

Quality of Well-Being and Self-esteem among Obese Patients

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Abstract: Obesity is a complex condition associated with serious health complications, and reduced health-related quality of life. **Objectives:** assess self-esteem and depression among obese and identify relation between obesity and quality of life. **Methods:** case control study, 300 obese and 300 non obese individuals were randomly recruited. Study tools: Obesity Specific Quality Of Life, WHOQOL-BREF, Rosenberg Self-Esteem and Beck Depression Scales. Anthropometric measurements and biochemical investigations were carried out. **Results:** mean obese age was 36.99±10.892 years compared to 35.74±10.428 years non obese. Fasting blood glucose, total cholesterol and low density lipoproteins were significantly higher among obese patients. Obese had significantly lower mean self esteem than non obese (13.19±4.487 vs 19.79±3.735). Moderate, severe or extreme depression constituted around third of obese compared to 4.7% of non obese. Obese had a significantly lower mean of physical domain (42.87±18.976 vs 68.61±13.740%), psychological domain (42.85±17.992 vs 67.506±12.334), social domain (37.58±25.286% vs 68.86±16.876%) and environmental domain (44.78±19.585 vs 69.59±13.530) on WHO quality of life scale than non obese. Obese had mean physical state of 64.01±18.796% and mean agility and vitality of 62.04±21.56% on obesity specific quality of life. **Conclusion:** Body mass index correlated negatively with quality of life and positively with depression.

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1. Introduction

Obesity is a chronic disease whose prevalence has been described as reaching epidemic proportions around the world (Larson and Story, 2008). The prevalence rates of overweight are not only rising but also apparently accelerating (Young People's Health, 2002). In 2005, the estimated total numbers of overweight and obese adults worldwide, were 937 million and 396 million respectively (Kelly et al., 2008), numbers that have doubled in comparison to 20 years ago (James et al., 2004), by 2030, these figures are projected to be 1.3 billion and 573 million for overweight and obese adults respectively (Kelly et al., 2008).

The increasing prevalence of obesity over the last 2 decades has generated considerable concerns about its health burdens. It is frequently stated in scientific and lay literature that obesity causes about 300000 deaths per year in the United States. It has been suggested that obesity is second only to smoking as a preventable cause of death (Satcher, 2002).

Morbidity and mortality are not the only two consequences of obesity, health-related quality of life (HRQL), including domains related to physical, mental, emotional and social functioning, is also impacted by obesity (Song et al., 2010). Multiple evidence is available through many studies over the

whole world that provide support for this relationship. A significant correlation between BMI and HRQL in men and women (Søltøft et al., 2009). Excess weight had a negative impact on HRQL, even for people without chronic diseases (Serrano-Aguilar et al., 2009).

In Kuwait, obesity is a growing health concern; several studies have shown the high prevalence of overweight and obesity among the population. In 2010, about 80% of women were overweight or obese, and childhood obesity continues to increase as well (El-Bayoumy et al., 2009). However, no available studies dealt with the relationship between obesity and quality of life. Thus, the following study was conducted to: assess self-esteem and depression status among obese persons and identify the relation between obesity and quality of life.

2. Subjects and Methods

A case control study was carried out in primary health care units affiliated to the Ministry of Health. Primary health care in Kuwait is provided through 92 centers distributed proportionate to the population size in each health region of the five health districts.

The target population of this study were all obese individuals attending primary health care centers in Kuwait. A list of all primary health care centers in the five health districts of Kuwait was prepared. One health care center was randomly selected from each health district (a total of five health centers were included). The five health centers were visited sequentially to recruit 300 obese individuals. For each obese individual recruited in the study; the next attending non obese patient for minor acute health ailment was selected as a control.

The inference population for this study is obese (BMI ≥ 30) patients attending the selected primary health care centers during the duration of the field work of the study as well as their controls (BMI < 30). All individuals less than 18 years or having major illness were excluded.

Tools of the study:

The used tools of this study included three parts:

Part I consisted of the following sections: Personal characteristics: (age, sex, marital status, nationality and level of education). Health status: current chronic health morbidities, family history and duration of obesity.

