ORIGINAL RESEARCH

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The prevalence of depression and anxiety in premenopausal and menopausal women: A cross-sectional study

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Abstract

Background and Aims: Targeted research on physiological and psychological changes during menopause is crucial. Most studies have prioritized the investigation of psychological disorders during menopause, with a limited comparison of mental health among women in the various stages surrounding menopause. This study aims to explore the difference in depression and anxiety prevalence between women in premenopausal and menopause.

Methods: This cross-sectional study was conducted on 242 female participants referred to Imam Hossein (AS) Educational and Therapeutic Hospital affiliated with Shahid Beheshti University of Medical Sciences. These 242 individuals were selected through accessible sampling. 122 individuals were placed in the menopausal group and 120 individuals in the premenopausal group. First, the medical history of all participants was taken, and then the Beck questionnaire was administered to examine the levels of depression and anxiety. The association between the occurrence and severity of depression and anxiety in menopausal and premenopausal groups was statistically analyzed.

Results: In this study, the age range of the participants was 45–70, the overall prevalence of depression was estimated to be 33.5% and the overall prevalence of anxiety was estimated to be 54.2%. The prevalence of depression was 30.2% and 36.6% in the menopausal and premenopausal groups, respectively. The prevalence of anxiety was estimated to be 52.5% and 55.7% in the menopausal and premenopausal groups, respectively. No significant difference was observed between the two groups in terms of the occurrence and severity of depression and anxiety.

Conclusion: our study found a higher incidence of depression during premenopause compared to menopause, possibly due to greater hormonal fluctuations. Despite this, there wasn't a significant confirmation of this hypothesis compared to other groups. Nonetheless, there's a higher prevalence of depression and anxiety among

premenopausal women, emphasizing the need for screening and intervention, such as hormone therapy, to prevent severe outcomes.

KEYWORDS
anxiety, depression, hormone therapy, menopause, premenopausal, women

1 | INTRODUCTION

As women age, they all go through menopause, which is a significant phase in their lives.[1] The World Health Organization defines menopause as the natural end of menstrual cycles in women resulting from the cessation of ovarian follicular function.[2] This marks the end of a woman's fertility period. Therefore, when a woman has gone without menstruating for at least 12 months, excluding pregnancy, breastfeeding, or hormonal imbalances, she is considered menopausal.[3]

Typically, menopause manifests in women aged 50 years and above, causing a decline in their estrogen levels. Currently, the global population of women aged 50 and above is estimated to be around 467 million. Projections indicate that by the year 2021, roughly 5 million women in Iran will have undergone menopause.[4]

Due to the growing aging population worldwide, including in Iran, and the rise in life expectancy, over a third of women experience estrogen deficiency during their postmenopausal years.[5] These biological and neuroendocrine changes result in the loss of fertility and menstrual function, potentially impacting a woman's physical and mental well-being.[6] While some women may view menopause positively, as it provides relief from unwanted pregnancies, many others fear this stage due to the appearance of symptoms and signs.[7]

During this period, women may undergo emotions of despondency, pessimism, strain, and unease. Correspondingly, factors that are connected to health and daily stress may contribute to the emergence of symptoms of depression and anxiety at this time.[8] The connection between mental health and menopause has been inadequately studied.[9] The topic of the correlation between mental health and alterations in sex hormones during the transition to menopause is still controversial. The short-term and long-term impacts of hormonal changes on women's mental functioning necessitate further research.[10]

Research on menopausal status and depressive symptoms has shown mixed results. While some large population-based studies link menopausal transition to increased depression, others argue it may stem from socio-demographic factors and declining health.[11] Anxiety symptoms in middle-aged women are reported, despite limited attention to anxiety and menopause. Some studies indicate increased anxiety during menopause, especially panic attacks. Anxiety symptoms may also exacerbate distressing symptoms like hot flashes.[12] However, a meta-analysis found anxiety levels not significantly elevated, though many studies lacked valid assessment tools. Conversely, the SWAN study revealed common anxiety during menopausal transition and early menopause.[12]

The objective of our research is to investigate the influence of hormonal changes on the mental well-being of women during premenopausal and menopause, in conjunction with other factors. Our approach involves analyzing the frequency of depression and anxiety among this demographic to gain insight into this topic.

