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Menopause Severity, Anxiety and Cognitive Difficulties in Middle Aged Indian Women

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Abstract
Menopause is a multifaceted experience in the reproductive life of women, extending beyond biological symptoms and into the realm of emotional and cognitive health among middle aged women. This study explored the associations among menopause severity, anxiety, and cognitive difficulties in 207 middle-aged Indian women using the Menopause Rating Scale (Heinemann et al., 2004), Generalized Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006), and Cognitive Failures Questionnaire (Broadbent et al., 1982). Significant positive correlations emerged between menopause severity and anxiety ($r = 0.734$, $p < .001$), as well as between menopause severity and cognitive difficulties ($r = 0.602$, $p < .001$). Partial correlations showed these relationships remained even when controlling for anxiety and cognitive difficulties. Regression analysis further revealed menopause severity to be a significant predictor of cognitive difficulties, while anxiety did not independently predict cognitive outcomes. These findings demonstrate the interrelatedness of physical symptoms, mental health, and cognitive complaints during menopause, shedding light on the need to address psychological components in menopause management.

Keywords: Menopause severity, Anxiety, Cognitive Difficulties

Introduction

Menopause is the transitional period in the end of a woman's reproductive life, marked by the end of menstruation. It occurs, on average, around the age of 52 years, when the ovaries stop producing reproductive hormones.

Its natural trajectory is described within the Stages of Reproductive Aging Workshop (2001), which identified three phases in the reproductive lifespan: reproductive, menopausal transition, and post-menopause (Soules et al., 2001). Other categorization includes the following:

- Perimenopause refers to the few years leading up to menopause, when ovarian function begins to reduce, leading to the decline in production of hormones estrogen and progesterone. This stage is marked by the experience of vasomotor symptoms, such as night sweats and heat flashes, irregular periods, brain fog, and mood swings.
- Menopause refers to the end of menstruation, when the ovarian function has ceased. At this stage, eggs are no longer released for fertilization, whereby an absence of menstruation for 12 consecutive months denotes occurrence of this stage. Menopause, however, may also be induced through medical treatment or surgery.

- Post menopause refers to the final stage after menopause. In this stage, the production of ovarian hormones is minimal and long-term effects of this decline become more pronounced, seen in the experience of vaginal dryness, changes in skin and hair, vasomotor symptoms, mood swings, sleep disturbances, and cognitive difficulties among other symptoms.

The hormonal changes during menopause produce significant shifts in physiology, with consequences that extend beyond the reproductive system. One major pathway is estrogen's role in mood regulation. Estrogen affects the serotonergic system by facilitating serotonin production, transmission, and receptor sensitivity. Its decline during menopause disrupts this system, increasing emotional volatility and vulnerability to mood disturbances such as anxiety and depression (Wharton et al., 2012). The HPA (hypothalamic-pituitary-adrenal) Axis Theory also highlights this vulnerability, explaining that estrogen normally dampens stress responses; with its withdrawal, the body is more prone to producing excess cortisol in response to stress, leading to chronic anxiety, fatigue, and mood instability (Hantsoo et al., 2023).

An additional theoretical model relevant to understanding anxiety during menopause is the Cognitive Appraisal Theory (Lazarus & Folkman, 1984). This theory posits that emotional responses—especially stress and anxiety—are shaped not simply by external events but by how individuals interpret or "appraise" those events. During menopause, women may face unfamiliar bodily changes, unpredictability in mood, disruption of social roles, and a growing sense of aging. If these experiences are appraised as threatening or overwhelming, especially in the absence of adequate coping resources, anxiety is likely to develop. For example, sudden memory lapses may be interpreted as a sign of serious cognitive decline, or physical symptoms like hot flashes may provoke fear of public embarrassment. The menopausal transition, therefore, becomes not just a physiological shift but a perceived psychological threat. Individual differences in personality, health literacy, and available social support further shape this appraisal process, determining whether a woman reacts with resilience or chronic anxiety. This theory emphasizes the interaction between personal interpretation and stress, making it particularly relevant to menopause where both internal and social meanings play a role.

The impact of this transition is further seen in its link to cognitive difficulties, commonly referred to as brain fog, which loosely includes complaints related to memory lapses, reduced concentration, and slower cognitive processing. The Neuroprotective Hypothesis of Estrogen posits that estrogen plays an important function in synaptic plasticity and neuroprotection in the hippocampus and prefrontal cortex, the brain regions important for memory and executive processes (Brinton, 2009). As estrogen concentrations decline, neural circuits are even more susceptible to breakdown, exposing an individual to greater risks for cognitive deterioration.

