High Risk for Obesity among Youth in West Bank /Palestine

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Abstract

Overweight and obesity are the fifth leading risk for global deaths. Obesity and the related health risks have been noted to be an epidemic problem worldwide , especially in developing countries. **Aim**: Application of health belief model among youth at high risk for obesity in Palestine (West Bank). **Research design**: A quasi-experimental design. **Settings**: The study was conducted at Faculty of Nursing /An-Najah National University, which located in Nablus and IBN Sina College for Health Sciences, West Bank- Palestine. **Subjects**: A purposive sample composed of 117 students, from both previous setting. **Tools**, three tools were used: **First:** A self-administered questionnaire, it was composed of four parts, **part one**: socio-demographic data, **part two**: Assess university student's knowledge regarding obesity, nutritional habits, and its consequence. **Part three**: Assess university student's practices related to health belief regarding healthy food and regular exercises. **Part 4:** Assess the effects of obesity on university student's life style. **Second tool**: The HBM sub constructs which used in this study. **Third tool**: Anthropometric measurement to detect body mass index. **Results**: Revealed that less than half of youth were obesity class1, and more than one third were obesity class II. There was a highly significant difference between student's knowledge and their practices regarding obesity,healthy food, and exercises pre &post nursing intervention program **Conclusion:** This study concluded that, the application of health belief model among youth had a significant statistical relationship with improved knowledge and practices related to health belief of student at high risk for obesity. **Recommendations**: Conducting routine screening for obesity, dieting and other weight reduction practices as an integral part of the ongoing health care provided by all health services .HBM also suggests that the benefits and barriers of changing health behavior must be taken into consideration.

Key words: ObesityYouth, Health Belief Model, Nursing Intervention Program.

Introduction

Work-related Obesity is defined as a situation by which there is excess body fat leading to health impairment. Clinically, it's defined for adults as Body Mass Index (BMI) $\geq$ 30.5(kg/m^2). Nowadays, obesity is a major serious public health problem and a big challenge, since its prevalence is accelerating rapidly not only in developed but also in developing countries **Barker , (2016)**.

The rise in obesity worldwide has been linked to urbanization, which entails a nutrition transition and sedentary lifestyle . Compared to western societies, Middle eastern countries experienced a later, but faster-paced nutrition transition.

Increasing prevalence of obesity has been reported both among adults and adolescents ,while diseases of under nutrition, such as anemia , persist. Palestinian society has also been undergoing epidemiology and nutritional transitions . Thus, for example, while the prevalence of obesity among colleague student in the West Bank is high , so too is the prevalence of iron-deficiency anemia **Al Sabbahetal., (2015).**

Obesity and the related health risks have been noted to be an epidemic problem worldwide , especially in developing countries . Within the Eastern Mediterranean Region, an increasing prevalence of overweight has been recorded and has been noted to be at "an alarming level" . The factors leading to this widespread increase in obesity have been suggested to include economic growth, modernization, westernization of lifestyles (including foods higher in fats and decrease in exercise levels), and the globalization of food markets , with women being suggested to be especially at risk **Al-Nuaimetal.,(2015).**

The Behavioral Risk Factor Surveillance System **(BRFSS)** reported that the greatest increase in obesity rates was among individuals ages 18-29 with at least some college education **(Wengreen&Moncur, 2014).** This increase in weight change is a result of multiple contributors which include 1) food composition and eating behaviors, 2) increases in eating at restaurants, 3) increases in portion sizes, 4) increases in unhealthy snacking, 5) increases in consumption of saturated fat, 6) increases in television viewing, 7) decreases in physical activity, and 8) a lack of appropriate duration and quality of sleep **(Moreno et al., 2014; Dolinsky et al., 2016).**

Obese youth are at a higher risk for cancer, liver disease, neurological issues, cardiovascular disease, asthma, sleep apnea, and orthopedic problems.

