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Understanding Brain Fog in Indian Women Across Reproductive Life Stages: A Qualitative Health Psychology Study

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Abstract

The term "brain fog" and the discussion around it have been increasingly discussed in relation to women's reproductive health, but it still remains poorly defined and underexplored within the Indian context. The already existing research in the area of brain fog represents mixed findings, with some studies showing measurable cognitive changes during pregnancy and menopause while others report stable and adaptive functioning. Despite this, many women consistently described subjective experiences of forgetfulness, mental fatigue, and reduced concentration. This highlights a gap between the clinical findings and lived experiences. This study aimed to understand and explore how Indian women across different reproductive life stages experienced and described their experience of brain fog. This study's main aim was to examine brain fog's psychosocial impact on daily life and identity, understand the role of cultural and social factors in shaping these experiences, and at the same time identify differences across menstruation, pregnancy, perimenopause, and postmenopause. A qualitative research design was adopted for this study. The data was collected through an online questionnaire using open-ended questions. The sample of the study included Indian women from various reproductive stages and then the responses were further analyzed using thematic analysis to identify the recurring patterns and meanings from the participants' narratives. The findings from the responses revealed that brain fog was experienced as a multidimensional phenomenon involving memory lapses, reduced attention, slowed thinking, and decision-making difficulties. Beyond the cognitive symptoms, the participants reported their emotional distress, self-doubts, reduced productivity, and identity-related concerns. They also mentioned their perspectives about cultural expectations, gender roles, and social validation and how that significantly shaped women's interpretation and how they managed their experiences. Finally, differences were observed between reproductive stages, with menstruation-related brain fog described as cyclical, pregnancy-related experiences as mixed, and menopausal experiences often normalized as part of aging. Overall, the study highlights brain fog as a biopsychosocial experience and emphasizes the importance of culturally sensitive, stage-specific support for women's cognitive well-being.

Keywords: Brainfog, Lived experiences, Indian Women, Women's reproductive health

Introduction

Over the recent years, the term "brain fog" has changed from an informal expression to a widely recognized description of subjective cognitive difficulties that is characterized by reduced clarity in thinking, attention, and memory. Its discussion increased majorly during the COVID-19 pandemic when many individuals reported having persistent cognitive complaints following the infection. Although the term is not defined as a formal clinical diagnosis, it is increasingly used in the clinical and research contexts to describe a constellation of cognitive symptoms that is associated with physiological, neurological, and psychological conditions. Brain fog has been usually linked to chronic stress, sleep disturbances, long COVID, mood disorders, and metabolic or vascular risk factors, therefore, this suggests that brain fog represents a transdiagnostic phenomenon. The emerging evidence also suggests that, in some cases, brain fog may also function as an early indicator of broader cognitive vulnerability, especially when it is associated with health risks. A substantial proportion of empirical research on brain fog has developed within the context of COVID-19. Meta-analytic evidence indicates gender differences in post-COVID neurological symptoms, with women reporting a higher rate of cognitive complaints. For instance, a study reported that approximately 38% of the women participants in their study were more likely to experience brain fog compared to men during long-term follow-up. However, these findings are primarily situated based on the factor of infectious disease recovery and do not study brain fog as an experience. So, therefore, broader investigations into reproductive, hormonal, and sociocultural influences remain limited (Gorenshtein et al., 2024). Similarly, qualitative research, on the other hand, has expanded the understanding of brain fog purely as a biological explanation, where the study explored women's lived experiences of brain fog across reproductive stages and found out that the participants did not conceptualize brain fog as a cognitive impairment but rather as an experience that affected their identity, self-perception, and daily functioning. Women frequently described feeling "less than" others due to their cognitive inefficiency. Importantly, brain fog was also reported across different life stages and was often intertwined with reproductive transitions, highlighting the relevance of hormonal and psychosocial contexts (Johnson and Ogden, 2024). When we look into the existing literature, even though there are studies that researched the cognitive complaints during reproductive stages, there still exists a lesser amount of qualitative research. Similarly, cognitive complaints during reproductive transitions also remain underrecognized. This gap underscores the need for research that integrates biological, psychological, and sociocultural dimensions to better understand women's cognitive experiences. The existing research on brain fog is still primarily based on Western populations, with little consideration given to culturally specific contexts, despite growing international attention. Brain fog has mostly been discussed in relation to COVID-19, but there are still few more comprehensive studies covering all stages of reproductive life. The perception, interpretation, and expression of brain fog may be influenced by sociocultural norms, gender roles, and the lack of open discussion surrounding women's cognitive health. As a result, little research has been done on the lived experiences of Indian women during all stages of reproduction.

