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Stress, anxiety, depression, and sexual dysfunction among postmenopausal women in Shiraz, Iran, 2015

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Abstract:

BACKGROUND: Menopause is associated with decreased sexual activity and a feeling of decreased attractiveness and sexual potency. This study tested the hypothesis that sexual health in postmenopausal women is not the same as nonmenopausal women with regard to symptoms of stress, anxiety, and depression.

MATERIALS AND METHODS: This cross-sectional study was conducted in 12 health centers in Shiraz between April and September 2015; 310 postmenopausal women included by convenient sampling. Data were collected through the Female Sexual Function Index, and depression anxiety stress scale 21 questionnaires. Analysis performed using SPSS version 22 and included descriptive statistics, Chi-square or Fisher's exact test, and Pearson correlation and linear regression; $p < 0.05$ was considered statistically significant.

RESULTS: The percentage of women with sexual dysfunction in the present study was 88.7%. There was a significant relationship between stress ($p = 0.04$), anxiety ($p = 0.01$), and sexual dysfunction. Furthermore, there was a statistically significant relationship between depression ($p = 0.003$) and sexual dysfunction. Pearson correlation coefficient showed that there was an inverse relationship among stress (-0.24), anxiety (-0.25), depression (-0.30), and sexual function. In addition, linear regression results showed that depression was the most important factor in the description of sexual dysfunction.

CONCLUSION: This study showed that there is an association of the status of mental health and sexual function in post-menopausal women. However, more studies should be carried out to find the confounders.

Keywords:

Anxiety, depression, Iran, menopause, sexual dysfunction, stress

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Introduction

Sexual desire which reflects biological, emotional, and social health is an important aspect of the quality of women's life. Women who are sexually dissatisfied may have psychological problems. It seems that the association with stress/distress (anxiety and depression) and basically, sexual health is mutual. Decreased sexual

function in women is associated with aging, menopause, attitude toward aging and menopause, body image, chronic illness, stress, fatigue, use of drugs, mental health, sexual partner's desires, and sexual activity.^[1] During menopause, women undergo a wide range of biological, social, and psychological changes. They may be more sensitive to psychological pressures, especially anxiety and depression.^[2] Some

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women also experience a deep sense of loss, particularly the loss of motherhood, youth, and beauty.^[3] Mental and emotional health plays an important role in sexual function. Depression, a common experience in old people in the United States of America, can affect sexual satisfaction.^[4] Depression is determined using the loss of interest, energy, self-esteem, and inability to experience pleasure. Long-lasting depression is associated with sexual dysfunction.^[5]

There appears to be a high prevalence of the conditions of depression and anxiety during the climacteric menopause. Forty-five percent of women who are referred to menopause clinics are clinically depressed, and 80% of women have had clinical depression in the past.^[6] It seems that menopausal transition occurs when women are more vulnerable to severe symptoms of depression or clinical depression and sexual function is impaired. Research in Peru showed that sexual function was associated with depression, hormonal status, and sexual function of the sex partner.^[1] Anxiety plays an important role in the course of sexual dysfunction and people with sexual dysfunction usually have anxiety disorders.^[7] Research has shown that anxiety can cause sexual dysfunction in women.^[8]

Stress can be defined as a set of external pressures imposed on the mind and body. Menopause is a period in a woman's life during which hormone levels decrease. Although this reduction in hormone levels occurs slowly and steadily, it causes stress in most women. Research indicates that women under stress do not express their feelings and desires as much as other women because cortisol impedes the function of oxytocin in the female's brain and her willingness to have sexual and physical relations.^[9] Since stress, anxiety, and depression can affect marital life and an individual's relationships cause problems of sexual dysfunction in women, especially postmenopausal women, the aim of the present study was to determine the prevalence of sexual dysfunction and any possible correlation with stress, anxiety, and depression.