2 | METHODS

This cross-sectional study was conducted on 242 female participants referring to Imam Hossein (AS) Educational and Therapeutic Hospital affiliated with Shahid Beheshti University of Medical Sciences. These 202 individuals were selected through convenience sampling. 122 individuals were placed in the menopausal group, and 120 individuals were placed in the premenopausal group. The process of selecting individuals began with providing a complete description of the study to each woman, and after obtaining informed consent, as outlined in (Appendix No S1), the individual entered the study.

Then, the individual's status regarding personal characteristics such as age, education, marital status, etc., was obtained, which is documented on the attached sheet labeled "Current Status" (Appendix No S2). Additionally, the Beck Depression Inventory[13] (BDI-II) was completed separately by each participant to assess the depression and anxiety status of the women. The Beck Depression and Anxiety questionnaires are provided in Appendices No. S3 and S4, respectively.

The sample size in this study was obtained using the following formula:

$$n = \frac{z^2 p \left(1 - p \right)}{d^2}$$

Z = 1.96, p = 0.55, D = 0.06

The criteria for inclusion in the study include the individual's consent and the woman being within the menopausal age range.

The criteria for exclusion in the study include the inability to respond to the parameters of the Beck questionnaire and individual dissatisfaction.

After completing and obtaining the Beck questionnaires the participants, based on the 29 items of the BDI-II, were categorized into four groups: 1–15 (no depression), 16–31 (mild depression), 32–47 (moderate depression), and 48–62 (severe depression). Similarly, based on the 29 items of the Anxiety questionnaire, the level of anxiety was scored, and accordingly, participants were categorized into four groups: 0–7 (no anxiety), 5–8 (mild anxiety),

16–25 (moderate anxiety), and 26-63 (severe anxiety).[13] Subsequently, the significant association of participants' frequency in these categories with the premenopausal and menopausal status and their respective subgroups was examined.

2.1 | The scoring method for depression and anxiety among participants is based on the Beck questionnaire

In the Beck questionnaire, each question is scored on a four-part spectrum from 0 to 3. Each item of the questionnaire describes one of the common symptoms of anxiety and depression.[14,15]

2.2 | statistical analysis

The data was subjected to statistical analysis. Fisher's exact test or chi-square test was used to compare the qualitative data, while the Kolmogorov-Smirnov test was used to analyze the normality of quantitative data, followed by t-test for comparison. GraphPad Prism software version 8 was used for all statistical analyses, and the software was also used to generate corresponding graphs. A value less than 0.05 is considered significant.

This study was approved by the Research Ethics Board of Shahid University of Medical Sciences (IR.SBMU.MSP.REC.1398.599).

3 | RESULTS

Among the participants in the study, the overall prevalence of different levels of depression symptoms was 33.5%, with 29.7% having mild depression, 2.8% having moderate depression, and 0.8% having severe depression. The overall prevalence of different levels of anxiety symptoms was 54.2%, with 30.5% having mild anxiety, 15.7% having moderate anxiety, and 7.8% having severe anxiety. Moreover, 28.5% of participants were experiencing both depression and anxiety at the same time. Table 1 presents additional information related to women, categorized into two groups based on their menopausal status: menopausal and premenopausal.

3.1 | The association between depression and menopausal status and premenopausal

Participants were grouped by depression severity and menopausal status. Depression prevalence was 30.2% for menopausal and 36.6% for premenopausal groups, with no significant difference ($p = 0.230$). Early and late menopausal status showed no significant depression association ($p = 0.99$). Similarly, no significant association existed between depression and early or late premenopausal status ($p = 0.990$). A comparison of depression levels in premenopausal women with regular and irregular periods found no significant difference ($p = 0.430$).

3.2 | The correlation between anxiety with menopause and premenopause

The study examined anxiety in menopausal and premenopausal groups across four categories. Anxiety prevalence was 55.7% for menopausal and 52.5% for premenopausal groups, with no significant difference ($p = 0.780$). The severity of anxiety also showed no significant difference between the groups ($p = 0.690$) (Figure 1).

3.3 | The correlation between anxiety with early menopause and late menopause

There is no significant correlation between anxiety and the timing of menopause, whether it occurs early or late ($p = 0.220$).

