

# Impact of Weight on Quality of Life in Obese Adults

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## Abstract

Background :Obesity is a complex multi factorial disease; genetic, metabolic, social, behavioral, and cultural , it has dramatic negative effects on overall health and related with decrements in overall aspects of quality of life whether it is physical, psychological, or social.

Objective to assess the extent to which weight affects the quality of life in obese persons and to assess which aspects of quality of life are most effected by weight.

Design; A descriptive cross-sectional study of 170 persons randomly selected (as convenience sample) from three major hospitals in AL-Hilla city south of Baghdad from 1<sup>st</sup> of March to 30<sup>th</sup> of May. All patients included were have BMI more than 30 kg/m<sup>2</sup>. Data obtained included IWOQL questionnaire (obesity-specific QOL questionnaire) ,measurement which included (body mass index ,waist circumference , waist to hip ratio ,body fat percentage) , were analysed by SPSS program version 17.

Results; The study included 170 obese persons, (35%) are male and (65%) are female with mean age (39.48 +\_ 9.65), years old. of those (34.7%)were have good quality of life while or (65.3%) were have poor quality of life. There was significant relation between QOL and BMI (p value=0.000), according to domains (self confidence and sexual life)were more impaired in female p value was (0.000) and (0.02) respectively and (physical function,work)were more impaired in male p value was (0.01) and (0.000), older age were more impaired in(physical function,sexual life,work) p value was (0.000), (0.018), (0.006) respectively ,younger age more impaired in self confidence value (0.018)

(58.5%) of study population were have no physical activity ,(56%) of study population were have sleeping time less than 8 hrs,(54%) were sitting on computer screen or watching TV more than 3 hours. Regarding dietary habits;(55%)of study population were eating irregular meals,(71%)eating breakfast daily,(58%)eating snack >3times/wk,(27%) were eating snack before bed time,(45%)were often eating fast food,(46%)were drinking water less than 2L/day. Statistically, there was significant relation between QOL and (irregular meal p value=0.042)and(nocturnal snacking pvalue=0.031)

Conclusion; increasing BMI has negative effect in on physical ,psychological ,and social aspects of life, it is effected by;age(older age more impaired in physical function,work and sexual life ,younger age more effected in self- confidence), gender (female in self-confidence and sexual life ,male in physical function and work), bad medical history , sedentary and unhealthy life style ,unhealthy eating habits can effect on quality of life in obese individuals.

Keywords: Obese , weigh, genetic, metabolic, social و behavioral, cultural.

## الخلاصة

خلفية البحث : السمنة هي مرض ناتج عن عوامل متعددة و معقدة : وراثية ، ابيضية ، اجتماعية ، سلوكية وثقافية ولها تاثير سلبي على الصحة بشكل عام وعلى جميع جوانب نوعية الحياة الجسمية والنفسية والاجتماعية هدف البحث:تحديد مدى تاثير البدانة على نوعية الحياة (الجسمية والنفسية والاجتماعية) وتحديد اي جانب من جوانب نوعية الحياة التي تكون اكثر تاثيرا بالوزن.

تصميم البحث: دراسة مقطعية وصفية تضمنت 170 شخص بدين تم اختيارهم بطريقة عشوائية من ثلاث مستشفيات رئيسية في مدينة الحلة جنوب بغداد ابتداء من 1 اذار ولغاية 30 ايارو شملت جميع المرضى الذين لديهم كتلة جسم اعلى من 30 كغم/م<sup>2</sup>. تم الحصول على البيانات التي تضمنت الاستبيانات ،القياسات والتي تشمل (كتلة الجسم ،محيط الخصر، نسبة الخصر الى الورك، مستويات الدهون في الجسم)

نتائج البحث:الدراسة شملت 170 مريض 35% منهم ذكور و65% اناث ،معدل اعمارهم ( 39.48\_+9.65) سنة،منهم (34.7%) كان لديهم نوعية حياة جيدة و(65.3%) لديهم نوعية حياة سيئة مع وجود ارتباط واضح وقوي بين كتلة الجسم ونوعية الحياة. اكثر جوانب الحياة تاثيرا بالبدانة كانت (الثقة بالنفس والحياة الجنسية)عند النساء في حين اكثر الجوانب تاثيرا عند الرجال هما العمل والنشاط الجسمي . فيما يتعلق بالعمر الجوانب الاكثر تاثيرا عند متوسط الاعمار وكبار السن هي (النشاط الجسمي والعمل والحياة الجنسية) اما الاعمار الاصغر سنا فان جانب (الثقة بالنفس) كان الاكثر تاثيرا .58% من الاشخاص المشمولين بالدراسة

لايمارسون اي نشاط فيزيائي، 56% ينامون اقل من 8 ساعات يوميا، 54% منهم يقضون اكثر من 3 ساعات جالسين امام شاشات الكمبيوتر او في مشاهدة التلفاز، اما فيما يتعلق بعادات التغذية: 55% منهم ياكلون وجبات غير منتظمة 71% منهم يتناولون الفطور يوميا، 58% ياكلون ما بين الوجبات اكثر من 3مرات بالاسبوع و 27% ياكلون قبل النوم، 45% غالبا يتناولون الوجبات السريعة و 46% يشربون الماء اقل من 2 لتر يوميا. اكثر العادات التي كان لها تأثيرا على نوعية الحياة عند مرضى البدانة هي (الوجبات الغير منتظمة والاكل قبل النوم.