Materials and Methods

This study is a descriptive, cross-sectional research conducted on postmenopausal women in Shiraz between April and September in 2015. The selection of the research setting was based on the map of Shiraz, four quadrants of which were considered. Three clinics were then selected in each quadrant according to high attendance. After this, the samples were selected through convenient sampling according to the inclusion criteria. Informed consent was taken from each participant. The study population consisted of married postmenopausal women who had menopause for at least 1 year. Based on

a study conducted in Isfahan, the sample size was 310 women with a significance level of 0.05 and confidence level of 0.95.^[10] All the 310 participants answered the questions and there was no missing data.

$$n = 310 \quad \alpha = 0.05 \quad z = 0.95 \quad d = 0.05 \quad P = 0.72$$

The inclusion criteria were as follows: (1) Residence in Shiraz; (2) Iranian nationality; (3) postmenopausal state; (4) married and living with husband; and (5) having sexual intercourse in the past 4 weeks. Women who were unwilling to participate in the study were excluded, and all incomplete answers to questions were eliminated. Questionnaires used were on: demography, the Female Sexual Function Index (FSFI), and depression anxiety stress scale 21 (DASS 21). The questions on demography included age, age at marriage, education, occupation, menopausal age, and the number of sexual relationships in a month. FSFI contained six main domains of sexual functions including sexual desire, arousal, lubrication, orgasm, satisfaction, and pain. It included 19 questions as follows: questions 1–2 were related to sexual desire; questions 3–6 to sexual arousal; questions 7–10 to sexual lubrication; questions 11–13 to orgasm; questions 14–16 to sexual satisfaction, and questions 17–19 to pain assessment. The reliability of the scale and subscales was obtained by calculating Cronbach's alpha coefficient estimated ≥ 0.70 for all participants that showed good reliability.^[11,12] The reliability and validity of the Persian version of the sexual dysfunction questionnaire were determined using Mohammadi *et al.* in 2009 and it was considered the basis of the present research. Reliability of the Persian version of questionnaire for each of the six domains and the whole scale for case groups, control groups and the total population was calculated by internal consistency using Cronbach's alpha. The correlation between questions in all domains was >0.61 , the control group was >0.70 , and the total number of participants was >0.70 , which were acceptable. The internal consistency of the whole scale in the case group, control group, and the whole population was >0.85 , which indicated a good reliability. Cronbach's alpha of the original version of questionnaire was >0.82 . Discriminant validity of the questionnaire was evaluated by comparing the scores of the two groups. Furthermore, based on the sensitivity and specificity analysis, Mohammadi *et al.* identified a score of 28 as a desirable cutoff for the diagnosis of women with and without sexual dysfunction.^[13]

The DASS 21 is a self-report measure assessing three psychological domains of depression, anxiety and stress. It includes 21 multiple-choice questions; the respondents are asked "How have you felt in the past week," which was scored on a four-point Likert scale ranging from 0 to 3. The higher score indicates more psychological distress. The reliability and validity of the Persian version of this

questionnaire (DASS 21) were determined by Samani and Jokar. Alpha coefficient was, respectively, estimated 85%, 75%, and 87% and was considered the basis of the present research. The reliability of the DASS 21 questionnaire was also obtained by test-Retest.^[14] Hence, in this study, the reliability (internal consistency) of the questionnaires were evaluated by researchers as $\alpha = 0.782$ for FSFI and $\alpha = 0.874$ for DASS 21 represented acceptable reliability. The researcher received written consent from the participants after they were referred to the selected clinics. Before the women were asked questions were asked, they were assured that the information they submitted would be confidential. Data were analyzed through descriptive statistics, Chi-square test, Fisher's exact test, Pearson correlation coefficient, and linear regression using SPSS software version 22 (version 16, IBM Company Armonk, NY, USA). In the study, a value of $P < 0.05$ was considered statistically significant ($P < 0.05$).

This research project was approved by the Local Ethics Committee of Shiraz University of Medical Sciences and written informed consent was obtained from all participants.