Part II included the following scales: Obesity Specific Quality of Life was measured using the Obesity Specific Quality Of Life (OSQOL) questionnaire (Le Pen *et al.*, 1998). Quality of life was measured using WHOQOL-BREF. It is composed of four domains: physical domain, psychological domain, social relationship domain and physical environment. The four domain scores denote an individual's perception of quality of life in each particular domain. Domain scores are scaled in a positive direction (i.e. higher scores denote higher quality of life) (WHO, 1996). Self esteem was measured by the Rosenberg Self-Esteem Scale (Crandal, 1973). Depression was measured by Beck Depression Scale which measures and interprets signs and symptoms of depression (Ghareeb, 1987).

Part III (measurements) consisted of the following sections: Anthropometric measurements: Weight and height measurements, body mass index was calculated as weight in kg / height in square meters. It was used as a measure of obesity. Waist (Abnormal waist circumference males > 102 cm, females > 88 cm) and hip circumferences were measured. Waist-hip ratio (WHR) was calculated (abnormal waist to hip ratio males ≥ 0.90 , females ≥ 0.85) (Dobbelsteyn *et al.*, 2001). Blood pressure: three blood pressure measurements were obtained using a standardized sphygmomanometer with an interval of at least 30 minutes between each measurement (High blood pressure $\geq 140/90$) (NIH, 2004). Biochemical investigations: A fasting blood sample was collected from each participant and analyzed for Fasting blood

glucose (FBG) (High fasting blood glucose ≥ 7.0 mmol/L) and Lipid profile (High total cholesterol ≥ 5.2 mmol/L, Low HDL < 0.90 mmol/L, High LDL > 3.4 mmol/L) (WHO, 2006).

Pilot study:

A pilot study was carried out on 30 individuals (15 obese and 15 non obese). The study was formulated to test the clarity, applicability and suitability of the used questionnaire, identify the difficulties that could be faced during the application, estimate the time needed for filling the questionnaire, and test analytic procedure and overall response of the patients. The whole administrative technique could also be explored through this study. This study revealed that, overall, the questionnaire was suitable, the interview consumed 45 minutes on the average, and the required modifications (a question about causes of quitting previous diet regimens was added) of the questions were performed.

Data Management:

Data were fed to the computer using Statistical Package for Social Science (SPSS, version 20). Possible entry errors were checked for by a serial range, minimum and maximum values as well as frequency distribution and cross tabulations to ensure that all questions had valid codes and values. Many variables were created for re-categorization of variables using the authors instructions. Also, all the used scales were scored according to the instructions of the authors. Percent score was calculated as follows: All negative questions were reversed first to add positively to the final score. The percentage was treated to range from zero to 100. The percent score was calculated using the following formula: The actual score X 100 / maximum possible score.

Simple descriptive statistics as frequency and percentage distribution for categorical variables and mean with the standard deviation for quantitative variables were used. The median was also calculated for all scores and non normally distributed variables.

For comparative purposes, Chi-square was used for categorical variables, student-t and Mann-Whitney (for discrete variables or those with non normal distribution) tests for quantitative variables. Spearman correlation coefficient was utilized to assess association among discrete quantitative variables. For comparison between cases and controls analysis was initially carried out based on a series of univariate comparisons. Appropriate inferential statistics was done with ≤ 0.05 level of significance.

Ethical considerations:

All the necessary approvals for carrying out the research were obtained including ethical approval. A written format explaining the purpose of the research was prepared and signed by the participants after explaining the aim and procedures of the study

and before filling the questionnaire. Complete confidentiality was ensured. Participants' right to withdraw from the study whenever they want without affection of their long term care plan was also ensured.

