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# Investigation Relationship between Body Mass Index and General Health of patient in Hamadan Fatemieh Hospital, Iran

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## ABSTRACT

*The problem of overweight and obesity is considered as a general health problem throughout the world. The problem leads to underlying diseases such as cardiovascular, diabetes, and gallbladder diseases and stroke, and in addition to cause underlying diseases, it also has impact on general, mental of the individuals. The present study aimed to examine the relationship between body mass index and general health of the patients referring to gynecology clinics in Hamadan. This cross-sectional study was performed on 300 women referring to gynecologic clinic of the Hamadan Fatemieh Hospital in 2015 in the available method. The data collection including demographic data questionnaire and general health questionnaire (GHQ-28). The data was analyzed by SPSS/16 statistical software, Pearson's correlation statistical tests, one-way analysis of variance, post hoc Bonferroni test, ANOVA. The significance level was considered (P <0.05). The women mean age was reported 37.22±0.43. The mean body mass index of patients was 28.35±2.1, the general health mean score was 45.31±18.46, and overall sexual function mean score was 19±4.35. According to Pearson's correlation test, the relationship between all aspects of general health and overall general health and body mass index was significant and direct (p=0.000). Using one-way ANOVA, there was a significant difference between the scores of physical symptoms, anxiety, insomnia, social dysfunction, depression in three groups of normal weight, overweight and obese (p=0.000). The results of this study show that body weight can be associated with mental health in the individuals.*

**Keywords:** Body mass index, general health, women

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## INTRODUCTION

The problem of overweight and obesity is considered as a general health problem throughout the world [1]. Obesity is the overweight that is 20% more than the ideal weight. The body mass index (BMI) is a valid index for the diagnosis of obesity, which is determined on the basis of height and weight [2]. The overall prevalence of

overweight and obesity is very different in developing societies and various ages, the lowest value is for Southeast Asia with 5.8% obesity and 20.7% overweight and the highest value is for Middle East, and Central and Eastern Europe with 14.5% obesity and 45% overweight [3]. The domestic research also showed that that the prevalence of obesity in Tehran is 29.5% among women and 14.2% among men [4]. It is estimated that by 2015, among 2.3 billion adults are overweight, more than 70 million are obese and 2.4% are suffering from morbid obesity [5]. The overweight and obesity is not only important in terms of health and its negative effects on the physical aspect, but also is partially considerable and preventable in terms of psychological, social, economic, and medical costs [6]. The problem leads to underlying diseases such as cardiovascular, diabetes, and gallbladder diseases and stroke, and in addition to cause underlying diseases, it also has impact on general and mental health of the individuals[7]. It is possible that the overweight or obesity lead to cause the symptoms of depression in the subjects under certain circumstances and also sometimes brings the overweight and obesity. This is correct especially when there are difficult fitness and thinness measures in the societies. There are contradictory results noted on the relationship between body mass index and mental and general health of the individuals. Some demographic variables of this relationship including the severity of obesity, gender, socioeconomic status, gene-environment interactions [6].There are several mechanisms on the relationship between obesity and general health of the individuals including biophysiology mechanisms, such as underlying genetic, hormonal relationships and neurotransmitters, consumption of mental disorder drugs, social-behavioral factors and so on. The obesity and overweight also leads to metabolic disorders and has impact on the people mentality [8].The general health is the psychological predisposition for coordination, pleasant and efficiently, flexibility in difficult situations and having the ability to recover the balance [9]. Scott et al. showed the strong relationship between anxiety and obesity [10]. The women's health is the most important way to achieve the overall objectives of health and improve the quality of life for all the humans [11, 12]. The women's health situation has an important impact on the society and the environment. Since the physical, mental and sexual health of the subjects are considered as the fundamental issues of the societies, the present study was aimed to examine the relationship between body mass index and general health of the patients referring to gynecology clinics in Hamadan.