In addition to hormonal causes, cognitive difficulties may also be exacerbated by emotional disturbances—particularly anxiety. This is best understood through Attentional Control Theory (Eysenck et al., 2007), which explains how anxiety interferes with the brain's ability to focus, shift attention, and manage working memory. When anxiety is high, cognitive resources are redirected toward threat monitoring and emotional self-regulation, leaving fewer resources for tasks like remembering details, organizing thoughts, or concentrating on conversations. Anxiety also disrupts the balance

between two attentional systems: goal-directed attention (needed for focused tasks) and stimulus-driven attention (which reacts to distractions). In menopausal women, this could manifest as difficulty staying on task, getting easily distracted, or mentally freezing during decision-making—common complaints grouped under "brain fog." This theory suggests that anxiety is not just a coexisting symptom but a compounding factor in cognitive difficulties, helping explain why many women report cognitive lapses during periods of heightened emotional distress.

Yet menopause is not simply a biological process—it is a psychosocial phenomenon that converges with identity, societal norms, and self-concept. Most women report difficulties with body image dissatisfaction, loss of femininity, and reduced self-esteem, shaped by cultural discourses that equate youth with worth and attractiveness (Vincent et al., 2025). The Social Role Theory suggests menopause as a role transition for society, many times overlapping with children leaving home, career transitions, or parent care for aged parents (Dillaway, 2020). Multiple stressors superimposed contribute to an aggravation of perceived loss, therefore, an elevated risk of anxiety and depression. In addition, women with negative attitudes toward menopause—usually influenced by cultural stigma—are more likely to experience psychological distress, further emphasizing the need to approach menopause both biologically and socially (Jones et al., 2012).

The psychological and cognitive consequences of menopause are numerous and significant, but healthcare systems still neglect their management. Women have long since faced obstacles in the access to appropriate healthcare either due to financial barriers, lack of autonomy over their bodies, biased focus on physical symptoms, or shortage of specialized service providers. Research indicates that women frequently lack sufficient information regarding the effects of menopause on mental health, which leads to a postponement in recognizing and addressing symptoms like anxiety and cognitive deterioration (WHO, 2024).

With the advancement of life expectancy, the population of menopausal women also grows, drawing attention towards awareness about the menopausal experience beyond simple reproductive implications. Previous studies explored the physiological and psychological impacts of menopause, but there is a lack of investigation into the relationship between anxiety, cognitive decline, and menopause within non-Western communities.

The present study seeks to make up for that deficit by examining the relationship between menopause, anxiety, and cognitive difficulty specifically among Indian women. The study of this relationship is crucial for healthcare clinicians as well as mental health professionals, allowing them to offer valuable information to this demographic and make informed decisions regarding their health, early detection, and treatment.

Method

Aim:

To assess the correlation between menopause severity, anxiety, and cognitive difficulties in middle aged Indian women.

Objectives:

1. To assess the menopause severity, anxiety, and cognitive difficulties in middle-aged Indian women.
2. To examine the correlation between menopause severity and anxiety in middle-aged Indian women.
3. To examine the correlation between menopause severity and cognitive difficulties in middle-aged Indian women.
4. To explore the influence of anxiety in the relationship between menopause severity and cognitive difficulties in middle-aged Indian women.
5. To explore the influence of cognitive difficulties in the relationship between menopause severity and anxiety in middle-aged Indian women.
6. To determine whether menopause severity and anxiety significantly predict cognitive difficulties in middle-aged Indian women through regression analysis.

Hypothesis:

- **H1:** There will be a significant correlation between menopause severity and anxiety in middle-aged Indian women.
- **H2:** There will be a significant correlation between menopause severity and cognitive difficulties in middle-aged Indian women.
- **H3:** Anxiety will influence the relationship between menopause severity and cognitive difficulties in middle-aged Indian women.
- **H4:** Cognitive difficulties will influence the relationship between menopause severity and anxiety in middle-aged Indian women.
- **H5:** Menopause severity will be a significant positive predictor of cognitive difficulties in middle-aged Indian women.
- **H6:** Anxiety will be a significant predictor of cognitive difficulties in middle-aged Indian women.

Variables:

Independent Variable	1.	Menopause Severity
Dependent Variables	2.	Anxiety
	3.	Cognitive Difficulties

Operational Definitions:

1. **Middle Aged Women:** Women aged 45-60 experiencing menopausal transition and post-menopause.
2. **Menopause Transition:** Menopause transition is the transient phase, when women move from the irregular menstrual cycles of perimenopause to the postmenopausal phase, where periods have ceased for 12 consecutive months.
3. **Menopause Severity:** It is the degree to which a woman experiences physiological, psychological, and urogenital symptoms associated with menopause. Measured using the Menopause Rating Scale (MRS), which assesses symptoms like hot flashes, sleep disturbances, mood changes, and joint discomfort. Higher scores indicate greater severity.
4. **Anxiety:** Anxiety is the psychological state characterized by excessive worry, nervousness, and physiological arousal.
   Measured using the Generalized Anxiety Disorder-7 (GAD-7) scale, which evaluates the frequency and intensity of anxiety symptoms over the past two weeks. Higher scores indicate higher levels of anxiety.
5. **Cognitive Difficulty:** Cognitive difficulty refers to temporary lapses or impairments in cognitive function.
   Measured by Cognitive Failures Questionnaire, which evaluates self-reported experiences of cognitive slips (e.g., forgetfulness, absent-minded errors). Higher scores indicate greater cognitive difficulty.