3. Results:

Table (1) shows socio-demographic characteristics of obese and non obese groups. The mean age of obese (36.99 ± 10.892 years) did not significantly differ from that of non obese (35.74 ± 10.428 years, $P=0.150$). Although, a higher proportion of the non obese (65.4%) held a university or higher certificate than the obese group (58.7%) yet, this difference is not statistically significant, $P=0.093$. Females tended to be more likely represented among the non obese (69.7%) than the obese (59.0%) group. Kuwaitis constituted 85% of the obese compared with 75.3% of the non obese ones, $P=0.003$. The majority of obese were married (57.0%) compared with 45.7% of the non obese, $P=0.004$.

Due to selection purposes, all none obese individuals were of normal weight with an overall mean BMI of 22.12 ± 1.369 kg/m² while, the obese group had a mean of 33.12 ± 3.257 kg/m². The majority

of the obese group had an abnormal waist circumference (62.7% compared with 1.3%) and abnormal waist to hip ratio (68.0% compared with 12.0%). On the average, the obese group suffered from obesity for 8.19 ± 4.352 years. They were also more likely to have a positive family history of obesity (88.7% compared with 60.5%, $P < 0.001$).

Table (2) illustrates that obese individuals significantly suffered from chronic diseases possibly associated with obesity namely, hypertension, hypercholesterolemia, diabetes mellitus, bronchial asthma, and joint pains more than the control group.

Table (3) portrays that Less than half (45.3%) the obese individuals tended to have hypertension compared with less than a quarter (22.3%) of the non obese group. Also about a quarter of the obese suffered from low HDL (25.0%) or high LDL (25.3%) compared with less than a tenth of the non obese group (9.0% and 7.0% respectively). Those suffering from high fasting blood glucose were more likely encountered among the obese group (15.3% compared with 7.7%). More than double the obese suffered from high total cholesterol compared to the non obese (22.0% compared with 10.3%).

Table (1): Socio-demographic characteristics of obese and non obese groups

Character	Obese (n=300)	Non obese (n=300)	Test (P)
Age (years)			
-Mean \pm SD	36.99 ± 10.892	35.74 ± 10.428	$t=1.440$ (0.150)
Sex			$X^2=7.438$ (0.006*)
-Male	123 (41.0)	91 (30.3)	
-Female	177 (59.0)	209 (69.7)	
Nationality			$X^2=8.816$ (0.003*)
-Kuwaiti	255 (85.0)	226 (75.3)	
-Non Kuwaiti	45 (15.0)	74 (24.7)	
Marital Status			$X^2= 8.854$ (0.014*)
-Married	171 (57.0)	137 (45.7)	
-Single	110 (36.7)	145 (48.3)	
-Divorced/widow	19 (6.3)	18 (6.0)	
Education			$X^2=2.830$ (0.093)
-Secondary or less	124 (41.3)	104 (34.6)	
-University or higher	176 (58.7)	196 (65.4)	

* Significant, $P \leq 0.05$ t = Student t test X^2 = Chi square test

Table (2): Chronic diseases possibly associated with obesity among obese and non obese groups

Current chronic diseases	Obese (n=300)	Non obese (n=300)	Test (P)
-Hypertension	108 (36.0)	44 (14.7)	$X^2=36.090$ (<0.001*)
-Bronchial asthma	42 (14.0)	12 (4.0)	$X^2=18.314$ (<0.001*)
-Diabetes	49 (16.3)	12 (4.0)	$X^2=24.983$ (<0.001*)
-Hypercholesterolemia	137 (45.7)	61 (20.3)	$X^2=43.540$ (<0.001*)
-Joint pains	42 (14.0)	7 (2.3)	$X^2=27.223$ (<0.001*)
-Hormonal dysfunction	26 (8.7)	15 (5.0)	$X^2=3.168$ (0.075)
-Others	17 (5.7)	5 (1.7)	$X^2=6.795$ (0.009*)

* Significant, $P \leq 0.05$ X^2 = Chi square test Others: renal, gastrointestinal, cardiovascular and respiratory diseases

Table (3): Blood pressure and biochemical measurements among obese and non obese groups

Measurement	Obese (n=300)	Non obese (n=300)	Chi square (P)
High blood pressure	136 (45.3)	67 (22.3)	$X^2=35.45$ (<0.001*)
High fasting blood sugar	46 (15.3)	23 (7.7)	$X^2=8.66$ (0.003*)
High total cholesterol	66 (22.0)	31 (10.3)	$X^2=15.06$ (<0.001*)
Low HDL	75 (25.0)	27 (9.0)	$X^2=27.22$ (<0.001*)
High LDL	76 (25.3)	21 (7.0)	$X^2=37.20$ (<0.001*)

* Significant, $P \leq 0.05$

Table (4) illustrates self esteem, depression and quality of life among obese and non obese groups.