الاستنتاج:زيادة كتلة الجسم له تأثير على نوعية الحياة بجميع جوانبها الجسمية والنفسية والاجتماعية، وتتأثر بالعمر (كبار السن اكثر تأثرا بجوانب العمل والحياة الجنسية والنشاط الجسمي والاعمار الاصغر سنا اكثر تأثرا بجانب الثقة بالنفس)، وتتأثر ايضا بالجنس (النساء اكثر تأثرا بجوانب الثقة بالنفس والحياة الجنسية بينما الرجال اكثر تأثرا بجوانب العمل والنشاط الجسمي)، والتاريخ المرضي ونمط الحياة غير الصحي وعادات التغذية السيئة يمكن ان يكون لها تأثيرا على نوعية الحياة عند مرضى البدانة. **الكلمات المفتاحية:** السمنة، الوزن، وراثية، ايضية، اجتماعية، سلوكية، ثقافية .

## Introduction

Obesity is an excessive accumulation of fat in the body to the extent that it can have a negative effect on health, people are considered obese when their body mass index (BMI), a measurement obtained by dividing a person's weight by the square of the person's height, is more than 30 kg/m<sup>2</sup>, with the range (25-30) kg/m<sup>2</sup> defined as overweight. (WHO, 2015).

Obesity increases the risk of cardiac disease, type 2 diabetes, sleep apnea, osteoarthritis, and some types of cancer (Haslam and James, 2005). Obesity is most likely caused by a combination of increase food energy intake, lack of physical activity, and genetic susceptibility, few cases are caused primarily by genes, endocrine disorders, medications, or psychiatric disorders. (Kushner, 2007)

Obesity is a preventable cause of death worldwide, with increasing rates in adults and children. it is one of the most serious public health problems of the 21<sup>st</sup> century (Barnes *et al.*, 2007). Obesity is considered as stigma in many of the Western world, although it was widely seen as a sign of wealth and fertility at other times in history and still is in some parts of the world (Woodhouse, 2008). In 2013, the American Medical Association classified obesity as a disease (Pollack, 2013; Weinstock, 2013).

Treating obesity and obesity-associated conditions costs billions of dollars a year. By one estimate, the U.S. spent \$190 billion on obesity-related health care expenses in 2005—double previous estimates. (Cawley *et al.*, 2012). Obesity is related with increased health risk and pain that can effect on physical health status and impose limitations on daily activity. Decrement in physical health status as well as stigmatization and discrimination related to obesity can contribute to impaired mental well being. (Hassan, *et al.*, 2003; Katz *et al.*, 2000). Although underlying comorbidities in obese individuals act as a major confounders impacting health related quality of life (HRQOL). Obesity itself significantly impacts Health Related Quality Of Life (HRQOL). (Doll *et al.*, 2000)

The use of HRQOL measures to evaluate clinical outcomes is rapidly growing (Spilker, 1996; Testa and Simonson, 1996). One of Obesity-specific measure of HRQOL is short form of impact of weight on quality of life (IWQOL)-Lite (Ronette & Ross, 2002)

The impact of weight on quality of life (IWQOL) questionnaire was the first instrument specifically developed to evaluate quality of life in obesity (Kolotkin *et al.*, 1995), but still of limited use in Iraq. The original IWQOL is an instrument (with five responses, from 'never true' to 'always true') consisting of 74 items that ask about the effects of obesity on quality of life in eight areas (health,

social/interpersonal, work, mobility, self-confidence, sexual life, activities of daily living, and comfort with food). The items of the IWQOL begin with the phrase 'Because of my weight' in order to assess obesity-specific quality of life. The goals in developing the IWQOL were as follows: (1) to develop an instrument that would reliably and validly measure the extent to which weight affects quality of life, (2) to be able to determine the aspects of quality of life that are most affected by weight, and (3) to measure improvement in quality of life that are associated with weight loss or other treatment interventions (Kolotkin *et al.*, 1995). Construct validity, test-retest reliability, and internal consistency reliability were assessed to be good for this instrument (Kolotkin and Brookhart 1997)

A 31-item, short form of the IWQOL (IWQOL Lite) was developed in order to minimize

response burden to subject (Kolotkin *et al.*, 2001). It consists of a total score and scores of each of five scales-physical function, self-esteem, sexual life, public distress, and work. (Ronette & Ross, 2002). There are three levels of answers (always true, sometimes true, never true) and IWQOL-Lite is scored by summing responses of all items or domains of the instrument yielding a single score for each domain or single score for the all instruments, lower values associated with poor quality of life. (A Brett Hauber, 2010).

## Methods

### Study design and data collection time

(1) A cross-sectional study was carried out as a convenient sample from three hospitals; Merjan Medical City, Al-Hilla General Teaching Hospital and Babylon Hospital for Pediatric and Gynecology. Data collection was carried out from 1<sup>st</sup> of March to 30<sup>th</sup> of May.

### 2) Study population

The total patients collected were 200 patients (125 females and 75 males) with age of 18 years old or older, 30 patients refused to participate in the study, the main reasons for non-participants were no time or being tired. 170 patients agreed to participate (110 females and 60 males).

### (3) Inclusion Criteria for the patient

\*) All the individuals with body mass index equal or more than 30 who are accepted to participate in the study

\*) Those individuals age 18-60.