Because the number of fat cells in a person is determined by late adolescence, many obese children face the consequences of adult obesity as well **(Levi et al., 2011).** In fact, it is estimated that 70-80% of overweight or obese children will stay overweight for the rest of their lives .Obesity has a considerable impact on student health in the future; it increases morbidity of chronic diseases such as CVD (Cardio Vascular Disease), Type 2 diabetes, hypertension, dyslipidemia, osteoarthritis, reproductive malfunction and some kinds of cancers **(Schaub& Marian, 2011).**

Several ways are used to determine overweight/ obesity. One commonly used parameter is BMI. Other methods include estimating the amount of adipose tissues in skin fold thickness, underwater weighing, bioelectrical impedance, and dual energy X-ray absorptiometey. In the present study, BMI was used to estimate overweight/obesity.BMI continues to be most widely used because of its relatively easy application and ability to predict the presence of adverse health outcomes in youth (*Skinner et al., 2015*). Obesity may be broadly categorized into type I obesity (BMI of 30-34.9); type II obesity (BMI of 35-39.9); and type III obesity (BMI of 40 and higher). The type I obesity is mostly a result of excessive and binge eating habits apart from a lack of physical activity that should complement one's eating habits. The type II kind of obesity accounts for less than 1% of the obesity cases registered and is a result of health related problems. In such cases, the patient witnesses abnormal weight gain in spite of a regulated lifestyle *(WHO, 2013)*.

Significance of the study:

The nurse can play a critical role to prevent obesity as educators and role models for their families, communities, also many nurses provide weight-related health information to the public

(Stanhop, 2015). Nurses can promote healthy lifestyle patterns that reduce the risks of being overweight or obese. For example, breastfeeding, physical activity, regular meals, and nutrition and weight counseling are all areas where nurses may help to reduce the risk of obesity (*ICN, 2014).*

The rank order for obesity in Arabic-speaking countries according to **WHO,(2015)** estimates in females Kuwait 55.2%, Egypt 48%, and the United Arab Emirates 42%, which is higher than all the European countries and about the same as the United States of America 48.3% and Mexico 41%. Countries such as Bahrain 37.9%, Jordan 37.9%,Saudi Arabia 36.4%, Palestine 42% and Lebanon 27.4% have higher obesity rates in females than UK 26.3%,and Greece 26.4% *Badranet al ., (2014)*.

Aim of the study:

The aim of this study is to assess the high risk for obesity among youth in West Bank /Palestine through:-

1-Identifying the magnitude of high risk obeseyouth bymeasuring BMIand effect of obesity on their health.

2-Assessing the university student knowledge about obesity.

3-Determining youth practices toward weight reduction.

4-Assessing effect of obesity on life style of youth.

Research questions:

1. How would be the youth' knowledge about obesity and health related riskfactors through BMI?

2. Are there association between Knowledge of university student and their practices?

Research Design:-

This study is a descriptive analytic study to assess the effect of obesity on student life style.

Setting:-

The study was conducted at Faculty of Nursing /An-Najah National University which located in Nablus-West Bank- Palestine with a total capacity of around 23000 university students and IBN SINA College for Health Sciences MOH, located in Nablus-West Bank Palestine with a total capacity of around 300 university students. The researcher chooses these settings because working on them.

Sampling: A purposive sample was used in the study .The students were chosen as a total number of 185 (65 from IBN Sina and 120 from An-Najah) through the year 2016/2017, the study sample included 117 students, from both settings according to inclusive criteria: university male and female students who enrolled in fourth academic years, and accepted to participate in the study & Excluded 50 students with normal weight according to BMI, also 10%(18) students were chosen randomly as a pilot study .

Technical design: - Tools for data collection:

Two tools were used for conducted this study.

First tool: A Self-Administered Questionnaire . It was developed by the investigator based on recent related literature and experts, opinion it includes four parts:-

Part One: Socio-demographic characteristics such as age, sex, marital status, place of residence, monthly income, number of family member and number of rooms

Part two: Assessing university student's knowledge. It covered knowledge about obesity, risk factors consequence and nutritional habits.

