

1 **Title: Determining the Prevalence and Severity of Menopausal Symptoms in Post-Menopausal**  
2 **Women of Eluru, Andhra Pradesh using the Menopause Rating Scale (MRS)**

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19 **Discussion Points:** There is a significant lack of awareness and limited literature addressing the specific  
20 challenges faced by women in India during menopause and in managing menopausal symptoms, especially  
21 women in a rural setting. This study aims to assess the prevalence and severity of menopausal symptoms  
22 among women in Eluru, Andhra Pradesh, in order to better understand the specific challenges faced by  
23 rural women during this transitional phase.  
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Accepted for publication

1 **ABSTRACT**

2 **Background:** This study aimed to assess the prevalence and severity of menopausal symptoms among  
3 women in Eluru, Andhra Pradesh, in order to better comprehend the specific challenges faced by rural  
4 women during this transitional phase.

5 **Methods:** Post-menopausal women who visited the Rural Health and Training Center in Eluru between  
6 September-November 2021 and had one year of amenorrhea, were included. A face-to-face interview  
7 administered a questionnaire to collect socio-demographic details and the Menopause Rating Scale (MRS)  
8 which contains 11 questions using a 4-point Likert scale. Microsoft Excel and SPSS-20, with one-way  
9 ANOVA test were used for data and statistical analysis.

10 **Results:** A total of 100 respondents were included, aged between 45-60 years. Majority of the respondents  
11 (37%) were aged 45-50 years, and were unskilled workers (53%) with a monthly income falling under the  
12 upper middle-class category (53%). Additionally, 61% belonged to nuclear families. Using the MRS, joint  
13 and muscle pains were the most prevalent symptoms (82%), followed by sleep problems (64%) and anxiety  
14 (57%). Heat discomfort was reported least frequently (25%). Age groups and symptom severity were found  
15 to be significantly associated, indicating that women between 45-50 years were more likely to experience  
16 mild-severe symptoms.

17 **Conclusion:** This study identified a notable prevalence of menopausal symptoms among women in Eluru,  
18 however, limitations included the limited sample size and geographic scope. Retrospective data collection  
19 might have introduced recall bias. The study highlights the need for increased awareness and education  
20 about menopause. Community-based programs and health centers should be established to address these  
21 needs.

22

23 **Keywords:** Menopause, Postmenopausal women, India, Menopause Rating Scale.

## 1 INTRODUCTION

2 Menopause is a natural biological process that is generally defined as the time of cessation of ovarian  
3 function, resulting in permanent amenorrhea. At this stage, the menstrual cycle stops for longer than 12  
4 months and is accompanied by a decrease in the levels of estrogen and progesterone. This period marks  
5 the end of a woman's reproductive life.<sup>1</sup>

6  
7 Menopausal symptoms can manifest in various ways. These included vasomotor symptoms (hot flashes  
8 and night sweats), psychosocial symptoms (mood swings, anxiety, depression), physical symptoms (joint  
9 and muscle pain, sleep disturbances), and sexual symptoms (vaginal dryness and decreased libido). These  
10 symptoms often occur due to the hormonal and biological fluctuations that take place during menopause,  
11 and they can have a profound effect on a woman's daily life, relationships, and overall health.<sup>2</sup>

12  
13 In the Indian context, the onset of menopause tends to occur at a relatively young age, with some women  
14 experiencing it as early as 30 to 35 years old.<sup>3</sup> Furthermore, the proportion of menopausal women in the  
15 general population has increased significantly in recent years due to rising life expectancy. By 2026, the  
16 number of women in India who are 45 years old or above is projected to reach 401 million, highlighting the  
17 substantial impact of menopause on a significant portion of the population.<sup>4</sup> Factors such as age at  
18 menarche, breastfeeding of multiple children, and age at first pregnancy have been found to be strongly  
19 correlated with menopausal age.<sup>5</sup> It is possible that the cultural practice of early marriage and subsequent  
20 early pregnancy in India may be contributing factors to the average age of menopause in the country.<sup>6</sup>

