Community Health Nursing, Medical Surgical Nursing and Maternity Nursing specialties. .

Ethical and administrative considerations:

Approval was obtained upon letters issued from the faculty of nursing to obtain permission for

conduction of the study and an oral consent from student who agreed to participate in this study. Each university female student was informed about her right withdraw from study. Privacy and confidentiality were assured for each one and taken into consideration.

Statistical design:

The collected data were tabulated and analyzed using Statistical Package of Social Science (SPSS), version 16. A variety of statistical methods were used to analyze the data in this study as percentage, mean, t-test, independent t-test chi square, correlation coefficient. Level of significance was considered at p -value ≤ 0.05 .

3. Results:

Table (1) shows that slightly less than three quarters of the intervention and control groups 71.6% & 74.0% respectively were in humanistic faculties. As regards family history of their obesity less than three quarters 71.6% & 71% respectively had obese family. As regards study hours/day, 70.3% and 50.7% had 5-8 study hours/ day. Concerning BMI 70.3% and 46% of female students had 25-29.9 body mass index while only 47.3% and 46% respectively of them are practicing exercises and the majority of intervention group 87.8% and 71.0% of control group had sleeping hours at night <8 hrs.

As shown in table (2), students' knowledge regarding the meaning of BMI, cut-off point, types of diseases caused by overweight / obesity, effect of Wt. reduction on improving QoL, benefits of Wt reduction. Revealed highly statistically significant relationships between intervention pre/ post and control group. There is strong evidence that the students' knowledge for the intervention group in post-test is significantly higher than in pre-test.

The difference between proportions is statistically significant level at 0.05.ion on improving their health, and description .Table (3) shows that there is a statistically significant difference in students' attitudes toward discrimination between the intervention group and control groups $Z=5.396$ & 6.473 respectively at $p < 0.0001$.

Table (4) indicates that there is highly statistically significant differences between intervention group pre / post lectures of the nutritional program in practicing exercise and frequency of practicing p -value = 0.001.

Table (5) shows that student's knowledge related their sleeping hours at night, there is significant strong relationship between intervention and control groups and number of hours they sleep at night.

As shows in table (6) there are highly statistically significant differences in students' knowledge - practices of intervention group pre / post-tests and between intervention and control groups post-test in breakfast taking, beverages drinking, sweetened drink, fast foods taking, checking labels

and taking meals regularly (p -value=0.001).

Table (7) reveals that in the students' practices of measuring Weight and height and Weight reduction represented 35.1% and 83.8% pre-test vs. 86.5% and 97.2% post-test respectively with statistically significant difference.

Table (8) shows that in both groups pre intervention BMI post-test was higher than pre-test 70.3% and 29.7% vs. 50.7% and 49.3% for intervention and control group respectively, with statistical by significant relationship ($P=0.001$).

Table (9) indicates that there are highly statistically significant differences between the mean scores of QoL for each domain physical health, psychological, social relationships and environment. before and after the program ($P \leq 0.001$).

Table (10) shows that there are statistically significant differences between the mean scores of QoL among intervention group overweight and obese students before and after the program for each domain (P -value ≤ 0.001).

Table (11) indicates that there are statistically significant differences between the mean scores of QoL among intervention group scientific faculty' students and humanistic faculty' students before and after the program for each domain ($P \leq 0.001$).

4. Discussion

The aim of the current study was to evaluate the impact of nutritional educational program on knowledge, attitude and knowledge related practice among overweight / obese students at Benha University students and reflecting on their quality of life. The present study showed that before the program the level of knowledge, attitude and knowledge related practice of overweight and obese students were inadequate while after program implementation, there were significant improvements.

As regards participant students and their general characteristics, present study showed that more than two thirds of them either in intervention or in control group were having a positive family history of overweight/obesity (Table 1). This finding indicates that overweight /obesity runs in families and may suggest, in a limited way, that there are genetic aspects for the development of overweight /obesity. This agrees with several findings as that of **MO-Swan**(16)who found that the risk for obesity in child increased 2-3 fold if having family history of obesity. In relation to place of residence, the study revealed that slightly more than three quarters of the intervention group lived in urban areas compared to slightly less than one quarter of them reside in rural areas.