### (4) Exclusion criteria for the patients

\*) The pregnant women.

\*) The patients with serious underlying conditions such as malignancy, chronic renal failure.

\*) The individuals with uncontrolled DM or uncontrolled hypertension or asthmatic patients who use steroid frequently.

\*) The individuals with endocrine disease such as Cushing syndrome, hypothyroidism or hyperthyroidism.

## 5) Data Collection tools

1) Questionnaires

2) Anthropometric measurements (weight, height, BMI, waist circumference, hip circumference, WHR.)

Data collection took place in two steps; the first step was face to face interview with patients to fill out the questionnaire, and the second step was to perform anthropometric measurements

### 5.1 Questionnaire

A questionnaire form was prepared by researcher and supervisor ,following a review of related literature and our reference to assess impact of weight on quality of life in obese individuals ,devided into 4 parts;

Part I; includes socio demographic factors ;name, age , gender, residence (urban and rural) ,marital status (married ,single, widow, divorce),education (illiterate ,primary school , secondary school ,and higher education).

Part II; includes family history, smoking, chronic disease, and drug history ,alcohol drinking

Part III; includes questions about life style(no. of physical activity/wk ,no of minutes ,TV watching time, and computer time)

Part IV;includes questions about dietary habits (regular meals, break fast, snacks time/wk, bed snack,fastfood and amount of water)

Part V; includes impact of weight on quality of life-Lite (IWQOL)-Lite scale(136) which consists of 31 items in 5 domains;

Devided into 3 attributes][Domain1; for physical activity ;

a)Daily activity includes 7items (trouble picking up object,tyingshoes,getting up from chairs,usingstairs,putting on or takingoffclothing,trouble with mobility and crossing legs)

b)physical symptoms include 3 items(shortness of breath, painful or stiff joints, swelling of legs)

c)worrying about health(one item)

Domain 2;for self-confidence includes 7 items which start by a phrase because of my weight Im (self-concious, my self-esteem is not what it could be unsure of myself, don't like myself, afraid of being rejected, avoid looking in mirror or photograph and embarrassed in public places

Domain 3;for sexual life includes 4 items (enjoy in sexual activity, desire, difficulty with sexual performance and avoiding sexual activity)

Domain 4;for public distress is devided into 2 attributes;

a)problems of moving and sitting include 3 items (fitting into seats,fitting through aisles,finding strong chairs)

b)teasing and desicrimination by others( 2 items)

Domain 5;for work includes 4 items (trouble with meeting responsibilities, lessproductive, don't receive promotion or recognition at work and afraid of going job interview)

There are three levels of answers (always=5 ,sometimes =3 ,never =1 ).The scoring can be calculated either by summing the items of each domain and by summing all items to calculate total score . The total sum of IWQOL scale was divided into good quality (31-93) and poor quality( >93). Best score is ( 31) and worse score is 155 .So ,higher score associated with poor quality of life, also we can calculate the score of each domain as; physical activity (11-55), self –confidence (7-35), sexual life (4-20), public distress (5-25),and work (4-20).

## Nutritional assessment

### 1)Body mass index

The weight was measured in kilograms by using balanced scale for all individuals, height was measured (in centimeters) by using a fixed board in standing position without shoes, and the head in horizontal plane. The body mass index was calculated according to (weight KG/height m<sup>2</sup>).

### **2) waist circumference ;**

To determine the central obesity we measured the waist circumference(wc) by using a tape measure on horizontal plane in mid point between lower rib margin and iliac crest, WHO cut off point of obesity is 102 cm for men and 88 cm for women.

### **3)waist to hip ratio;**

Hip circumference was measured by using a tape measure from the maximum circumference around the buttocks posteriorly to symphysis pubic anteriorly, then we calculate WHR ,cut off WHR which increase morbidity is >1 in men and >0.8 in women

### **Pilot study**

Before starting to collect information, a pilot study was carried out for two weeks. The pilot study done in Merjan Medical city for a period from 1<sup>st</sup> to 14<sup>th</sup> of February 2014 aimed to; a) Testing the reliability and validity of questionnaire form to reveal any modification needed

b) Estimate the time needed to collect the required data.

c) To find out the potential difficulties.

The pilot study was excluded from the study sample. The modifications were concentrated in the time allocated for filling the questionnaire

### **Data Analysis**

Statistical analysis was carried out using spss version 17. Categorical variables were presented as frequencies and percentages. Pearson chi square test and Fisher exact test were used to find the association between the categorical variables. A p-value  $\leq 0.05$  was considered as significant.

### **Results**

The overall mean age of participants was (39.48 +\_9.56), the mean age of female (39.37+\_10.21) and male (39.68+\_8.32). The overall mean of BMI of participants was (41.63+\_5.99), (19.5%) of them BMI CLASS I (30-34.9) kg/m<sup>2</sup>, (29.5%) CLASS II (35-39.9) kg/m<sup>2</sup>, (51%) CLASS III (more than 40kg/m<sup>2</sup>). Mean of waist circumference (127.44+\_18.94), mean of hip circumference (120.20+\_16.15), mean of waist to hip ratio (1.067+\_0.17). Mean of total score was (99.70+\_19.26). 59 (34.7%) of study population were have good quality and 111 (65.3%) of them were have poor quality.