Scoring system:

A. knowledge regarding obesity: It was composed of 4 items as; meaning of obesity, complication, method of weight reduction & types of exercises which help in weight reduction. A correct answer scored one and each incorrect answer scored zero, a total of 50% and above was considered satisfactory and less than 50% were considered unsatisfactory.

B. knowledge about nutritional habits and its risk factors consequences. It was composed of 10 items regarding numbers of meals, component of healthy diet, most healthy way of cooking, The main food groups, high carbohydrate, fiber, and calories of food, type of food contain calcium, complication of obesity, and Advice for control fat; a correct answer scored one and each incorrect answer scored zero, a total of 50% and above were considered satisfactory and less than 50% were considered unsatisfactory.

Part three: Assessing university student's practices. It covered the following healthy food and regular exercises.

Scoring system:

A. Healthy food: it was composed of 16 items, each item has been scored as 2 score =always, sometimes, 1=one score and rarely =0, and the total optimal score = 33.

B. Regular exercises: it was composed of 13 items, each item has been scored as 2 score =always, sometimes, 1=one score and rarely =0, and the total optimal = 26.

Total student practices was classified into the following scale always >75%, sometimes 50% and more, while rarely <50%.

Part four: Assess the effects of obesity on student life style .It was composed of 20 item regarding their Physical health, Self esteem and Social distress .

Scoring system:

Physical health, it was included 9 items, Self-esteem included 5 items, and social distress included 6 items. Always score 1, sometimes score 2, and rarely score 3. The total assessment scored 20 point and classified as 50% and above was considered positive style, less than 50% was considered negative style.

Second tool: Anthropometric measurement to detect body mass index **DHSCDP,(2005).** Three variables were measured by the investigator, weight, height, and BMI, **The height** was recorded to the nearest 0.5 cm. The subject stood upright barefooted or in thin socks and bareheaded using a height scale measurement to take height .**The Weight** was recorded to the nearest 1 Kg using appropriate international standards scales, and 0.5kg standard weight for assessing and adjusting the scales were used. Weight was taken without shoes and with light clothing and body mass index (BMI) is a measure of body fatness. It was calculated by the equation: BMI = Weight in Kg / Height² in meters.

Scoring system:

According the BMI, university students were classified into: overweight a BMI from25-29.9 kg\m2, , BMI from

30- 34.9 kg\m2 were obese class1, BMI from 35-39.9 kg/m2 were obese class 11 and BMI >40kg/m2 were Obese class III .

The Validity: will be tested through 5 experts, from community health nursing department, faculty of nursing, Ain Shames University

The reliability was done by Cronbach's Alpha coefficient test which revealed that each of the three tools consisted of relatively homogenous items as indicated by the moderate to high reliability of each tool.

Pilot Study: It was conducted for 18 students were chosen randomly to test the content. The aim of the pilot study was to evaluate clarity, visibility, applicability, as well as the time required to fulfill the developed tools. According to the obtained results, modifications such as omission, addition and rewording were done. The number of the pilot study was excluded from the study sample.

Statistical data analysis:

Collected data were coded and tabulated using personal computer. Statistical package for social science (SPSS) version 20was used. Descriptive as well as inferential statistics were used to answer research question. Statistical significance was considered at p-value <0.05.

- **Protection of ethical and human rights:** Approval was taken from research of ethics committee, faculty of nursing, Ain Shames University. An official permission including the title and purpose of the study were submitted from the concerned authorities in the faculty of nursing/ An-Najah National University and IBN Sina College for Health Sciences/Ministry Of Health to get an approval for data collection to conduct the study . Confidentiality was maintained as the tools were not shared and students were reassured that data will not be reused in another researches.

Field Work:

- After obtaining a permit the researcher started to interviewed the university students to explain the aim and program content in the two faculties, 4 days per week /(Saturday, Sunday, Monday and Tuesday) , two days for each faculty from 9 am to 2pm for data collection.

- After the students had been fully informed and consented for participation in the research, the researcher started to collect data through structured interview which took 30 minutes& measuring BMI took 45 minutes.

