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Screening for Cognitive Impairment in Post-Menopausal Women using the Brief Cognitive Rating Scale Tool

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Abstract

Cognitive impairment is characterized by diminished cognitive abilities beyond those resulting from various factors that interfere with the brain's typical processing functions. To screen cognitive impairment in post-menopausal women and to raise awareness among women on self-caring after menopause. This prospective observational study was conducted over six months in both the inpatient and outpatient units of a tertiary care hospital. Females in the postmenopausal years (five to ten years after menopause) who had not previously had any of the following conditions were eligible to participate: no history of trauma, head injury, stroke, mental illness, or non-psychotic medication. The Brief Cognitive Rating Scale (BCRS) was utilized to assess and screen for cognitive impairment. Out of 150 patients, 118 were found to have cognitive impairment. Common symptoms included memory problems, lack of concentration, orientation issues, and functional decline. This study's results confirm the BCRS's validity and reliability as a screening tool for cognitive impairment, and also highlight the need to make lifestyle changes and get counseling early on to keep the quality of life high.

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Keywords: Brief Cognitive Rating Scale Tool, Cognition, Cognitive Impairment, Post-menopause, Screening for Post-Menopausal.

1. INTRODUCTION

Every woman goes through menopause at some point, and it is common for women to experience hot flashes, insomnia, and mood swings. But what is less talked about is the impact it can have on the brain. For many women, this stage quietly brings difficulties with memory, focus, and decision-making. Globally, more than 50 million women enter menopause each year, and nearly one in five of them are in India. Studies suggest that up to one in three women may notice some form of cognitive decline during this time (Conde et al., 2021).

Estrogen is one of the main hormonal key factors behind menopause. Beyond its role in reproductive health, estrogen helps keep brain cells communicating and protects blood flow in the brain. As levels drop during menopause, these protective effects also fade. Unlike physical symptoms that are easily noticed, cognitive changes can slowly build up. A woman might brush off forgetfulness or trouble concentrating as a normal part of getting older. Often, it is only when these problems start to affect her daily life that she seeks help; by then, the burden can be significant (Conde et al., 2021).

Sleep disturbances, which are also common during menopause, further worsen cognitive performance. Interrupted or poor-quality sleep affects memory consolidation and emotional regulation. In turn, the stress of poor sleep can lead to anxiety and low mood, further worsening cognitive issues. Mental health experts who can assist in recognizing and addressing these interrelated issues may be inaccessible to some Indian women, especially those living in rural areas or with limited resources (Jehan et al., 2015).

To tackle this issue, we need healthcare that speaks the language of women's lives, both scientifically and culturally. Community awareness campaigns can help women and families understand that changes in memory or focus during menopause are not "just in their head" (Popli R, 2024). Including traditional Indian foods that are rich in plant-based estrogens like soy, flaxseed, or lentils might offer nutritional support (Petrine et al., 2020). (Sharma & Kozlowska, 2020). Yoga, meditation, and deep breathing are all examples of mind-body practices that have demonstrated potential for stress reduction and enhanced cognitive function (Brunner et al., 2017).

In addition to improving cardiovascular health, research indicates that physical activity also promotes brain-derived neurotrophic factor (BDNF), a protein essential for learning and memory. A slower rate of cognitive decline and other age-related brain changes can be achieved with regular aerobic activity, such as walking or cycling. According to Erikson et al. (2011), encouraging women to maintain an active lifestyle throughout menopause ought to be a top concern for public health.

Recognizing brain health as part of menopause care is long overdue. By blending modern science with cultural understanding, we can ensure that Indian women do not have to silently struggle through changes that are both real and treatable.

Education, early detection, and accessible interventions could make a meaningful difference in improving quality of life during this life stage.

2. LITERATURE SURVEY

Cognitive health issues during menopause often emerge gradually, starting with minor forgetfulness or difficulty focusing, but may eventually disrupt a woman's daily life. In India, where millions of women enter menopause each year, this issue is becoming a growing public health concern that is still underrecognized. The post-menopausal decline in estrogen, a hormone known to support brain plasticity and memory, plays a central role in this cognitive shift. Without the neuroprotective effects of estrogen, the brain becomes more vulnerable to deficits in memory, attention, and executive function. This risk is compounded in the Indian context, where menopause tends to occur earlier and is often accompanied by co-existing health issues such as hypertension and diabetes, both known accelerators of cognitive decline (Parkin et al., 2024).

