International Journal of Women's Health

Dovepress

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ORIGINAL RESEARCH

Exploring the Intersection of Depression, Anxiety, and Sexual Health in Perimenopausal Women

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Purpose: The perimenopausal period is marked by hormonal fluctuations that trigger a complex interplay between estrogen levels and neurotransmitters' function, contributing to increased susceptibility to depression and anxiety in women. Concurrently, hormonal changes, coupled with alterations in vaginal tissue, lead to sexual dysfunction during this transitional phase. This study aimed at evaluating the association between menopausal symptoms and sexual dysfunction among perimenopausal women and identifying the mediating effects of depression and anxiety on this association.

Patients and Methods: Data for the present cross-sectional study were collected from participants via Arabic versions of three questionnaires; the modified Menopausal Rating Scale (MRS), the Female Sexual Functioning Index (FSFI) and the Hospital Anxiety and Depression scale (HADS).

Results: Our study was conducted on 149 females with age ranged from 45 to 55 years. On studying the relation between modified MRS and HADS, the menopausal symptoms were significantly high among female with high anxiety scores. Regarding the relationship between MRS and FSFI, women with anxiety and physical and mental exhaustion had significantly lower FSFI scores than women without such symptoms (19.2 [2–31.4] vs 21.7 [3.8–30.9], $p = 0.04$, respectively). Furthermore, there were statistically significant negative correlations between depression scores and sexual desire ($r = -0.32$, $p < 0.001$), arousal ($r = -0.25$, $p = 0.003$), and total FSFI scores ($r = -0.27$, $p = 0.04$).

Conclusion: Perimenopausal women experience a confluence of challenges related to depression, anxiety, and sexual dysfunction. Understanding the interconnectedness of hormonal and psychosocial factors is essential for tailored interventions aimed at improving mental health and sexual well-being during this transitional phase.

Keywords: anxiety, depression, perimenopausal, sexual dysfunction

Introduction

Menopause is a natural phenomenon defined as a permanent menstrual cessation for 12 months due to a stoppage of follicular activity and a decrease in ovarian hormone release.[1]

Perimenopause is the transitional phase preceding menopause, which is a complex period marked by hormonal fluctuations that can have profound effects on women's mental health and sexual well-being. Multiple researches underscore the significant prevalence of depression and anxiety symptoms during this phase. Hormonal shifts, particularly fluctuations in estrogen levels, have been implicated in the increased vulnerability to mood disorders among perimenopausal women.[2,3] Menopause developed various symptoms, such as hot flashes, insomnia, and numbness in extremities. The intricate interplay of biological and psychosocial factors makes perimenopause a critical period for understanding and addressing mental health concerns.

Received: 8 April 2024
Accepted: 18 July 2024
Published: 31 July 2024

Sexual life is an important part of human life as it can affect the quality of life and the emotional status of both partners. Female sexual dysfunction is considered an obvious problem; however, most women deny its presence under the pressure of traditional culture.[4]

Normal sexual function relies on normal mental and emotional health. Moreover, depression, "which is a common disease that attacks old people universally" affects sexual satisfaction.[5]

Depression is determined using the loss of interest, energy, self-esteem, and inability to experience pleasure. Long-lasting depression is associated with sexual dysfunction.[6]

Forty-five percent of women who are referred to menopause clinics are clinically depressed, and 80% of them have had clinical depression in the past. Additionally, it seems that menopausal symptoms occur more when women are more vulnerable to severe symptoms of depression and when sexual function is impaired. Different studies reported that sexual function is directly related to depression and hormonal status, and people with sexual dysfunction usually have anxiety disorders.[7]

Female sexual dysfunction may be considered a culprit of the divorce rate increase, domestic violence, and serious disturbance in both partner relationships which deeply affect family and social stability.[8]

Menopausal symptoms such as hot flashes, sleep disturbances, anxiety, depression, and sexual dysfunction can significantly impact a woman's quality of life. In addition, social and economic factors can influence the experience and management of menopausal symptoms, yet there is limited research focusing on these aspects within the Egyptian context. By identifying the specific needs and challenges faced by perimenopausal women in this region, research can inform health policy and practice to ensure that women receive comprehensive and compassionate care. Therefore, the present study aims to fill this gap by providing a comprehensive analysis of menopausal symptoms, anxiety, depression, and sexual function among perimenopausal women attending outpatient clinics at Zagazig University Hospitals.