The researcher justified for many reasons that both groups(the intervention and the control) lead sedentary life style, an easily accessible and palatable diet, and using care for transportations played an

important role in developing overweight /obesity, while rural life is associated with more activity and limited food availability. As well, the negative association between family size and overweight/obesity might be related to the limited financial power of large families, compared to small families and this could be reflected directly on the accessibility of getting food with high caloric values or the frequency of eating in food outlets (**Table 1**). The study entitled parent and child factors associated with youth obesity carried on a sample of 334 by **Nunez-Rives** (17) who identified that in relation to family size and birth order, the prevalence of overweight /obesity was lower in family size of five or more. As regards knowledge of the participant students, the level of knowledge of students in the intervention group after conducting the program regarding the meaning of BMI, cut off point, effect of weight reduction on improving QOL, types of diseases caused by overweight /obesity and the benefits of losing weight, was improved. Results also revealed that most of questions related to dangerous effect of overweight/obesity on students health, the probable causes of overweight/obesity, meaning of BMI and benefits of weight reduction were highly significant ; so the difference between the proportions between pre /post-tests of the intervention group and control group are statistically significant (**Table 2**).The results of the current study were consistent with a study of **Kolodinsky et al.**, (18) which revealed that improving students' knowledge about nutrition and healthy habits may promote healthy body weight management among student and reduce the prevalence of overweight and obesity. Concerning participant students attitude toward body weight reduction, the result of the current study showed that there are statistically significant differences in students' attitudes toward discrimination and weight reduction between the intervention and control group. scores ($Z=5.396$ & 6.473 respectively at $P \leq 0.001$). Therefore, the difference in improvement of students' attitudes between the intervention group pre-test and post-test and between intervention and control group is statistically significant. However, there is an insignificant difference toward students' attitudes of their weight description between the intervention group pre-test and post-test and between intervention and control group post-test (**Table 3**). This could be explained as, some obese students were not treated alike by some teachers, having trouble in physical education imposed by culture. They claimed that their obesity affects their grades and achievements Moreover, some of students have a wrong idea about the obese one because the obese student's do not feel that their weight makes them different. Regarding presentation of body image as evidenced by their weight description, less than two thirds of students in

the intervention group perceived themselves as either overweight or obese the program compared with slightly less than four fifth of student of the current study were consistent with a study conducted by **Q'Deo**(19)regarding the misperceptions of body image by Saudi females were reported in previous studies, revealed that where a sizeable proportion of obese women considered themselves of normal weight, psychosocial variables as body image are important in shaping dietary practices, the association between body figure and eating disorders was documented in several studies. Moreover, the influence of body image on dietary behavior is more evident among young females (20).

According to participants' knowledge related their practicing exercises, the study finding revealed that the overweight/obese students were less physically active, in addition they consume more snacks with high sugar and fat contents. The results of the present study were consistent with those of the study conducted by **Khader et al.**, (21) who found that the prevalence of overweight/obesity is more if sitting more than two hours /day. Regarding to frequency of exercise (**Table 4**). the majority of students, were not used to engage in daily. Only slightly more than one tenth of students were practicing exercise daily before compared to two fifths after program intervention. Swimming, bicycling, jumping and weight lifting were also listed by participant, but mentioned for less frequently than walking. The transition from high school to the university life has known to be a problematic stage in adult development. This transition implies that students have to adopt to a new social, academic and psychological environment accompanied by decreased physical activity for many students "Leisure time tasks dominate by television watching, playing cards, playing computer games, internet chatting and other inactive pass times.

Thus, overweight/obesity may be a normal response to the new life style for Egyptian students, which is associated with a decline in energy expenditure as people adopt increasing by sedentary life style. This is in agreement with **Sibcu et al.**,(22)since they found that over weight/obesity in adolescent was significantly more prevalent in those who do not practice exercise. These findings correspond to the results of a study undertaken by **Carnier et al.**,⁽²³⁾ who reported that Aerobic exercise programs are related to better QoL scores, but physical exercise alone is not enough to promote a complete improvement for any successful treatment, They added it is necessary to consider the individual in his/her totality (physical, social & psychological aspects), and this is only possible in a multi-disciplinary life-style therap.