Memory and executive function are two areas that tend to suffer as estrogen levels drop, which happens throughout menopause. Studies show rural postmenopausal women often have poorer cognitive performance than urban women due to limited healthcare access. A validated tool for evaluating cognitive performance in many cultures, including South Asians, is the Mini-Mental State Examination (MMSE). However, research comparing urban and rural postmenopausal women's cognitive function remains limited, especially in Bangladesh, underscoring the need for focused studies to guide effective interventions (Husna et al., 2024).

Estrogen depletion in postmenopausal women is linked to increased inflammation, which may contribute to cognitive decline. Several studies have shown that inflammatory biomarkers such as CRP, IL-6, and TNF-α are elevated in poor, pro-inflammatory diets, which further increases this risk. Research has found that postmenopausal women with anti-inflammatory diets have better cognitive scores and lower inflammation levels. Higher dietary inflammatory potential is linked to a larger likelihood of cognitive impairment, but education and physical activity also have protective effects. Common cognitive assessment tools for this population include the Mini-Mental State Exam (MMSE) and the Montreal Cognitive Assessment (MOCA). Skoczek-Rubinska et al. (2021) found that postmenopausal women may be able to prolong their cognitive function and quality of life by incorporating anti-inflammatory foods into their diets and staying active.

A known risk factor for cognitive impairment, particularly in postmenopausal women, is type 2 diabetes mellitus (T2DM). Mild cognitive impairment (MCI) and dementia are more common in those with poorly controlled diabetes and in those whose disease has persisted for a longer period, according to the research. Elevated HbA1c levels and chronic hyperglycemia contribute to neurodegeneration and vascular changes affecting cognition. Studies using tools like the MoCA consistently report a high prevalence of MCI in diabetic postmenopausal women, emphasizing the

need for regular cognitive screening in this group to enable timely intervention (Dhivya et al., 2024).

Recent literature highlights the growing burden of cognitive decline and neurodegenerative diseases in ageing populations, emphasizing the need for effective preventive strategies. Lifestyle interventions such as cognitive training, dietary modifications, and physical exercise have shown significant promise in preserving cognitive function among older adults. Cognitive stimulation, physical exercise on a regular basis, a diet high in healthy fats and antioxidants, and a reduced risk of cognitive decline are all things that have been shown in studies to help people live better lives. Multimodal and personalized interventions, as well as sustained engagement, appear especially beneficial (Patil et al., 2024).

India stands at a turning point where embracing both traditional wisdom and modern medicine could dramatically reduce the burden of cognitive impairment in aging women. By empowering women, proactive cognitive health can be achieved through shifting the narrative to timely interventions, as well as knowledge access from silent suffering.

3. PROPOSED SYSTEM DESIGN AND METHODS

3.1. *Study design*

A six-month prospective observational study was conducted at a healthcare facility.

3.2. *Study Site*

Inpatient and outpatient Department of Tertiary Care Teaching Hospital, Bangalore.

3.3. *Inclusion Criteria*

Patients admitted to the hospital's inpatient and outpatient units who were women experiencing menopause symptoms (5 to 10 years post menopause).

3.4. *Exclusion Criteria*

Patients with a history of:

- Trauma.
- Head injury.
- Stroke.
- Psychiatric problems.
- Anti-psychotic drugs.
- Those who declined to take part in the pilot project.

3.5. *Data Collection*

After obtaining informed consent, patients who were eligible for inclusion were recruited. All details, such as demographics, obstetrics and gynecology history, medical history, and medication history, were corrected. The BCRS scale was used to assess their cognitive function. All the data were pooled and analyzed. Among selected patients, data extracted from patients include their demographics, medical history, medication history, and ongoing treatment from medical records to screen cognitive impairment in Post Menopausal Indian Women using the BCRS tool.

3.6. *Results*

Demographics: 150 female patients in post-menopausal state (between five – ten years).

Table 1. Distribution of Patients based on Age (Years).