#### **(a) the socio- demographic characteristics of study population;(table 1)**

(46%) of study population were age between (18-38) years old, (54%) of them were between (39-59) years old. (35%) were male and (65%) were female. (58%) were lived in urban area and (42%) were lived in rural area. (91%) were married, there was significant relation between age and QOL (p value was 0.01), also there was significant statistical relation between gender and QOL (p value=0.04), there was no significant association with residence, marital status, occupational status as well as educational level as show in table 1.

variable	Good quality N=59	Poor quality N=111	Total N=170	Chi square	P value
<b>Age</b> (18-38) (39-59)	35(45%) 24(26%)	43(55%) 68(74%)	78(46%) 92(54%)	6.573	<b>0.01*</b>
<b>Gender</b> male female	26(43%) 31(28%)	34(57%) 79(72%)	60 (35%) 110 (65%)	3.999	<b>0.04*</b>
<b>Residence</b> Urban Rural	40(40.4) 19(27%)	59(59.6%) 52(73%)	99(58%) 71(42%)	3.396	<b>0.065</b>
<b>Marital status</b> Married Un-married	52(34%) 7(47%)	103(66%) 8(53%)	155 (91%) 15(9%)	1.039	<b>0.308</b>
<b>Occupation</b> No-employment Self-employment Government- employment	23(32%) 9(33%) 27(38%)	48(68%) 18(67%) 45(62%)	71(42%) 27 (16%) 72 (42%)	0.438	<b>0.803</b>

<b>Education</b>						
Illiterate	7(25%)	21(75%)	28(16%)	3.224	0.358	
Primary school	6(26%)	17(74%)	23(14%)			
Secondary school	13(34%)	25 (66%)	38(22%)			
Higher education	33(41%)	48(59%)	81(48%)			

P value > 0.05 was significant

b)Medical history of and QOL (Table 2)

the association between QOL and medical history including (family history, smoking ,chronic disease ,drug history, alcohol), (54%) of study population were have positive family history of obesity,(22%) were smoker,(7%) were drinking alcohol our study shows no significant relation between family history of obesity ,smoking ,drinking alcohol and QOL.(31%) of study population were have chronic disease (hypertension, D.m, chronic joints problems) and (43%) were using drugs (anti hyper tension, oral hypo glyceic agent, NSAID, contraception), there was significant association with chronic disease (p value=0.026) and with drug (p value=0.039) .

**Table: 2 medical history and quality of life**

Variable		Good quality N=59	Poor quality N=111	Total number = 170	Chi square test	P value
<i>Family history of obesity</i>	<b>Yes</b>	28(30%)	64(70%)	92(54%)	1.614	0.204
	<b>No</b>	31(40%)	47(60%)	78(46%)		
<i>smoking</i>	<b>NonSmoker</b>	45(39%)	71(61%)	116(68%)	3.653	0.161
	<b>x-smoker</b>	6(35%)	11(65%)	17(10%)		
	<b>Current smoker</b>	8(22%)	29(78%)	37(22%)		
<i>Chronic disease</i>	<b>Yes</b>	12(23%)	41(77%)	53(31%)	4.946	0.026*
	<b>No</b>	47(40%)	70(60%)	117(69%)		

<i>Drug history</i>	<b>Yes</b>	19(26%)	54(74%)	73(43%)	4.252	0.039*
	<b>No</b>	40(41%)	57(59%)	97(57%)		
<i>alcohol</i>	<b>Yes</b>	3 (25%)	9 (75%)	12(7%)	0.537@	0.549
	<b>No</b>	56(35%)	102(65%)	158(93%)		

\*P value >0.05 was significant

c) The association between life-style and quality of life( Table 3)

It includes (times of physical activity/wk ,no. of min. /time , sitting time on watching TV or computer ,sleeping time ). (58.5%) of study population were have no physical activity, (21%)were have physical activity less than30 min/day ,and (20.5%) were have physical activity more than 30 min/day. There was significant association between quality of life and physical activity(p value=0.009) . (54%) of study population spend their time sitting on watching TV or on computer screen .There was no significant association between quality of life and watching TV time, computer time ..(56%) of study population were have sleeping time less than 8 hrs. ,there was significant association between sleeping time and quality of life (p value=0.024).

**Table: 3 life style and quality of life**

Variable		Good quality N=59	Poor quality N=111	Total number =170	Chi square	P value
<i>Physical activity/week</i>	Zero	25(25%)	74(75%)	99(58.5%)	9.362	0.009*
	< 30 min/day	17(47%)	19(53%)	36(21%)		
	>30 min/day	17(49%)	18(51%)	35(20.5%)		
<i>Watching TV or Computer time ≥ 3 hr</i>	Yes	27(30%)	64(70%)	91(54%)	2.191	0.139
	No	32(41%)	47(59%)	79(46%)		



variable	Good quality N=59	Poor quality N=111	Total number = 170	Chi square test		P value
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<i>Sleeping time</i>	<8 hr	26(27%)	69(73%)	95(56%)	5.116	0.024*
	≥8hrs	33(44%)	42(56%)	75(44%)		

\*p value >0.05 was significant

**d) Dietary habits and quality of life (table 4)** It includes (regular meals, breakfast, snack times/ wk , snack before bed time(nocturnal snacking) (,55%) of study population were have irregular meals ,(29%) were not eating breakfast, (58%)were eating snacks more than 3 times /week ,(27%) were eating snack at night(nocturnal snacking ),(45%) were often eating breakfast,(46%) were drinking water less than 2 liters/day. There was significant association between irregular meals and quality of life( p value =0.042) and also there was significant association with nocturnal snacking (p value=0.031).

