The Association Between Obesity and Quality of Life Among the Elderly

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Abstract

Background: The prevalence of obesity in the elderly is increasing worldwide. Obesity greatly impacts quality of life (QoL). The present study aimed to investigate the association between obesity and QoL among the elderly, in Tehran, Iran.

Methods: This cross-sectional study (observational) was conducted in 2014 in Tehran, Iran. A total of 421 elderly people aged ≥ 60 years old were recruited using simple random sampling methods. Height, weight, and waist circumference were measured by standard methods; body mass index (BMI) was calculated from height and weight. QoL was evaluated by the Persian language version of the SF-36 questionnaire in. The alpha value was set at 0.05 to indicate the statistical significant level. Independent samples t-tests and Chi-square tests were used for comparing the quantitative and categorical variables, respectively. One-way ANOVA, followed by Tukeys' post-hoc test, was used to compare mean scores of SF-36 scales between BMI groups. Pearson correlation coefficients were used for investigating the relationship between SF-36 scores and anthropometric parameters.

Results: The mean age of participants was 77.6±8.6 years. The frequency of obesity and overweight (BMI ≥ 25 kg/m2) was 59.4% (57.2% in males and 60.6% in females). Except for the mental health scale, for all other SF-36 scale mean scores, participants with overweight or obesity had lower scores compared to their normal-weight counterparts (p < 0.05). Additionally, subjects with underweight had significantly lower scores for the vitality scale (p < 0.05). The association between obesity and quality of life among the elderly. Int J Health Stud 2016;2(2):17-21.

Conclusions: The results of present study persist on importance of preserving normal weight on improving quality of life in elderly. Although the observed association in this study was bidirectional and prospective studies are needed to investigate the cause and effect relationship.

Keywords: Quality of life, Aged, Obesity, Body mass index, Waist circumference.

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Introduction

In recent years, the proportion of individuals who are elderly is increasing in many developed and developing countries.1 Based on the predictions of the United Nations, between 2007 to 2050 elderly populations will increase by 2-fold in size.2 Recent studies have shown that factors such as decreased birth ratio and increased life expectancy (to 70 years), have a great impact on growing aged population.3 Based on the results of the 1956 census conducted in Iran, about 6.2% of the Iranian population were 60 years old or greater, while in the 2006 and 2011 censuses, this number had increased to 7.3% and 8.3%, respectively.4 Although aging and increased life expectancy in the community seems desirable, mental, physical, and physiological changes that occur commonly in the elderly can reduce quality of life (QoL). Thus, understanding the factors that may predict quality of life among the elderly is becoming increasingly important. In other words, dynamic aging is an important goal nowadays, and QoL should also be considered as an important issue along with the increased proportion of individuals who are elderly.5,6

QoL has different physical, mental, and social aspects and the concept of QoL has numerous and various definitions. The World Health Organization (WHO) has defined QoL as people’s perception of opportunities, expectations, standards, and concerns in life.7

The prevalence of both obesity and overweight are increasing in developing countries,8,9 and are one of the most important public health problems in many societies.10 There is strong evidence to suggest a direct association between obesity and some chronic diseases, such as type 2 diabetes, cardiovascular disease, osteoporosis, respiratory apnea, and cancer.11-14 Some studies have shown that abdominal obesity is associated with increased mortality.15-18 The effect of overweight and obesity on physical health is well established, and it is determined that overweight and obesity can decrease the individual ability, and increase mortality, and morbidity rates and can lead to the additional treatment charges to health care systems. Obesity is also associated with psychological problems.19 A recent study found a strong association between obesity and depression, especially in women.20 Daviglus et al., (2003) showed that body mass index (BMI) has an inverse correlation with all of the health aspects of quality of life 21 and several other studies on children and adults in different countries.22-24 Several studies have suggested that severe weight loss, as well as higher BMI, can increase disability in the elderly population.25-27

Due to the aging populations the critical roles of QoL in these populations, as well as the increased prevalence of obesity and overweight worldwide, an investigation of the relationship between obesity and QoL is warranted. Since few studies have been conducted in this regard, especially in the Iranian elderly population, the present study aimed to investigate the association between obesity and QoL among the elderly population of Tehran, Iran.