With regard to sleeping hours at night, The study results revealed that the majority of student slept

at night less than 8 hours compared to more than three quarters of students after the program. The intervention group of students were sleeping at night more than 8 hours representing ground one tenth compared to slightly more than one fifth after the program with a statistically significant relationship ($P \leq 0.05$) (**Table 5**). Therefore, the increase in rate of overweight/obesity could be explained as if the person sleeps less than eight hours over an extended period of time the metabolism, will slow, This was in agreement, with the study conducted by **Layton et al.**, (24) which revealed that the leptin hormone is intricately involved in the regulation of appetite, metabolism and calorie burning which its level increases within 7-9 hours after sleep. Therefore, the decrease in leptin brought on by sleep deprivation can result in a constant feeling of hunger and a general slow-down of metabolism college students who often do not get adequate sleep it is recommended that adults get at least eight hours of sleep each night (**National Sleep Foundation**)⁽²⁵⁾. Thus it appears that lack for sleep is a problem among college students.

In addition to overweight/obesity, getting little sleep has also been associated with poorer academic performance **Pilcher et al.**,⁽²⁶⁾ The current study results indicated that two thirds of the student has irregular meals with two main meals per day corrected to slightly less than half of students after the program. The majority of the students were not eating vegetables and fruits daily but twice per week in maximum. As well, about one fifth of them eat fast foods daily before the program. These habits were corrected to one eighth after application the nutritional program to promote healthy eating habits. On the other hand, one third of the students take breakfast daily, eat with their families, are aware of the balanced nutrition these habits stressed on and improved to be vast majority of students Therefore after the program, these habits ought to be encouraged. Habit of water drinking 2-3 lit./daily found in about one third of students before and improved to become slightly less than two fifths after program. Regarding daily beverage drinking and sweetened drinking, results of the current study found that most of students and slightly more than half of students respectively before intervention. The habit of drinking water 2-3L/day was found in about one third of student before intervention and improved after and to become less than two fifths. Checking labels before food consumption was practiced by half of students before, and improved as well after intervention to become the majority of students. With regard to taking meal regularly, this study result revealed that slightly less than half of students eat irregular meals before intervention compared to more than half after the program (**Table 6**), this could explain that the students were having very poor diet and this is a habit with their life styles.

Egyptians use bread with every meal. In addition, a higher proportion of students concentrate of fried foods as their main dish and drink soft drinks, rich in refined carbohydrates and sugar, during the day. Furthermore, a significant proportion of Egyptians consume, bread, falafel, Fava beans (foul) with sweat end tea at breakfast and supper daily. Fresh vegetables and fruits have been taken on average twice a week. This indicates the quantitative significance of sweet/Fat combination food in promoting a passive over- consumption of energy. In addition, various factors determine students selection of food, these factors include shortage of time, convenience, cost, taste, health, physical and social environment and weight control. Eating habits tend to become worse during college and young adulthood due to the fact that students combined both cultural and college food habits, In accordance a study conducted by **Paradaki et al.**,⁽²⁷⁾ revealed that significant decrease in the consumption of fruits, fresh and cooked vegetables, together with increased intake of sugar and fast foods were the major dietary changes reported for university students living away from the family income. In addition the research has suggested that the lack of experience in planning meals, and assuming responsibility for food purchasing and preparing for the first time are the main factors underlying unhealthy dietary choices of these students The current study results indicated that more than one third of intervention group of students improved to be the majority were measuring their weigh .and height. On the after hand the majority of them were practicing weight reduction practices before intervention which improved to be most of them as a way of losing weight there was a statistically significant difference in the students practices of measuring weight / height and weight reduction practices ($X^2= 34.225$ & 46.532) between intervention group pre/ post-test and the control group respectively, ($P \leq 0.001$ at $\alpha = 0.05$) (**Table 7**). This could be explained that a few students used to practice routine check-up in spite of focusing on its value in the course of the program but, because of the cost of such visits and in culture doctors are visited only when someone is complaining of serious conditions or is catching a disease. Concerning weight and height measurement it is an easy, costless act and useful for follow up to monitor the improvement and weight reduction. Practicing it indicate that the students complied with and having the desire and willingness to lose and improve their QoL.