The present study addresses this gap by examining how Indian women across four reproductive stages, ie; menstruation, pregnancy, perimenopause, and post-menopause experiences and describe brain fog. The study will use a qualitative thematic approach guided by a health psychology framework. The study will look into the women's perceptions of cognitive clarity, the impact of brain fog on identity and quality of life, and the coping strategies adopted to manage these experiences. By giving more importance to women's narratives and experiences, the research aims to develop a contextualized and multidimensional understanding of brain fog.

Review of Literature

Brain fog is widely described as a constellation of cognitive symptoms characterized by mental cloudiness, slowed thinking, forgetfulness, and difficulty concentrating. Although frequently reported across both clinical and non-clinical populations, it is not recognized as a formal diagnostic category and lacks standardized operational criteria. Instead, it is best understood as a subjective cognitive experience that varies in presentation, severity, and functional impact. A multidisciplinary report from Stanford Medicine identified brain fog as one of the most disabling and persistent symptoms associated with long COVID. The report estimates that individuals with long COVID experienced ongoing cognitive difficulties that co-occured with fatigue, headaches, sleep disturbances and mood-related symptoms. The evidence from the paper suggested that fluctuations in estrogen and progesterone significantly affect brain networks involved in attention, memory, and emotional regulation (From Smell Loss to Brain Fog: Unpacking the Long COVID Puzzle, n.d.-b).

Puberty is a critical developmental period marked by hormonal, neurological, and psychosocial transitions that begins between 8 and 13 years of age. These biological changes are accompanied by structural brain development which may increase vulnerability to emotional and cognitive challenges during adolescence. A large-scale data shows that earlier pubertal timing is associated with higher levels of depressive symptoms and measurable changes in brain structure (MacSweeney et al., 2023). Supporting this, another study found out that earlier puberty was linked to accelerated brain maturation and elevated mental health problems although brain maturation itself did not fully explain psychological vulnerability (Dehestani et al.2023). Similarly, a longitudinal neuroimaging research further demonstrated a measurable association between pubertal development and predicted brain age which reinforces the link between hormonal transitions and neurological maturation (Holm et al.2022). From a structural perspective, a report stated that pubertal hormones such as testosterone and estradiol are associated with region-specific gray and white matter changes,which supports the view that puberty is not only a physical transition but also a period of significant brain reorganisation (Herting & Sowell, 2016) .

The reproductive years are characterised by cyclical fluctuations in estradiol and progesterone that influence brain function and cognitive performance. A systematic review reported consistent hormone-related structural and functional changes across the menstrual cycle, particularly in corticolimbic regions such as the hippocampus and prefrontal cortex (Dubol et al., 2020). Similarly, phase-dependent variations in whole-brain network dynamics have been observed, with greater neural complexity during the pre-ovulatory phase when estradiol peaks (Avila-Varela et al., 2024). Behavioural findings align with these neural patterns, with improved memory and attention reported during the pre-ovulatory phase compared to the menstrual phase (Sawicka et al., 2025). Complementing these findings, qualitative research indicates that women experience brain fog as a cyclical and hormonally linked phenomenon affecting cognition, emotions, and identity (Johnson & Ogden, 2024).