Materials and Methods

Study Setting, Design, and Sampling

This is a cross-sectional study conducted from December 2022 till August 2023 in Zagazig University Obstetrics/Gynecology and Psychiatry outpatient clinics.

Our inclusion criteria included any woman between the ages of 45 and 55 years, married, sexually active and agrees to participate. All social classes and educational levels were included. Pregnant or lactating women; women with uncontrolled medical conditions such as hypertension, diabetes mellitus, or heart disease; women with a history of psychiatric illness; women who were undergoing treatment for cancer or were in remission or on hormone replacement therapy; women with a history of hysterectomy or ovarian resection were excluded from the study.

The sample size was calculated using open epi according to the following total number of perimenopausal female coming to ZUH outpatient clinic in 6 months expected to be 300 cases and prevalence of sexual dysfunction in perimenopausal female was 78.2%,[9] so at 95% confidence interval the sample size calculated to be 141 females, 20% of total sample were added to overcome drop out so total sample was 169 females. After exclusion of incomplete responded questionnaires, 149 females were included in the statistical analysis.

Assessment Measures

All participants recruited in the study were subjected to the following in a single face-to-face setting:

- A semi-structured questionnaire to obtain socio-demographic data and clinical history.
- Assessment of menopause symptoms using a validated Arabic version of the modified Menopause Rating Scale (MRS).[10] The modified MRS is composed of eleven items and is divided into three subscales: Somatic scale (hot flashes, heart discomfort/palpitation, sleeping problems and muscle and joint problems), psychological scale (depressive mood, irritability, anxiety, and physical and mental exhaustion) and urogenital scale (sexual problems, bladder problems and dryness of the vagina). Females asked whether they had experienced the 11 menopausal symptoms or not.

- Anxiety and depressive symptoms were assessed using a validated Arabic version of the Hospital Anxiety and Depression Scale (HADS).[11] HADS was originally developed to screen for anxiety (HADS-A) and depression (HADS-D) in the general population and in hospital settings.[12] It included 14 items: seven items assessing depression and seven items assessing anxiety. Responses are rated on a 4-point Likert type (0–3). Each subscale has a maximum score of 21. Normal scores lie between 0 and 7, borderline case has a score between 8 and 10, and scores between 11 and 21 mean positive case of anxiety or depression.[13]
- Assessment of female sexual function using the validated Arabic version of the Female Sexual Functioning Index (FSFI),[14] which was developed by Rosen et al.[15] The FSFI comprises 19 items in six domains: sexual desire (two items), sexual arousal (four items), vaginal lubrication (four items), orgasm (three items), satisfaction (three items) and pain during intercourse (three items). Items 1 and 2 (both related to sexual desire) are measured on a 5-point scale ranging from 1 (nearly or very low) to 5 (always or very high). The other seventeen items are measured on a 6-point scale where zero indicates no sexual activity, 1 indicates "rarely", and 5 indicates always. Each domain score is multiplied by the weighted value of each factor, and the resultant products are summed to arrive at the total sexual function score. The total score ranges from 2 to 36, with higher scores indicating better perceived sexual function.[15]

Ethical Consideration

The study was approved by the Institutional Review Board of Zagazig Faculty of Medicine (ID: 10188 l7-12-2022) and Zagazig University Hospitals Administration. Informed consent to participate in the study was obtained from all participants after explaining the study objectives, measures, and assuring confidentiality. All experiments were conducted according to the relevant guidelines and regulations, and the participants were not exposed to any harm or unintended effects. The study adhered to the ethical principles of the Declaration of Helsinki.

Statistical Analysis

The collected data were computerized and statistically analyzed using SPSS program (Statistical Package for Social Science) version 27.0 (IBM, 2020) Qualitative data were represented as frequencies and relative percentages. Quantitative data were expressed as mean ± Standard deviation, median and range. Chi square test, Independent *t*-test, Mann Whitney test, Pearson's and Spearman correlation coefficient were used according to type of data. P value of <0.05 indicates significant results and of <0.001 indicates highly significant results.