Materials and Methods

The present cross-sectional study was performed to evaluate the QOL and its association with obesity in elderly people who are covered by health houses in Zone five of Tehran, Iran.
Participant recruitment started in November 2013 and was completed in April 2014. A total of 421 elderly (both males and females) at the age of 60 years old and above who were willing to participate in this study and complete the study steps were been selected by simple random sampling method (based on population proportion in each center). After presenting the potential information about the study procedure, signed informed consent was obtained from participants. Participant’s with presence of cognitive impairment or developmental disability, Alzheimer’s disease, using antidepressant drugs, and unwillingness to participate in the study were excluded (28 subjects). A socio-demographic questionnaire containing information about marital status (married, widowed, divorced, and single), living status (living alone with other persons), educational level, employment status (working at home) and current smoking status was completed by each participant.

Anthropometric measurements were performed using standard methods. Weight of participants was measured with a digital scale with an accuracy of 0.1 kg (TANITA, BC-418, Japan) with light clothes and without shoes, and height was measured in the relaxed position with freely hanging arms using a SecaStadiometer with an accuracy of 0.5 cm. Waist circumference (WC) was obtained using a non-elastic tape at the mid-point of the last rib and the iliac crest to the nearest 0.5 cm. BMI was calculated by dividing weight (in kg) by height (in m) squared.

According to World Health Organization guidelines, BMI was categorized into four groups: underweight (<18.5 kg/m²), normal weight (18.5–24.9 kg/m²), overweight (25–29.9 kg/m²) and obesity (≥ 30 kg/m²). WC more than 88 cm in women and 102 cm in men were considered as abdominal obesity.

Quality of life (QoL) was measured with the multidimensional 36-item Short Form Health Survey (SF-36) questionnaire (Persian language version). The SF-36 questionnaire is a self-reported method which measures health in eight dimensions. This questionnaire is considered to be an appropriate tool for gathering physical, mental, emotional, and general information. The validity and reliability of the questionnaire in Iranian elderly have been established.

The questionnaire consists of 36 items with 8 sections (physical function, role limitation related to physical problems, role limitation related to emotional problems, bodily pain, general health, vitality, social function, and mental health). In total, the questionnaire is used for the mental, physical and general evaluation of the QoL. For scoring the SF-36 questionnaire, the Likert method (0 to 100) was used. Zero points represent the lowest and 100 points represents the highest QoL.

Continuous data was expressed as mean±standard deviation, and categorical variables were presented as numbers and percentages. The alpha value was set at 0.05 to indicate the statistical significant level for comparisons. The one-sample Kolmogorov-Smirnov test was used to determine if data were normally distributed. Independent samples t-tests and Chi-square tests were used to compare quantitative and categorical variables, respectively. One way ANOVA followed by Tukey post-hoc test was used to compare mean scores of SF-36 scales between BMI groups. Pearson correlation coefficient was used for investigating the relationship between obtained SF-36 scores and anthropometric parameters. All data entry and statistical analysis was performed using SPSS version 21 (SPSS Inc., Chicago, IL).

**Results**

In this cross-sectional study, 421 elderly participants (aged 60 and over) were examined. From this population, 131 participants (31.1%) were men. The mean age of the participant was 77.6±8.6 (range 60–93) years. As shown in Table 1, the mean of BMI and WC were 27.7±4.8 (kg/m²) and 96.2±28.5 cm, respectively. No significant differences were found between men and women for BMI (p=0.12) but, women had a relatively greater WC than men (P=0.04). Only a few participants lived alone (18.7%) at the time of data collection. The percent of married participants was approximately 2-fold greater than unmarried participants. Only 12.1 percent of studied population had university education. Most participants (74.5%) were unemployed and were not currently smokers (80.8%).