Perimenopause is characterised by fluctuating estrogen and progesterone levels over approximately four years, during which women frequently report verbal retrieval difficulties, attention lapses, and working memory concerns (Johnson & Ogden, 2024). Qualitative findings further highlight the impact of brain fog on daily functioning, identity, emotional wellbeing, and work performance, although older women often demonstrate greater acceptance through adaptive psychological framing (Johnson & Ogden, 2024). Longitudinal evidence from the Study of Women's Health Across the Nation indicates declines in verbal memory and processing speed during late perimenopause, with relative stabilisation after menopause (Greendale et al., 2009). Neurobiological models suggest that estrogen decline contributes to

hypometabolism in brain energy pathways (Brinton, 2015), supported by imaging studies showing altered glucose metabolism and receptor activity during the menopausal transition (Mosconi et al., 2021). Overall, perimenopausal brain fog appears to emerge from interacting hormonal, sleep-related, emotional, and contextual factors, often without permanent cognitive impairment but with meaningful effects on wellbeing.

Menopause is defined as twelve consecutive months without menstruation, that typically occurs between ages 45 and 55, and is associated with persistent cognitive concerns even as vasomotor symptoms decline (Harlow et al., 2012). Neuroimaging research shows changes during the menopausal transition, including reduced cerebral glucose metabolism, gray matter volume loss, and increased white matter hyperintensities, with partial recovery after menopause suggesting neuroplastic adaptation rather than permanent degeneration (Mosconi et al., 2021). Longitudinal data from the Study of Women's Health Across the Nation indicate gradual midlife declines in processing speed and delayed memory, although these changes are not specifically accelerated by menopause alone (Greendale et al., 2010).

Post-menopause begins 12 months after the final menstrual period and some women continue to report persistent brain fog. Declining estradiol during the menopausal transition affects hippocampal and frontal regions involved in memory and attention, contributing to subjective cognitive difficulties (Russell et al., 2019). Recent evidence presented highlights measurable structural brain changes during menopause including reductions in gray matter in frontal and temporal regions and the hippocampus, alongside increases in white matter hyperintensities. These changes have been associated with cognitive complaints such as memory decline and mental fatigue, particularly in women with early menopause or frequent vasomotor symptoms. Importantly, partial gray matter recovery post-menopause suggests adaptive neuroplasticity rather than irreversible degeneration. (The Menopause Society, 2026).

Theoretical Framework: Biopsychosocial Approach to Brain Fog

This study is guided by the biopsychosocial model proposed by George L. Engel, which conceptualizes health as the interaction of biological, psychological, and social factors. This framework is particularly suited to understanding complex, subjective experiences such as brain fog (Philip & Cherian, 2020).

1. Biological factors include hormonal fluctuations across reproductive stages that influence memory, attention, and mental clarity, alongside neurochemical and genetic influences.
2. Psychological factors involve stress, anxiety, mood changes, cognitive overload, and identity-related concerns, all of which may intensify perceived cognitive difficulties.
3. Social factors include gender roles, caregiving demands, socioeconomic conditions, sleep, nutrition, and stigma surrounding menopause and mental health.

Overall, the biopsychosocial model frames brain fog as a context-dependent experience emerging from interacting biological changes, psychological processes, and social conditions, rather than a purely biomedical problem.

Methodology

This study adopted a qualitative research design to explore how Indian women experience brain fog across different reproductive life stages. A qualitative approach was considered appropriate because it allows for an in-depth understanding of women's lived experiences, meanings, and cultural influences. It helps capture how women describe and interpret brain fog within their everyday lives and social environments (Kalra et al., 2013).

Data Collection

The data was collected through an open-ended, semi-structured online questionnaire that was administered via Google Forms. The format will allow participants to describe their experiences of brain fog in their own words, covering cognitive changes, emotional and psychosocial impacts, cultural interpretations, and coping strategies. An online approach was chosen to improve accessibility, ensure geographical diversity and allow participants to complete the survey at their own pace and convenience.

Sampling Strategy

Purposive sampling will be used to recruit participants who self-identify as experiencing symptoms of brain fog. To ensure better reach across different reproductive stages, snowball sampling was also applied as that will allow participants to share study information with other eligible individuals. The study aims to recruit approximately 24 participants, with six participants from each reproductive stage: menstruating , pregnant, perimenopausal, and postmenopausal women.

Data Saturation

Data collection will continue until thematic saturation is reached. Saturation refers to the point at which no new themes or meaningful insights emerge from the data.