**Table:4 dietary habits and quality of life**

variables	Good quality n=59	Poor quality n=111	Total n=170	Chi square	P value
<b>Regular meals</b>					
yes	33(43%)	44(57%)	77(45%)	4.127	0.042*
No	26(28%)	67(72%)	93(55%)		
<b>Breakfast</b>					
Yes	44(36%)	77(64%)	121(71%)	0.509	0.476
No	15(31%)	34(69%)	49 (29%)		
<b>Snacktime</b>					
-<3 times/wk	26(37%)	45(63%)	71(42%)	0.197	0.657
->3times/wk	33(33.3%)	66(66.7%)	99(58%)		
<b>Bed snack</b>					
Yes	10(22%)	36(78%)	46(27%)	4.679	0.031*
No	49(40%)	75(60%)	124(73%)		
<b>Fast food</b>					
Rare	32(34%)	61(66%)	93(55%)	0.008	0.929
often	27(35%)	50(65%)	77(45%)		
<b>Water drinking</b>					
-<2L/day	24(31%)	54(69%)	78(46%)	0.986	0.321
->2L/day	35(38%)	57(62%)	92(54%)		

\*p value> 0.05 was significant

**Table 5; BMI and quality of life**

<b>BMI Classes</b>	<b>I(30-34.9)</b>	28(85%)	5(15%)	33(19.5%)	58.473	<b>0.000*</b>
	<b>II(35-39.9)</b>	21(42%)	29(58%)	50(29.5%)		
	<b>III(≥40)</b>	10(11%)	77(89%)	87(51%)		

\*p value >0.05 was significant

E) Table5, shows association between BMI and quality of life ,(19.5%) of study population were have BMI between(30-34.9)only (15%) of them were have poor quality,(29.5%) of study population were have BMI between(35-39.9) ,(58%)of them were have poor quality ,while those who have BMI more than 40 kg/m2 constitutes(51%) of study population (89%) them were have poor quality there was high significant association with BMI(p value=0.000)

**f) Gender and IWQOL domains**

Table 6 shows difference between males and females in domains of IWQOL scale , by using t-test to compare between means of domains by gender, females were significantly more impaired than male in (self-esteem and sexual life domains) (p value =0.000) while males were significantly more impaired in (physical function p value =0.01 and work p value=0.000) ,there was no significant difference in public distress domain between males and females.

**g)Age and IWQOL domains**

Table 7 show difference in domains of IWQOL scale by age,the age group (39-59) were significantly more impaired in (physical function p value=0.000),sexual life p value =0.018 ,work p value=0.006), while young age group (18-38) were significantly more impaired in self-confidence p value 0.018, there was no significant difference in public distress.

**Table:6 difference by gender in domains of QOL**

\* p value> 0.05 was significant

**Table:7difference by age in domains of QOL**

variable	Male x/sd	Female x/sd	Total x/sd	t-test (2 tailed)	P value
Physical function	39.10 +_9.26	35.40+_8.57	36.70+_8.97	2.612	<b>0.01*</b>
Self-confidence	19.35+_7.21	27+_7.23	24.30+_8.08	-(6.597)	<b>0.000*</b>
Sexual life	11.63+_3.40	13.03+_4.19	12.54+_3.98	-(2.359)	<b>0.02*</b>
Public distress	15.40+_4.66	16.40+_3.35	16.05+_3.88	_(1.478)	<b>0.106</b>
work	12.51+_3.57	10.21+_2.99	11.02+_3.38	4.461	<b>0.000*</b>

  

	Age group I (18-38)	Age group II (39-59)	Total x/sd	T test	P value
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	N=78	N=92			
Physical function	33.16+ <sub>8.67</sub>	39.70 + <sub>8.13</sub>	36.70+ <sub>8.97</sub>	-(5.068)	<b>0.000*</b>
Self- esteem	25.88+ <sub>7.91</sub>	22.95+ <sub>8.02</sub>	24.30+ <sub>8.08</sub>	2.386	<b>0.018*</b>
Sexual life	11.75+ <sub>3.98</sub>	13.20+ <sub>3.87</sub>	12.54+ <sub>3.98</sub>	-(2.399)	<b>0.018*</b>
Public distress	16.42+ <sub>4.20</sub>	15.73+ <sub>3.59</sub>	16.05+ <sub>3.88</sub>	(1.144)	<b>0.254</b>
work	10.25+ <sub>2.96</sub>	11.68 + <sub>3.59</sub>	11.02+ <sub>3.38</sub>	-(2.796)	<b>0.006*</b>

\*p value> 0.05 was significant

**Table:8 body fat percentage ,Wc ,WHR and QOL**

	Good quality N=59	Poor quality N=111	T-test	P value
Body fat percentage	43.84+ <sub>7.16</sub>	53.22+ <sub>8.50</sub>	_(7.216)	<b>0.000*</b>
Waist circumference	114.15+ <sub>15.30</sub>	134.51+ <sub>16.81</sub>	_(7.747)	<b>0.000*</b>
Waist to hip ratio	1.01+ <sub>0.17</sub>	1.09+ <sub>0.17</sub>	_(2.653)	<b>0.009*</b>

\*p value> 0.05 was significant

## Discussion

obesity is associated with negative effect on physical, psychological, and social aspects of quality of life. The impact of overweight and obesity has been studied from health-related quality of life (HRQL). there is no standard definition of HRQL, however, it is generally accepted that it is a subjective, multidimensional assessment of the physical, psychological, and social domains of health. There is a growing of cross-sectional data that support a strong relationship between obesity and QOL, in that the quality of life seems to decrease with increasement of body weight.