Results

Our study was conducted on 149 females with age ranged from 45 to 55 years with mean 49.28 ± 3.51 years. Husbands' ages ranged from 44 to 73 years with mean 54.88 ± 5.71 years. Marriage duration ranged from 8 to 42 years with mean 26.18 ± 6.18 years. Almost half of the females were from urban resident (50.3%) and two-thirds of them had middle education and not working. Also, two-thirds of husbands had middle education and about 80% of them were working. Almost half of the studied females were of moderate social class (Table 1).

Table 1 revealed medical and menses history of the studied female. Half of them had comorbidities, and most frequent were diabetes mellitus and hypertension. In about one-third of them, menses had stopped (median for 4 years) and was irregular in about one-quarter of them. Regarding husbands, 34.9% had comorbidity, and most frequent were also diabetes mellitus and hypertension.

According to MFS, most frequent menopausal symptoms among the studied females were joint and muscular discomfort, anxiety, irritability, and physical and mental exhaustion (Figure 1).

In Table 2, results of HADS score were found to be as follows: mean anxiety score was 11.68 ± 3.75 with range from 4 to 19 and mean depression score was 8.75 ± 3 with range from 1 to 17. According to the scale, 61.7% of the cases had anxiety, and 26.8% had depression (Figure 2).

Female Sexual Function Index results were revealed in Table 2. The median of sexual desire, arousal, lubrication, orgasm, satisfaction, and pain scores were 2.4, 2.7, 3.3, 3.2, 3.6 and 3.2, respectively. The total FSFI ranged from 2 to 31.4 with a median of 19.4.

Table 1 Demographic Data and History of the Studied Females

Variable		**(n=149)**	
Age: (years)	Mean ± SD Range	49.28±3.51 45–55	
Husband age: (years)	Mean ± SD Range	54.88±5.71 44–73	
Duration of marriage: (years)	Mean ± SD Range	26.18±6.18 8–42	
Variable		**No**	%
Residence:	Rural Urban	74 75	49.7 50.3
Education:	Illiterate Read & write Middle College Post college	8 11 102 23 5	5.4 7.4 68.5 15.4 3.4
Occupation:	Not working Working	97 52	65.1 34.9
Husband education:	Illiterate Read & write Middle College Post college	11 8 96 33 1	7.4 5.4 64.4 22.1 0.7
Husband occupation:	Not working Working	31 118	20.8 79.2
Financial problems:	Yes No	83 66	55.7 44.3
Social class:	Low Middle High	48 72 29	32.2 48.3 19.5
Comorbidity:	No Yes Diabetes mellitus Hypertension Cardiac Osteoporosis Cancer Thyroid BA & Allergic Rh Hepatic Rheumatology Thrombosis Psychological	76 73 28 27 10 8 5 4 2 2 1 1 1	51 49 18.8 18.1 6.7 5.4 3.4 2.7 1.3 1.3 0.7 0.7 0.7

(*Continued*)

Table 1 (Continued).

Variable		(n=149)	
Husband comorbidity:	No	97	65.1
	Yes	52	34.9
	Diabetes mellitus	30	20.1
	Hypertension	21	14.1
	Cardiac	8	5.4
	Chest	3	2
	Hepatic	3	2
	Osteoporosis	2	1.3
	Thrombosis	1	0.7
	Psychological	1	0.7
	Neurological	1	0.7
	GIT	1	0.7
Menses:	Regular	59	39.6
	Irregular	38	25.5
	Stopped	52	34.9
Menopause duration:		(n=52)	
	Mean ± SD	4.58±3.29	
	Median (Range)	4 (0.17–15)	

Abbreviations: SD, Standard deviation; BA, Bronchial asthma; Rh, Rhinitis; GIT, Gastrointestinal tract.

On studying the relation between modified MRS and HADS among the studied females, it was found that the frequency of hot flashes, sleep problems, heart discomfort, sexual problems, anxiety, irritability, depressed mood, and physical and mental exhaustion were significantly increased among female with abnormal anxiety score. Also, the frequency of sleep problems and physical and mental exhaustion were significantly decreased among females with normal depression and anxiety scores, while irritability and depressed mood were significantly increased among females with abnormal depression scores (Table 3).

Table 4 revealed the relation between modified MRS and FSFI. Females with sexual problems, anxiety and physical and mental exhaustion had significantly lower score of FSFI compared to females without.