Inclusion Criteria

Participants will be included in the study if they:

- Identify as women
- Are Indian residents or of Indian origin
- Belong to one of the defined reproductive life stages
- Are 18 years of age or older
- Self-report experiencing symptoms of brain fog (e.g., forgetfulness, mental cloudiness, or difficulty concentrating)
- Are able to read and respond in English

Exclusion Criteria

Participants will be excluded from the study if they:

- Have a diagnosed neurological disorder such as epilepsy, dementia, or multiple sclerosis
- Are currently undergoing treatment for severe psychiatric disorders unrelated to brain fog symptoms
- Use cognitive-enhancing medication unless cognitive complaints persist despite treatment
- Do not fall within the defined reproductive categories for this study

Data Analysis

Data will be analyzed using thematic analysis following Braun and Clarke's (2006) six-phase framework, which includes:

- Familiarization with the data
- Generating initial codes
- Searching for themes
- Reviewing themes
- Defining and naming themes
- Producing the final report with supporting participant quotations

The analysis will be guided by a biopsychosocial framework to interpret findings across biological, psychological and social/cultural dimensions. This approach allows integration of individual experiences with broader contextual influences. Taguette,a qualitative data analysis software will be further used to support systematic coding, data organization, and data retrieval throughout the analysis process.

Results

A total of 14 responses were included in the analysis with 13 participants belonging to the menstruating category and no responses obtained from the pregnant, perimenopausal, or postmenopausal groups. Data collection for the menstruating group continued until thematic saturation was reached. Thematic analysis generated 128 codes, of which 125 were applied at least once, resulting in 497 coding references. The most frequent codes included cognitive difficulty (n = 50), adaptive coping (n = 24), gendered dismissal (n = 21), lack of awareness (n = 15), and confusion (n = 14). These codes were then organised into five themes capturing women's lived experiences of brain fog across psychological, functional, cultural, coping, and reproductive dimensions.

Theme 1: Lived Experience of Brain Fog

The participants described brain fog as a subjective cognitive disruption marked by reduced mental clarity, difficulty concentrating, forgetfulness, impaired decision-making, word-finding challenges, and mental slowness, with several using the term "foggy" to describe their experience. The experience varied across participants, with some reporting recurring or fluctuating episodes and others noting gradual cognitive changes over time. While a few perceived the impact as mild with limited functional disruption, others reported no current experience of brain fog.

Theme 2: Psychological and Functional Impact on Daily Life and Self

The participants reported that brain fog affected their emotional wellbeing, daily functioning, and self-perception. Emotional responses included frustration, emotional instability, feeling overwhelmed, mood changes, numbness, social withdrawal, self-blame, and uncertainty about health. Many participants described reduced self-confidence and negative self-evaluations, with concerns about declining competence, although a few stated that brain fog did not affect their self-concept. Functionally, brain fog disrupted productivity and daily routines, leading to procrastination, avoidance of social activities, reduced work efficiency, and difficulty completing tasks. Sleep disturbances and appetite changes were also reported as contributing factors to these experiences.

Theme 3: Cultural and Gendered Meaning-Making of Brain Fog

Many participants also reported experiences of gendered dismissal, where cognitive complaints were minimised, normalised, or attributed to stereotypes about emotional sensitivity or low stress tolerance. Themes such as stereotype-based explanations, symptom dismissal, and lack of validation reflected limited recognition of brain fog as a legitimate concern. The participants also described silence and selective disclosure and often avoiding discussion of symptoms due to fear of misunderstanding or invalidation, although a minority of responses reflected neutral or absent gendered framing.

Theme 4: Coping Responses and Adaptation Strategies

Adaptive coping strategies were most frequently reported and included self-monitoring, adjusting daily routines, pacing activities, regulating emotions, using reminders and educating themselves about their symptoms. Some participants reported developing stable long-term coping mechanisms, whereas others described temporary relief through rest and lifestyle adjustments. Avoidant or maladaptive coping responses were also mentioned, including emotional withdrawal and ignoring cognitive difficulties. These strategies were often linked to limited social validation or lack of support. Support-seeking emerged as an additional important dimension of coping. Participants emphasized the value of open conversations, emotional support, and sharing experiences with others. However, several women reported unmet support needs.