### Socio-demographic factors and quality of life

Our study shows that older age group(39-59) year were have poorer QOL than the age group(18-38), these results agree with study done in USA which reported that there is a negative effect of increasing age with regard to the impact of obesity on QOL in obese people (Zabelina *et al.*, 2009), this result can be explained by; increasing age is associated with more impairment in many aspects of life in obese persons such as work ,interest of sexual activity, appearance of physical symptoms (joints pain ,dyspnea ,back pain,...) and chronic disease related with obesity increase with age.(Zabelina *et al.*, 2009).

According to gender, 65% of participants were females and 35% were males, this may be related to high prevalence of obesity in females (In Iraq, prevalence of obesity was 8% in males and 19% in females) (WHO estimates 2010),our study reported that obese females were significantly poorer QOL than obese males and this result agrees with other study done in Korea(Song HR 2010).The explanation of this result may be due to that the nature of females are more interest with her appearance and body image

than male so, obesity effects on her psychology and her self-confidence and being afraid of rejection from others.

About(58%) of participants those were living in urban area and were have better QOL than those who living in rural area ,although this result is not significant statistically , but multiple factors, social ,cultural ,economical ,medical as well as individual factors can effect on QOL in rural areas,other study (*Zagozdzon et al., 2011*) reported poor physical health domain of QOL in rural areas.

Married participants were have poorer QOL than un married persons that may be associated with sexual problems due to obesity in married persons.

There was no significant association between occupational status of participants and QOL,this may be related to the nature of occupation ;There have been alterations in the types of occupation from 'high activity' to 'low activity' occupations ,workers may now spend more sedentary times in their work than previously .(*Brownson et al.,2005*). Workers in sedentary occupations may need more physical activity and life style modification to protect them from obesity ,while (high activity ) occupations act as protective factor against obesity (*Margaret et al., 2010*). On other hand, obesity is associated with impairment of work domain of QOL , obese workers are unable to do well in their work,losing many hours from their time work and have poor performance.

Regarding educational status ,75% of illiterate participants were have poor QOL, educated people have better QOL they are more aware about healthy diet and healthy life style ,how to deal with their problems and they are more searching for better QOL,this is agree with other study(*María José et al., 2009*)which reported that higher prevalence of obesity in population segments with a lower educational level, also suggests that education may improve the negative effect of obesity on (HRQOL).

Table 2 shows no statical significant relation between family history of obesity and quality of life in obese individuals, but those who were have positive family history of obesity were poorer QOL; this may be related with genetic role in obesity(*Marianne et al., 2001*) reported the persons who have family history of obesity( in first degree relative) were significantly higher BMI and associated with greater risk of hyperlipidemia ,hypertention,and DM.

22% of participants were current smoker,78%of them were have poorQOL with no significant relation between smoking in obese persons andQOL,, there is no clear cut about the relation between smoking and obesity ,both smoking and obesity increase mortality and act as risk factors for many comorbid diseases and lowering life expectancy and quality of life(*Stewart, et al.,2009*). Other studies reported that smoking protects against obesity especially among young age smokers and heavy smokers. Stop smoking may be related with temporary weight gain. Therefore, smoking cessation interventions should include weight management support. (*Dare et al.,2015*).

31% of participants were have chronic disease ,they were significantly poorer QOL. Obesity is associated with many chronic diseases ;hypertension ,coronary artery diseases, hypercholesterolemia ,type 2 DM, stroke, and some types of cancer (*Ronetteand Ross 2002*), chronic disease with obesity increase limitation mainly in physical function domain of QOL (daily activities ,physical symptoms and worry about health) (*Katz et al.,2000*)

74% of persons who were using medications reported significantly poorer QOL ,this result can be explained by; the persons who use drugs either have chronic diseases or have physical symptoms such as chronic back pain or joint pain, that has negative effect on quality of life in obese individuals.

Only12(7%) of participants were drinkers (75%)of them reported poor quality of life, with no significant relation between sub groups because all participants are obese

and a complex nature of relationship between alcohol and obesity. It is heavily influenced by individual characteristics including BMI, dietary habits, and the level of physical activity as well as frequency, pattern, amount of consumption and types of drinks consumed (Suter, 2005)

Table (3) shows strong relation between physical activity and QOL, participants who were have more physical activity time reported better QOL, (this can be explained by improvement in physical function from daily activities to more strenuous activities, such as climbing several stairs and running in obese individuals) this result agree with other studies (Randi *et al.*,2013)which revealed that physical activity was positively related with life satisfaction and physical functioning

( 2major components of QOL) prior to life style intervention and (Randi Jepsenet *al.*, 2015). Reported that increase in physical activity is independently associated with improvement in physical, mental, and obesity-specific QOL and life satisfaction in obese individuals after two years of lifestyle intervention.