- Data collection was carried out in the period from October 2016 up to January 2017.

Results:

Table (1): Shows that 90.6 % of the university youth age was ranged from 20 to 25 years old, 73.5%, were female and 91.5% of them were single and 59.8 % resident at rural area while 31.7 % live at urban area. Concerning family members 53.8 % of them had family form of6-8 members, 53.0% had sufficient and save income, mean while72.7% were not sufficient & 70.0%of them lived in more than three rooms.

Figure (1): illustrated that 47.0 % of university students were obese class1, 38.4% was obese class II,10.3% were obese class III and only 4.3% of them were overweight.

Table (2): reported that students correct knowledge regarding to obesity and risk. 34.1% had correct answer for meaning of obesity,33.3% had correct knowledge for causes, 27.4% for complication and 38.5% for types of exercises which help in weight reduction. Regarding the total correct knowledge of students related to obesity the same table shows that there were 34.1% of them had total satisfactory knowledge while 65.9% had unsatisfactory knowledge**.**

Table (3): Reveals that the total correct satisfactory knowledge of students related to nutritional habits reported 43.6% while 56.4% had unsatisfactory knowledge.

Table 4:illustrated that total university student's practice regarding taking healthy food were 12.1%, 28.9% of student had always& sometimes taking healthy food while 59.0% of student had rarely taking healthy food

Table (5): Describes that 7.2%, 18.1% of university student's had always& sometimes practice of regular exercises while 74.7% hadn't exercises.

Table (6):illustrated that 71.9% &16.1% of university students had always and sometimes total physical effect of obesity on their physical health while regarding their self stem the study reported 77.9%, &14.8% of student's had always & sometimes effect of obesity regarding their social distress Also the same table reported 58.0%,&28.9% of student's had always& sometimes social effect.
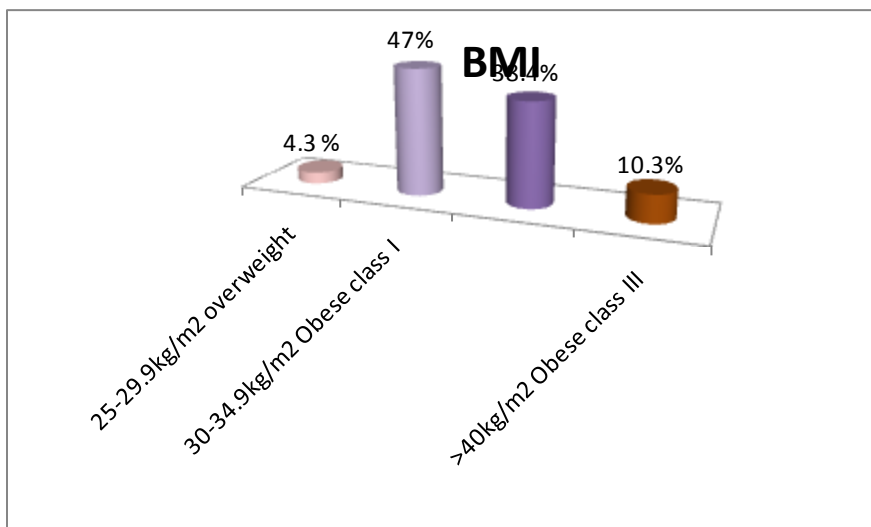
Table (7): shows that statistically significant P > 0.05 relation between student knowledge regarding obesity and their practices.

Results:

Table (1): Distribution of university students according to their socio demographic characteristics (N=117).

Items	NO	%
Age		
20-25 years	106	90.6
>25years	11	9.4
Sex		
Male	31	26.5
Female	86	73.5
Marital Status		
Single	107	91.5
Married	10	8.5
Place of residence		
Urban	37	31.7
Rural	70	59.8
Camps	10	8.5
Monthly Income		
Sufficient	3	2.5
sufficient &save	29	24.8
not sufficient	85	72.7
Number of family member		
<3-5 members	18	15.5
6-8members	63	53.8
>8 members	36	30.7
Number of rooms		
1-3 rooms	35	30.0
< 3	82	70.0

Figure (1): Distribution of university students according to their body mass index.