3.4 | The association of anxiety with early premenopause and late premenopause

There is no significant association between experiencing anxiety and being in the early or late stages of menopause ($p = 0.530$).

3.5 | The association of anxiety with premenopausal regular menses and irregular mense

The anxiety levels in two groups of premenopausal women with regular periods and the other with irregular periods. The results showed that there was no significant difference in anxiety levels between the two groups ($p = 0.570$).

4 | DISCUSSION

Depression is a prevalent mental illness impacting millions globally, irrespective of age. With over 264 million affected individuals, accounting for 4.4% of the world's population, it significantly contributes to the global disease burden and disability rates. Women are more susceptible to depression than men. However, effective treatments, including psychological and pharmacological therapies, offer hope for moderate to severe cases. In Iran, research indicates an overall depression prevalence of 4.1%, with women experiencing a higher rate of 4.8% compared to men at 2.3%, indicating women are 1.95 times more likely to develop depression than men.

Research has indicated that menopause symptoms of depression affect a significant percentage of women, ranging from 15% to 50%. Furthermore, in 15% to 30% of cases, these symptoms are serious enough to be classified as a depressive disorder.[16,17]

A research study conducted on middle-aged women in Australia aimed to explore the link between menopause and symptoms of depression and anxiety. The findings revealed that menopause is linked to a higher likelihood of experiencing symptoms of anxiety and

TABLE 1 Demographic and clinical characteristics of the participants.

Parameters	Category	Menopause	Premenopause
Age	-	56.28 ± 5.82 (45–70)	47.45 ± 2.71 (45–58)
Education	Illiterate	7 (5.7)	0 (0)
	School and school	61 (50)	40 (33.3)
	Expert	54 (44.2)	80 (66.6)
Job	Housewife	65 (53.2)	44 (36.6)
	Employed	57 (46.7)	76 (63.3)
Income status	$180>	69 (56.6)	68 (56.7)
	$180–360	41 (33.6)	48 (40)
	$300<	12 (9.8)	4 (3.3)
Marital status	Single	6 (4.9)	12 (10.8)
	Married	94 (77.04)	102 (85)
	Divorced	11 (9.01)	5 (4.1)
	Widow	11 (9.01)	0 (0)
BMI	-	27.39 ± 3.94	26.81 ± 4.26
Past Medical History	Yes	80 (65.6)	57 (57.5)
PPSH	Yes	29 (23.8)	22 (18.3)
Drug History	Yes	76 (62.3)	55 (45.8)
Habitual History	Smoking	12 (9.8)	4 (3.4)
	Alcohol	3 (2.5)	1 (0.8)
	Exercise	50 (40.9)	49 (40.8)
fertility history	Yes	115 (94.3)	102 (85)
Menopause	Early	64 (52.4)	
	Late	58 (47.5)	-
Pre- Menopause	Early	-	109 (90.8)
	Late	-	11 (9.2)
Pre- Menopause	Regular mense	-	72 (60)
	Irregular mense	-	48 (40)
Irregular mense	60 day<	-	11 (9.1)
	60 day>	-	24 (20)
	Menorrhagia	-	3 (2.5)
	No specific pattern	-	10 (8.3)
Sign and Symptoms	Recent weight gain	62 (50.8)	56 (46.6)
	Vaginal dryness	49 (40.2)	31 (25.5)
	Hair loss	60 (49.2%)	63 (52.5)
	Hirsutism	13 (10.7%)	17 (14.2)
	Dysuria and freqeuncy	36 (29.5)	37 (30.8)

depression in women who did not have a prior history of independent depression or anxiety. Additionally, the study examined the influence of multiple factors, including social, demographic, lifestyle, and health factors on the relationship between menopause and these symptoms.[18]

A study on Chinese women aimed to assess anxiety and depression symptoms during or after menopause. Results showed a higher prevalence of depression symptoms compared to anxiety. Depression symptoms increased from 14.5% before menopause to 18.2% during, and
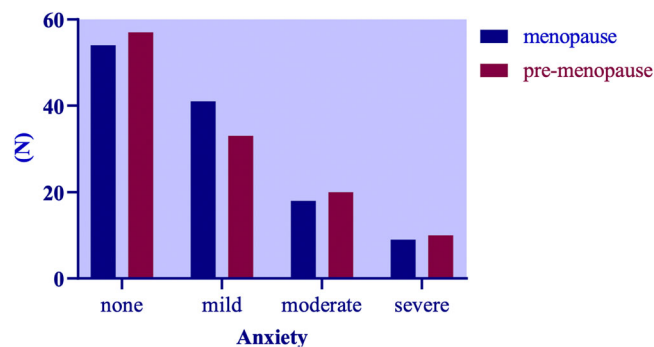
FIGURE 1 Examining the association of anxiety intensity with menopause and premenopause status. The vertical column shows the number of participants in each category.