There was significant association between sleeping time in obese and QOL, 56% of participants were have short sleeping time(less than 8 hrs),sleep deprivation has been shown to endocrine and metabolic alteration decrease glucose intolerance and decrease insulin sensitivity, increase level of ghrelin and decrease leptin level ,increase hunger and appetite ,sleeping is the only sedentary activity protect from obesity(GuglielmoBeccuti and Silvana Pannain 2011). This result agree with other study in United states (Buxton and Marcelli; 2010) which reported that short sleeping time(<7 hrs) increase risk of obesity by 6% and other studies done in Australia (Magee *et al.*, 2010) which reported that short sleeping (time less than 6 hrs) as well as long sleeping time (more than 9 hrs) increase risk of obesity. and on other hand, sleep disorder in obese persons like sleep apnea and poor sleep quality is associated with impairment of work, mood disorders, depression and lower quality of life among obese people (Magee *et al.*, 2010 ;G. Neil Thomas *et al* 2013).

About 54% of participants were spending more than 3 hours in sitting in front of computer screen or in watching TV,and they reported poorer QOL,this can be explained by; spending more time in TV watching or sitting on computer displaces physical activity , reduce energy expenditure and increased food intake because persons tend to eat during watching TV or sitting on computer and follow unhealthy eating pattern (Hu FB *et al.*,2003). Persons who watching TV for more than 3 hr/day compareds with those viewing TV for less than 1 h/day had an almost( two times) increased risk for obesity. several studies have shown direct relation between TV watching time and risk for increasing BMI and WC(Jakes *et al.*, 2003;Hu *et al.*,2003; Bertraiset *al.*, 2005)

Table 4 shows effect of some dietary habits on obesity-specific quality of life ,there was significant association of regular meals on quality of life in obese individuals , participants who were eating irregular meals were significantly poorer QOL ,this result can be explained by irregular meals pattern is associated with lower energy expenditure and decrease thermal effect of food, elevaedtotal and LDL cholesterol, and lower insulin sensitivity, increase risk of weight gain and cardiovascular disease (Hamid R Farshchi, *et al.*,2005)

Irregular eating is one of bad eating habits which are common in many communities ,our study reported that 55% of participants were eating irregular meals. Other studies done in male college students in Saudi arabia reported (63.3%) eat

irregular meals (Abdallah *et al.*, 2010) while 64.6% of Lebanese and 81.6% of Chinese students take regular meals (Sakamaki *et al.*, 2005; Yahia *et al.*, 2008)

29% of participants were skipped break fast from their meals ,reported poorer quality of life ,this can be explained by that persons who do not eat early in the day may tend to be hungry later on and then may eat a large number of calories during the evening hours than persons who eat consistently in the day. Increase energy intake may be associated with more fat storage and increase in body weight, other studies done in US (Yunsheng Ma1, *et al.*, 2003) reported subjects who regularly not eat breakfast had 4.5 times the risk of obesity as those who regularly eat breakfast. Another study suggests that eating breakfast daily is important for weight loss maintaining and may be a factor in their success (Wyatt *et al.*, 2002), in our study 71% of participants were eating breakfast daily, this may be associated with quality and quantity of their breakfast which include large amount of fat, and carbohydrate with less physical activity .

58% of participants were eating snack more than 3 times per week, no significant relationship between eating snacks and quality of life in obese individuals. The term "snack" includes all foods and drinks that taken outside of the three main meals (de Graaf, 2006) .Although increased snacking is thought to be increased rates of obesity, yet, no clear cut relation between snacking and obesity . (Spanos and Hankey, 2010) found no relation between obesity and snacking. (de Graaf, 2006) reported that snacking may related with positive energy balance and weight gain. Another study reported an inverse relationship between weight gain and snacking may be related with large amount of high-calorie meals are taken in absence of snacks. (Abdallah *et al.*, 2010)

There was significant relation between snacking at night and QOL, 78% of those who eating night snacking were poor QOL, this result agrees with other studies (Colles, *et al.*, 2007) which reported snacking at night associated with obesity, psychological stress , and may be associated with eating disorder like binge eating disorders., night eating syndrome (NES) is a pattern of eating where most food consumption is late in the day and night, So, it causes morning nausea and evening hyperphagia and insomnia (but not wake to eat). This condition is observed frequently in obese people.) while "Frequent nocturnal snackers who wake to eat reported higher symptoms of hunger and depression, and have a more severe impairment than individuals with NES. (Colles, *et al.*, 2007)

On other hand ,55% of population study were rare consumption of fast food with no significant relation with QOL, this may be associated with large percentage of participants in our study were housewives females who rarely consumes fast food ,and also our traditions to eat with family reduce the consumption of eating outside home, or may be associated with income factor ,( fast food related obesity is more common in high income countries). (Roberto *et al.*, 2014).

54% of participants were drinking water >2L /day ,with no significant relation with QOL. Some studies have reported that at least 8 glasses (240 mL) are required by an adult per day. (Dallas, 2000). Another study reported that an individual's thirst gives better guide for the amount of water they require rather than a fixed quantity. (Valtin, 2002)., several studies linked between drinking water and weight loss (Dennis *et al.*, 2010), (Vij VA and, Joshi AS , 2013), ( Muckelbauer *et al.*, 2013) and ( Hassan *et al.*, 2003), which reported that consumption of water associated with weight loss

In current study, many participants were drinking adequate amount of water, association with obesity and QOL may be related with other factors; collection of

sample were in summer (the temperature in Iraq was between (45-50)C, and may be related with other dietary habits and physical activity.