4.3 % 47% **BMI** 36.4% 10.3%

25-29.9kg/m2 overweight 30-34.9kg/m2 Obese class I >40kg/m2 Obese class III

Table (2): Distribution of university students according to their correct knowledge related obesity and risk factor (N=117).

Obesity knowledge	Correct	
	No	%
Meaning of obesity	40	34.1
Causes of obesity	39	33.3
Causes of obesity during study	33	28.2
Complication of obesity	32	27.4
Method of weight reduction	45	38.5
Types of exercises which help in weight reduction	45	38.5
Health risk due increased fat	75	64.1
Health risk due to snacks	39	33.3
Total knowledge Satisfactory Unsatisfactory	40 60	34.1 65.9

Table (3): Distribution of university students according to their correct knowledge related nutritional habits, and its consequences on health (N=117)

Nutritional habits knowledge	Correct	
	No	%
Numbers of meals are recommended daily	73	62.4
Component of healthy diet	53	45.3
Most healthy way of cooking	41	35.0
The main food groups	33	28.2
High carbohydrate food	57	48.7
High fiber food	46	39.3
High calories foods	46	39.3
Kinds of food which contain high percentage of calcium	59	50.4
Complication of obesity	80	68.4
Susceptibility to complication	33	28.2
Advice for control fat	39	33.3
Total knowledge		
Satisfactory	49	43.6
Unsatisfactory	51	56.4

Table (4): Percentage distribution of university students according to their taking the healthy food (N=117).

Healthy food practice	Preprogram		
	Always	Sometimes	Rarely
	%	%	%
Be sure to eat three main meals a daily	36.1	14.5	49.4
Be sure to eat fresh vegetables and fruits daily	0.0	12.1	87.9
Make sure that the food contains all the nutrients	24.1	16.1	59.8
The best eating fried food using little fat	1.2	21.7	77.1
ruled out the fat from the meat before eating	23.0	19.3	57.7
Avoid any Food between 3 meals	0.0	10.0	90.0
More than sweets and sugars to increase activity and movement	52.8	12.1	35.1
Be sure to drink milk each day	30.1	9.7	60.2
pick low-fat foods	10.0	0.0	90.0
Eating a meal high-volume food (Super)	100.0	0.0	0.0
More than eating junk food	77.1	6.1	16.8
pick up a large amount of eating over a short period of time	31.3	37.4	31.3
Feel full after eating	48.3	30.1	21.8
Drink more fluids while dining	31.3	55.4	13.3
Over tea and coffee for the continuation of the activity	71.2	14.4	14.4
Eat olives and pickles to open the appetite	73.5	19.3	7.2
More than snacks a day	96.4	3.6	0.0
Total	**12.1**	**28.9**	**59.0**

Table (5): percentage distribution of university students Practices according to their regular physical exercises pre/post program (N=117).

Practices regular exercises	Always	Sometimes	Rarely
	%	%	%
Doing exercise running and exercise for an hour a day	12.1	36.1	51.8
Marking enough activity daily life	40.9	37.4	21.7
Practicing the activities and exercises in a specialist center under the supervision of specialists	10.8	20.5	68.7
doing home exercises and without supervision	9.6	9.7	80.7
Doing exercises without specifying a particular time	9.6	4.9	85.5
Taking a nap after a meal	9.7	4.8	85.5
best sleep after dinner immediately	12.1	40.0	47.9
deemed exercise sports the best way to lose weight	0.0	19.3	80.7
Practicing aerobics to keep the strength of my body	0.0	20.0	80.0
Loving exercise but irregularly	7.2	4.9	87.9
I would like to exercise aerobics	7.2	4.9	87.9
Consulting a doctor constantly before and after strenuous activities	9.6	4.9	85.5
Measuring the body mass index at least once a week	00.0	37.3	62.7
Total	**7.2**	**18.1**	**74.7**

Table (6): percentage distribution of university students according to the effects of obesity on their life style

Items	Always	Sometimes	Rarely
Total Self esteem	77.9	14.8	7.3
Total social distress	58.0	28.9	13.1
Total Physical health	71.9	16.1	12.0

Table (7): Relation between student's total Knowledge of university student and their practices.