Research Design:
The present study adopts a quantitative design with a correlational and regression-based approach. It aims to examine the relationship and predictive value between menopause severity, anxiety, and cognitive difficulties using standardized questionnaires. Data were analyzed using SPSS to perform correlation and regression analyses.

Sample:
A total of 207 participants were included in the study, of which 165 were administered the questionnaires online, 32 were administered the questionnaires in-person, and 10 were administered the questionnaires telephonically. All participants completed the questionnaires.

The 207 participants were selected from the pool of 216 total collected responses on the basis of the following:
Inclusion criteria:

1. The participants must be women aged between 40 and 60 years.
2. The participants must be of Indian nationality.
3. The participants must be in perimenopause, menopause, or postmenopausal.
4. The participant must have a natural onset of menopause.
5. The participant must not have previous diagnosis of any psychiatric illness (e.g., major depressive disorder, schizophrenia, bipolar)

The study adopted convenience and snowball sampling. By employing this method, a diverse range of participants was included in the sample, given the restrictions on feasibility. There was no use of recruitment sites (i.e., hospitals or community centres) in this approach.

Description of Tools:

Menopause Rating Scale

The Menopause Rating Scale (MRS) is a self-assessment questionnaire developed in the early 1990s by Schneider and his colleagues, and since then has gone through several stages of validation. The purpose of this scale extends beyond the evaluation of menopausal symptoms to identify how much of daily life is affected by these symptoms. The tool was developed with the clear aim of allowing comparison of menopausal symptoms on different populations.

The instrument consists of 11 items that cover the three dimensions:

1. Psychological Symptoms: Depression, irritability, and anxiety.
2. Somatic Symptoms: hot flushes, sweating, sleeping problems, and heart discomfort.
3. Urogenital symptoms: sexual problems, bladder problems, and vaginal dryness.

Many studies have confirmed the reliability and validity of the MRS. The instrument was found to be reliable by the values of the alpha coefficient of Cronbach (0.70 and over) indicating good internal consistency. It is additionally validated by the results of the reliability and stability of the same measurements obtained from the retest method, as well as the high correlation (Heinemann, 2004).

Generalized Anxiety Disorder Scale

The Generalized Anxiety Disorder Scale (GAD-7) is a brief, self-report instrument, made to evaluate the intensity of general anxiety disorder (GAD). Developed by Dr. Robert L. Spitzer, Dr. Kurt Kroenke, and colleagues in 2006, it is now one of the most utilized screening tools for anxiety disorders in clinical settings.

The GAD-7 consists of 7 items that measure the frequency and intensity of anxiety symptoms over the last 14 days. The content of every question corresponds to a central symptom of generalized anxiety disorder, e.g., being nervous, being unable to control worrying, worrying about different things, being unable to relax, becoming irritable, and feeling that something awful will happen. The subject is presented with a 4-point Likert scale for each question: 0 ("not at all"), 1 ("several days"), 2 ("more than half the days"), and 3 ("nearly every day").

The scale is very reliable internally as it has a high Cronbach's alpha range of 0.88-0.93, which is consistent with one factor: anxiety (Johnson, 2019). Even though test-retest reliability has not been so thoroughly explored, it is clear that the GAD-7 gives the same results each time under the same circumstances. The scale demonstrates a good construct validity, which means that it is able to accurately measure anxiety as it was expected (Kroenke, 2010). GAD-7 has also been compared with

other valid measures of anxiety and has remarkably been found to have good criterion validity, due to its high positive correlation (Spitzer, 2006).

Cognitive Failures Questionnaire

The Cognitive Failures Questionnaire (CFQ) is an instrument for self-assessment that can be used by people to report how often they experience cognitive failures in everyday life. Forgetfulness, distractibility, and lapses in action are common examples of cognitive difficulties me evaluated by this instrument. Originally developed for the first time in 1982 by Donald Broadbent and his team, the CFQ was created to be a measure of individuals ' perceptions of their cognitive functions in the real world.

The 25 items that make up the CFQ provide an account of a commonly occurring cognitive lapse, such as being unable to recall where one put an item or not noticing any directions while driving. The CFQ does not have a clinical inflection point for diagnostic screening; however, one can expect a high score (43 and above) to be indicative of cognitive difficulties, including but not limited to distractibility, forgetfulness, or difficulties in executive functioning.

