

ORIGINAL ARTICLE

What kind of sexual dysfunction is most common among overweight and obese women in reproductive age?

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The aim of this study was to investigate the association between body mass index (BMI) and sexual health and determine what kind of sexual dysfunction is most common among overweight and obese women in reproductive age from Iran. A cross-sectional descriptive design was adopted. The data of 198 women who referred to health centers during 2014–2015 in Iran were collected through convenient sampling. Data were collected using a demographic questionnaire, female sexual function and sexual satisfaction indexes. Participants' heights and weights were recorded in centimeters and kilogram. Data were analyzed applying descriptive statistics, one-way analysis of variance, regression logistic analysis and χ^2 . *P*-values < 0.05 were considered significant. The mean age of women was 29.89 ± 7.01 and ages ranged from 17 to 45 years. 85.9% of the participants had sexual dysfunction, and 69.7% had dissatisfaction and low satisfaction. According to our evaluations, orgasm dysfunction had the most frequency; on the other hand, desire dysfunction and pain dysfunction had the lowest frequency among overweight and obese women, respectively. Using logistic regression analysis, we have shown that BMI affected on sexual satisfaction, but there was not significant differences between BMI and sexual function. This article concludes that all women especially women with overweight and obesity should be counseled about health outcomes related to sexual activity. This article concludes that all women especially women with overweight and obesity should be counseled about health outcomes related to sexual activity.

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INTRODUCTION

The increasing prevalence of obesity represents a major public health problem, with an effect on physical, emotional and psychosocial function.¹ An obese or overweight individual is not seen as a complete person and many of the medical or psychological needs go unmet due to the healthcare providers' focus on the patient's weight.² Obesity and negative body image can have a significant impact on a person's sexual life. Sexual dysfunction may also be related to obesity, but is rarely mentioned, which may cause concern for the affected individual and her partner, causing a great problem.³ Overweight and obese groups seem to be heterogeneous with respect to sexual satisfaction.⁴ The definition of female sexual dysfunction (FSD) includes persistent or recurrent disorders of sexual interest/desire, disorders of subjective and genital arousal, orgasmic disorders and pain and difficulty with attempted or incomplete intercourse.⁵ Sexual satisfaction is defined as the affective response arising from one's evaluation of his or her sexual relationship, including the perception that one's sexual needs are being met, fulfilling one's own and one's partner's expectations, and a positive evaluation of the overall sexual relationship.⁶ Ferenidou *et al.*⁷ showed that sexual dissatisfaction and sexual difficulties do not always go hand-in-hand.⁷ The relationship between sexual function/satisfaction and amount of body fat in females is still obscure.⁸ The distinction between the terms overweight and obese is based upon structured weight classifications that are determined using a formula that yields a body mass index (BMI), commonly referred to as BMI. BMI formula is based on a person's weight and height, and it is not a direct measure of body fat or obesity. However, it

provides an estimate of body fat percentage, and is used by major health organizations like the CDC (Center for Disease Control) and the WHO (World Health Organization).⁹ Many of the other aspects of the obese patient's health and well-being, including sexual behavior and sexual health, are overlooked or neglected.¹⁰ The adverse effects of obesity on health are well documented.¹¹ We investigated sexual health by BMI. Therefore, the aim of this study was to investigate the association between BMI and sexual health and determine what kind of sexual dysfunction is most common in overweight and obese women in reproductive age.

MATERIALS AND METHODS

This research used a cross-sectional descriptive design to examine relationships among Female Sexual Function Index (FSFI), Index of Sexual Satisfaction (ISS), and BMI in Iranian women who referred to health centers of Urmia in 2014–2015. Included in this study were Iranian reproductive-age women who, according to their own statements, were not pregnant, and more than 6 weeks postpartum and who did not have any chronic or severe medical or psychiatric illnesses, diabetes mellitus, gynecological surgery, lower urinary tract symptoms, multiple sclerosis, known cancer, cardiovascular disease, gynecologic surgery, pelvic trauma, infertility, menopause state and use or abuse of any drugs. The participants also stated that their partners did not have any kind of sexual dysfunctions.