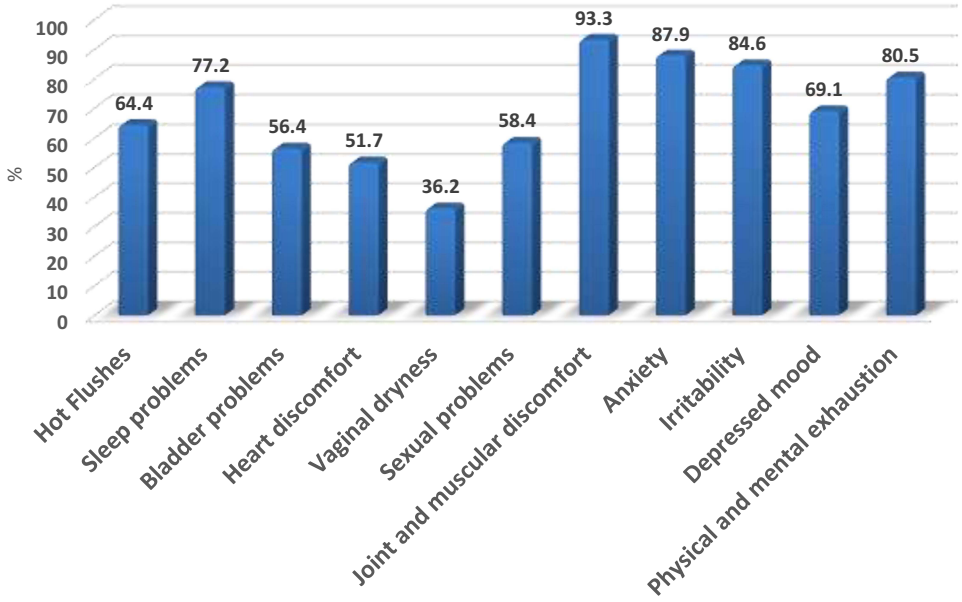

Figure 1 Modified Menopause Rating scale among the studied females.

Table 2 Hospital Anxiety and Depression Scale and Female Sexual Functioning Index Scores Among the Studied Females

Variable		(n=149)
HADS-A: (anxiety)	Mean ± SD Range	11.68±3.75 4–19
HADS-D: (depression)	Mean ± SD Range	8.75±3 1–17
Sexual desire:	Mean ± SD Median (Range)	2.66±1.07 2.4 (1.2–5.4)
Arousal:	Mean ± SD Median (Range)	2.43±1.59 2.7 (0–5.7)
Lubrication:	Mean ± SD Median (Range)	2.67±1.84 3.3 (0–6)
Orgasm:	Mean ± SD Median (Range)	2.59±1.81 3.2 (0–6)
Satisfaction:	Mean ± SD Median (Range)	3.30±1.70 3.6 (0.8–6)
Pain:	Mean ± SD Median (Range)	2.97±1.78 3.2 (0–6)
Total FSFI:	Mean ± SD Median (Range)	16.62±7.77 19.4 (2–31.4)

Abbreviations: SD, Standard deviation; HADS, Hospital Anxiety and Depression Scale; FSFI, Female Sexual Functioning Index.

In Table 5 results of correlation between HADS & FSFI among the studied females. There was a statistically significant negative correlation between depression score and sexual desire, arousal and total FSFI scores.

Comparison between menopausal and non-menopausal female showed that in modified MRS scale, there was a statistically significant increase in joint and muscular discomfort among menopausal compared to non-menopausal females. In FSFI, there was a statistically significant decrease in sexual desire, arousal, orgasm and total FSFI score among menopausal compared to non-menopausal females (Table 6).

Table 7 revealed correlation between HADS & FSFI and demographic data of the studied females. Anxiety scores had a statistically significant negative correlation with husband education and social class. Depression scores had

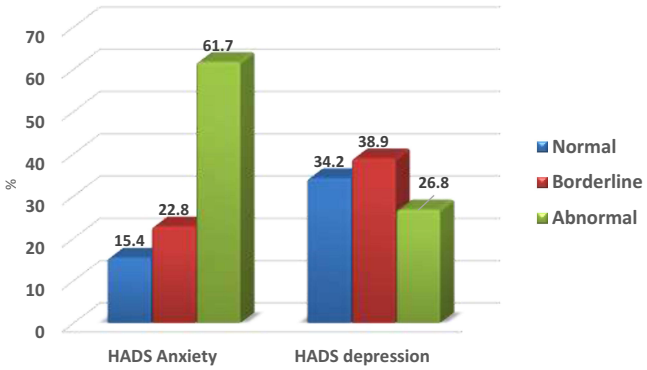

Figure 2 Frequency of depression and anxiety according to Hospital Anxiety and Depression Scale (Hads) among the studied females.