As far as psychometric properties are concerned, the CFQ's reliability shows good test-retest reliability of 0.71, meaning the CFQ tends to yield consistent scores over time, while also demonstrating good internal consistency, suggesting that its items also measure the same construct (Bridger, 2013). The results of factor analysis confirmed the construct validity of the CFQ showing a clear factor structure.

Procedure:

The data for this research was obtained through questionnaire administration in the modalities: in-person, online and telephonic. Convenience and snowball sampling was employed to collect data from 216 individuals, out of which 207 were included the final sample.

In the process of administration of the questionnaires, the participants first filled the informed consent statement followed by demographic questions and the standardized assessment scales. These were limited to the Menopause Rating Scale (MRS), the Generalized Anxiety Disorder Scale (GAD-7), and the Cognitive Failures Questionnaire (CFQ). The participants were asked to complete all the questionnaires and to answer them honestly, based on their personal experiences during the last few months.

All the responses were anonymous, and no information about personal identities was disclosed. After the data was collected, the responses that were handed in were reviewed, and only completed questionnaires were taken into account in the final analysis.

Statistics Used:

The collected data were statistically analyzed to examine the relationships among menopause severity, anxiety, and cognitive difficulties. These variables were measured using the Menopause Rating Scale

(MRS), the Generalized Anxiety Disorder Scale (GAD-7), and the Cognitive Failures Questionnaire (CFQ). Analysis was conducted using IBM SPSS software to identify patterns and associations, offering insight into how menopause severity relates to emotional and cognitive well-being in middle-aged Indian women.

- Descriptive statistics (mean, standard deviation, minimum, and maximum) were calculated.
- Normal distribution of the data was assessed using histograms with normal curve overlays.
- Pearson's correlation coefficient was used to assess the strength and direction of relationships between the variables.
- Partial correlation analysis was conducted to explore the association between two variables while statistically controlling for the influence of a third. Specifically, the relationships between menopause severity and anxiety, and between menopause severity and cognitive difficulties, were examined while controlling for cognitive difficulties and anxiety, respectively.
- Finally, linear regression analysis was performed to determine the extent to which menopause severity predicts anxiety and cognitive difficulties, offering additional insight into the variance explained by these relationships.

Result

Table 1

Distribution of Participants Based on Interpretation (N = 207)

	Score range	Interpretation	Percentage of Participants
Menopause Severity	0 to 4	No or Minimal Symptoms	2.42%
	5 to 8	Mild Symptoms	9.66%
	9 to 15	Moderate Symptoms	43.96%
	16 and above	Severe Symptoms	43.96%
			N = 207
Anxiety	0 to 4	Minimal Anxiety	12.56%
	5 to 9	Mild Anxiety	32.37%
	10 to 14	Moderate Anxiety	36.71%
	15 and above	Severe Anxiety	18.36%
			N = 207
Cognitive Difficulties	0 to 42	Non-significant Cognitive Difficulties	56.04%
	43 and above	Significant Cognitive Difficulties	43.96%
			N = 207

Table 1 presents the number of participants distributed across various interpretation categories for the three standardized scales used in the study: the Menopause Rating Scale (MRS), the Generalized Anxiety Disorder-7 Scale (GAD-7), and the Cognitive Failures Questionnaire (CFQ).

For the MRS, the largest groups of participants were classified under moderate symptoms (n = 91) and severe symptoms (n = 91), indicating that nearly 88% of the sample experienced moderate to severe menopausal symptoms. Regarding anxiety measured by the GAD-7, moderate anxiety (n = 76) was the most common, followed by mild anxiety (n = 67), suggesting a considerable prevalence of emotional distress in over half of the sample. For cognitive difficulties as measured by the CFQ, 91 participants were classified as having significant cognitive difficulties, which is almost half the sample reported cognitive lapses substantial enough to warrant attention.

Figure 1: Distribution of Participants by Menopause Severity Categories (N = 207)