Data collection procedures

Considering the study conducted by Yaylali *et al.*, in which the frequency of sexual dysfunction in obese and overweight women, with an error rate of 5%, was reported to be 86%, the optimum sample size for the study was 185 people.¹² Thus, taking the 10% probable dropout into account, a

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Table 1. Frequency of sexual dysfunctions and dissatisfaction among normal weight ($N=65$), overweight ($N=110$) and obese women ($N=23$)

| BMI categories | 24.9> | 25.0–29.9 | ≥30.0 | P-value |
|------------------------|------------|-------------|------------|-------------|
| Sexual dysfunction | 48 (73.8%) | 101 (91.8%) | 21 (91.3%) | $P=0.003^a$ |
| Normal function | 17 (26.2%) | 9 (8.2%) | 2 (8.7%) | |
| Total | 65 (100%) | 110 (100%) | 23 (100%) | |
| Sexual dissatisfaction | 34 (52.3%) | 89 (80.9%) | 15 (65.2%) | $P<0.001^a$ |
| Normal satisfaction | 31 (47.7%) | 21 (19.1%) | 8 (34.8%) | |
| Total | 65 (100%) | 110 (100%) | 23 (100%) | |

Abbreviation: BMI, body mass index. ^a χ^2 -test.

sample size of 200 participants was selected for the study. Initially, the researcher approached the leaders of health centers explaining the purpose of the study and asking for a list of potential subjects with telephone numbers to contact. Among reproductive age women, covered by health centers 200 participants were randomly selected using a table of random numbers. During the phone call, the aim of the study was explained to them, and they were asked to attend the health centers, if they wished to participate in our study. In the health centers, after measuring their heights and weights, the participants completed a self-report questionnaire. After collecting the questionnaires, two of them were excluded due to incomplete data. Thus, at the end, 198 questionnaires were analyzed.

Socio-demographic characteristics questionnaire

The women who attended the research were asked questions about their age, educational level, job, economic situation, years of marriage, number of children and number of gravidity. Heights and weights were recorded in centimeters and kilogram by the researcher. The participants' weights and heights were measured twice with a calibrated digital scale and a portable stadiometer, respectively.

Female sexual function index

The questionnaire assessed sexual functioning or problems during the last four weeks which is a validated, 19-item self-report instrument. According to the FSFI,¹² sexual function domains consisted of sexual desire (two items), arousal (four items), lubrication (four items), orgasm (three items), satisfaction (three items) and pain (three items). The total score ranged from 2 to 36. A total score of more than 28 was considered normal female sexual function. The Persian version of the FSFI was previously validated by Fakhri et al., and the alpha reliability coefficients for the total scale and subscales were ≥ 0.70 .¹³

Index of sexual satisfaction

The sexual satisfaction was assessed with the ISS.¹⁴ The ISS measures intimates' satisfaction with their sexual relationship by asking them to indicate the extent to which 25 statements describe their current sexual relations with their partner on a scale from 1 (rarely or never) to 5 (most or all of the time). Items 1, 2, 3, 9, 10, 12, 16, 17, 19, 21, 22 and 23 are reverse scored. This will produce scores ranging from 0 to 100 points. There are two cutting scores for this measure. The first one is 30. Scores below this point indicate an absence of a clinically significant problem. Although scores above 30 indicate the likelihood of a clinically significant problem. The second cutting score is 70. Scores above this point nearly always indicate that clients are experiencing severe stress and a type of violence. The Persian version of the ISS was previously validated by Shams Mofarrah et al., with 0.98% internal consistencies for the reliability coefficients of the total scale.¹⁵

Data analysis

The Statistical Package for the Social Sciences (SPSS, SPSS, Chicago, IL, USA), version 22.0, was used for data analysis. First, descriptive statistics

were applied to analyze demographic and socio-demographic characteristics of the samples as well as the FSFI, ISS and BMI variables. Kolmogorov–Smirnov test was used to examine if the data was normally distributed. Then, one-way analysis of variance and *post hoc*, and χ^2 -test were used to investigate differences in FSFI and ISS among BMI groups. Regression logistic analysis was used to determine associations among FSFI, ISS and BMI after adjusting factors such as years of marriage, job and educational status. A P -value $< 5\%$ was considered as significant.