Theme 5: Reproductive Life Stage and Contextual Influences

Among menstruating participants, brain fog was often associated with menstrual changes, hormonal fluctuations, and periods of heightened stress. Many women interpreted their symptoms through a stress-related lens rather than attributing them solely to biological causes. Some participants reported no perceived connection between brain fog and reproductive stages, describing it as context-dependent rather than stage-specific. A few participants linked their experiences to other life stages such as postpartum periods or midlife transitions, associating increased responsibilities, fatigue, and age-related changes with cognitive difficulties.

Table 1: Represents the themes, subthemes and sample codes

THEME	SUBTHEMES	SAMPLE CODES
Lived Experience of Brain Fog	Cognitive disruption and its pattern and nature	Cognitive difficulty, forgetfulness, poor concentration, word-finding difficulty, foggy, slowness, confusion.
Psychological and Functional Impact	● Emotional impact ● Identity and self-perception ● Daily functioning	Emotional instability, reduced self-confidence, procrastination, numbness.
Cultural and Gendered Meaning-Making	● Gendered dismissal ● Silence and invisibility ● Neutrality	Gendered stereotypes, non-disclosure, lack of awareness, negative labeling, lack of validation.
Coping Responses and Adaptation	● Adaptive coping ● Avoidant coping ● Support-seeking	Self-monitoring, avoidance, social support, emotional withdrawal.
Reproductive Life Stage and Context	● Menstruation-related experiences ● Non-stage-specific experiences	Hormonal attribution, stress-focused interpretation, Nonstage-related experience, Postpartum, age specific vulnerability.

Discussion

This study explored how Indian women experience and interpret brain fog across their reproductive life contexts with attention to its psychological, functional, and sociocultural dimensions. The findings suggest that brain fog is primarily experienced as a disruption in cognitive functioning; however, its impact extends beyond cognition to influence emotional well-being, identity, and daily activities. Although most responses were obtained from menstruating participants, brain fog was not perceived as strictly tied to a

specific reproductive stage; instead, it was described as a dynamic and context-dependent experience that is shaped by biological, psychological, and social factors. The participants characterized brain fog as a cluster of cognitive difficulties, including forgetfulness, reduced concentration, slowed thinking, and word-finding problems, rather than as a single or clearly defined symptom. This aligns with existing literature that conceptualizes brain fog as a heterogeneous and multidimensional experience (McWhirter et al., 2022; Denno & Hampshire, 2025). The variability in intensity and duration reported in this study further corresponds with the four-dimensional framework which highlights attention, memory, executive functioning, and mental energy as core domains affected (Alim-Marvasti et al. 2024). Importantly, women connected cognitive difficulties to emotional distress, workload, stress, and gendered expectations, indicating a strong psychosocial influence. The experiences of dismissal and normalization was also shaped by how symptoms were understood and communicated. These findings reinforce the biopsychosocial interpretation of brain fog demonstrating that cognitive experiences are not solely determined by biological mechanisms but are also constructed through psychological responses and sociocultural contexts. Overall, brain fog emerged as a subjective and fluctuating experience that exists along a continuum rather than as a fixed clinical condition.

The second theme demonstrated that brain fog extends beyond cognitive impairment and significantly affects women's emotional well-being, self-concept, and daily functioning. The participants described brain fog not only as forgetfulness or mental slowing but also as a disruption that influences how they feel about themselves and manage everyday responsibilities. In the responses, emotional distress was a prominent component with many reporting frustration, irritability, anxiety, emotional instability, and feelings of being overwhelmed. Some participants expressed self-blame and concerns about declining competence while others reported emotional numbness or withdrawal indicating variability in responses. These findings align with qualitative research showing that subjective cognitive difficulties generate psychological strain, stigma, guilt, and reduced confidence, particularly when symptoms are invisible and misunderstood (Callan et al., 2021;Chasco et al., 2022; Dass et al., 2025). The emotional burden often coexists with cognitive disruption which creates a cycle in which psychological distress reinforces perceptions of impaired cognition. Brain fog also shaped identity and self-perception. The participants frequently used negative self-labels such as "lazy," "incompetent," or "not good enough," reflecting weakened self-confidence during episodes of cognitive difficulty. These narratives mirror findings from qualitative studies identifying identity disruption and "spoiled identity" processes when cognitive limitations interfere with valued roles (Callan et al., 2021; Johnson & Ogden, 2024). Similar patterns have been reported in the concept of analysis of brain fog, where individuals described a loss or alteration of core aspects of identity linked to persistent cognitive strain (Dass et al., 2025). While most participants reported some degree of identity impact, a minority maintained stable self-perception, suggesting that resilience and coping strategies may buffer identity disruption. The participants also reported procrastination, avoidance of social or professional commitments, and difficulty in sustaining focus; this indicates that cognitive challenges translate into practical limitations. Sleep disturbances and appetite changes were also reported suggesting that brain fog intersects with broader health behaviors. These findings are consistent with large-scale empirical research demonstrating that subjective brain fog is associated with measurable impairments in attention, executive functioning, and daily productivity, as well as reduced labor performance and long-term functional consequences (Alim-Marvasti et al., 2024; McWhirter et al., 2022).