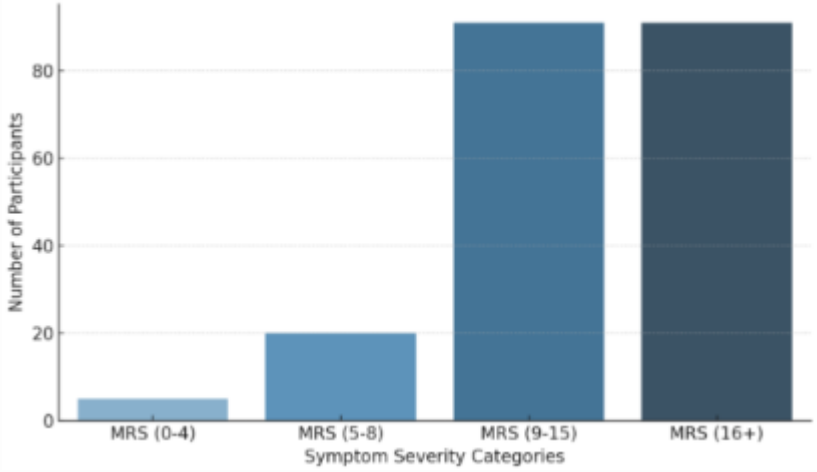

Figure 1 shows that most participants experienced either moderate or severe menopausal symptoms, with very few reporting minimal or mild symptoms. This creates a bimodal distribution, indicating that symptom severity is concentrated at the higher end.

Figure 2: Distribution of Participants by Anxiety Categories (N = 207)

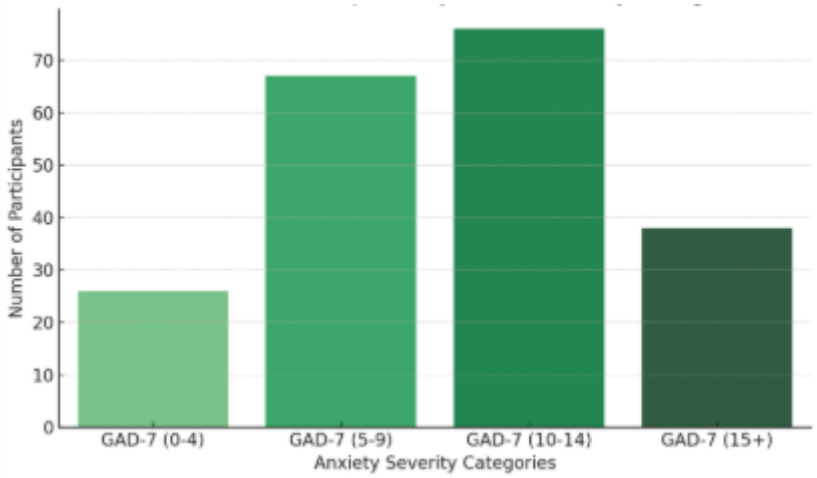

Figure 2 presents a more balanced spread of anxiety levels. While moderate anxiety was most common, the distribution is closer to a normal curve, suggesting that participants were fairly evenly spread across different anxiety severity levels.

Figure 3: Distribution of Participants by Cognitive Difficulties Categories (N = 207)

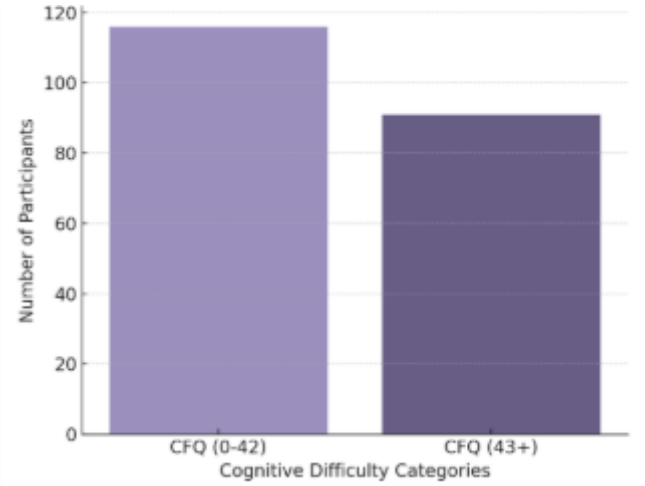

Figure 3 displays a relatively even division between participants with significant cognitive difficulties and those with fewer difficulties. While not normally distributed, it shows that cognitive concerns are present in a substantial portion of the sample.

Table 2: The mean, standard deviation, minimum, and maximum scores for menopause severity, anxiety, and cognitive difficulties among the participants (N = 207).

	N	Minimum	Maximum	Mean	Std. Deviation
Menopause Severity	207	2	29	14.61	5.495
Anxiety Level	207	0	23	10.18	4.831
Cognitive Difficulties	207	5	68	40.15	11.917

Table 2 shows the descriptive statistics and provides an overview of the scores from the three questionnaires. The mean score for menopause severity was 14.61 (SD = 5.495), with scores ranging from 2 to 29, suggesting varying severity of menopausal symptoms across participants. Similarly, anxiety levels had a mean of 10.18 (SD = 4.831), with scores ranging from 0 to 23. Cognitive difficulties showed the highest variability, with a mean score of 40.15 (SD = 11.917) and a range of 5 to 68, indicating substantial differences in subjective cognitive functioning among participants.