Table 5 shows highly significant association between BMI and quality of,89% of those with BMI ( $\geq 40$ ) were reported poor QOL this result agrees with other studies (Hassan *et al.*,2003) and (Benjamin Kearns, *et al* 2013),as well as (Taylor *et al.*, 2013). Obesity has negative impact of health, physically, many health problems are associated with obesity like hypertension, coronary artery diseases, high blood cholesterol, type 2 DM, joint problems, stroke, and several types of cancers (Kolotkin *et al.*,2001). Psychologically, obesity is related with lower self-concept, negative self-confidence, and decreased self-image ([Faith *et al.*,2003). Socially, obese individuals are prone to discrimination and teasing by others, which have further negative economic and social consequences (Kolotkin *et al*, 2001). So, obesity is associated with negative impact on all aspect of QOL.

Table 6 shows females were higher scores in (self-esteem and sexual life) domains which mean more impairment in these measures of QOL and this can be explained by ;females are more interest with her body image and physical appearance, socially, obese females are more prone to teasing and discrimination ,afraid of rejecton from others and this will effect on her psychology and her self –confidence, also will effect on sexual activity ;teasing from her partener and low self esteem will effect on her desire, difficulty in initiation of sex in addition to musculoskeletal problem which effect on sexual performance, so obese females are often try to avoid sextual relation . This result agrees with other studies(Ronette& Ross 2002),( EleonoraPoggiogalle, 2014).

In contrast, males were higher scores in physical function and work domains which mean more impairment in these 2 domains, this result disagrees with other studies (Ronette& Ross, 2002) (which reported that females have higher score (in physical function and work) while another study done in Brazil (Pimenta *et al.*,2015) reported that there is no difference between male and females in quality of life domains. This can be explained by sociocultural factors, our traditions ,that males must work more and has more responsibilities than females which need more effort, males have more stressful works and occupations, obese males are not able to do these works in a proper way ,and often have impairment of work due to their body weight ,and have more physical symptoms ,more worry about health ,which impair physical function of males more than females .

No significant difference in public distress between males and females but females were little higher scores (more effected), this domain consists of 2 parts ;the first part is related to walking and sitting in public places which is more likely to be not differ by gender while the second part is including teasing and discrimination by others, which are more effected in female (,associated with body image and self esteem)

Table 7 the age group (39-59) significantly more impairment in physical function, work, and sexual life while the age group (18-38) significantly more impairment in self-confidence.

This result can be explained by; obesity with aging associated with more difficulties to do daily activities (such as mobility, claimbing stairs ,putting or taking off clothes,..) and physical symptoms related obesity (dysnea, joint pain,swelling of legs) and also back pain, sleep disorder and chronic disease increase in older age, lead to impairment of work.

Increasing of age has also negative effect on sexual life, (desire, interest of sex and sexual problems) while aging has positive effect on self-esteem, this may be related to loss of interest with body images with increasing age(Robins *et al.*,2005),

These results agree with other study (Darya *et al.*,2009). Regarding the public distress there was no significant difference between the 2 age groups.,but the younger age were higher scores (more effected),this may be associated with part of( teasing and discrimination) which is more impaired in younger age (such as self- esteem and body image)

Table 8 shows that participants with higher bod fat percentage reported significantly poorer quality of life..The body fat percentage is the total mass of fat divided by total body mass; body fat consists of (essential and storage fat). It is the only body measurement that calculates an individual's body composition without respect to height or weight. (BMI) gives a measure that allows the comparison of the adiposity of persons with different weightsandheights. While BMI increases as adiposity increases, due to differences in body composition, other indicators of body fat give more accurate results; for example, persons with larger muscle mass or larger bones will have higher BMIs, Average range of body fat percentage(BFP) is (18-24%) in menand(25–31%)in women ,in obese (>32% in women)and(>25%in men) (ACE, 2009). Some studies showed higher body fat percentage considered as risk factor for hypertension and type 2 diabetes at normal BMI range proposed by the WHO.And overweight is as an excess of body fat not as an excess of weight (increased BMI)(Chandrasekharan *et al.*,2012)

Also there was highly significant association between QOL and abdominal obesity (which are measured by WC and WHR), this result agrees with another study (WUS, *et al.*, 2014) which reported that abdominal obesity impairs physical health domain of QOL, and other study(Wu, *et al.*,2014) which showed negative impact of BMI, WHR, BF on physical functioning and health in a sample of Greek healthy adults central obesity, is an increase of abdominal fat around the stomach and abdomen to the extent that it is likely to have an adverse effect on health, central obesity is related with a higher risk of cardiac disease, hypertension, DM Type 2, and Metabolic syndrome. Central obesity is a symptom of Cushing's syndrome ,polycystic ovary syndrome (PCOS) and dyslipidemia.(Yusuf *et al.*,2004),( Anjana, *et al.*, 2004),(Després, and Lemieux, 2006) .Absolute WC(>102 cm in men and >88 cm in women) (National Cholesterol Education Program, 2002).

WHR(the circumference of the waist divided by that of the hips of >0.9 for men and >0.85 for women (Yusuf *et al.*, 2004).

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