Results

In this study, the mean age of the participants was 55.92 ± 5.42 ; the mean age at marriage was 18.31 ± 5.32 ; the mean age of menopause was 48.13 ± 4.74 as shown in Table 1, the highest frequency of sexual intercourse was 1–3 times per month (238 women). Most women

had a Diploma, 88 women were housekeepers as shown in Table 1. Two hundred and sixty women suffered from sexual dysfunction (88.70%). Frequency of sexual dysfunction and its domains are shown in Table 2. Chi-square test showed that there was a significant relationship between stress ($P = 0.04$), anxiety ($P = 0.01$), and sexual dysfunction. Furthermore, Fisher's exact test indicated a statistically significant relationship between depression ($P = 0.003$) and sexual dysfunction. The correlation coefficient showed that there was an inverse relationship between these three variables and sexual function. Relationship between the three variables and sexual function in the two groups was significant [Table 3]. In step-wise regression analysis, depression, age at marriage, and age of participants were the most important factors in explaining sexual dysfunction. Accordingly, depression was able to determine 9.5% of sexual dysfunction, while depression with age of marriage determined 10.6%, and depression together with the age of marriage and age of participants accounted for 11.8% of sexual dysfunction. Moreover, the relationship between depression and age at marriage and the age of participants with sexual dysfunction were significant ($P < 0.001$) [Table 4].

Discussion

In this study, there was a statistically significant relationship between stress, anxiety, depression, and sexual dysfunction in postmenopausal women. There was an inverse correlation between the three mentioned

Table 1: Demographic characteristics of the postmenopausal females according to their sexual function

Group	Subgroup	With sexual dysfunction N (%)	Without sexual dysfunction N (%)	Mean±SD	Maximum	Minimum	p-Value
Age	45-50	34 (94.40)	2 (5.60)	55.92±5.42	74	45	0.26*
	50-60	167 (86.50)	26 (13.50)				
	>60	74 (91.40)	7 (8.60)				
Marriage age	<18	136 (89.50)	16 (10.50)	18.31±5.32	46	9	0.19*
	18-25	120 (89.60)	14 (10.40)				
	25-35	16 (84.20)	3 (15.80)				
	>35	3 (60)	2 (40)				
Age of menopause	<45	49 (90.70)	5 (9.30)	48.13±4.74	61	32	0.87*
	45-50	99 (88.40)	13 (11.60)				
	>50	127 (88.20)	17 (11.80)				
Education	Illiterate	60 (92.30)	5 (7.70)				0.51*
	Preliminary	75 (86.20)	12 (13.80)				
	Degree	36 (94.70)	2 (5.30)				
	Diploma	76 (86.40)	12 (13.60)				
	Collegiate	28 (87.50)	4 (12.50)				
Occupation	Employed	46 (92)	4 (8)				0.42*
	Housewife	229 (88.10)	31 (11.90)				
Frequency of sexual intercourse (In month)	1-3	216 (90.8)	22 (9.2)	2.84±2.65			0.054**
	4-6	26 (76.5)	8 (23.5)				
	<6	33 (86.8)	5 (13.2)				

*Chi-square test, **Fisher exact test. SD = Standard deviation

variables and sexual function so that the higher the anxiety, depression, and stress, the lower the sexual function. Furthermore, according to step-wise regression model, depression had the most important impact on the prediction of sexual dysfunction.

Results from other studies in Iran on depression and sexual dysfunction are in agreement with ours. For example, Beigi's study in (2008) in Esfahan reported double the sexual dysfunction in people with depression.^[10] Moreover, Tarivirdi *et al.* (2007) research on psychological problems in postmenopausal women in Tabriz reported a significant relationship between the mean score of depression and reduction of sexual desire.^[15] The results of another research showed that sexual problems and the state of menopause were associated with the level of depression.^[16] Another

study conducted in Abadeh also showed that as stress, anxiety, and depression increased sexual self-concept decreased.^[17] In agreement with this study, many psychologists have found that women with positive sexual self-concept experienced less psychological problems such as stress, anxiety, and depression.^[18]