Table 3: Pearson Correlation Between Menopause Severity and Anxiety

		Menopause Severity	Anxiety
Menopause Severity	Pearson Correlation	1	.802 **
	Sig. (2—Tailed)		< 0.001
	N	207	207

Anxiety	Pearson Correlation	.802 **	1
	Sig. (2—Tailed)	< 0.001	
	N	207	207

****: Correlation is significant at the 0.01 level.**

Table 3 presents the Pearson correlation coefficient (r) between menopause severity and anxiety among participants (N = 207). The results demonstrate a strong positive correlation (r = .802, p < .001) between menopause severity and anxiety. This would indicate that the more severe a case of menopause, the more intense the symptoms of anxiety.

Table 4: Pearson Correlation Between Menopause Severity and Cognitive Difficulties

		Menopause Severity	Cognitive Difficulties
Menopause Severity	Pearson Correlation	1	.602 **
	Sig. (2—Tailed)		< 0.001
	N	207	207
Cognitive Difficulties	Pearson Correlation	.602 **	1
	Sig. (2—Tailed)	< 0.001	
	N	207	207

****: Correlation is significant at the 0.01 level.**

Table 4 presents the Pearson correlation coefficient (r) between menopause severity and cognitive difficulties among participants (N = 207). The results indicate a moderate positive correlation (r = .602, p < .001) between menopause severity and cognitive difficulties. This suggests that as menopause severity increases, participants report greater cognitive difficulties.

Table 5: Partial Correlation Between Menopause Severity, Anxiety, and Cognitive Difficulties

Control Variable	Correlation Between	Partial Correlation	Significance (p)
Cognitive Difficulties	Menopause Severity and Anxiety	$r_{12.3} = 0.734$	< .001
Anxiety	Menopause Severity and Cognitive Difficulties	$r_{13.2} = 0.421$	< .001

Table 5 presents the results of partial correlation analysis, examining the relationships between menopause severity, anxiety, and cognitive difficulties while controlling for potential confounding effects. The correlation between Menopause Severity and Anxiety remains strong and positive ($r_{12.3}$ = 0.734 , p < .001) when cognitive difficulties were controlled for, which suggests an independently strong relationship between the two variables. However, partial correlation when anxiety was controlled for demonstrated a significant but weaker relationship between menopause severity and cognitive difficulties ($r_{13.2}$ = 0.421, p < .001), suggesting that anxiety contributes to the relationship between menopause severity and cognitive difficulties.

Table 6: Multiple Linear Regression Analysis Predicting Cognitive Difficulties from Menopause and Anxiety Scores

Variable	Coefficient (β)	Standard Error	t-value	p-value
Intercept	21.08	1.89	11.14	< .001
Menopause	1.34	0.20	6.62	< .001
Anxiety	-0.05	0.23	-0.23	0.819

Table 6 presents the results of a multiple regression analysis conducted to examine the predictive value of menopause severity and anxiety levels on self-reported cognitive difficulties. The analysis revealed that menopause severity was a significant predictor of cognitive difficulties ($\beta = 1.34$, $p < .001$), indicating that for each one-unit increase in menopause score, cognitive difficulty increased by approximately 1.34 points. In contrast, anxiety did not significantly predict cognitive difficulties ($\beta = -0.05$, $p = .819$), suggesting that once menopause severity was accounted for, anxiety contributed negligibly to the variance in cognitive scores.

Figure 4: Scatterplot with Regression Line – Menopause Severity and Cognitive Difficulty

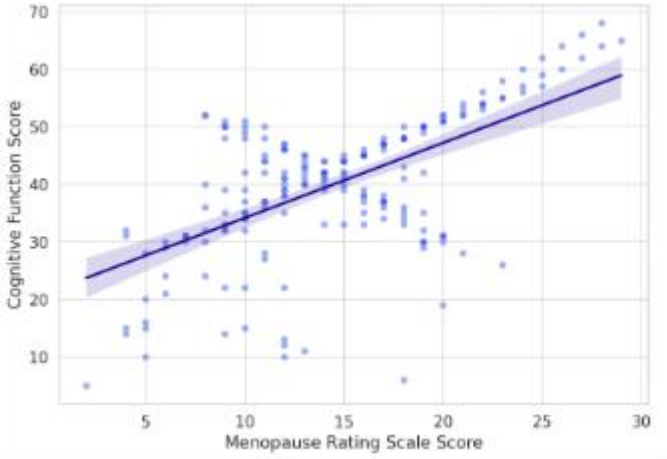

Figure 4 illustrates a strong positive correlation between menopause severity and cognitive difficulties. Participants with higher scores on the Menopause Rating Scale consistently reported higher levels of cognitive dysfunction. The regression line confirms this trend, with the data tightly clustered around the line, reflecting a significant and consistent relationship.