## MATERIALS AND METHODS

The present study was a cross-sectional study performed on 300 women referring to Hamadan Fatemieh Hospital in 2015 for two months. The inclusion criteria consisted of being educated, married, aged 15-50, no infertility, and no use of sedations. The exclusion criteria consisted of pregnancy, notable physical and mental diseases with physician confirmation, and BMI lower than 18.5kg/m2. The sample size was estimated using the means scale and considering the 95% confidence limit and 90% ability test of 270 subjects, and according to the possible loss of samples, the sample size was increased to 300 subjects. Then, the samples were selected in non-probability and available method among the patients referring to the Hamadan Fatemieh Hospital. The data collection tools were demographic profile questionnaire, general health questionnaire (GHQ-28).

**A) Demographic profile questionnaire:**

B:General health questionnaire (GHQ-28): To measure the general health variable, the measures of physical symptoms, anxiety and insomnia, social dysfunction and depression were used. In other words, the general health questionnaire (GHQ) has four subscales, each of them with 7 items: the subscale of physical symptoms, anxiety and insomnia, social dysfunction and depression. The test duration on average was about 10-12 minutes. Four subscales were obtained based on statistical analysis of responses (factor analysis). The subscale (A) includes items on the person's feeling toward the health status and fatigue, and was associated with physical symptoms. The items of the subscale were specified in the questionnaire in the questions 1-7. The subscale (B) includes items that are associated with anxiety and insomnia. Seven items of this subscale were specified in questions 8-14. The subscale (C) measured the extent of ability of the individuals for the professional demands and everyday life issues and revealed their feelings on how to deal with common situations of life. Seven items of this subscale werein the questions 15-21. The subscale (D) includes items that were associated with major depression and suicidal tendency, and its seven distinctive items were specified in the questionnaire with questions 22-28. Each question includes four items, and the scores were from one to four. Those with score greater than 24 were located in the group of subjects suffering from psychological problems. The validity of this questionnaire was obtained in internal consistency method (Cronbach's alpha) for the scales of physical symptoms by 85%, anxiety and insomnia by 78%, social dysfunction by 79%, major depression by 91% and overall questionnaire by 78% [13].

## RESULTS

The mean age of women and mean age of their husbands were reported 32.22±0.43 and 37.35±0.52, respectively. The majority have two children, most of them have high school diploma (45.3%), and their husbands have under high school diploma education (54.3%). The average body mass index of subjects was 28.35±2.1 and the mean score of overall general health was 45.31±18.46, where 109 subjects (36.3%) were obese, 123 subjects (41%) were overweight, and 68 subjects (22.7%) were normal weight. The mean and standard deviation was calculated for physical symptoms (15.94±4.47), anxiety (17.60±5.58), social dysfunction (17.24±64.4), and depression (15.09±6.78) (Table 1). In order to measure the relationship between body mass index and general health subscales, the Pearson's correlation tests were used. The results show that the correlation between physical symptoms, anxiety and insomnia, social dysfunction and depression of overall general health was significant and direct with body mass index variable and the significance level in all dimensions was (p=0.000). Meaning that by increasing the body mass index, the score of scales of general health index was increased and the individuals had lower general health (Table 2). Also, in according to Table 3, and using one-way analysis of variance, the scores of physical symptoms, anxiety and insomnia, social dysfunction and depression had significant difference in three groups of normal weight, overweight and obese (p=0.000). According to the results of the table, the scores of general health subscales in obese and overweight groups is reported more than normal weight group, and higher scores was seen in the scale of depression, anxiety, social dysfunction, physical symptoms in obese and overweight groups than those in the normal weight group. The results indicate that by increasing the weight, the scores of general health subscales are higher, and as a result, the individuals had lower mental health. For more accurate examination of pairwise differences between groups, the post hoc Bonferroni test was used. The test results show that there is a significant difference between normal and obese subjects and also those with overweight in the scores for all the general health subscales (Table 4).