21  
22 Despite advancements in developing nations, including India, the existing biomedical healthcare model  
23 primarily focuses on addressing the medical symptoms of menopause to minimize their impact on women's  
24 psychosocial transition during this phase. However, there is a considerable lack of awareness and  
25 understanding regarding the effects and challenges faced by women during menopause, particularly among  
26 rural communities.<sup>7, 8</sup>

27  
28 Although India offers various programs for maternal and child health, family planning, and other health  
29 services, the attention given to women's health is mainly focused on sexual and reproductive health, with  
30 little to no consideration for post-menopausal or mid-life health.<sup>9</sup> For example, Reproductive, Maternal,  
31 Neonatal, Child, and Adolescent Health (RMNCH+A) is a program under the National Health Mission (NHM)  
32 aimed at promoting lifecycle interventions, but it does not extend to health concerns beyond the  
33 reproductive years.<sup>10</sup> Moreover, rural areas often face significant challenges in accessing health care  
34 services. Shortages of female doctors and health staff in rural settings exacerbate these challenges, as  
35 these areas are often considered remote or challenging posts by health care providers. Consequently, rural  
36 women may encounter barriers in seeking timely and appropriate healthcare, particularly for conditions  
37 related to menopause and mid-life health.<sup>11</sup> Existing research also primarily focuses on northern and central

1 India, with limited attention given to the unique socio-cultural and environmental factors influencing  
2 menopausal experiences in the southern regions.

3

4 To bridge this knowledge gap, this study aimed to evaluate the prevalence and severity of menopausal  
5 symptoms among women in Eluru, Andhra Pradesh, in southern India. By examining the common  
6 symptoms experienced by women who met these inclusion criteria, this study sought to shed light on the  
7 challenges faced during this transitional period, which could ultimately help in developing targeted  
8 interventions, improving healthcare services, and enhancing the overall well-being of women in rural India  
9 during their menopausal years.

10

### 11 **Aims and Objectives**

12 Hence, the primary objective of this study was to ascertain the prevalence and assess the severity of  
13 menopausal symptoms in postmenopausal women in Eluru. Furthermore, it aims to explore potential  
14 sociodemographic factors, including age, monthly per capita income, and type of family structure,  
15 associated with the severity of menopausal symptoms among these women.

Accepted, impress

## 1 **METHODOLOGY**

### 2 **Design and Setting**

3 The present study was an analytical cross-sectional study that adhered to the STROBE guidelines. The  
4 study was conducted during September, October, and November 2021 at the Rural Health and Training  
5 Center (RHTC) in Eluru, which serves as a primary healthcare facility catering to the healthcare needs of  
6 the rural population in the region. This was a significant setting for this study, as it provided access to a  
7 diverse population of postmenopausal women. This article has been reported in accordance with The  
8 Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for cross-  
9 sectional studies (Appendix 1).<sup>12</sup>

10

### 11 **Inclusion and Exclusion Criteria**

12 The present study used convenience sampling method, and all women visiting the Rural Health and  
13 Training Center (RHTC) in Eluru, who had experienced at least one year of amenorrhea and were willing  
14 to provide informed consent, were included in the study. We excluded individuals who were unwilling to  
15 participate, those with medically or surgically induced menopause (i.e., previous history of hysterectomy),  
16 or women using hormone replacement therapy (HRT) to eliminate the influence of exogenous hormonal  
17 interventions on menopausal symptom presentation. Women with a known history of tumors, tuberculosis,  
18 rheumatoid arthritis, or osteoarthritis were also excluded from the study to minimize the impact of specific  
19 medical conditions known to present symptoms that could mimic or exacerbate menopausal symptoms.

20

21 These criteria were applied to ensure that the study focused on naturally occurring menopausal symptoms  
22 among a homogeneous group of participants, and to minimize potential confounding factors associated  
23 with induced menopause or specific medical conditions.