Figure 5: Scatterplot with Regression Line – Anxiety and Cognitive Difficulty

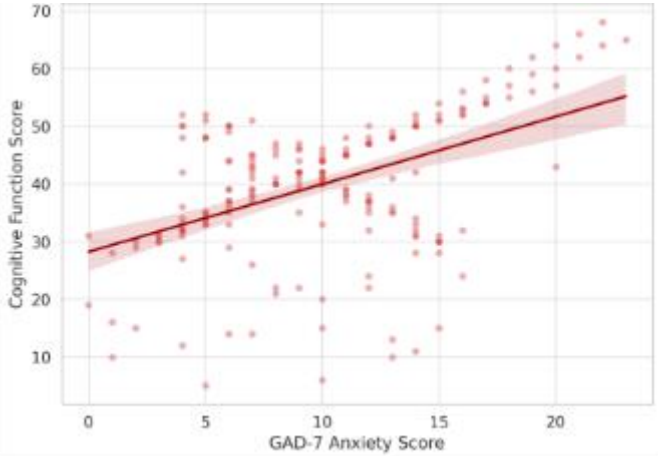

Figure 5 shows the association between anxiety and cognitive difficulties. In contrast to the relationship observed with menopause, the data points are widely scattered with no clear upward or downward trend. The nearly flat regression line indicates a lack of significant correlation between anxiety scores and cognitive impairment. This supports the statistical conclusion that, after accounting for menopause severity, anxiety does not independently predict cognitive difficulty in this sample.

Discussion

Menopause is a crucial period of transition in the reproductive life of women, and is often accompanied by a variety of physiological, emotional, and cognitive manifestations. A large portion of research available on the topic has targeted the hormonal and physical symptoms of menopause, while its emotional and cognitive aspect remains relatively underexplored, especially among south Asian women. Given the strong anecdotal evidence, the present study sought to examine the relationship between menopause severity, anxiety and cognitive difficulties among middle-aged Indian women.

The study featured a sample of 207 middle aged Indian women who were administered the Menopause Rating Scale (MRS) for the measurement of menopause severity, Generalized Anxiety Disorder Scale (GAD-7) for the measurement of anxiety, the Cognitive failures Questionnaire (CFQ) for the measurement of cognitive difficulties.

Descriptive statistics revealed a significant burden of menopausal and psychological symptoms in the sample. A majority of participants experienced either moderate or severe menopause symptoms (88%), with nearly 69% reporting moderate to severe anxiety levels. Approximately 44% of the women also reported significant cognitive difficulties. These findings reflect a compelling intersection between hormonal, psychological, and cognitive health challenges during the menopausal transition.

The study utilized both correlational and regression analyses to investigate the following hypotheses:

H1: There will be a significant correlation between menopause severity and anxiety.
A statistically significant positive correlation was observed between menopause severity and anxiety ($r_{12.3}$ = .734, $p < .001$). These findings resonate with previous research linking estrogen decline to

dysregulation in serotonergic pathways and heightened reactivity within the HPA axis (Wharton et al., 2012; Hantsoo et al., 2023), both of which are implicated in increased anxiety during menopause. Studies by Gibson et al. (2025) and Schleicher (2024) also confirm that vasomotor symptoms such as hot flashes and sleep disturbances are predictive of heightened anxiety, particularly in women navigating hormonal transition.

H2: There will be significant correlation between menopause severity and cognitive difficulties.
The data revealed a statistically significant positive correlation between menopause severity and cognitive difficulties ($r = .602$, $p < .001$), indicating that higher symptom severity was associated with more pronounced cognitive complaints. This relationship is consistent with the Neuroprotective Hypothesis of Estrogen, which suggests that estrogen plays a critical role in maintaining cognitive function through its support of synaptic plasticity in brain regions such as the hippocampus and prefrontal cortex (Brinton, 2009). Findings by Zhu et al. (2023) and Reuben et al. (2021) further validate this connection, demonstrating increased cognitive complaints and structural brain changes during perimenopause.

H3: Anxiety will influence the relationship between menopause severity and cognitive difficulties.
Partial correlation analysis showed that when anxiety was statistically controlled, the correlation between menopause severity and cognitive difficulties weakened but remained significant ($r_{13.2} = .421$, $p < .001$). This suggests that anxiety partially mediates the relationship—exacerbating cognitive complaints in women experiencing more severe menopause symptoms. These findings align with the work of Epperson et al. (2013), who documented that stress-related anxiety during menopause impairs cognitive domains such as verbal memory. This supports the argument that while cognitive changes are biologically rooted, they are compounded by emotional stressors such as anxiety.

H4: Cognitive difficulties will influence the relationship between menopause severity and anxiety.
When cognitive difficulties were controlled, the correlation between menopause severity and anxiety remained strong and statistically significant ($r_{12.3} = .734$, $p < .001$). This suggests that although cognitive symptoms often co-occur with anxiety, they do not fully explain the relationship between menopause and anxiety. These findings mirror results reported by Alblooshi et al. (2023) and Kandasamy et al. (2024), which showed that menopausal anxiety is independently driven by hormonal and psychosocial changes rather than cognitive deficits alone.