**Table (1): Mean and standard deviation of general health and its dimensions**

| Variable | Mean ± Standard deviation |
|---|---|
| Physical | 15.94±4.47 |
| Anxiety | 17.60±5.58 |
| Dysfunction | 17.24±4.64 |
| Depression | 15.09±6.78 |
| Overall general health | 37.82±18.99 |

**Table (2): Correlation between body mass index and general health subscales**

| Variable | Correlation coefficient | Significance level |
|---|---|---|
| Physical | 0.34 | 0.000 |
| Anxiety | 0.32 | 0.000 |
| Dysfunction | 0.30 | 0.000 |
| Depression | 0.30 | 0.000 |

*Pearson correlation test*

**Table (3). Results of one-way analysis of variance of general health subscales scores based on body mass index**

| Variable | Mean±Standard deviation (Normal weight group) | Mean ±Standard deviation (Overweight group) | Mean±Standard deviation (Obese group) | Significance level |
|---|---|---|---|---|
| Dysfunction Social | 14.07±4.1 | 15.08±4.13 | 18.08±4.3 | 0.000 |
| Depression | 15.14±4.95 | 16.64±5.76 | 20.24±4.67 | 0.000 |
| Anxiety | 15.52±3.82 | 16.47±4.5 | 19.18±4.62 | 0.000 |
| Physical symptoms | 12.76±6.33 | 13.78±6.83 | 18.03±5.96 | 0.000 |

*One-way analysis of variance test*

**Table (4): Results of post hoc Bonferroni test of general health subscales scores based on body mass index**

| | Normal – overweight | Overweight - obese | Normal - obese |
|---|---|---|---|
| Physical | 0.111 | 0.000 | 0.000 |
| Anxiety | 0.058 | 0.000 | 0.000 |
| Dysfunction | 0.158 | 0.000 | 0.000 |
| Depression | 0.296 | 0.000 | 0.000 |

*post hoc Bonferroni test*

## DISCUSSION

The obesity and overweight is increasing in the world, and is associated with diseases such as type 2 diabetes, cardiovascular disease, heart attack, some cancers and so on, and also affects the physical, psychological and general health of the individuals [14]. In the present study, a significant relationship was seen between body mass index and general health subscales, which is in agreement with results of Dwight et al. (2010) and Gavin et al. (2010) [15, 16]. Sadok believes that when obese or overweight people are affected by the stress or emotional states such as depression or anxiety, response to this state by overeating [17]. Also, according to the research findings, the depression was higher compared to other scales of general health in overweight and obese subjects. Zaho et al. (2011) and Gavin et al. (2010) showed that obesity was a risk factor for depression and obese women are at greater risk for developing depression [2, 16]. The change in the norms of societies and cultures, and more attention to diet and fitness, is effective in the increased prevalence of depression and mental health problems in obese women. The fitness value is transmitted to subjects through social media, mass media and so on and opens the way for incidence of symptoms such as sadness and depression and so on [18]. On the other hand, no significant difference was seen between the mental health or GHQ scores and body mass index [19], and Aliramai (2006), examined the relationship between the general health and body mass index of 300 women referred to health centers in Sanandaj. He concluded that there is no statistically significant relationship between general health and body mass index [20, 21, 24], and the reason for difference in study results could be the difference in sampling, diagnostic tool scoring, diagnostic methods, difference in the classification of body mass index and data analysis and so on. The attention to psychological aspects of obese women and efforts to improve the mental health, in addition to the trainings of lifestyle modification, is essential to modify the nutritional pattern and modulate the activity. Scott et al. also examine the relationship between body mass index and psychological disorders in the adult population and it was found that there is strong relationship between anxiety disorders and obesity [10]. The problem of obesity, mental health, and sexual function are among the main general health issues but their relationship is unclear [22, 23]. But in the present study, the relationship between body mass index and general health aspects and sexual function was approved.

## CONCLUSION

According to the results of this study and the research conducted in this regard, the obesity and overweight has great impact on physical and mental health of women, therefore the recognition of the factors associated with obesity and its prediction and treatment is essential. One of strengths of this study is high number of the participants, face-to-face Interview and so on. This is a cross sectional study, and because of this limitation, the causal relationship between the risk factors of incidence of obesity is analyzed, and the sampling was also only in one center. It is suggested that other studies are performed in order to examine the effect of diet, surgeries for weight loss for general health in age ranges and in different centers. The prediction of exciting and emotional problems seems to be essential and obesity treatment may be a method to deal with mood disorders. Due to the significant relationship between general health and body mass index, the solution of this article is for modification of weight and body mass index, lifestyle modification, nutritional status modification, increased physical activity, decreased consumption of high-calorie foods, and the mass media has important impact in this regard.

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