Table 3 Relation Between Modified Menopause Rating Scale and Hospital Anxiety and Depression Scale Among the Studied Females

		Anxiety						P	Depression						P
		Normal		Borderline		Abnormal			Normal		Borderline		Abnormal		
		N	%	N	%	N	%		N	%	N	%	N	%	
Hot flashes:	No	15	28.3	13	24.5	25	47.2	0.003*	16	30.2	24	45.3	13	24.5	0.49
	Yes	8	8.3	21	21.9	67	69.8		35	36.5	34	35.4	27	28.1	
Sleep problems	No	12	35.3	7	20.6	15	44.1	0.001*	18	52.9	9	26.5	7	20.6	0.03*
	Yes	11	9.6	27	23.5	77	67		33	28.7	49	42.6	33	28.7	
Bladder problems	No	14	21.5	17	26.2	34	52.3	0.08	21	32.3	24	36.9	20	30.8	0.64
	Yes	9	10.7	17	20.2	58	69		30	35.7	34	40.5	20	23.8	
Heart discomfort	No	17	23.6	18	25	37	51.4	0.01*	28	38.9	25	34.7	19	26.4	0.47
	Yes	6	7.8	16	20.8	55	71.4		23	29.9	33	42.9	21	27.3	
Vaginal dryness	No	17	17.9	24	25.3	54	56.8	0.26	26	27.4	43	45.3	26	27.4	0.06
	Yes	6	11.1	10	18.5	38	70.4		25	46.3	15	27.8	14	25.9	
Sexual problems	No	17	27.4	16	25.8	29	46.8	0.001*	24	38.7	25	40.3	13	21	0.36
	Yes	6	6.9	18	20.7	63	72.4		27	31	33	37.9	27	31	
Joint & muscular discomfort	No	2	20	2	20	6	60	0.91	2	20	7	70	1	10	0.11
	Yes	21	15.1	32	23	86	61.9		49	35.3	51	36.7	39	28.1	
Anxiety	No	9	50	6	33.3	3	16.7	<0.001**	13	72.2	5	27.8	0	0	0.001*
	Yes	14	10.7	28	21.4	89	67.9		38	29	53	40.5	40	30.5	
Irritability	No	9	39.1	7	30.4	7	30.4	0.001*	15	65.2	7	30.4	1	4.3	0.001*
	Yes	14	11.1	27	21.4	85	67.5		36	28.6	51	40.5	39	31	
Depressed mood	No	16	34.8	15	32.6	15	32.6	<0.001**	25	54.3	13	28.3	8	17.4	0.002*
	Yes	7	6.8	19	18.4	77	74.8		26	25.2	45	43.7	32	31.1	
Physical & mental exhaustion	No	9	31	10	34.5	10	34.5	0.002*	17	58.6	6	20.7	6	20.7	0.007*
	Yes	14	11.7	24	20	82	68.3		34	28.3	52	43.3	34	28.3	

Note: P, Chi square test; *Significant (P<0.05); **Highly significant (P<0.001).

Table 4 Relation Between Modified Menopause Rating Scale and Female Sexual Functioning Index Among the Studied Females

		N	Female Sexual Functioning Index		P$
			Median	Range	
Hot flashes:	No	53	17.5	2–34.1	0.94
	Yes	96	19.45	2–26.9	
Sleep problems	No	34	20.4	2–34.1	0.10
	Yes	115	19.1	2–28.6	
Bladder problems	No	65	21	2–30.9	0.17
	Yes	84	19.25	2–31.4	
Heart discomfort	No	72	19.2	2–31.4	0.80
	Yes	77	19.4	2–28.6	
Vaginal dryness	No	95	19.9	2–31.4	0.09
	Yes	54	18.2	2–24.3	

(*Continued*)

Table 4 (Continued).