Sl. No.	Age Range (Year)	No. of patients	Percentage (%)
1	31-40	NIL	NIL
2	41-50	39	26
3	51-60	90	60
4	61-70	21	14
	Total	**150**	**100**

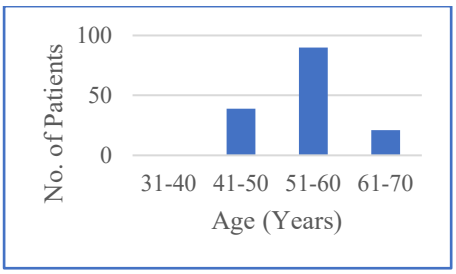

Fig. 1. The distribution of patients based on Age (Years).

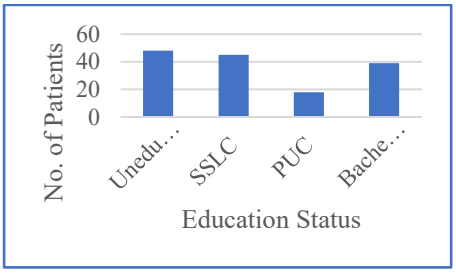

Fig. 2. The Distribution of Patients based on Educational Status.

Table 2. Distribution of Patients Based on Educational Status.

Sl. No.	Education Status	No. of patients	Percentage (%)
1	Uneducated	48	32
2	SSLC	45	30
3	PUC	18	12
4	Bachelor's/Master's/PhD	39	26
	Total	**150**	**100**

Table 3. Distribution of Patients Based on Occupation.

Sl. No.	Occupation	No. of patients	Percentage (%)
1	Housewife	116	77.3
2	Servant	13	8.6
3	Academician	13	8.6
4	Attender	8	5.3
	Total	**150**	**100**

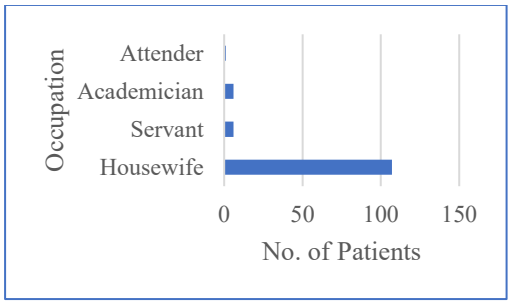

Fig. 3. The Distribution of Patients Based on Occupation.

Table 4. Distribution of patients based on the Type of Menopause

Sl. No.	Type of Menopause	No. of Patients	Percentage (%)
1	Natural Menopause	101	67.3
2	Hysterectomy	49	32.6
	Total	**150**	**100**

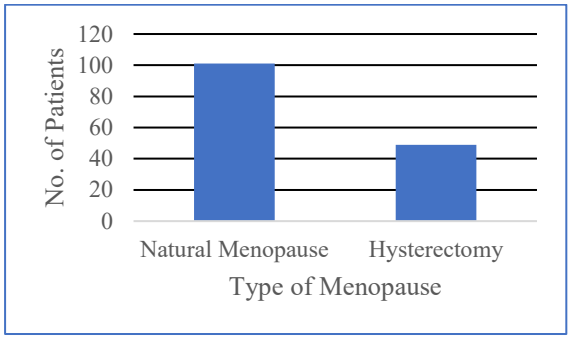

Fig. 4. The Distribution of Patients based on Type of Menopause.

Table 5. Distribution of Patients based on No. of Gravida.

Sl. No.	No of Gravida	No. of patients	Percentage (%)
1	0	8	5.3
2	1	10	6.7
3	2	64	42.7
4	3	59	39.3
5	4	9	6
	Total	**150**	**100**

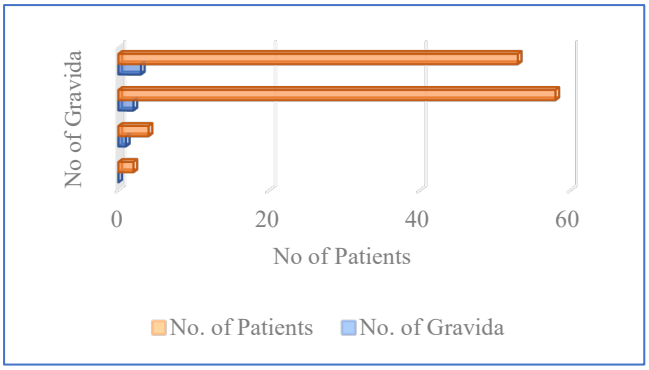

Fig. 5. The Distribution of Patients based on No. of Gravida.