The third theme demonstrates that women's experiences of brain fog are shaped not only by cognitive disruption but also by broader cultural and gendered contexts. The participants reported experiences of gendered dismissal, stereotyping, and invalidation when discussing their cognitive difficulties. The participants described feelings of shame, frustration, and self-doubt when their concerns were dismissed, suggesting that social invalidation intensifies psychological distress. The concept of epistemic injustice is reflected in the responses where repeated dismissal led women to question the legitimacy of their own experiences. Importantly, negative labeling such as being described as "lazy" or "incompetent" illustrates how cognitive challenges were moralized rather than medicalized. From a feminist health psychology perspective, such responses reflect structural and cultural expectations that position women as emotionally regulated and highly productive. The findings resonate with frameworks such as the feminist political economy of health, which argues that health inequities are shaped by broader social and economic structures rather than solely biomedical factors (Syed, 2021). However, not all experiences were framed through gendered dismissal. A smaller subset of participants reported neutral interpretations, where brain fog was treated as a personal or situational difficulty rather than socially judged. This variation indicates that gendered meaning-making is not universal but context-dependent. Neutrality may reduce overt invalidation, though it does not necessarily imply active support.

The fourth theme findings highlights that brain fog is best understood as a contextually shaped, biopsychosocial experience rather than a uniform or purely hormone-driven cognitive deficit. While several participants interpreted fluctuations in attention, clarity, and memory through the lens of menstruation, others reported no consistent stage-based pattern and instead attributed their cognitive changes to stress, workload, sleep disruption, or emotional strain. This variability aligns with large-scale evidence indicating inconsistent objective cognitive differences across menstrual phasesand research suggesting that subjective cognitive complaints are more strongly associated with mood and stress than with hormonal shifts alone (Jang et al., 2025).

In the fifth theme, the findings indicate that women actively situated brain fog within, or outside of, reproductive frameworks depending on their lived experience. Many participants described menstruation-linked fluctuations in attention and mental clarity, interpreting these changes through embodied awareness rather than clinical reasoning. Experimental findings show task-specific estrogen-related variations in implicit memory, offering partial biological plausibility, while narrative reviews highlight that mood and stress often co-occur with subjective cognitive complaints (Maki et al. 2002). Together, these findings support participants' interpretations that hormonal shifts interact with emotional strain and contextual pressures rather than operate as sole causes. At the same time, a substantial group did not associate brain fog with reproductive stage, instead they linked it to workload, stress, or fatigue, aligning with research showing that subjective cognitive complaints frequently reflect contextual and psychological factors rather than hormonal status alone.

The following section below briefly reviews research on pregnancy, perimenopause, and postmenopause, as the present study did not include sufficient participants from these stages.

The evidence on pregnancy-related brain fog is mixed but meaningful. A study conducted at Jinnah Postgraduate Medical Center using the Montreal Cognitive Assessment found modest reductions in memory and language among pregnant women, particularly in later trimesters, with education acting as a protective factor (Ali et al., 2025). In contrast, neuroimaging research reported preserved or even adaptive cognitive functioning in late pregnancy (Raz, 2024). Similarly, women with prior hypertensive pregnancy disorders reported increased subjective cognitive complaints without consistent objective deficits (Postma

et al., 2016). Overall, the literature suggests that pregnancy-related brain fog is commonly experienced but inconsistently measurable, reflecting interactions among hormonal shifts, stress, sleep disruption, and contextual factors rather than permanent cognitive decline.