The current data demonstrated that, more than two thirds of the student in intervention group were overweight whereas; after application of the program the overweight students became slightly more than half. While, obese were slightly more than one fourth as before intervention. On the other hand, the percentage of students who moved from either

overweight or obesity and became within the normal range of BMI reached around one sixth of students after the application of the program (**Table 8**). Therefore, the improvement that occurred on BMI of overweight and obese student's in the intervention group was directly been related to the effectiveness of the program sessions for the students. On the other hand, there were some improvement of overweight student in control group from slightly more than half to more than two fifths which from the researcher point of view were related to reactive effect of the pre-test, where they perceived the seriousness of overweight/obesity and threat to their health. The researcher has established that improvement in knowledge; attitudes and practice have resulted from participations in nutritional educational program. The results of the current study disagreed with those The results of the current study disagreed with those **Hart et al.**,⁽²⁸⁾ in a similar study **Villareal et al.**,⁽²⁹⁾ that persons who are obese are at an increased risk for developing these. The threatening conditions, in addition, to the health risks associated with obesity are more severe than in persons who are overweight thus, the overweight participants may not have felt their weight was a health risk which may have caused their increased perception of very good or excellent health⁽³⁰⁾ The current study result indicated that there were

statistically significant differences between the mean scores of QoL among overweight and obese student, before and after the program for each domain ($P \leq 0.001$). However, overweight students were slightly better than obese students in mean scores of QoL in psychological health, social relationship and environmental domain. However, obese students were better than overweight students in physical domain (**Table 10**). This could explained that overweight students having slightly better potentials than obese student's that; they were able to comply better with such program and could benefit more in spite of a significant difference between them in knowledge acquisition and in weight loss practice as earlier mentioned There were also a statistically significant differences between the mean scores of QoL among scientific and humanistic colleges students before and after the program for each domain ($P \leq 0.001$). The humanistic faculty students were better than scientific faculty students in most domains (physical health, social relationship and environmental) this could be explained by the feelings that they might have due to prior knowledge and experience on the subject as demonstrated in their participation earlier. However, scientific faculties' students were slightly better than humanistic faculties' students in psychological domain (**Table 11**).

Table (1): General characteristics of the studied sample

Variable	Intervention (n=74)		Control (n=69)	
	No.	%	No.	%
* Faculties type				
Scientific	21	28.4	18	26.0
Humanistic	53	71.6	51	74.0
* University Grades				
First	19	25.7	18	26.1
Second	21	28.4	13	18.9
Third	14	18.9	19	27.5
Fourth	20	27.0	19	27.5
* Residence				
Urban	57	77.0	58	84.1
Rural	17	23.0	11	15.9
* Family history of obesity				
Yes	53	71.6	49	71
No	21	28.4	20	29
* Number of family members				
> 4	21	28.4	35	50.7
4 +	53	71.6	34	49.3
* Study hours/day				
≥ 5 hrs/day	22	29.7	34	49.3
5-8	52	70.3	35	50.7
* Body mass index (BMI)				
> 25	0.0	0.0	0.0	0.0
≥ 25-29.9	52	70.3	35	50.7
≥ 30	22	29.7	34	49.3
Daily habit				
*Exercises				

Practicing	35	47.3	32	46.4
No	39	52.7	37	53.6
* Sleeping hours/ night				
≤ 8 hrs	64	87.8	49	71.0
> 8 hrs	9	12.2	20	29.0

Table (2): Distribution of female students in relation to their knowledge regarding overweight/obesity before and after nutritional program implementation. (N = 143).

Variables	Intervention group (n=74)				McNemar Test	p-value	Control group (n=69)		X2 Test	P-value
	Pre-test		Post-test				No.	%		
	No.	%	No.	%						
Meaning of BMI	33	44.6	62	83.8	21.189	<0.001*	19	27.5	45.999	<0.001*
BMI cut-off point	27	36.5	64	86.5	28.000	<0.001*	13	22.0	55.942	<0.001*
Causes of over weight/ obesity	62	83.8	71	95.9	7.364	0.013*	63	91.3	1.304	0.253
Types of disease	63	85.1	72	97.3	2.614	0.0045*	54	78.3	3.515	0.002*
Effect of weight reduction on QoL	69	93.2	74	100	5.000	0.025*	61	88.4	9.088	0.003*
Benefits of weight reduction	53	71.6	68	91.9	10.714	0.001*	49	71.0	10.462	0.001*
Dangers on health	71	95.9	73	98.6	0.500	0.480	66	95.7	1.179	0.278

*Highly statistically significant differences ($p < 0.001$) were found for all items except danger on health.