Ethical considerations

Before collecting the data, the proposal for the study was approved by the institutional review board where the study was conducted. All potential subjects were informed about the purpose of the study, what being in the study would involve, and anonymity and confidentiality issues. In addition, an oral consent was obtained from all potential subjects and they were given the primary investigator's (PI) contact information and were encouraged to contact her if they had any questions or concerns.

RESULTS

The mean age of women was 29.89 ± 7.01 and ages ranged from 17 to 45 years. Most of the women (94.9%) were housewives. 44.4% of the women had high school or higher levels of education. 71.7% of them were married for 5 years and more. 68.2% of participants had 2 and < 2 gravidity. 82.8% of the women declared their income and expenditure as equal.

Kolmogorov–Smirnov test showed that female sexual function and satisfaction scores, were normally distributed.

According to the findings, sexual dysfunctions among overweight and obese women, especially overweight women, were more prevalent in comparison to normal weight women (Table 1). According to our evaluations, orgasm dysfunction had the highest frequency, while desire dysfunction and pain dysfunction had the lowest frequency among overweight and obese women, respectively.

There was a significant difference in sexual function and satisfaction between obese and overweight women as compared with women with a normal BMI (Table 1).

Among 198 women, 85.9% had sexual dysfunction. The mean FSFI score for normal weight women was 23.82 ± 6.44 and the mean FSFI score for overweight and obese women was 19.00 ± 6.68 and 22.48 ± 4.26 , respectively. Hence, there was a significant difference among BMI groups (P -value = 0.000). By *post hoc* test, we found that sexual function mean was different between normal weight women and overweight/obese women, but it was not different between overweight and obese women (Table 2).

69.7% of women had dissatisfaction and low satisfaction, and 30.3% of women were sexually satisfied. The mean ISS scores for normal weight, overweight and obese women were 27.44 ± 1.50 , 41.35 ± 14.74 and 34.04 ± 14.83 respectively. Hence, there was a significant differences among BMI groups (P -value = 0.000). By *post hoc* test we showed that the mean score sexual satisfaction was different among normal weight women, overweight and obese women (Table 2).

After adjusting confounding factors such as years of marriage, job and educational status, by logistic regression analysis, it was shown that BMI had an effect on sexual satisfaction. So overweight women had an odds ratio of 1.55 in comparison with normal weight, and obese women has an odds ratio of 0.025 in comparison to normal weight women. In other words, overweight women had more sexual dissatisfaction than normal weight women, while obese women had less sexual dissatisfaction compared with normal weight women.

On the other hand, logistic regression analysis showed that there was not a significant difference between BMI and sexual function, after adjusting confounding factors such as years of marriage, job and educational status.

Table 2. Compare of FSFI and ISS questionnaire scores among BMI categories, among normal weight ($N=65$), overweight ($N=110$) and obese women ($N=23$)

| BMI categories | 24.9 > | 25.0–29.9 | ≥ 30.0 | P-value |
|---------------------|---------------------------------|---------------------------------|---------------------------------|--------------------|
| Sexual function | 23.82 \pm 6.44 ^{a,b} | 19.00 \pm 6.68 ^{a,b} | 22.48 \pm 4.26 ^{a,b} | 0.000 ^c |
| Sexual satisfaction | 27.44 \pm 1.50 ^{a,b} | 41.35 \pm 1.47 ^{a,b} | 34.04 \pm 1.48 ^{a,b} | 0.000 ^c |

Abbreviations: ANOVA, analysis of variance; BMI, body mass index; FSFI, Female Sexual Function Index; ISS, Index of Sexual Satisfaction. ^asame symbol means insignificant. ^bPost hoc test. ^cOne-way ANOVA test P -value = 0.05.

DISCUSSION

The general worldwide increase in obesity among most populations may result in sexual dysfunction.¹⁶ It is noteworthy that overweight and obesity are considered risk factors for male sexual dysfunction; but their effect on sexual function in women remains unclear.¹⁷ Because sexuality is an integral part of psychosocial functioning and a person's sense of well-being, addressing sexual quality of life and sexual function and satisfaction is essential, even though questions about sexual satisfaction and function may be difficult to ask.

