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The Effect of Body Mass Index on Sexual Function.

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ABSTRACT

Sexual function is a part of life and human behavior which is considered as a part of an individual's sexual health and one of human essential needs. The effect of the relationship between obesity and overweight on women's sexual function is ambiguous; therefore, the present study aimed to investigate the relationship between body mass index and sexual function in women. This cross-sectional study was conducted by convenience method on 300 women who had referred to Women's Health Clinics in 2015. The data collection instruments included a questionnaire of demographic data and a standard questionnaire of female sexual function (FSFI). Data were analyzed through SPSS 16.0 Software using Chi-square test, ANOVA and multivariate regression test. The significant level was set at 5% ($P < 0.05$). Average and standard deviation of women and their husbands' age was 32 ± 0.4 and 37 ± 0.5 years, respectively. The mean score of total sexual function was 19 ± 4.3 and the average body mass index was 28.3 ± 2.1 . There was a significant difference between the three obese, overweight and normal groups under investigation in terms of all areas of their sexual function ($p < 0.001$). At last, multivariate regression was employed and it was concluded that there was a statistical and inverse significant correlation between body mass index and age of spouse and sexual function. There was a direct and significant correlation between other variables such as housing status, income status, length of marital life and the level of spouse's education. There is significant correlation between body mass index and all areas of women's sexual function; therefore, preventing and managing obesity are the essential needs of this group of society.

Keywords: Body Mass Index, Sexual function, FSFI.

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INTRODUCTION

Sexual function is a part of life and human behavior. It is combined with individual character, in a way that it seems impossible to speak about it as an independent phenomenon. It is also considered as part of human's sexual health [1-3]. Sexual function is consisted of stages: sexual response, desire, arousal, orgasm and subsidence. In previous studies, some factors were found as effective factors in sexual function, including age, emotional factors, interpersonal relationships, self-esteem, mental image of one's body, low physical activity and so on [4]. In most studies, the most common sexual dysfunctions reasons were: decreased libido, pain during sexual intercourse, orgasm disorder and deficiency of sexual arousal [5]. It is estimated that about 25-63% of women suffer from sexual dysfunction. Different factors involved in sexual dysfunction prevalence such as: differences in race, ethnic, culture and the predominant traditions of the community. It seems that the high prevalence of this disorder has a profound impact on quality of life, self-esteem, mood, marital relations and social activities [3]. Some studies suggest that body weight can affect sexual function [6]. The relationship between overweight or obesity on sexual function is ambiguous [7]. Overweight and obesity are considered as major health issues and are introduced as the second preventable factor of death after smoking. There is significant correlation between obesity and health status in community [8]. Obesity is defined as an overweight of 20% more than the ideal weight. Body Mass Index [BMI] is a valid factor to diagnose obesity based on height and weight [9, 10]. Investigations show that the prevalence of obesity in Tehran among women and men is respectively 29.5% and 14.2% [11]. It was estimated that by 2015, approximately 2.3 billion adults would be afflicted by overweight, more than 70 million would be obese and 2.4% would suffer from morbid obesity [12]. Obesity and overweight are important and noteworthy not only in term of health and their negative impact on the physical aspect but also in terms of psychological, social and economic aspects and medical costs [13]. The performed studies on BMI and sexual function reported contradictory results, i.e. some studies reported a positive correlation between BMI and sexual problems others reported no relation between them [14-17]. According to the contradictory results in these studies and high prevalence of obesity and overweight and their impact on sexual function, and also considering the role of sex in people's lives, the present study aimed to investigate the relationship between BMI and sexual function in women.