Practices	Knowledge				Total
	Satisfactory		Unsatisfactory		
	No	%	No	%	
• Done.	48	24	125	62.5	173
• Not done.	74	7	13	6.5	27
Chi 2 =6.34 P value less than 0.05 significant					

Discussion:

Obesity is now well recognized as a disease in its own, one which is largely preventable through changes in life style. The prevalence of obesity defined with a BMI of ≥30 is increasing worldwide and is regarded as one of the biggest challenges for public health .According to the WHO, there will be about 2.3 billion overweight people aged 17 years and above, and over 700 million obese people worldwide in 2015**(WHO, 2016).**

According to socio-demographic characteristics of the university student's, the present study reveals that most of the student's age was ranged from 20 -25 years old, more than two third were female**.** This result in the same line with the results of the study about demographic and health survey, population at Palestinian by (**Al-Rifai and Roudi 2014**)who stated that the highest obesity prevalence 42.1%was in the age group 18-40 significantly higher than the other age groups, being overweight and obesity were increasing with age. Concerning family members and their income this study revealed that more than half of them had family form of 6-8members&53.0% had sufficient and save income .This finding agrees with the results of the study by **Khader et al.,(2014)** who find that in the study about Overweight and Obesity among adolescence in Jordan, the daily pocket money was associated with overweight, while family monthly income associated with obesity. Also this result in the same line with **Grundy, (2014).**who studied that in a study about obesity and relation with family income cross-national in USA study reported that the prevalence of obesity in the United States is lower among those of higher socioeconomic status. This may be high economic index were more likely to be overweight and obese. Also disagree with other studies, about the socio demographic correlates of nutritional status of adolescents in Palestine by **Shi et al.,(2013)** who find that the mean family size in Palestine is 5.7 % however, it was larger in this study 8.1% in Ramallah and 8.9 %in Hebron as the sample represents a selected segment of families that have progressed further into their life cycle. Small family size was associated with overweight/obesity; and disagree with **Al-Isa,(2014)**who studied obesity and relation with family size cross-national USA study reported that the prevalence of obesity in the United States is lower among those of small family number and stated that There exists a negative correlation between family size and obesity prevalence for student. This could be due to the fact that smaller families had better food availability. The prevalence rates of underweight and stunting in our sample were low among girls; however, certain groups were more vulnerable to under nutrition.

Regarding body mass index of university youth the current study reveals that less than half of them were obesity class1, more than one third was obesity class II, one tenth were obesity class III and only less than one tenth of them were overweight**.** This finding in the same line with the results of studies from Kuwait and Saudi Arabia indicated a range of adolescent overweight/obesity using NCHS/WHO reference between 35-45%, While in Palestinian study on 2131 survey which was conducted among Palestinian adolescents aged 18-25 years in 2013/2014reported that the overweight/obesity of 20.4% among boys and 23.0% among girls **Al-Isa,(2014).** This trend was opposite to what was found by **Klesages, et al., (2015)** in this study where the prevalence of overweight/obesity was 15.0%among boys and 18.3%among girls in the USA adolescents using the same definition. However, such a comparison must be taken with caution as the Palestinian study among adolescents& used self-reported weights and heights while in this study, reported that the weights and heights were measured. Self-reported data underestimate overweight prevalence especially among girls and overweight adolescents **Al Rukban (2013),** also moreover, the findings concur with the about earlier reports of trends in obesity by National Center for Health Statistics**(NCHS), (2015)** reported that the Prevalence of obesity among adults and youth in the United States, 2011–2014 shows that no increase among youth since 2003–2004, but trends do show increases in both adults and youth from 1999–2000 through **(2013–2014)**.there were No significant

differences between (2011–2012) and(2013–2014) were seen in either youth or adults.