		N	Female Sexual Functioning Index		P$
			Median	Range	
Sexual problems	No Yes	62 87	21.45 16.8	2–31.4 2–25.2	0.001*
Joint & muscular discomfort	No Yes	10 139	21.4 19.4	2–28.5 2–31.4	0.69
Anxiety	No Yes	18 131	23 19.1	2–31.4 2–28.6	0.01*
Irritability	No Yes	23 126	22 19.4	2–31.4 2–28.6	0.07
Depressed mood	No Yes	46 103	19.5 19.4	2.3–31.4 2–28.6	0.10
Physical & mental exhaustion	No Yes	29 120	21.7 19.2	3.8–30.9 2–31.4	0.04*

Note: $Mann Whitney test; *Significant (P<0.05).

Table 5 Correlation Between Hospital Anxiety and Depression Scale and Female Sexual Functioning Index Among the Studied Females

Variable	Anxiety Score (n=149)		Depression Score (n=149)	
	r	P	r	P
Desire	−0.12	0.15	−0.32	<0.001**
Arousal	−0.03	0.74	−0.25	0.003*
Lubrication	−0.03	0.70	−0.09	0.28
Orgasm	−0.07	0.43	−0.13	0.13
Satisfaction	−0.11	0.20	−0.08	0.37
Pain	−0.03	0.71	−0.02	0.83
Total FSFI	−0.02	0.85	−0.27	0.04*

Note: *Significant (P<0.05); **Highly significant (P<0.001).
Abbreviations: FSFI, Female Sexual Functioning Index; r, Pearson's correlation coefficient.

a statistically significant positive correlation with comorbidity in both females and husbands. Female Sexual Function Index had a statistically significant negative correlation with female's age, husband's age, and duration of marriage.

Discussion

Perimenopause is a process involving sex hormone fluctuations and ovarian dysfunction. This stage is accompanied by symptoms of menopause, increased risk of various chronic diseases, and decline in reproductive function,[16,17] causing varying degrees of negative changes to women's physiological, psychological, and social relations. In addition to physical discomfort, another often-overlooked effect of perimenopause in women is female sexual dysfunction (FSD), perhaps via estrogen fluctuations affecting certain brain mediators such as serotonin and gamma amino butyric acid.[18]

Table 6 Relation Between Menopause and Different Scores Among the Studied Females

Variable			Not menopausal (n=97)		Menopausal (n=52)		P
			N	%	N	%	
MRS	Hot flashes:	No Yes	36 91	67.9 63.5	17 35	32.1 36.5	0.56 ^
	Sleep problems	No Yes	23 74	67.6 64.3	11 41	32.4 35.7	0.72 ^
	Bladder problems	No Yes	44 53	67.7 63.1	21 31	32.3 36.9	0.56 ^
	Heart discomfort	No Yes	48 49	66.7 63.3	24 28	33.3 36.4	0.70 ^
	Vaginal dryness	No Yes	65 32	68.4 59.3	30 22	31.6 40.7	0.26^
	Sexual problems	No Yes	43 54	69.4 62.1	19 33	30.6 37.9	0.36^
	Joint & muscular discomfort	No Yes	10 87	100 62.6	0 52	0 37.4	0.02*^
	Anxiety	No Yes	13 84	72.2 64.1	5 47	27.8 35.9	0.50^
	Irritability	No Yes	15 82	65.2 65.1	8 44	34.8 34.9	0.99^
	Depressed mood	No Yes	27 70	58.7 68	19 33	41.3 32	0.27^
	Physical & mental exhaustion	No Yes	22 75	75.9 62.5	7 4545	24.1 37.5	0.18^
HADS	Anxiety:	Normal Borderline Abnormal	12 24 61	52.2 70.6 66.3	11 10 31	47.8 29.4 33.7	0.33^
	Depression:	Normal Borderline Abnormal	36 37 24	70.6 63.8 60	15 21 16	29.4 36.2 40	0.56^
	HADS-A: (anxiety)	Mean ± Sd	11.88±3.61		11.31±4.03		0.38#
	HADS-D: (depression)	Mean ± Sd	8.51±2.87		9.21±3.22		0.71#
FSFI	Desire:	Median (Range)	3 (1.2–5.4)		2.4 (1.2–4.8)		0.002*$
	Arousal:	Median (Range)	3 (0–5.7)		1.95 (0–4.2)		<0.001**$
	Lubrication:	Median (Range)	3.6 (0–6)		2.7 (0–5.4)		0.08$
	Orgasm:	Median (Range)	3.2 (0–6)		2.8 (0–6)		0.02*$
	Satisfaction:	Median (Range)	3.6 (0.8–6)		3.2 (0.8–6)		0.41$
	Pain:	Median (Range)	3.6 (0–6)		3.2 (0–6)		0.32$
	Total FSFI:	Median (Range)	20.5 (2–31.4)		15.8 (2–27)		0.006*$

Note: ^Chi square test; #Independent *t*-test; $Mann Whitney test; *Significant (P<0.05); **Highly significant (P<0.001).