METHOD

The present cross-sectional study was performed on 300 women in 2015 for a period of 2 months. The study inclusion criteria were: having literacy education, being married, having stable sexual relationship over the last two months, monogamy and aging between 15-50 years. Study exclusion criteria were: menopause, pregnancy, infertility, breast feeding women who passed less than 8 weeks of their childbirth, serious physical and mental illness, taking effective drugs on sexual function, history of surgery for treatment of obesity, BMI lower than 18.5 kg/m^2 . The sample size was determined to be 270 subjects using means comparison formula and considering the confidence limit of 95% and test power of 90%. However, due to possible loss of samples, 300 subjects were included in the study. Afterwards, the participants were selected through convenience sampling. Data collection was carried out through a demographic characteristics questionnaire and a standard questionnaire of female sexual function (FSFI). This questionnaire includes 19 questions and assesses sexual function (sexual desire, arousal, sexual pain, lubrication and sexual satisfaction) over 4 weeks. Higher scores indicate better sexual function. In order to give all dimensions equal value, the maximum score for each dimension was considered 6 and the total score was 36. A score of under 4.28 indicated sexual dysfunction, under 5.08 arousal disorder, under 5.45 lubrication disorder, under 5.05 orgasm disorder, and under 5.04 sexual satisfaction disorder (3). In order to evaluate the reliability of this scale, Cronbach's Alpha Coefficient was employed, which was over 0.70 for all dimensions. The appropriate cut-off point of the whole scale to diagnose sexual dysfunction was 28 or lower [18].

In order to collect the required data, the researcher referred to Women's Health Clinics. After the objectives and method of the study was explained to the qualified women and their informed consent was obtained, they were asked to complete the questionnaires. In so doing, they were required to fill out the questionnaire anonymously. Moreover, they were permitted to quit the investigation whenever they liked. The individuals were assigned into three groups: normal weight ($18.5 \leq \text{BMI} < 25$), overweight ($25 \leq \text{BMI} < 29$) and obese ($\text{BMI} \geq 30$). The collected data were analyzed through Chi-square test, ANOVA and multivariate regression. The significant level was set at 5% ($P < 0.05$).

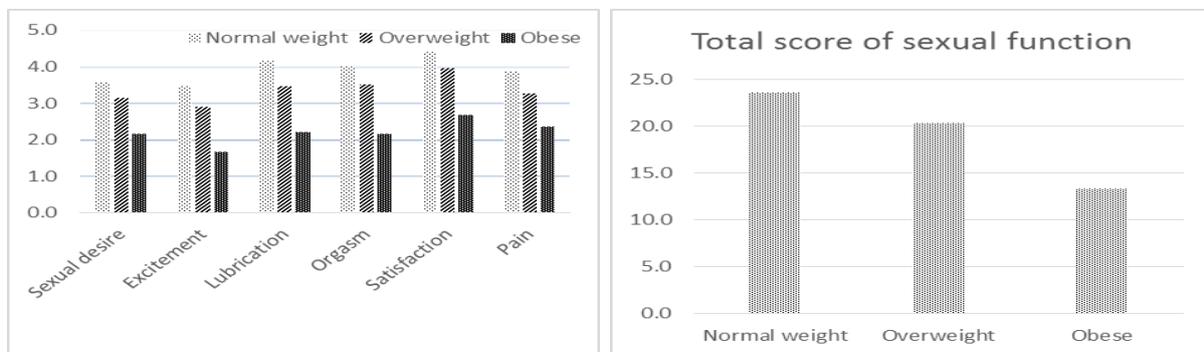
RESULTS

The mean age of the women and their husbands was 32±0.4 and 37±0.5 years, respectively. Most of them had two children, and 75% of them used contraceptive methods. There was a significant difference among the three groups in terms of the women’s age (p<0.001), husband’s educational level (p<0.001), husband’s job (p=0.003), income status (p<0.001), housing type (p<0.001), contraception (p=0.007) and family economy status (p=0.005) (See Table 1).

Table 1: Some demographic characteristics of women in three BMI groups of the study