Table (3): Frequency of the studied sample attitude about body weight reduction before and after application of nutritional program (n=143).

Variables	Intervention group No=74				Z-Test	P-value	Control Group N=69		Z-test	P-value
	Pre-test		Post-test				No.	%		
	No	%	No	%						
Discrimination	37	50.0	67	90.5	5.396	<0.001*	27	39.1	6.473	<0.001*
Weight reduction	71	95.9	73	98.6	0.500	0.480	63	91.3	4.137	0.042*
Weight description	45	60.8	53	76.8	0.95	0.90	50	72.5	1.475	0.1403

* The Relationship is statistically significant level at $P \leq 0.001$

Table (4): Distribution of female students based on knowledge related practicing Exercises before and after application of program (n=143).

Practicing Exercises	Intervention group (n=74)				Control group (n=69)		Paired t-test	p-value
	Pre		Post		No	%		
	No	%	No	%				
Type of exercises:-								
Walking	35	47.3	66	89.2	48	69.6	4.188	0.001*
Bicycling	3	4.1	4	5.4	2	2.9		
Swimming	3	4.1	7	9.5	4	5.8		
Tennis	0	0	5	6.8	4	5.8		
Jumping	6	8.1	14	18.9	6	8.7		
Wt. lifting	6	8.1	7	9.5	1	1.4		
Gardening	2	2.7	11	14.9	6	8.7		
Others	23	31.1	9	12.2	8	11.6		
Frequency of exercise:-								
Daily	9	12.2	30	40.5	8	11.6	4.708	0.001*
2-3 times a week	15	20.3	19	25.7	14	18.8		
Once weekly	24	32.4	7	9.5	30	43.5		

* The Relationship is statistically significant level at $P \leq 0.001$

Table (5): Distribution of the female student's knowledge related practicing their sleeping hours before and after nutritional program implementation.(n=143).

Sleeping hours/night	Intervention group (n=74)				Control group (n=69)		X ² test	P- value
	Pre		Post		N	%		
	N	%	N	%				
≤ 8	65	87.8	58	78.4	49	71.0	6.251	0.009*
>8	9	12.2	16	21.6	20	29.0		

* The Relationship is statistically significant level at $P \leq 0.001$

Table (6): Distribution of the female students, knowledge -related practice about their dietary pattern before and after program implementation.(n=143).

Dietary Patterns	Intervention group (n=74)				McNemar Test	P-value	Control group (n=69)		X ² Test	P-value
	Pre-test		Post-test				No.	%		
	No.	%	No.	%						
Fruits consumption/daily	5	6.8	6	8.1	0.054	0.900	5	7.2	0.037	0.847
Breakfast taking /daily	26	35.1	64	86.5	34.225	<0.001*	21	30.4	46.532	<0.001*
Beverages drink/ daily	72	97.2	62	83.8	26.342	<0.001*	61	88.4	-0.105	0.9165
Sweetened drink / daily	39	52.7	18	24.3	3.570	<0.001*	40	58	1.915	0.050*
drinking Water 2-3 liters/daily	23	31.1	27	36.5	1.057	0.29	22	31.9	1.163	0.245
Fast foods taking /daily	14	18.9	6	8.1	2.259	<0.024	15	21.7	2.465	<0.004*
Checking labels before food consumption	37	50	60	81.1	4.261	<0.001*	32	46.4	4.362	<0.001*
Taking meals regularly	35	47.3	39	52.7	0.575	0.567	27	39.1	2.035	0.361

* The Relationship is statistically significant level at $P \leq 0.001$

Table (7):Distribution of the female students, knowledge- related practice regarding routine check-up, measuring weight and height and weight reduction pre- post program implementation.(n=143).

Variables	Intervention group (n=74)				McNemar Test		Control group (n=69)		X ² Test	
	Pre-test		Post-test		Value	P-value	No.	%	Value	P-value
	No.	%	No.	%						
Routine check up	5	6.8	6	8.1	0.000	1.000	5	7.2	.037	0.847
Measuring Weight. & height	26	35.1	64	86.5	34.225	<0.001*	21	30.4	46.532	<0.001*
weight Reduction	62	83.8	72	97.2	26.342	0.031*	61	88.4	-0.105	0.9165

* The Relationship is statistically significant level at $P \leq 0.001$

Table (8): Distribution of female students regarding their body mass index between intervention and control groups pre-post nutritional program implementation.