Abbreviations: MRS, Menopause Rating Scale; FSFI, Female Sexual Functioning Index; HADS, Hospital Anxiety and Depression Scale; SD, Standard deviation.

Table 7 Correlation Between Hospital Anxiety and Depression Scale and Female Sexual Functioning Index and Demographic Data of the Studied Females

Variable	Anxiety Score (n=149)		Depression Score (n=149)		Total FSFI (n=149)	
	r	P	r	P	r	P
Age	0.09	0.30	−0.09	0.29	−0.21	0.009*
Age of husband	0.04	0.66	−0.14	0.10	−0.16	0.04*
Duration of marriage	0.07	0.40	0.11	0.19	−0.19	0.02*
Residence	0.07	0.41	0.12	0.06	0.01	0.99
Education	−0.08	0.33	−0.05	0.58	0.02	0.86
Occupation	−0.03	0.74	0.15	0.06	−0.13	0.12
Husband education	−0.19	0.02*	0.14	0.10	−0.03	0.75
Husband occupation	0.11	0.20	−0.07	0.40	0.10	0.21
Social class	−0.17	0.04*	−0.05	0.55	0.01	0.88
Comorbidity	0.10	0.24	0.29	<0.001**	−0.04	0.64
Husband comorbidity	0.07	0.38	0.24	0.004*	−0.13	0.12
Menses duration	−0.02	0.90	0.02	0.88	0.001	0.99

Note: *Significant (P<0.05); **Highly significant (P<0.001).
Abbreviations: FSFI, Female Sexual Functioning Index; r, Spearman correlation coefficient.

A previous study showed that the incidence of FSD in perimenopausal women was as high as over 60%,[19] which not only impacts mental health but also interferes with family harmony and stability.

Our results reflected the typical perimenopausal age range. The majority had middle-level education, which might influence their awareness and understanding of menopausal symptoms. The fact that about half of the women were from urban areas and nearly half were of moderate social class could influence access to health care resources and support networks, potentially affecting the management of menopausal symptoms. Considering the husbands' ages, education, and employment status is crucial for understanding the overall household dynamics and potential support systems available to these women during the perimenopausal phase. The high prevalence of comorbidities, particularly diabetes mellitus and hypertension, among both women and their husbands, suggests the need for a holistic approach to health care for these couples.

On studying the relation between modified MRS and HADS among the studied females, it was found that the frequency of menopausal symptoms was significantly increased among females with abnormal anxiety scores. Also, the frequency of sleep problems and physical and mental exhaustion was significantly decreased among females with normal depression scores and the frequency of anxiety, irritability and depressed mood was significantly increased among females with abnormal depression scores, these results match with a study done by Shariat Moghani et al[20] and Malaijerdi et al[21] as they mentioned that the higher the anxiety, the higher the menopausal symptoms. Moreover, some other researchers have also reported that high levels of stress and anxiety potentially exacerbate menopausal symptoms.[22–24]

Erbil[25] study conducted in 2018 showed that women who have an optimistic attitude towards menopause have a more positive body image and their level of depression is lower.

On the other hand, the study of Bahri et al[26] showed that there is no relationship between the severity of menopausal symptoms and depression and anxiety in menopausal women.

Regarding the relation between modified MRS and FSFI. Females with sexual problems, anxiety and physical and mental exhaustion had significantly lower scores of FSFI compared to females without such symptoms. These findings

are in same line with Thornton et al[27] and Prairie et al[28] who found that sexual function components may be affected by menopause due to changes in sensory perception, central and peripheral nerves, peripheral blood flow, and the capacity to create muscle tension in response to estrogen deficiency. These changes may lead to lower self-esteem, weaker body image, and reduced sexual desire. Some women feel less sexually attractive or less satisfied with their bodies. In fact, their self-image can change because they tend to gain weight as their metabolism slows down. Thus, depression and emotional distress, in turn, can be a risk factor for sexual dysfunction, and it can be imagined as a mutual relationship between emotional state and sexual function.