In the above-mentioned studies, DASS 21 and FSFI were not used simultaneously, and one of the questionnaires in our study was different. Therefore, the researchers suggest further similar studies in Iran, and hence that the results could be compared to those of the present study. Other issues that could be considered are sample size, the place of study, culture, which were different in those studies. However, despite these differences, the results are consistent, which could be due to the reduction of the production of menopause. Scientists believe that steroid hormones such as estrogen affect the human body through various mechanisms in the central nervous system. For example, they stimulate the synthesis of neurotransmitters, receptors, and permeability of the cell membrane.^[19] In fact, Estrogen increases the effects of serotonin and norepinephrine, which appear to be neurotransmitters that are more related to the physiological cause of depression.^[20]

Studies in other countries have also reported similar results. A study conducted in India, for instance, showed that 90% of the married women had sexual dysfunction. Furthermore, in this study, there was no relationship between age, socioeconomic situation, occupation, and sexual function.^[21] Another study of Spanish women showed that according to the regression model there was an inverse correlation between sexual function and depression. In addition, there was a positive relation between education and sexual function and a negative

Table 2: Frequency of sexual dysfunction (Female Sexual Function Index) and its domains in postmenopausal women

	Sexual dysfunction	N (%)
FSFI	>28	35 (11.30)
	≤28	275 (88.70)
Desire	>3.3	116 (37.40)
	≤3.3	194 (62.60)
Arousal	>3.4	125 (40.30)
	≤3.4	185 (59.70)
Lubrication	>3.4	108 (34.80)
	≤3.4	202 (65.20)
Orgasm	>3.4	209 (67.40)
	≤3.4	101 (32.60)
Satisfaction	>3.8	186 (60)
	≤3.8	124 (40)
Pain	>3.8	230 (74.20)
	≤3.8	80 (25.80)

FSFI = Female Sexual Function Index

Table 3: Relationship between stress, anxiety, and depression and sexual dysfunction in postmenopausal women

Group	Subgroup	With sexual dysfunction N (%)	Without sexual dysfunction N (%)	p-Value	Pearson correlation coefficient
Stress	Normal	129 (83.20)	26 (16.80)	0.04*	-0.24
	Mild	27 (96.40)	1 (3.60)		
	Average	57 (95)	3 (5)		
	Severe	43 (91.50)	4 (8.50)		
	Very severe	19 (95)	1 (5)		
Anxiety	Normal	109 (83.20)	22 (16.80)	0.01*	-0.25
	Mild	31 (86.10)			
	Average	45 (88.20)	6 (11.80)		
	Severe	35 (94.60)	2 (5.40)		
	Very severe	55 (100)	0		
Depression	Normal	126 (81.80)	28 (18.20)	0.003**	-0.30
	Mild	37 (94.90)	2 (5.10)		
	Average	51 (94.40)	3 (5.60)		
	Severe	25 (92.60)	2 (7.40)		
	Very severe	36 (100)	0		

*Chi-square test, **Fisher's exact test

Table 4: Results of stepwise regression analysis between dependent variables and Female Sexual Function Index

Variable	FSFI	R	R ²	β	p-Value
Model 1	Depression	0.307	0.095	-0.166	<0.001
Model 2	Depression	0.326	0.106	-0.161	<0.001
	Marriage age			0.117	
Model 3	Depression	0.344	0.118	-0.163	<0.001
	Marriage age			0.116	
	Age			0.113	

FSFI = Female Sexual Function Index

correlation between sexual function and age.^[22] Multiple linear regression analysis in a study of Peruvian women showed that sexual function had an inverse correlation with depression.^[11] Some other research conducted in Bulgaria and Korea of middle-aged women also showed a significant relationship between sexual dysfunction and depression.^[23,24] The effect of depression on sexual function in the aforementioned studies can be due to the protection that sex hormones provide against the development of depression. Since sex hormones diminish with menopause the rate of depression in these patients increases.^[25] Overall, researchers state that menopause is a determinant for sexual dysfunction,^[26] and that anxiety and depression have a “devastating” effect on sexual relations.^[27]