Rosenberg scale: the obese groups had a significantly lower mean self esteem score, using the Rosenberg scale, than the non obese group (13.19±4.487 compared with 19.79±3.735, $P < 0.001$).

Beck depression scale: the obese group had a significantly higher mean depression score than the non obese group (18.16±11.908 compared with 6.17±7.417, $P < 0.001$). Categorical classification showed that the majority of the non obese (82.7%) were classified as normal compared with less than a third (29.0%) of the obese group. Those suffering from moderate, severe or extreme depression constituted less than a third (31.7%) of the obese group compared only with 4.7% of the non obese group.

WHO-QOL-BREF: the obese group had a significantly lower physical domain mean percent score than the non obese group (42.87±18.976 compared with 68.61±13.740%, $P < 0.001$). The non obese group had a significantly higher mean percent score of psychological domain than the obese group. The obese group had a mean social relationship percent score of 37.58±25.286% that is significantly lower than that of the non obese groups who had a mean of 68.86±16.876%. The results of the environmental domain are similar to those of the other domains.

OSQOL scale: the physical state domain mean percent score was 64.01±18.796%. Similar findings were detected for the agility and vitality domain with a mean of 62.04±21.56%.

Table (4): Self esteem, depression and quality of life among obese and non obese groups

Scale	Obese	Non obese	Test
Rosenberg scale			$Z=15.564$
-Min – Max	10.0 – 22.0	10.0 – 29.0	(<0.001*)
-Mean ± SD	13.19 ± 4.487	19.79 ± 3.735	
-Median	10.00	20.50	
Beck depression scale			$Z=12.159$
-Min – Max	0.00 – 50.00	0.00 – 50.00	(<0.001*)
-Mean ± SD	18.16 ± 11.908	6.17 ± 7.417	
-Median	20.00	4.00	
WHO-QOL-BREF			
Physical domain			
-Min – Max	10.71 – 82.14	14.29 – 100.0	$Z=15.221$
-Mean ± SD	42.87 ± 18.976	68.61 ± 13.740	(<0.001*)
-Median	35.71	75.00	
Psychological domain			
-Min – Max	12.50 – 75.00	20.83 – 95.83	$Z=15.735$
-Mean ± SD	42.85 ± 17.992	67.500 ± 12.334	(<0.001*)
-Median	41.67	70.83	
Social relationship domain			
-Min – Max	0.00 – 75.00	0.00 – 100.0	$Z=14.312$
-Mean ± SD	37.58 ± 25.286	68.86 ± 16.876	(<0.001*)
-Median	25.00	75.00	
Environmental domain			
-Min – Max	6.25 – 75.00	15.63 – 100.0	$Z=14.642$
-Mean ± SD	44.78 ± 19.585	69.59 ± 13.530	(<0.001*)
-Median	40.63	75.00	
OSQOL Scale			
Physical state			
-Min – Max	25.0 – 100.0	-	
-Mean ± SD	64.01 ± 18.796	-	
-Median	67.86	-	
Agility and suppleness			
-Min – Max	25.0 – 100.0	-	
-Mean ± SD	62.04 ± 21.56	-	
-Median	62.50	-	

Z = Mann Whitney test

* Significant $P \leq 0.05$.

The results of the question measuring relations with other people showed that more than half the obese group (58.3%), absolutely or fairly felt true that they are being attacked when people talked about their corpulence. Also, more than half (55.4%) of them had the same feeling towards being ill at ease.