Variable	Group	BMI			Sig.
		Normal N(%)	Overweight N(%)	Obese N(%)	
Woman’s Age (Years)	15-24	28(41)	19(15.4)	9(8.3)	0.001
	25-34	27(40)	64(54)	60(50)	
	35-44	11(16)	33(26.8)	35(32.1)	
	45-60	3(2)	7(5.7)	5(4.6)	
Mean (STD)		28 (8.3)	32 (8.0)	33 (5.9)	
Woman’s Education	Under Diploma	25(38.8)	52(42.3)	43(39.4)	0.09
	Diploma	28(41.2)	51(41.5)	57(52.3)	
	University	15(22.1)	20(16.3)	9(8.3)	
Husband’s Education	Under Diploma	30(44.1)	61(49.8)	72(66.1)	0.001
	Diploma	19(27.9)	36(29.3)	32(29.4)	
	University	19(27.9)	26(21.1)	5(4.6)	
Woman’s Job	Housekeeper	60(88.2)	112(91)	104(95.4)	0.2
	Employed	8(11.8)	11(9)	5(4.6)	
Husband’s Job	Self-employed	47(69)	84(68.3)	98(88.1)	0.003
	Office Worker	16(23.5)	34(27.6)	10(9.2)	
	Unemployed	5(7.5)	5(4.1)	3(2.8)	
Income Status	Enough	52(76.5)	84(68.3)	34(31.2)	0.001
	Less than Enough	14(20.6)	36(29.3)	74(67.9)	
	More than Enough	2(2.9)	3(2.4)	1(0.9)	
Housing Type	Rental	16(23.5)	48(39)	66(60.9)	0.001
	Private	30(44.1)	53(43.1)	30(27.5)	
	With Family	22(32.4)	22(17.9)	13(11.9)	
Contraception	Yes	48(70.6)	84(68.3)	93(85.3)	0.007
	No	20(29.4)	39(31.7)	16(14.7)	
Family Economy Status	Poor	15(22.1)	18(14.6)	34(31.2)	0.005
	Average	47(69.1)	89(72.4)	72(66.1)	
	Good	6(8.8)	16(13)	3(2.8)	

The mean score of total sexual function was 19±4.3 and the average body mass index was 28.3±2.1; 109 subjects (36%) were obese, 123 subjects (41%) were overweight and 68 subjects (22.7%) were normal. The mean score of total sexual function in the normal-weight, overweight, and obese groups was 23.54±5.35, 20.3±8.33, and 13.31±10.37, respectively. All dimensions of sexual function in the three groups were examined through ANOVA, and there was a significant difference among them in terms of all areas of sexual function (p<0.001) (See Graph 1 & Table 2).



Graph 1: The areas of sexual function of the participants in three groups

Table 2: Sexual function areas among women in three BMI groups

Variable	Mean±SD (Normal Group)	Mean±SD (Overweight Group)	Mean±SD (Obese Group)	Sig.
Sexual Desire	3.75±1.02	3.14±1.31	2.17±1.34	0.001
Excitement	3.5±1.19	2.9±1.46	1.67±1.7	0.001
Lubrication	4.17±1.16	3.47±1.68	2.22±2.14	0.001
Orgasm	4±1.23	3.52±1.81	2.17±2.04	0.001
Satisfaction	4.41±1.38	3.97±1.67	2.7±1.81	0.001
Pain	3.87±1.28	3.28±1.85	2.37±2.21	0.001
Total Score of Sexual Function	23.54±5.35	20.3±8.23	13.31±10.37	0.001

Finally, multivariate regression test was employed to examine the effect of the variables of sexual function indices, the results of which indicated that there was a significant reverse relationship between sexual function and BMI ($p < 0.001$) and husband’s age ($p < 0.001$), i.e. with an increase in BMI and husband’s age, sexual function dropped. There was a significant direct relationship between sexual function and other variables of housing status ($p < 0.001$), income status ($p < 0.004$), length of marital life ($p < 0.001$), and the level of the husband’s education ($p < 0.02$) (See Table 3).

Table 3: The results of multivariate regression test to investigate the effect of the variables on sexual function indices

Variable	Beta Coefficient	Standard Error	Sig.
BMI	-0.6	0.11	0.001
Housing Status	2.24	0.65	0.001
Income Status	2.68	0.93	0.004
Spouse’s Age	-0.3	0.07	0.001
Length of Marital Life	0.02	0.006	0.001
Spouse’s Educational Level	1.56	0.62	0.02