According to our results, there was an inverse correlation between sexual dysfunction, stress, and anxiety. Consistent with this result, research conducted on the prevalence of sexual dysfunction and its relationship with mental disorders in women aged 50 and over in Korea indicated that those with mental, behavioral, and anxiety disorders are more likely to experience sexual dysfunction and that those with mental disorders are more likely to experience all types of sexual dysfunction than those with no mental disorders. In this study, psychological disorders led to 2.7 times increase in sexual dysfunction. It was also concluded that sexual dysfunction in old people might be caused by multiple factors such as biological, psychological, social, and cultural.^[24] Another study conducted on young women with medium and high level of stress who were sexually active indicated that daily stressful factors increased cortisol and distraction, and consequently sympathetic nervous system activity and the release of dehydroepiandrosterone sulfate (DHEA-S). Researchers explained this by the fact that “increased cortisol levels can affect the sexual function.”^[28] Another research states that stress affected sexual function of individuals who were dissatisfied with their sexual activity.^[29] In this regard, research has shown that a sexual partner’s emotional and physical problems and the resultant unresponsive relationship between the couple were the factors causing sexual dysfunction.^[30] Similarly, in the present study, most individuals at the time of menopause reported a lower score in sexual function than the cutoff

point, and were dissatisfied with their sexual activity. However, depression, anxiety, and stress were not strong predictors of sexual dysfunction. More studies are required to explore the reasons for this using the regression model.

Furthermore, research on reduced sexual desire disorder in postmenopausal women in North America indicated that decreased sexual desire was associated with mental and emotional pressures.^[27] In addition, another study showed that sensitivity to anxiety and sexual dysfunction could be genetic.^[31] In this regard, research has revealed that anxiety played an important role in the creation of sustained sexual dysfunction and usually people with sexual dysfunction had anxiety disorder. Of course, in many cases, it is not clear which disorder occurred first. Also, sexual dysfunction may engender permanent impairment in many people with mental disorders.^[7]

Also, a study on hormonal changes during stress states that women who were sexually active did not show major changes in the levels of cortisol compared to DHEA-S and the heart rate but that they had low sexual arousal.^[29]

Therefore, it seems that in spite of the variety of tools used to measure stress, anxiety and depression, the different sample sizes, the diverse research environments and a range of age groups, all of these studies, reported a correlation between the variables and sexual function. The reason for this could be the significant impact of mental health on sexual dysfunction in postmenopausal women and the effect of changing levels of hormones. Therefore, menopause could be an important factor in the creation, continuing or increase of sexual dysfunction in women. On the other hand, the severity of physical, psychological, sexual, mental and urogenital symptoms might influence the severity of health disorders and mental health of menopausal women and their families. Therefore, it is necessary for Family Health Planners and Women’s health policy makers to investigate the symptoms of menopause, the psychological problems and reduced sexual knowledge of women and their husbands in order to provide them the necessary counseling and instruction on the strength of their personal, social and cultural characteristics. The limitations of this research include the lack of cooperation, low literacy or illiteracy of some participants and their inability to fill out the questionnaire, lack of motivation resulting from problems of menopause.

Conclusion

Stress, anxiety, and depression are related to sexual function in postmenopausal women. It could be said that the better the mental health of a woman, the better the sexual function and vice versa. Since depression is the

most descriptive factor, one of the priorities of the health professional should be the scrutiny of postmenopausal women's mental health status. It has also been suggested that counseling and the promotion of awareness are likely to diminish menopausal and mental health problems and ultimately foster better sexual health. These actions might reduce the adverse feelings women have towards sexual intercourse during menopause.

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Conflicts of interest

There are no conflicts of interest.

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