**Table 1. Characteristics of the study population by gender**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Men (N=131)</th>
<th>Women (N=290)</th>
<th>Total (N=421)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years) (mean±SD)</td>
<td>76.7±6.2</td>
<td>78.9±6.3</td>
<td>77.6±6.6</td>
<td>0.32</td>
</tr>
<tr>
<td>BMI (kg/m²) (mean±SD)</td>
<td>26.3±4.2</td>
<td>28.7±4.6</td>
<td>27.7±4.8</td>
<td>0.12</td>
</tr>
<tr>
<td>WC (cm) (mean±SD)</td>
<td>92.4±3.3</td>
<td>98.5±3.1</td>
<td>96.2±3.5</td>
<td>0.04</td>
</tr>
<tr>
<td>Living status (N%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>30 (22.9)</td>
<td>49 (16.8)</td>
<td>79 (18.7)</td>
<td>0.05</td>
</tr>
<tr>
<td>With others</td>
<td>101 (77.0)</td>
<td>241 (83.2)</td>
<td>342 (81.3)</td>
<td>0.07</td>
</tr>
<tr>
<td>Marital status (N%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>88 (67.1)</td>
<td>192 (66.2)</td>
<td>280 (66.5)</td>
<td>0.09</td>
</tr>
<tr>
<td>Not married*</td>
<td>43 (32.9)</td>
<td>98 (33.7)</td>
<td>141 (33.5)</td>
<td>0.24</td>
</tr>
<tr>
<td>Education level (N%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>28 (21.3)</td>
<td>42 (14.4)</td>
<td>70 (16.6)</td>
<td>0.36</td>
</tr>
<tr>
<td>Less than guidance</td>
<td>25 (18.2)</td>
<td>95 (32.7)</td>
<td>120 (28.5)</td>
<td>0.06</td>
</tr>
<tr>
<td>Guidance and diploma</td>
<td>57 (43.5)</td>
<td>123 (42.4)</td>
<td>180 (42.7)</td>
<td>0.47</td>
</tr>
<tr>
<td>university education</td>
<td>21 (16.0)</td>
<td>30 (10.4)</td>
<td>51 (12.1)</td>
<td>0.32</td>
</tr>
<tr>
<td>Occupation (N%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>73 (55.7)</td>
<td>34 (11.7)</td>
<td>107 (25.4)</td>
<td>0.002</td>
</tr>
<tr>
<td>At home</td>
<td>58 (44.2)</td>
<td>256 (88.2)</td>
<td>314 (74.5)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Current smoker (N%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>67 (51.2)</td>
<td>14 (4.8)</td>
<td>81 (19.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>64 (48.8)</td>
<td>276 (95.2)</td>
<td>340 (80.8)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

* Including widowed, divorced, and single subjects.

* Independent t-test was used for quantitative variables and χ² test for qualitative variables.

Table 2 presents QoL scores as measured by the SF-36, according to BMI classifications in men and women, separately. In general, men had higher scores than women. Social functioning in normal-weight men was the highest scored scale, while general health in obese women was the scale with the lowest score.

Among men with obesity, the mean scores for physical functioning (P<0.01), role physical (P<0.01), physical pain (P<0.001), general health (P<0.05), vitality (P<0.01) and social functioning (P<0.05) scales were significantly lower than men with normal weight. As compared to men with normal weight, subjects with under and overweight showed no significant difference on role emotional and mental health scales. With the exception of physical functioning and mental health, in
all other SF-36 scale mean scores, women with obesity had lower QoL compared to women with normal weight. Also, underweight women, just as in men, had lower mean scores on vitality (P<0.05), than those with normal weight. Moreover, as compared with normal-weight women, those with overweight showed significant differences in role physical (P<0.01), social functioning (P<0.05) and role emotional (P<0.001) (Table 2).

Results of correlation analyses showed that anthropometric indices had an inverse correlation with all the aspects of QoL in this research (Table 3). There was no correlation between social function, mental health, and general health with BMI and also between bodily pain and WC.

**Discussion**

With regard to the growing aging population, QoL becomes one of the more highlighted issues in the health care systems and health sector policies. QoL is associated with different factors that obesity is one of the most important predictive variables. In the present study, obesity was correlated to the physical component of QoL, but not with all scores of the mental components.