Table 6. Distribution of patients based on the post-menopause period.

Sl. No.	Post-Menopause Period (between Five-Ten years)	No. of patients	Percentage (%)
1	5	47	31%
2	6	24	16%
3	7	15	10%
4	8	27	18%
5	9	6	4%
6	10	31	21%
	Total	**150**	**100**

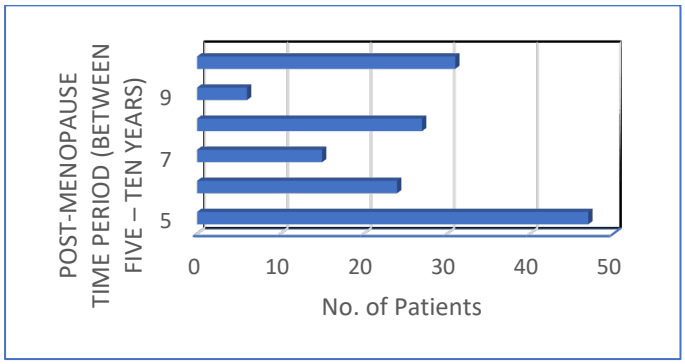

Fig. 6. The Distribution of Patients Based on Post-Menopause period (between Five – Ten years).

Table 7. Distribution of patients based on Cognitive Status.

Sl. No.	Cognitive Status	No. of patients	Percentage (%)
1	No Cognitive Decline	32	21
2	Very Mild Cognitive Decline	112	75
3	Mild Cognitive Decline	0	0
4	Moderate Cognitive Decline	0	0
5	Moderately Severe Cognitive Decline	6	4
6	Severe Cognitive Decline	0	0
7	Very Severe Cognitive Decline	0	0
	TOTAL	**150**	**100%**

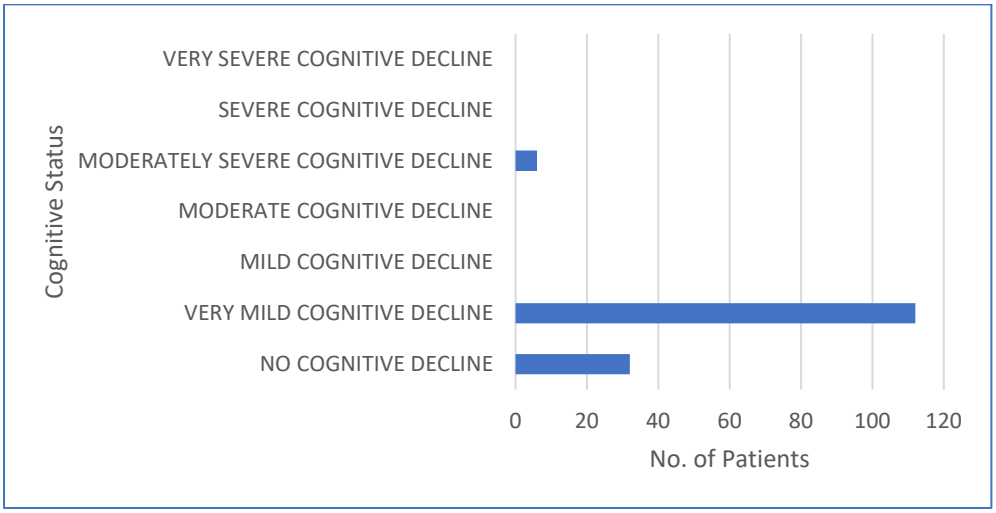

Fig. 7. The Distribution of Patients based on Cognitive Status.