Table (5) illustrates correlation among obesity indicators and depression and quality of life scores among obese group. Generally, significant

correlations could be obtained among these indicators and the other parameters however The value of the correlation coefficient of BMI were larger than those for waist circumference or waist to hip ratio. Negative correlations with the four domains of QOL and Rosenberg scales denote that with increasing of the obesity indicators there is accompanied decrease of quality of life.

Table (5): Correlation of obesity indicators, depression and quality of life score among obese group

Obesity index	Beck	Rosenberg	Phys D	Psych D	Soc D	Env D
Body mass index	0.455*	-0.426*	-0.479*	-0.459*	-0.441*	-0.423*
Waist circumference	0.237*	-0.184	-0.250*	-0.199*	-0.182*	-0.174
Waist/hip ratio	0.200*	-0.195*	-0.249*	-0.163*	-0.186*	-0.142*

* Significant, $P \leq 0.05$

4. Discussion

Obesity is a complex condition affected by genetic, metabolic, social, behavioral, and cultural factors, and is associated with a wide range of serious health complications, and reduced health-related quality of life HRQoL (Kolotkin *et al.*, 2001).

The current study revealed that both obese and non-obese nearly had similar mean age. On the average, obesity started around the middle age. Although females constituted the majority of both groups, yet they were more likely encountered among the obese group. Obesity is greatly affected by sex and age. The study also revealed that obese individuals were more likely to be married than the non obese ones. A study comparing socio-demographic characteristics of obese and non obese individuals revealed that the prevalence of obesity was higher among married than among single women (Atek *et al.*, 2013). Also men with primary or secondary education were more obesity-prone. These findings go hand in hand with the results of this study which revealed that those holding a university or higher certificate formed 65.4% of the non obese compared with 58.7% of the obese group.

Consistent with its broad impact on physiology and health, obesity is increasingly linked to impairments in central nervous system (CNS) function. Mood disorders are now well recognized as significant risks of obesity and related metabolic illnesses. Obese individuals have about a 55% increased odds of developing depression (Luppino *et al.*, 2010). The results of the current study confirms these results. Using the Beck Depression Inventory; the majority of obese individuals suffered from depression compared with less than one third of the non obese participants. There is also a bidirectional association between obesity and depression such that depressed individuals are more likely to gain excessive weight due to poor food choices and

reduced physical activity (Pan *et al.*, 2012). This might explain the inconsistencies of the relation between obesity and depression revealed in some studies (McIntyre *et al.*, 2006).

Beyond diminishing quality of life and functioning, depressed mood presents additional threats to obese individuals by counteracting adherence to treatment and lifestyle changes and increasing the risk of complications. Abdominal adiposity and poor diet quality have been implicated in the development of depressed mood during obesity (Zhao *et al.*, 2011; Hamer *et al.*, 2012). In addition, the current study revealed that obese persons have low self esteem, as these participants had a significantly lower mean score on Rosenberg self esteem scale than the non obese individuals.

Morbidity and mortality are not the only two consequences of obesity, health-related quality of life (HRQL), including domains related to physical, mental, emotional and social functioning, is also impacted by obesity (Song *et al.*, 2010). Multiple evidence is available through many studies over the whole world that provide support for this relationship. The 2003 Health Survey for England of 14416 individuals aged ≥ 18 years noted a significant correlation between BMI and HRQL in men and women (Søltøft *et al.*, 2009). Results from a representative random sample of 4110 people of ≥ 16 years old noted that excess weight had a negative impact on HRQL, even for people without chronic diseases (Serrano-Aguilar *et al.*, 2009). Some studies were conducted in Asian countries. A cross-sectional, hospital-based study of 448 Korean adults aged 20–80 years noted that the impact of overweight on obesity-related quality of life was different for gender and age groups, women had a poorer obesity-related quality of life compared to men (Song *et al.*, 2010). A national representative sample of 14221 Taiwanese aged from 18 to 96 years showed that

excess weight was related to worse physical, but not mental HRQL(Huang *et al.*, 2006). This study confirms these results, as the studied obese individuals tended to have a significantly lower mean scores on the WHO QOL-BREF than the non obese ones. This trend was consistently observed on the physical, psychological, social relationship, and environmental domains of the scale. Not only that, but the obese individuals also had a significantly lower score of the whole scale indicating a lower quality of life than the non obese.