24

### 25 **Study Tools**

26 A pre-designed and ethically approved questionnaire, consisting of three sections, was administered by the  
27 researchers via face-to-face structured interviews. The first section included an informed consent form  
28 provided in both the English and Telugu languages. The second section collected sociodemographic data,  
29 including information on age, occupation, type of family (nuclear or joint), and monthly income based on  
30 Per Capita Income. The third section employed the Menopause Rating Scale (MRS), which is a well-  
31 established health-related quality of life scale developed in the early 1990s, and has since been used by  
32 researchers such as Armo et al. and Sushmitha et al. in various regions across India to evaluate  
33 menopausal symptoms on women's quality of life.<sup>13, 14, 15</sup>

34

35 The scale comprises 11 items, with each item scored from 0 to 4, where 0 indicates no complaints and 4  
36 represents very severe complaints. Scores for each item are then summed up, and the total scores were

1 then classified into five grades, ranging from “none,” “mild,” “moderate” and “severe.” The scale assesses  
2 the quality of life across three independent dimensions: somatic, psychological, and urogenital.<sup>13</sup>

3

#### 4 **Data Entry and Analysis**

5 Microsoft Excel 2010 and Statistical Package for Social Sciences (SPSS) version 20 were used to analyze  
6 the data. Sociodemographic variables and the prevalence of menopausal symptoms were documented in  
7 terms of frequency and percentage. To explore associations between sociodemographic factors and the  
8 items on the MRS, one-way Analysis of Variance (ANOVA) with a 95% Confidence Interval (CI) was  
9 employed. Statistical significance was set at  $p < 0.05$ . ANOVA was considered as an appropriate statistical  
10 test to explore potential differences in these scores across different sociodemographic factors, allowing for  
11 a comprehensive assessment of the impact of these factors on the severity of menopausal symptoms.

12

#### 13 **Ethical Issues**

14 The study was approved by the Institutional Ethics Committee (IEC) of the Alluri Sitarama Raju Academy  
15 of Medical Sciences, with approval number IEC/ASR/APPROVAL/023/2021. The study adhered to ethical  
16 guidelines, ensuring voluntary participation of individuals without coercion. Confidentiality was maintained  
17 by anonymizing participant data through the use of study IDs instead of personal identifiers.

18

Accepted, 11/11/2021



## 1 RESULTS

2 A total of 109 responses were collected, of which seven were excluded due to incomplete collection of data,  
3 and two were excluded because they did not meet the stipulated inclusion criteria, particularly concerning  
4 the requirement of at least one year of amenorrhea or other specified criteria. Therefore, the responses of  
5 the 100 participants were included in the analysis.

### 6 **Socio-demographic Characteristics**

7 Table 1 shows the respondents' sociodemographic characteristics. The age of the participants ranged from  
8 45 to 60 years, with the majority (37%) of participants belonging to the 45-50 age group, and most (53%)  
9 of the participants were unskilled workers.  
10

11  
12 Regarding monthly income, participants' responses were categorized based on their per capita income  
13 (PCI). The majority (53%) earned Rs. 3,766-7,532 per month (~45-90 USD), which, according to the revised  
14 modified BG Prasad's scale, falls under the upper middle class category.<sup>16</sup> Additionally, information on the  
15 type of family revealed that most women (61%) belonged to nuclear families.  
16

### 17 **Menopause Rating Scale (MRS)**

18 Participants scored the items on the Menopause Rating Scale (MRS) on a scale of 0–4. The severity of the  
19 symptoms, as reported by the participants, is shown in Figure 1.  
20

21 The grading of symptom severity and the total number of participants in each grade are shown in Table 2.  
22 Four participants had a total score of > 15, indicating the need to manage their problems.  
23

24 Table 3 summarizes the number of participants who reported each item on the subscale as a problem  
25 (scoring 1-4). Among these symptoms, joint and muscle pain were the most frequently reported (82%),  
26 followed by sleep problems (64%). Anxiety was the most common psychological symptom (57%). Heat  
27 discomfort was the least frequently reported symptom (25%) in this study. The overall mean score for each  
28 subscale is also presented, with somatic symptoms being the most reported symptoms (Mean=3.3,  
29 SD=1.9), and urogenital items being the least reported symptoms overall, (Mean=1.3; SD=1.6).  
30

### 31 **Association between Socio-demographic factors and Items on the MRS**

32 A one-way ANOVA test was conducted to examine the associations between sociodemographic factors  
33 and grades of symptom severity, as shown in Table 4.  
34

35 There was no significant association between family type, per capita income, and symptom severity grades.  
36 However, age groups showed a significant association, with an F-statistic value of 7.64 and a p-value <0.05.