Perimenopausal cognitive complaints are common but inconsistently defined. The qualitative research from India shows that menopause is interpreted as normal transition, distress, or freedom, with forgetfulness and mental fatigue often normalised rather than medicalised (Singh & Sivakami, 2020). Population data further indicate that most rural perimenopausal women report fatigue, irritability, and reduced concentration, with symptoms associated with depression, BMI, and lifestyle factors, supporting a biopsychosocial interpretation (Nagaraj et al., 2021). Additional qualitative evidence highlights that cognitive complaints are embedded within identity shifts and social role transitions, suggesting that biological explanations alone are insufficient (Sathiyaseelan et al., 2024). Quantitative findings show that early menopause is linked to poorer cognitive performance and reduced frontal gray matter volume, although causal conclusions cannot be established (Mensegere et al., 2024). Similarly, menopause severity predicts cognitive difficulties even after controlling for anxiety, reinforcing a physiological contribution alongside emotional context (Singh, 2025). Overall, perimenopausal brain fog appears multidimensional, shaped by hormonal transition and psychosocial factors rather than estrogen decline alone.

Postmenopausal research in India rarely focuses specifically on brain fog, but cognitive complaints commonly appear within broader symptom patterns. A study reported that postmenopausal women experienced fatigue, irritability, and reduced mental clarity, with symptoms interpreted either as normal aging or relief from reproductive roles, showing that meaning-making shapes symptom appraisal (Popli, 2023). Another study found that cognitive concerns such as poor concentration and forgetfulness were embedded within sociocultural and systemic pressures, with surgical menopause and employment status influencing symptom intensity (Mitra et al., 2025a). Similarly showed that women in rural settings described mental fatigue but often viewed it as a natural part of aging and rarely sought care due to access barriers (Sarkar et al., 2023a). Overall, postmenopausal cognitive experiences are strongly shaped by social context and healthcare access, with research focusing more on subjective complaints than measurable cognitive decline.

Across the studies done in pregnancy, perimenopause and postmenopause, the research shows that cognitive complaints resembling brain fog are common but inconsistently captured through objective testing. Pregnancy studies report mixed findings with some identifying mild cognitive reductions and others demonstrating neural adaptation with preserved performance. Perimenopause research links hormonal transition to cognitive complaints while also highlighting the influence of stress and mood. Postmenopausal studies emphasise identity shifts, sociocultural meaning-making, and systemic barriers rather than purely biological decline. A consistent pattern across stages is the gap between subjective reports of forgetfulness, slowed thinking, and reduced concentration and limited objective evidence of significant impairment. This suggests that brain fog reflects an interaction of neuroendocrine changes, emotional wellbeing, sleep disruption, workload, and social context. However, Indian research remains limited, largely cross-sectional and region-specific, with minimal longitudinal tracking or hormonal integration. The term “brain fog” is also rarely used explicitly despite clear symptom overlap. Future research should adopt stage-specific, longitudinal designs that integrate objective and subjective measures within culturally grounded frameworks.