The present work did not only reveal a qualitative relationship between obesity and quality of life, meaning that obese individuals have a lower quality of life, but also showed a quantitative relationship. A significant negative correlation was noted between obesity indicators and domains of quality of life. This denotes that with increasing obesity there is an accompanied decreased in the quality of life. This indicates a dose effect relationship between obesity and quality of life. As noted by several studies which had shown that both physical and psychological functioning are affected by obesity(Kolotkin *et al.*, 2002).

The relationship between obesity and quality of life has also been confirmed by intervention studies. Numerous studies have suggested that individuals reported improvements in psychosocial functioning with weight loss(Kolotkin *et al.*, 2009). This relationship may be strongest among individuals who lose larger amounts of weight(Maciejewski *et al.*, 2005). Health- and weight-related quality of life appear to improve in the vast majority of studies of persons who undergo bariatric surgery(Sarwer *et al.*, 2010).

The current study also revealed that not all indicators of obesity have similar strength of correlation with the studied domains of quality of life. BMI tended to have stronger correlation with either the physical, psychological, social and environmental domains of the WHOQOL-BREF scale or the depression and specific obesity quality of life scale than waist circumference or waist to hip ratio. The value of correlation coefficient differed from one domain to another. A review of HRQOL outcomes in 34 randomized controlled trials for weight loss interventions indicated inconsistencies across studies, with varying types of measures used, diverse assessment points, and differing outcomes(Maciejewski *et al.*, 2005). Even when the same measure was used – for example, the SF-36 – positive treatment effects were shown for some domains, but not others, and these domains varied across studies. When obesity-specific measures were used, a greater percentage of the trials showed improved HRQOL(Maciejewski *et al.*, 2005). This might be attributed

to multiple factors as each indicator of obesity represents a different pattern of obesity. However, selection of the obese participants depending on the BMI, in this study, may be the main cause for such relationship. In fact, the multiple indicators of obesity as well as the multiple morbidities associated with it might play an important role in this relationship.

Although a large body of research has shown that obesity is associated with impairments in quality of life yet, this relationship is a complicated one and affected by many other factors(Sarwer *et al.*, 2012). More specifically, studies have suggested that both health and weight-related quality of life are impacted by excess body weight. Given the multidimensional nature of both forms of quality of life, weight-related co-morbidities such as type 2 diabetes and hypertension, as well as the physical limitations imposed by excess body weight, have the potential to impact quality of life. A number of studies have identified a strong relationship between the degree of obesity and impairments in HRQOL(Fabricatore *et al.*, 2003).

The current study also revealed higher levels of depression and lower levels of self-esteem which may contribute to undermining their quality of life. Also, the obese participants tended to have poor health as they had higher rates of hypertension, heart disease, diabetes, in addition to regular use of medicines. All these factors may interact with obesity to affect its impact on the quality of life of obese individuals. Excess weight has been associated with worse psychosocial well-being and quality of life and a higher frequency of psychological disorders has been described in obese persons, probably related to a lower degree of social acceptance(Kolotkin *et al.*, 2001).

Health extends beyond clinical events, to encompass psychological well-being. Whereas physical functioning evaluates the degree to which health limits physical activities, such as self-care, walking and the like, Role-physical and Role-emotional ascertain how such limitations (physical or emotional respectively) interfere with activities of daily living(Ware *et al.*, 1993). Being overweight or obese was associated with compromised physical HRQOL (Rosenthal, 1996). Some studies that indicate that excess weight is solely or at least to a larger extent related to reduced physical than to reduced mental HRQOL(Oliva-Moreno and Gil-Lacruz, 2013). However, the results of the current study showed both physical and psychological domains were similarly undermined among obese individuals than the non obese participants on the WHOQOL-BREF. Yet, the specific obesity quality of life questionnaire showed that the physical domain was more affected than the psychological aspect. The

differences between the two used tools might be attributed to both the different structure and purpose of use. Earlier studies have demonstrated either a negative association or no association between obesity and mental HRQOL (De Beer *et al.*, 2007) or related HRQOL domains (Friedlander *et al.*, 2003). Only a few investigations have revealed that some obese people have slightly better mental HRQOL than those of normal weight (Hopman *et al.*, 2007).