1 Women in the 45-50 age group were thus observed to be more likely to experience mild to severe  
2 symptoms.

3

#### 4 **DISCUSSION**

5 The present study aimed to identify the prevalence and severity of menopausal symptoms in women in  
6 Eluru and explore the associations between sociodemographic factors and symptom severity. Our study  
7 has several noteworthy findings.

8

9 Among the 100 women considered, a majority (37%) belonged to the 45-50 age group, indicating a younger  
10 than average menopausal age group of approximately 50 years. This finding aligns with previous studies  
11 in India, which have reported a relatively early onset of menopause among Indian women compared to  
12 Western populations, such as the review by Pallikadavanth et al. and Prasad et al.<sup>4,17</sup> It is also important to  
13 note that this is different from the younger age of menopause as reported by the 1996 data from, and  
14 suggests that women in rural India also experience similar patterns of menopausal symptoms as reported  
15 elsewhere.

16

17 In India, the national classification of labor is as follows: unskilled workers (e.g., construction workers,  
18 peons), semi-skilled workers (e.g., bearers, assistant electricians), skilled workers (e.g., electricians,  
19 mechanics, tailors), and professionals (e.g., teachers, doctors).<sup>18</sup> We found that most of the participants in  
20 our study were unskilled workers (53%) and earned an income of Rs. 3,766-7,532 per month (53%), which  
21 according to B.G. Prasad's socioeconomic scale (2020), falls under the upper middle class category.<sup>16</sup> A  
22 nuclear family system is defined as 'a two generation family consisting of a father and mother and children  
23 or a single parent and his/her children', while a joint family is defined as 'three or more generations living  
24 together, having a single line of authority, either patrilineal or matrilineal'.<sup>19</sup> An overall 61% of women in our  
25 study belonged to nuclear families.

26

27 The type of family (joint/nuclear) and socioeconomic status can potentially affect the severity of menopausal  
28 symptoms. Joint families might provide more familial support, which could mitigate the psychological impact  
29 of symptoms, and higher socioeconomic status may offer better access to healthcare resources, leading to  
30 more effective management of symptoms.<sup>20</sup> However, the extent of these influences may vary across  
31 different cultural and geographical contexts. The present study found no significant association between  
32 the type of family (joint/nuclear) and the severity of symptoms. This is in contrast to studies by Vijayalakshmi  
33 et al., Thakur et al., and Sushmitha et al., who observed a significant association between socioeconomic  
34 status and symptom severity.<sup>15, 21, 22</sup> This could be due to the limited sample size of the various  
35 socioeconomic groups in our study. Furthermore, the present study found no significant association  
36 between per capita income and severity of symptoms, while Karmakar et al. noted a significant association  
37 between vasomotor symptoms and type of family.<sup>1</sup> These discrepancies highlight the need for more

1 comprehensive research incorporating larger and diverse samples across different regions to better  
2 understand the relationship between socioeconomic factors, family type, and menopausal symptoms.

3  
4 In terms of specific symptoms on the MRS, joint and muscle pain were the most frequently reported (82%),  
5 followed by sleep problems (64%). These findings align with studies conducted by Gyawali et al. in Nepal  
6 and Singh et al., in rural Delhi.<sup>23, 24</sup> However, it is worth noting that heat discomfort was the least common  
7 symptom (25%) in our study, which is in contrast to the findings of Pandey et al., who also noted that it is  
8 one of the more common findings in studies outside Nepal.<sup>25</sup> This may be attributed to cultural factors and  
9 the conservative nature of reporting sexual health-related symptoms among women in rural India.<sup>25, 27</sup>