We found that 91.5% of overweight and obese women in our study had sexual dysfunction. This is in consistence with the findings of a study conducted in Brazil by Martins *et al.*,¹⁸ which showed that the prevalence of sexual dysfunction among obese and overweight women aged over 30 years was 87.3%. In contrast, Tehrani *et al.*, estimated prevalence of sexual dysfunctions among non-menopausal reproductive-age women as 27.3%.¹⁹ An overall rate of 43% for sexual problems among women was reported in a study with a sample of 1749 women between the ages of 18 and 59 years in the United States.²⁰ Lewis *et al.*²¹ concluded that estimates of the prevalence of low sexual function among women ranged from 17 to 55%. A study concerning the prevalence of FSD in Turkish population reported that the prevalence of FSD was 53.1%.²² In Australia the most prevalent FSD condition with a mean score of 64% and a range of 16–75% was reported.²³ These differences may be because of different personal perceptions about sexual behavior, as well as the differences in the age ranges of the participants and the locations of the studies. Tehrani *et al.*¹⁹ selected the participants from four randomly selected provinces. The provinces selected were Ghazvin, Kermanshah, Golestan and Hormozgan, located in the Central, West, North and South of Iran, respectively. Also location of our study, is one of borders of Iran, so its people cultural may be affected by neighbor countries.

The prevalence of FSD in this study and between overweight and obese women were 91.8% and 91.3%, respectively. Consistent with our study, Yaylali *et al.*, found that 86% of obese and overweight women had FSD.¹⁷ The current study was an attempt to explore the difference between overweight/obese women and normal weight women in terms of total FSFI scores. It also indicated significant differences among three categories of BMI regarding sexual function. Which is in contrast with a number of previous studies.^{24–26} Bajos *et al.*²⁷ and Smith *et al.*²⁸ showed no significant difference in sexual dysfunction between obese or overweight women compared with women with a normal BMI. Also, in some studies^{29,30} there was no difference between BMI groups in their total FSFI scores. On the other hand, Kolotkin *et al.* showed a lack of sexual desire and difficulties with sexual performances among obese women.⁴ Veronelli *et al.* showed that obese women had a lower score in the FSFI questionnaire when compared with normal weight women.³¹ Larsen *et al.* expressed that the number of different sexual difficulties may arise with obesity in women. These include difficulties with lack of orgasm, reduced sexual desire and lack of satisfaction.¹⁶

In the current study obesity and overweight affected all sexual function aspects. But, logistic regression analysis showed that

there were not any significant differences between BMI and sexual dysfunction, after adjusting confounding factors such as years of marriage, job and educational status. Esposito *et al.*³² showed that obesity affects several aspects of sexual function, including arousal, lubrication, satisfaction and orgasm. Assimakopoulos *et al.*²⁵ suggested three possible mechanisms through which obese people may have sexual impairment: (a) insulin resistance and associated hormonal changes; (b) dyslipidemia and related drugs; and (c) psychological problems.

The findings of this study showed that sexual satisfaction decreased among women with overweight and obesity. Mozafari *et al.*²⁴ reported that there was a significant association between BMI and sexual satisfaction. Melin *et al.*³³ found that obese women reported significantly less sexual satisfaction. These findings are in contrast with the results of Smith *et al.*²⁸ who found that overweight people did not differ in sexual satisfaction from people of normal weight. In two other studies by Larsen *et al.* and Kolotkin *et al.*, both of which were conducted with Swedish population, no difference was found in sexual satisfaction of obese and normal weight women.^{4,16} Findings suggest that BMI, including actual body size as well as physical condition, have an important role in women's sexual satisfaction. It may be that levels of sexual satisfaction would increase if BMI changes, for instance through dieting, exercising or using cosmetic surgery.

Limitations

In the present study, the sexual performances of the women's husbands were not taken into account.

CONCLUSION

Using regression logistic analysis, this study revealed that there was not any association between sexual function, but there was association between sexual satisfaction and BMI among Iranian women.

This article concludes that all women especially overweight and obese women should be counseled about health outcomes related to sexual activity.

It is suggested to conduct similar studies on obese and overweight women in menopause. Other studies can also be carried out to determine the effect of years of marriage, education and job status, on female sexual function.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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