BMI	Pre (n=143)				X ² Test	P-value	Post (n=143)				X ² Test	p-value
	Intervention (n=74)		Control (n=69)				Intervention (n=74)		Control (n=69)			
	No	%	No	%			No	%	No	%		
<25	0.0	0.0	12	17.6	5.725	<0.001*	12	16.2	0.0	0.0	18.14	<0.001*
25-29.9	52	70.3	35	50.7			41	55.4	31	44.9		
≥30	22	29.7	22	29.7			21	28.4	38	55.1		

• * Relationship is statistically significant level at $P \leq 0.001$

Table (9): Relation between mean scores of quality of life domains among the intervention and control group before and after application of the nutritional program.

Domains	Intervention Group (N=74)		Wilcoxon Test	P-value	Control Group (N=69)	Mann-Whitney-Test	p-value
	Pre-test	Post-test					
	Mean	Mean					
Physical health	25.58	28.80	-5.572	<0.0001*	23.46	-6.656	<0.0001*
Psychological	17.97	22.73	-6.436	<0.0001*	16.94	-7.124	<0.0001*
Social relationships	10.01	11.89	-4.928	<0.0001*	9.67	-5.512	<0.0001*
Environment	23.38	30.66	-6.638	<0.001*	23.36	-6.749	<0.001*

- Difference between the two means is highly statistically significant at $P \leq 0.001$

Table (10): Relation between mean scores quality of life domains among the intervention group (overweight and obese) before and after the program application (n=74)

Domain	Over weight group (n=40)		Wilcoxon Test	P-value	Obese group (n=34)		Wilcoxon Test	p-value
	Pre	Post			Pre	Post		
	Mean	Mean			Mean	Mean		
Physical health	25.58	28.46	-4.221	<0.0001*	25.59	29.59	-3.648	<0.0001*
Psychological	18.23	23.15	-7.224	<0.0001*	17.36	21.73	-4.882	<0.0001*
Social relationships	9.56	12.50	-4.328	<0.0001*	11.09	11.63	-2.394	0.009*
Environment	23.19	30.77	-5.439	<0.0001*	23.82	30.62	-3.797	<0.0001*

*Difference between the two means is highly statistically significant at $P \leq 0.001$

Table (11): Relation mean score quality of life domains among the intervention group (scientific and humanistic faculties) before and after the program application. (n=74)

Domains	Scientific Faculties group (n=21)		Wilcoxon Test	p-value	Humanistic Faculties group (n=53)		Wilcoxon Test	P-value
	Pre	Post			Pre	Post		
	Mean	Mean			Mean	Mean		
Physical health	25.76	28.19	-2.619	<0.005*	25.51	29.04	-4.944	<0.0001*
Psychological	19.14	23.62	-5.010	<0.0001*	17.51	22.38	-5.282	<0.0001*
Social relationship	10.00	11.43	-1.949	<0.026*	10.02	12.08	-4.576	<0.0001*
Environment	24.76	30.57	-4.694	<0.0001*	22.83	30.70	-5.684	<0.0001*

*The difference between the two means is statistically significant at $P \leq 0.001$

Conclusion:

According to the results of the present study it could be concluded that, University students either overweight or obese felt that they were in good health. Obese students were not fully aware of how severe their weight problem was, but were still likely to be losing weight. However, overweight students were aware that they need to lose weight. The obese student did not practice frequently enough physical activity and they also experienced bad eating habits, than overweight one's due to lack of knowledge.

Recommendations:

- The nurse plays an important role in assisting university students in developing skills and acquiring

knowledge regarding healthy eating, physical activity and stress management technique.

- Encourage overweight and obese students to cooperate in youth
- affairs, activities especially exercise program in their faculties.
- Health educational programs about healthy and balanced diet should be conducted to all university students.
- Further studies are needed to be conducted on a larger on sample size to increase awareness of students in schools, universities, and their families regarding obesity/overweight reduction.

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