H5: Menopause severity will be a significant positive predictor of cognitive difficulties in middle-aged Indian women.
The regression analysis revealed that menopause severity was a statistically significant predictor of cognitive difficulties ($\beta = 1.34$, $p < .001$), supporting this hypothesis. The model explained 36.2% of the variance in cognitive scores, indicating a meaningful predictive relationship. This finding reinforces prior research highlighting the neurocognitive effects of estrogen decline during menopause and the heightened risk of cognitive impairment in individuals with more severe menopausal symptoms (Matyi et al., 2019; Weber et al., 2021). These results add empirical weight to the view that menopause is a critical period of vulnerability for cognitive functioning.

H6: Anxiety will be a significant predictor of cognitive difficulties in middle-aged Indian women. Although anxiety was strongly correlated with both menopause severity and cognitive difficulties in bivariate analyses, it did not emerge as a statistically significant predictor in the regression model (β = -0.05, *p* = .819). This outcome suggests that the predictive power of anxiety diminishes once menopause severity is accounted for, indicating that the cognitive complaints reported may be more directly attributed to physiological changes associated with menopause.

Although the overall findings are consistent, the difference between correlation and prediction in this case deserves attention. Anxiety was strongly linked to cognitive difficulties when looked at on its own, but it did not significantly predict cognitive issues when considered alongside menopause symptoms. This suggests that anxiety and cognitive problems might both stem from the same root cause—severe menopausal symptoms—rather than anxiety directly causing cognitive difficulties. This view is supported by research showing that declining estrogen levels are a key factor in cognitive decline, while anxiety may worsen the issue but is not the main cause (Weber et al., 2021; Brinton, 2009). This finding shows why it is important to use multivariate analysis, which helps separate the unique effects of related factors. It also suggests that future research should explore how these variables interact over time or under different conditions.

Conclusion

The present study examined the relationships among menopause severity, anxiety, and cognitive difficulties in middle-aged Indian women using both correlational and regression analyses. Results revealed that menopause severity is significantly associated with and predictive of both anxiety and cognitive difficulties. While anxiety correlated strongly with both variables, it did not independently predict cognitive difficulties once menopause severity was accounted for. This finding highlights the dominant role of physiological changes in driving cognitive outcomes, with anxiety acting as a mediating but not primary factor. The hypotheses were largely supported, with five of the six hypotheses accepted based on statistical evidence, as shown in table 7.

Table 7: Status of Hypotheses

	Hypothesis	Status
H1	There will be a significant correlation between menopause severity and anxiety in middle-aged Indian women.	Accepted
H2	There will be a significant correlation between menopause severity and cognitive difficulties in middle-aged Indian women.	Accepted
H3	Anxiety will influence the relationship between menopause severity and cognitive difficulties in middle-aged Indian women.	Accepted
H4	Cognitive difficulties will influence the relationship between menopause severity and anxiety in middle-aged Indian women.	Accepted
H5	Menopause severity will be a significant positive predictor of cognitive	Accepted

	difficulties in middle-aged Indian women.	
H6	Anxiety will be a significant predictor of cognitive difficulties in middle-aged Indian women.	Rejected

Limitations

- The current research design limits the ability to infer causality or long-term trajectories.
- Data was self-reported, which may introduce bias or inaccuracies, particularly in assessing cognitive complaints.
- The use of convenience sampling may limit generalizability to the broader population.
- Cultural, lifestyle, and socio-economic variables were not controlled or explored in this study, which could have moderated the findings.

Recommendations

- Future research should adopt longitudinal designs to assess how these variables evolve over time during and after menopause.
- Incorporating objective cognitive assessments (e.g., neuropsychological testing) could validate and strengthen the subjective self-reports.
- Studies should examine additional mediating/moderating variables such as social support, sleep quality, physical health, and resilience.
- Increased inclusion of rural or underrepresented women can enrich the cultural understanding of menopause-related experiences.

Implications

The findings of this study highlight the urgent need to integrate screening for anxiety and cognitive difficulties into routine menopause care, particularly in primary and gynecological healthcare settings. Recognizing menopause as a biopsychosocial transition—where emotional and cognitive health are deeply linked to hormonal changes—calls for the implementation of psychoeducation and early intervention programs. The results also advocate for interdisciplinary collaboration among gynecologists, psychologists, and primary care providers to deliver more comprehensive support. Especially within the Indian cultural context, where psychological aspects of menopause are often neglected or stigmatized, these findings emphasize the importance of culturally sensitive awareness and mental health interventions.

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