In relation to students knowledge related to obesity and health risk ., the current study represented that the total correct knowledge of students related to obesity ,there were more than one third . This finding disagree with the results of the study about obese student attending weight-management clinics in the United Kingdom by **Swift et al., (2014)** who studied indicated that the obese adolescence had poor knowledge about the health risks of obesity. Also This finding contradicted with the results of the study about weight reduction practices and its effects on the nutritional status of Saudi Females attending weight reduction clinics in Riyadh City by **Suliman, (2014)**who reported that in his study ,the university college obesity reported that 9.9% of them had good knowledge, while 56.1% and 34% had fair and poor knowledge levels at pretest period. At posttest still those who had good level of knowledge represented the least proportion 10.8% and this may be referred to most of the sample were study in university.

Concerning student knowledge about nutritional habits and its consequences on health during adolescence, the current study reveals that the total correct knowledge of students reported that less than half of them had correct knowledge , this finding disagree with a study about obese youth in Taiwan 18-25 years old and participated in a fitness program and reported that Obese youth consume high-fatty food habits and high-sugar food habits this study reported by **Shene-Pin et al., (2012)** . This may be due to less of health educations program conducted by health care providers to prevent obesity regarding youth.

In relation to university students Practices according to their regular physical exercises ,the result describes that less than one quarter of university student's had always& sometimes practice of regular exercises. This finding goes with the results of the study about obesity among people in **USA by Kathryn etal.,(2013)** who studied reported that there were significantly greater improvements in the health transition, for the participants in physical activity group compared to participants in controlled group .Also the same result agrees with **Randi et al., (2014)** who studied that the morbid youth obesity in Kingdom of Norway reported statistically significant improvement in physical activity , self-care,& activities during the 12 month follow-up. This may be due to that the majority of student's wide availability of indoor food stimuli, not interested to do daily exercise& physical activity to improve their life style.

According to the effect of obesity on their physical health and self -esteem the present study shows that more than two third of university students had always and sometimes total physical effect of obesity on their physical health . The result disagree with the results of the study about obesity among Portugal students by **Vieira et al ., (2014)** who studied found that all variables, were different (p < 0.001) between normal-weight and overweight/obese students. For body image, worse psychosocial scores were observed linearly with higher obesity levels. Self-esteem was lower in overweight and obese youth in comparison with normal-weight youth, with no statistical difference.

Conclusion:

Based on the current study results and research questions, the following can be concluded:

Total number of the studied sample was 117, most of them aged ranged from 20 - 25 years old and more than two third were female. As regard body mass index the present study shows that less than half of them were obesity class1, more than one third were obesity class II. The total correct knowledge of university students related to nutritional habits reported 43.6% had correct knowledge .in accordance to student practices the current study reported that 7.2%, 18.1% of university student's had always& sometimes practice of regular exercises while 74.7% hadn't exercises. Also 71.9% &16.1% of them had always and sometimes total physical effect of obesity on their physical health while regarding their self stemthe study reported 77.9%, &14.8% of student's had always& sometimes effect of obesity regarding their social distress ,meanwhile the same table reported that 58.0%,&28.9% of student's had always& sometimes were social effect. There werestatistically significant P > 0.05 relation between student knowledge regarding obesity and their practices.

Recommendations:

The finding of the present study, suggested the following recommendations

1-Provide culturally appropriate health education programs for promoting physical activity especially among university students regarding nutritional habits, and its consequence,method of weight reduction & types of exercises, also continuously monitor the numbers of overweight and obese student with a national register for obesity.

2-Follow up periodically for overweight or obese student and continuous health education programs for them to enhance their life style practices to reduce the prognosis of the disease.

Further Researches on:

1. Investigate contributing factors of obesity to improve understanding and management.

2. Conduct experimental research on Nutritional therapy and physical activity to improve obesity management especially regarding adolescence stage.

3. Examine the relationship between body mass index and health related life style.

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