19.6% after menopause. Anxiety symptoms increased from 3.1% before menopause to 7.0% during, and 7.4% after menopause. However, the differences were not statistically significant. Poor physical health correlated with anxiety, while higher BMI, poor health, and low education were linked to depression symptoms independently.[19]

Our study, focusing on 40 Iranian women in the premenopausal period, aimed to assess depression prevalence and associated factors. Results showed 55% of women had depression, with no significant difference between premenopausal and menopausal women. Despite lower depression prevalence compared to past research, variations in sample size and population studied may account for this. Studies suggest women experiencing depression during menopause are at risk for further episodes and higher rates of illness and mortality. Preventive measures during this transition can improve women's health, overall well-being, and prospects.[20]

The hormonal fluctuations that occur during menopause can cause mood changes and are indicative of menopausal changes. Anxiety symptoms often occur alongside vasomotor symptoms during this time. Furthermore, anxiety may worsen vasomotor symptoms, resulting in considerable discomfort throughout the menopausal transition.[21]

Hormone therapy, often used to alleviate physical symptoms, has uncertain effects on mood and behavior. A review study explored its link to depression symptoms and disorders in premenopausal and post-menopausal women, suggesting it might reduce menopause-related depression. Individualized hormone therapy administration, monitored closely, is recommended. In severe depression cases, combining antidepressants with hormone therapy may be considered.[22]

Raising consciousness regarding the psychological manifestations that could arise throughout the premenopause and menopause phases might enhance women's outcomes during this duration and escalate the chances of timely and efficient treatment.[23,24] According to our research results, it is imperative to conduct further research into the prevalence of anxiety and depression during the menopausal transition to recognize the predisposing factors for the emergence of such indications among middle-aged women.[22]

The onset of menopause heightens susceptibility to depression and anxiety, potentially due to fluctuations in estrogen levels impacting neurotransmitters like serotonin and GABA. Additionally,

underlying neuroticism and concurrent stressful life events serve as risk factors for experiencing depression during menopause.[6]

In a study by Nneka Onya, In contrast to our study on the premenopausal population, nearly half of the post-menopausal women in this study experienced depression. Therefore, routine screening for depression in post-menopausal women is recommended to ensure timely intervention, regardless of their socio-demographic status.[25]

In the study conducted by Fathimath, it was found that both premenopausal and postmenopausal women exhibit similar levels of depression and anxiety.[26]

In terms of the limitations of this research, while the Beck questionnaire is a valuable resource for assessing the prevalence and intensity of depression and anxiety, it may not be an appropriate tool for differentiating between anxiety and depression within the general population.[27]

Our study only considered women who reported experiencing natural menopause, thus our results may not be generalizable to women who undergo menopause through surgical intervention or other causes.

5 | CONCLUSION

Variations in estrogen and progesterone levels across a woman's life stages, like premenstrual, postpartum, and premenopause, can impact brain chemistry, potentially leading to anxiety and depression. While it's expected that premenopausal and early menopausal women may have higher rates of these conditions due to hormonal shifts, these findings highlight the importance of screening and evaluating women who are in the premenopausal period for anxiety and depression symptoms, especially those who have risk factors. This provides the possibility of pharmacological interventions including hormone therapy and prevention of more serious symptoms and consequences for women.

It is recommended that future studies, in addition to considering the impact and role of demographic and clinical factors on depression and anxiety in women, should also consider a larger sample size, encompassing the entire population of women from all age groups, and select an appropriate control sample matched for homogeneity to allow for more precise examinations.

CONFLICT OF INTEREST STATEMENT
The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

All relevant data and materials are provided within manuscript.

TRANSPARENCY STATEMENT

The lead author Seyyedeh Neda Kazemi affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.