Conclusions

Overall, across menstruation, pregnancy, perimenopause, and postmenopause, the findings demonstrate that brain fog is not an isolated cognitive deficit but a lived, multidimensional experience shaped by hormonal transitions, emotional wellbeing, social expectations, and cultural meaning. Existing research shows mixed evidence, some clinical and neuroimaging studies identify measurable cognitive changes during pregnancy or menopausal transitions, whereas others demonstrate stable performance or even adaptive neural functioning. However, women consistently report subjective experiences of forgetfulness, mental slowing, distraction, and reduced confidence in thinking. This persistent gap between objective testing and subjective experience underscores that brain fog cannot be understood solely through neuropsychological scores. A key contribution of this study is centering Indian women's voices and examining cognitive experiences across multiple reproductive stages rather than isolating one phase. Participants actively interpreted and normalized their cognitive changes by linking them to hormonal fluctuations, stress, caregiving demands, identity shifts, and social pressures. This meaning-making process demonstrates that brain fog is not simply experienced but actively constructed within biological and sociocultural contexts an area that remains underexplored in Indian research. The findings further highlight that brain fog extends beyond biology. Emotional distress, sleep disruption, workload, gendered expectations, family responsibilities, and healthcare access all shape how cognitive changes are experienced and validated. By integrating biological, psychological, and sociocultural dimensions, this study moves beyond a purely biomedical interpretation and supports a biopsychosocial framework. Importantly, the study challenges two dominant misconceptions: that brain fog is imaginary or exaggerated, and conversely, that it necessarily signals cognitive decline. Instead, it reflects dynamic neurobiological transitions combined with real-life pressures. Understanding brain fog through this balanced lens can encourage more sensitive healthcare responses and reduce stigma around reproductive-stage cognitive changes. Stage-specific patterns also emerged. During menstruation, brain fog was often described as cyclical and temporary. In pregnancy, experiences were mixed with increased forgetfulness and fatigue frequently linked to stress, sleep disruption, and physical demands, alongside evidence of possible neural adaptation in the literature. In perimenopause, cognitive complaints were strongly connected to identity shifts and aging concerns. In postmenopause, symptoms were often normalized as part of aging, though emotional distress and limited support intensified experiences for some women. These variations demonstrate that brain fog is not uniform but context-dependent across life stages.

Implications

1. This study emphasizes the importance for a better recognition and validation of cognitive concerns in the healthcare context. Women's complaints about forgetfulness, mental fatigue, or problems with concentration are commonly attributed to normal aging or stress, so healthcare professionals should recognize these complaints as valid experiences and investigate underlying causes rather than downplaying them.
2. Healthcare professionals, such as gynecologists, family physicians, and mental health professionals, would greatly benefit from education about cognitive changes throughout the different reproductive phases. Healthcare practice could include screening for cognitive problems, stress, sleep problems, and emotional well-being, along with counseling and support strategies.
3. Health education at the public health level is also important. Women should be provided with clear information about the potential changes in cognitive function that may occur throughout the different

reproductive phases to improve self awareness and alleviate uncertainty. Health education programs can be implemented in schools, antenatal clinics, community health centers, and workplace health programs. It is important to note that health awareness campaigns should not be limited to women, it should also include partners, families, and caregivers to encourage supportive reactions rather than skepticism and criticism.

4. The workplace is also an important area. Gender-sensitive policies like flexible work hours, modified workloads during challenging periods, telecommuting, and supportive management can help alleviate cognitive load and burnout. Identifying cognitive well-being as a part of overall employee well-being is a step forward in inclusion and productivity and helps eliminate stigma associated with reproductive transitions.

Limitations

Several limitations should be acknowledged.

1. Firstly, the participants were not evenly distributed across all the stages which limited the extent to which the study participants in the different stages could be compared.
2. The study did not adequately control for the effects of factors such as the quality of sleep, mental health conditions, medications, workload, and the presence of chronic conditions, which may affect cognitive experiences and may be related to the reproductive stages.
3. In addition, since the study participants described the experience of brain fog as changing over time, the results may be better understood if the study was longitudinal in nature.
4. Lastly, the study was based on an online survey, which limited the extent to which the researcher was able to interact with the participants and observe the participants' non-verbal and emotional responses.

Suggestions for Future Research

1. Future studies should include qualitative face to face in-depth interviews to provide more insight into the interpretation and experience of brain fog in women. Interviews enable probing and exploration of meaning in more depth than in a survey.
2. Longitudinal designs are highly recommended to follow the experience of cognitive phenomena over reproductive transitions. This would enable the determination of patterns, duration, and variability of brain fog.
3. Future studies should also include both subjective experience and neuropsychological testing to explore the relationship between subjective cognitive experience and objective performance. This would enable a more comprehensive understanding of both experience and objective performance.
4. In addition, future research should focus on more diverse samples of women, including those from different socioeconomic groups, rural, and differing levels of education. This would help to understand a greater generalisability and exploration of contextual differences in the experience of brain fog.

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