References

1. Atek M, Traissac P, El Ati J, Laid Y, Aounallah-Skhiri H. (2013). Obesity and Association with Area of Residence, Gender and Socio-Economic Factors in Algerian and Tunisian Adults. PLoS ONE; 8(10):e75640.
2. Crandal, R. (1973). The measurement of self-esteem and related constructs, Pp. 80-82 in J.P. Robinson & P.R. Shaver (Eds), Measures of social psychological attitudes. Revised edition. Ann Arbor: ISR.
3. de Beer M, Hofsteenge GH, Koot HM, Hirasing RA, Delemarre-van de Waal HA, Gemke RJ. (2007). Health-related-quality-of-life in obese adolescents is decreased and inversely related to BMI. Acta Paediatrica; 96:710-4.
4. Dobbelsteyn CJ, Joffres MR, MacLean DR, Flowerdew G. (2001). A comparative evaluation of waist circumference, waist-to-hip ratio and body mass index as indicators of cardiovascular risk factors. The Canadian Heart Health Surveys. Int J Obes Relat Metab; 25 (5): 652-61.
5. El-Bayoumy I, Shady I, Lotfy H. (2009). Prevalence of obesity among adolescents (10 to 14 years) in Kuwait. Asia Pac J Publ Health; 21:153-9.
6. Fabricatore AN, Wadden TA, Sarwer DB, Faith MS. (2003). Depressive symptoms as a function of body mass index and health-related quality of life in the treatment seeking obese adults. Obes Res; 11:A10.
7. Friedlander SL, Larkin EK, Rosen CL, Palermo TM, Redline S. (2003). Decreased quality of life associated with obesity in school-aged children. Arch Pediatr Adolesc Med; 157(12):1206-11.
8. Ghareeb G. (1987). An investigation of some variable related to depression in Egyptian Youth. Paper presented at the Cairo World Congress of Mental Health. World Federation for Mental Health, Cairo.
9. Hamer M, Batty GD, Kivimaki M. (2012). Risk of future depression in people who are obese but metabolically healthy: the English longitudinal study of ageing. Mol Psychiatry; 17:940-5.
10. Hopman WM, Berger C, Joseph L, Barr SI, Gao Y, Prior JC, Poliquin S, Towheed T, Anastassiades T, Grp CR. (2007). The association between body mass index and health-related quality of life.: data from CaMos, a stratified population study. Qual Life Res; 16(10):1595-603.
11. Huang IC, Frangakis C, Wu AW. (2006). The relationship of excess body weight and health-related quality of life: evidence from a population study in Taiwan. Int J Obesity; 30:1250-9.
12. James PT, Rigby N, Leach R. International Obesity Task Force. (2004). The obesity epidemic, metabolic syndrome and future prevention strategies. Eur J Cardiovasc Prev Rehabil; 11:3-8.
13. Kelly T, Yang W, Chen CS, Reynolds K, He J. (2008). Global burden of obesity in 2005 and projections to 2030. Int J Obes; 32:1431-7.
14. Kolotkin RL, Meter K, Williams GR. (2001). Quality of life and obesity. Obes Rev; 2:219-29.
15. Kolotkin RL, Crosby RD, Williams GR. (2002). Health-related quality of life varies among obese subgroups. Obes Res; 10:748-56.
16. Kolotkin RL, Crosby RD, Gress RE, Hunt SC, Adams TD. (2009). Two-year changes in health-related quality of life in gastric bypass patients compared with severely obese controls. Surg Obes Relat Dis; 5:250-6.
17. Larson N, Story M. (2008). The adolescent obesity epidemic: why, how long, and what to do about it. Adolesc Med; 19:357-79.
18. Le Pen C, Lévy E, Loos F, Banzet MN, Basdevant. (1998). "Specific" scale compared with "generic" scale: a double measurement of the quality of life in a French community sample of obese subjects. J Epidemiol Community Health; 52:445-50.
19. Luppino FS, de Wit LM, Bouvy PF, Stijnen T, Cuijpers P, Penninx BW, Zitman FG. (2010). Overweight, Obesity, and Depression A Systematic Review and Meta-analysis of Longitudinal Studies. Arch Gen Psychiatry; 67(3):220-9.
20. Maciejewski ML, Patrick DL, Williamson DF. (2005). A structured review of randomized controlled trials of weight loss showed little improvement in health-related quality of life. J Clin Epidemiol; 58:568-78.
21. McIntyre RS, Konarski JZ, Wilkins K, Soczynska JK, Kennedy SH. (2006). Obesity in Bipolar Disorder and Major Depressive Disorder: results from a National Community Health Survey on Mental Health and Well-Being. Can J Psychiatry; 51:274-80.