4. DISCUSSION ON RESULTS

The purpose of this research was to screen the cognitive impairment in post-menopausal women in the Indian population using the BCRS tool. The analysis included 150 patients who were in the post-menopausal state between five to ten years. Menopause is defined as exactly 12 months following the cessation of that period. When we consider a post-menopausal woman, tertiary sources define that as exactly 5 years after menopause. So, we considered subjects who were between the ages of 5-10 after menopause because patients below 5 years may not have enough hormonal changes, and above 10 years may have age-related cognition issues. So, it was discussed and decided to recruit the subjects between 5-10 years of menopause.

Cognitive status among post-menopausal women revealed very mild cognitive impairment, especially in the 51 – 60 years old age group. This is associated with menopausal transition and estrogen decline, which affect brain metabolism and amyloid deposition, especially in patients with natural menopause and hysterectomy. In contrast, women aged 41-50 years show fewer cognitive declines, mostly no impairment or very mild cognitive changes.

Cognitive status was screened using the Brief Cognitive Rating Scale (BCRS), which showed 75% of women) experienced very mild cognitive decline, 21% showed no detectable decline, and only 4% exhibited moderately severe decline. These results resemble earlier findings by Conley et al. (2022). The high proportion of very mild decline suggests that this post-menopausal phase represents a critical window for initiating cognitive interventions, particularly lifestyle-based or neuroprotective strategies that can delay progression to more severe impairment (Patil et al., 2024).

Importantly, the absence of severe cognitive cases may indicate either a delayed onset beyond our ten-year focus or may require extended follow-up to detect long-term progression. This reinforces the value of periodic monitoring even in asymptomatic individuals, especially during early post-menopause when the brain undergoes estrogen withdrawal and begins to affect neuronal function (Skoczek-Rubinska et al., 2021).

The design was effectively tailored for post-menopausal Indian women between five to ten years in the post-menopausal state. Women more than ten years post-menopause may show cognitive impairment largely attributable to age-related neurodegenerative processes rather than menopause itself (Han et al., 2021; Shumaker et al., 2004). There have been some positive effects on cognition and metabolism from HRT when begun early, around menopause. Women who are at risk for cardiovascular disease should use transdermal estrogen since it is safer. To optimize benefits while minimizing hazards, future research should center on developing precise screening criteria, improving treatment regimens, and personalizing ERT (Al-Sharafi et al., 2025).

5. ADVANTAGES OF THE PROPOSED SYSTEM

Focusing on women five – ten years post-menopause helped us understand cognitive changes due to hormones rather than aging. Using the BCRS tool made screening easier, especially for women with limited literacy. It is quick, low-cost, and does not need lab tests, making it ideal for real-world hospital settings. Most women showed very mild decline, highlighting a key window where early action, like lifestyle changes, can make a big difference.

6. SOCIAL WELFARE OF THE PROPOSED SYSTEM

This study brings attention to a silent problem many women face but rarely discuss: cognitive decline after menopause. Rural and underserved women especially benefit, as BCRS can be used without needing specialists. Early detection helps reduce unnecessary tests, hospital visits, and caregiver stress. Improving women's mental health and quality of life as they age is another benefit.

7. FUTURE ENHANCEMENT

Future studies can include blood tests or estrogen levels to better understand the causes. A mobile app version of BCRS could help screen women in remote areas. Long-term follow-up and adding simple interventions like yoga or memory exercises could show if symptoms improve. Expanding the study across different regions would also improve its relevance nationwide.

8. CONCLUSION

In conclusion, this study underscores the critical need for routine cognitive screening in Indian post-menopausal women, particularly during the five-to-ten-year window after menopause, where early signs of decline are most detectable yet frequently overlooked. The predominance of very mild cognitive impairment (75%) in our cohort highlights a pivotal opportunity for timely interventions that could mitigate progression to severe decline. The study also revealed the effectiveness of the Brief Cognitive Rating Scale (BCRS) as a culturally adaptable tool for this population, addressing gaps in literacy and regional applicability. To evaluate the course of cognitive decline, however, longer-term follow-up is required as severe cases are not present. These findings advocate for integrating menopausal cognitive health into primary care protocols, emphasizing lifestyle modifications and early counseling to preserve quality of life. Culturally sensitive awareness programs are essential to overcome stigma and encourage proactive mental health engagement among this high-risk group.

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Data Availability: All data generated and analyzed are included in this research article.