Our study revealed that there is a statistically significant negative correlation between depression scores and sexual desire, arousal and total FSFI scores. As reported by a study from Malaijerdi et al[21] who showed that health anxiety has a significant relationship with the dimensions of desire ($p = 0.045$ and $r = -0.142$) and sexual pain ($p < 0.001$ and $r = 0.274$).

In justification of the results, it can be said that people who experience depression tend to be less engaged in sexual activities, and if they do, they experience higher sexual pain, which itself can cause a decrease in relationship satisfaction, not to mention that mental health problems are frequently associated with sexual dysfunction such as decreased libido, poor orgasm and less satisfaction.[29] The reverse is also true that sexual dysfunction can lead to depression.[30]

There was also a significant relationship between the attitude towards menopause with sexual performance ($p < 0.001$ and $r = 0.244$). Also, the study of Yazdanpanahi et al[6] showed that there is a relationship between mental health status and sexual performance in postmenopausal women.

The study has several strengths, including the use of validated Arabic versions of well-established assessment tools such as MRS, HADS, and FSFI, which ensured reliable and culturally relevant evaluation of menopausal symptoms, anxiety, depression, and sexual function. Inclusion and exclusion criteria were clearly defined and systematically excluded participants with conditions that could confound results, such as those with a history of psychiatric illness. Sample size calculation was robust, with adjustments for potential attrition resulting in a final sample size adequate for statistical analysis. In addition, all assessments were conducted in a single face-to-face setting, reducing variability and potential bias, and the study used a variety of appropriate statistical tests, increasing the robustness and validity of the findings.

However, the study has several limitations. The cross-sectional design limits the ability to draw causal inferences, and the single-center setting at Zagazig University Hospitals may limit the generalizability of the findings to other settings or populations. The reliance on self-reported data introduces potential recall bias, which affects the accuracy of the information collected. The exclusion of pregnant and lactating women, women on hormone replacement therapy, and women with a history of hysterectomy or oophorectomy, while necessary for the focus of the study, may limit the applicability of the results to all perimenopausal women. In addition, the high prevalence of comorbidities such as diabetes mellitus and hypertension among participants and their husbands may influence the outcomes related to anxiety, depression, and sexual function, potentially confounding the study results. Finally, social desirability bias might have influenced participant responses. Participants may have been hesitant to report negative sexual experiences or symptoms due to social stigma surrounding these topics.

Recommendations

To improve the quality of life for perimenopausal women, health care providers should employ an integrated approach that addresses both physical and mental health needs, including routine screening for anxiety, depression, and sexual dysfunction. Awareness programs are essential to help women and their families understand and manage the changes associated with menopause. Mental health support should be readily available, with integration between mental health and gynecology professionals. Sexual health awareness, counseling, and interventions, including appropriate medical treatment, should be prioritized.

Future research should employ longitudinal designs and consider more diverse populations to further elucidate these relationships, understand causal relationships, and inform targeted interventions. Tailored interventions based on demographic factors, support networks, group therapy, and advocacy for adequate resources and reduced stigma are also essential for comprehensive care. Implementation of these recommendations may lead to improved health outcomes and enhanced support for perimenopausal women.

Conclusion

Perimenopausal symptoms significantly affect women's mental health and sexual function, with a high prevalence of anxiety and depression observed among participants. There is a noticeable negative correlation between depression and various aspects of sexual function, highlighting the interrelationship between mental health and sexual well-being. The high prevalence of comorbidities such as diabetes mellitus and hypertension among participants and their husbands indicates the need for a holistic health care approach that addresses both physical and mental health to improve overall quality of life during menopause. Our findings highlight the need for comprehensive health care strategies that integrate psychological and physiological care to better support women through the perimenopausal transition.

Acknowledgments

The authors are grateful to all the participant for their cooperation and grateful to Princess Nourah bint Abdulrahman University, Researchers supporting project number (PNURSP2024R347), Princess Nourah bint Abdulrahman University Riyadh, Saudi Arabia.

Funding

The authors declare that financial support was sponsored by Princess Nourah bint Abdulrahman University, Researchers supporting project number (PNURSP2024R347), Princess Nourah bint Abdulrahman University Riyadh, Saudi Arabia.

Disclosure

The authors report no conflicts of interest in this work.

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