Previous studies have reported that obesity is associated with lower QoL (21–23, 35–45). A study conducted on 88 elderly women (mean age of 71 ± 5 years) showed that higher BMI is associated with lower physical function in the 18 movement physical tests. In a study on participants aged 65 or higher (n = 3605) in Spain, it was found that most of the participants with poor physical function were in obese group (BMI of 30 or over). Hongli et al. (2002), found a linear relationship between waist circumference and disability in elderly women. However, in some studies, lower BMI was correlated with lower QoL. In a study conducted by Sach et al., underweight patients were estimated to be 2.48 times more likely to be anxious or depressed according to the SF-6D. The significant lower SF-6D score for underweight patients was due to their likelihood of having problems on the role limitations dimension. On the other hand, some underweight persons may have lost weight due to underlying illness; thus, the temporal nature of the relationships among underweight, QoL, and chronic disease are more complex.

Obesity and overweight are important predictors of type two diabetes, higher systolic and diastolic blood pressure, and insulin resistance. Moreover, the potent correlations between obesity and gallbladder diseases, arthritis, specific cancers (prostate, breast, colon), sleep disorders and respiratory problems could influence QoL. In a review of the literature by manuti and et al. (2012) difficulty in daily activities increased with greater BMI. As shown in another study, lower QoL scores were associated with aging. It seems that aging can cause increases in QoL.
the prevalence of lower QoL indices, such as chronic diseases, decreased energy and physical strength and the loss of social relationships. Obesity is known to be associated with the risk of many chronic diseases that are highly prevalent among the elderly.\textsuperscript{25,50,59}

The relationship between weight and QoL in the mental aspect has been shown in some studies.\textsuperscript{21,50} Lijing et al., evaluated the correlation between BMI and quality of life in 3981 men and 3099 women and found that obesity is associated with low total and physical (but not mental) quality of life.\textsuperscript{56} The results of another study indicated that lower psychological domain of QoL is associated with increasing BMI levels.\textsuperscript{50}

The previous results on the relationship between obesity and QoL in the mental and social function aspects are inconsistent.\textsuperscript{51,62} While some studies show an inverse relationship between the QoL in mental and social function aspects and obesity,\textsuperscript{22,37,39,41} some studies found no relationship.\textsuperscript{21,42} Ford et al., showed that obesity has great impact on the mental component than the physical component, and also indicated that there is a direct and significant relationship between BMI and unhealthy mental conditions.\textsuperscript{25} Some of observed inconsistencies are related to design of studies and study population. It’s possible that recent weight loss or weight gain changed the BMI class of some participants and there is not enough time to develop adverse effects, especially in the social and mental domains.\textsuperscript{51} It should be mentioned that the absence or presence of other diseases can also impact QoL and the obtained scores.

It is suggested that people with obesity tend to have lower self-esteem, higher anxiety and poorer self-image,\textsuperscript{63,6} which are important factors in reducing the social aspect of QoL in people with obesity.\textsuperscript{64} However, some studies have reported that the impact of obesity on physical aspects is more than that of psychological components.\textsuperscript{23} In addition, the social component of QoL, self-esteem and body image may be more related to age, and so not reflecting the QoL.\textsuperscript{43}

Our study has some limitations. Many diseases such as diabetes, hyperlipidemia, and endocrine disorders are obesity-related diseases are also prevalent in older adults and greatly affect QoL. These variables were not considered as confounding variables in present study. Furthermore, QoL assessment was self-reported method by SF-36 questionnaire, which reflects participants’ experiences and expectations in life that may be affected by environmental and cultural conditions. The cross-sectional design of study can lead to observing bidirectional associations, and we cannot determine temporality in assessing causality (exposure and outcome) between obesity and QoL. Another limitation of the study was that participants were recruited from health homes. The center’s members benefit from some services like sport and educational programs which can affect the QoL, and the obtained results haven’t sufficient generalizing power. It is suggested that future studies be performed on the general elderly population.

Finally, according to the findings of the present study we can conclude that obesity and overweight are associated with QoL. Due to the increased rates of obesity and rising life expectancy, weight management in this sector of the population seems to be of great importance.

Acknowledgment
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Conflict of Interest
The authors declare that they have no conflict of interests.

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