22. NIH. (2004). Prevention, detection, evaluation, and treatment of high blood pressure. U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES National Institutes of Health National Heart, Lung, and Blood Institute
23. Oliva-Moreno J, Gil-Lacruz A. (2013). Body weight and health-related quality of life in Catalonia, Spain. *Eur J Health Econ*; 14(1):95–105.
24. Pan A, Sun Q, Czernichow S, Kivimaki M, Okereke OI, Lucas M. (2012). Bidirectional association between depression and obesity in middle-aged and older women. *Int J Obes (Lond.)*; 36:595–602.
25. Rosenthal JA. (1996). Qualitative descriptors of strength of association and effect size. *J Soc Serv Res*; 21(4):37–59.
26. Sarwer DB, Wadden TA, Moore RH, Eisenberg MH, Raper SE, Williams NN. (2010). Changes in quality of life and body image after gastric bypass surgery. *Surg Obes Relat Dis*; 6:608–14.
27. Sarwer DB, Lavery M, Spitzer JC. (2012). A review of the relationships between extreme obesity, quality of life, and sexual function. *Obes Surg*; 22:668–76.
28. Satcher D. (2002). Surgeon general's column. *Commissioned Corps Bull*; 16(2):1–2.
29. Serrano-Aguilar P, Munoz-Navarro SR, Ramallo-Farina Y, Trujillo-Martín MM. (2009). Obesity and health related quality of life in the general adult population of the Canary Islands. *Qual Life Res*; 18:171–7.
30. Søltøft F, Hammer M, Kragh N. (2009). The association of body mass index and health-related quality of life in the general population: data from the 2003 Health Survey of England. *Qual Life Res*; 18:1293–9.
31. Song HR, Park HS, Yun KE. (2010). Gender and age differences in the impact of overweight on obesity-related quality of life among Korean adults. *Obes Res Clin Pract*; 4(1): e15–e23.
32. Ware JE, Snow KK, Kosinski M, Gandek B. (1993). SF-36 health survey. Manual and interpretation guide Boston: The Health Institute, New England Medical Center.
33. WHO. (1996). WHOQOL-BREF: Introduction, administration, scoring and generic version of the assessment. WHO, Geneva.
34. WHO. (2006). Definition and diagnosis of diabetes mellitus and intermediate hyperglycaemia Report of a WHO/IDF consultation. WHO, Geneva, Switzerland.
35. Young People's Health in Context. Health Behaviour in School-Aged Children (HBSC) Study. (2002). International Report from the 2001/2002 Survey; Currie C, Roberts C, Morgan A, Smith R, Settertobulte W, Samdal O Rasmussen VB. Eds; WHO Regional Office for Europe: Copenhagen, Denmark.
36. Zhao G, Ford ES, Li C, Tsai J, Dhingra S, Balluz LS. (2011). Waist circumference, abdominal obesity, and depression among overweight and obese U.S. adults: National Health and Nutrition Examination Survey 2005–2006. *BMC Psychiatry*; 11:130.

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