DISCUSSION

The present study aimed to investigate the relationship between BMI and sexual function among women who had referred to Women’s Health Clinics. There was a significant relationship between the normal, overweight, and obese groups in terms of all dimension of sexual function. The scores of all sexual dimensions [sexual desire, excitement, lubrication, orgasm, satisfaction and pain] were respectively lower in the obese and overweight groups compared to the normal-weight group, i.e. sexual function had decreased with an increase in weight. Pace et al observed that BMI of over 30 is directly correlated with the risk of sexual dysfunction. There was a reverse relationship between BMI and arousal, orgasm, lubrication, and satisfaction; however, there was no relationship between BMI and pain and sexual desire [2]. In another study, it was concluded that individuals with hyperlipidemia obtained lower scores in their sexual arousal, orgasm, lubrication and satisfaction compared to those without hyperlipidemia [19]. The results of another study indicated that the rate sexual dysfunction was higher among women with diabetes and hypothyroid, and obese women had more problems in the quality of their sexual life [20]. Esposito et al conducted a study to compare 52 women with sexual dysfunction. The concluded that there was a relationship between BMI and women’s sexual function such that the score of excitement, lubrication of vagina, orgasm, and satisfaction among obese and overweight women was lower than the normal-weight group [15]. Some researcher concluded that obese individuals have a poor mental image of their body and low self-esteem, and since sexual function is correlated with these characteristics, obese women’s sexual quality is not proper [21]. The effect of obesity on sexual desires is a multidimensional phenomenon that includes biological, social and mental factors. Three mechanisms through which obese individuals can suffer from sexual disorders include insulin resistance in obese individuals and its related hormonal changes, dyslipidemia and its medicines, and mental problems caused by obesity, which can affect the individuals’ sexual life and the quality of their lives [6]. On the other hand, Kadioglu et al conducted a study and observed no significant difference between the groups with different BMI in regard with their total sexual function and its areas [22]. Moreover, in a studies conducted by Fatemi et al [2009] and Yencilek no relationship between BMI and sexual function was discovered [23, 24]. In another study, it was observed that there was no relationship between total sexual function and BMI and waist and hip circumference; however, there was a reverse significant relationship between orgasm, satisfaction and BMI [17]. The difference in the abovementioned results and those of the present one can be attributed to women’s personal expectations for satisfaction with a sexual relationship, the study method, the

sample size, different study backgrounds, etc. Moreover, based on regression model, an increase in spouse's age had a reverse significant relationship with individual's sexual function, i.e. the individuals' sexual function dropped with an increase in their spouse's age. Salmani et al conducted a study in order to investigate factors related with orgasm disorders among women. The results of their study there was a significant relationship between women's orgasm disorders and an increase in spouse's age in a way that orgasm disorders increased with an increase in spouse's age [25, 26]. In some studies, it was observed that an increase in men's age led to a decrease in sexual desires and an increase in erection disorders among men. Lumen believes that an increase in men's age results in sexual and mental disorders among them and their wives [27, 30]. On the other hand, the relationship between housing status, income status, length of marital life, and the level of husband's education was significant, i.e. with an improvement in housing status and income status, and increase in the length of marital life and the husband's education level, the individuals' sexual function increased. In the study conducted by Nobareh and Guya, the results indicated that the chance of occurrence of sexual dissatisfaction among people without personal abode can reflect the effect of environment and life on sexual satisfaction [31]. The environment in which sexual intercourse occurs is significant in a way that the environment should be sufficiently sensual, safe, and private and way from other's disturbance [32]. Income and social and economic issues are also among factors that are related to sexual problems [33] which is in agreement with the results of the study conducted by Bakoyi et al who indicated that sexual disorder had a significant relationship with poor income status [34]. The results of the study conducted by Salmani et al are in line with those of the present study in a way that with an increase in the number of ages of marital life, fewer problem have been reported in regard with sexual relationship, which can be attributed to an increase in the couples' individual and family experiences, a decrease in individuals' expectations, etc. [35]. Moreover, the study conducted by Ramezani et al indicated that there was a significant relationship between the level of spouse's education, housing possession, and husband's income, which is in agreement with the results of the present study. Perhaps few years of marital life can affect sexual function because couple do not express their sexual issues and are not well-informed [3]. In regard with the spouse's educational level, it can be stated that individuals with higher education can resist any damage against them due to their awareness of and study about their individual and family rights, and they improve their marital status by seeking different methods [33]. The present study was faced with some limitations which make it difficult to generalize the results. One of the limitations is related to individuals' characteristics, mental and spiritual features, life differences, cultural and social differences, samples' shame and decency while responding to questions about their sexual issues, and the samples were just women, which could not be controlled by the researcher.

CONCLUSION

It is highly significant to pay attention to factors related to sexual function. According to the results of the present study and previous ones, obesity can have a remarkable effect on women's sexual function. On the other hand, obesity affects physical and mental health as well; therefore, it is necessary to understand, prevent and manage the factors related to obesity.

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