10  
11 Regarding psychological symptoms, anxiety was the most commonly reported (57%), which is similar to  
12 studies by Poomalar et al. and Ayranci et al., while the study conducted by Singh et al. in rural Delhi reported  
13 depression to be more common.<sup>24, 28, 29</sup> Furthermore, a study by Bernis and Reher in Spain noted that  
14 women in urban areas were found to be more affected by these psychological symptoms than rural  
15 women.<sup>30</sup> The lower frequency of urogenital symptoms compared to the other two subscales is another  
16 interesting observation, which was also noted by Armo et al. in Chhattisgarh.<sup>14</sup> This trend aligns with  
17 previous research by Joshi et al. and Anukriti et al., indicating the hesitancy among women in rural India to  
18 report such symptoms, possibly due to cultural conservatism surrounding sexual health matters.<sup>31,32</sup>  
19 Women in rural India also have different customs and beliefs regarding reproductive health, and these  
20 cultural, and religious, beliefs and values have a significant role in shaping women's experiences during  
21 the menopausal period.<sup>33</sup> Studies by Mackey et al., and Hunter et al., observed a positive effect of religion  
22 on the mental health of midlife South Asian women, and observed that their belief in a higher power allowed  
23 them to cope with stressors.<sup>34, 35</sup> Therefore, promoting religious and spiritual practices among religious  
24 women and reassessing cultural norms are crucial to support women during this transitional phase, and  
25 these findings underscore the importance of researchers approaching these sensitive topics with cultural  
26 sensitivity and discretion, and suggests a need for further investigation into the sociocultural factors  
27 influencing women's perceptions and experiences in discussing these issues openly.<sup>27,30</sup>

28  
29 Our study found that women in the 45-50 age group were more likely to experience mild to severe  
30 menopausal symptoms than women in other age groups. This is consistent with previous studies, indicating  
31 that the perimenopausal period is characterized by more severe symptoms than the postmenopausal  
32 phase.<sup>36</sup> Thus, it is important for healthcare providers to recognize the increased symptom burden during  
33 this transitional phase and provide appropriate support and management strategies.

34

### 35 **Limitations**

36 Although our study provides valuable insights into menopausal symptoms among women in rural India, it  
37 has some limitations. The sample size was restricted to one area of Eluru, which may limit the

1 generalizability of the findings. A larger and more diverse sample encompassing women from various rural  
2 areas would provide a more comprehensive understanding of menopausal symptoms in this population.  
3 The convenience sampling method employed in our study could also introduce a selection bias and impact  
4 the generalizability of the findings. The recruitment of participants from the Rural Health and Training Center  
5 in Eluru might not fully represent the entire spectrum of women experiencing menopausal symptoms in  
6 rural areas, potentially excluding those who did not seek healthcare or access a specific health center  
7 during the study period. The exclusion of such individuals might influence the representation and variation  
8 in menopausal symptom experiences within the broader rural community. Additionally, the retrospective  
9 nature and self-reporting of the data collected from older women may have introduced recall bias owing to  
10 the longer time span since their menopausal transition, highlighting the need for caution when interpreting  
11 the results.

12  
13 These limitations emphasize the necessity of more inclusive sampling methods and prospective study  
14 designs to attain a more nuanced understanding of menopausal symptoms and their implications among  
15 women in rural India.

16  
17 **Conclusion**

18 The prevalence of menopausal symptoms among women in Eluru highlights the critical need for targeted  
19 interventions and enhanced awareness programmes. Despite the limitations of our study, notably the  
20 restricted sample size, our findings emphasize the urgency to address menopause-related challenges in  
21 rural communities. A crucial finding of our study was the lack of awareness among the majority of women  
22 regarding menopause and the management of associated symptoms through interventions such as  
23 exercise and yoga.<sup>37, 38</sup> This presents a significant opportunity for healthcare initiatives focused on  
24 education and awareness-building among women and their families. By fostering a deeper understanding  
25 of menopausal transitions and their management, these initiatives could substantially improve the quality  
26 of life of women in rural areas. Furthermore, our study underscores the need to establish community-based  
27 programs and health centers dedicated to addressing menopausal health concerns. Collaborative efforts  
28 involving ASHA workers, MLHP professionals, Anganwadi centers, and female village volunteers can play  
29 a pivotal role in disseminating information, offering support, and providing accessible healthcare services  
30 to menopausal women.

31  
32 The practical implications of our findings extend beyond the identification of prevalent symptoms; they call  
33 for a proactive approach to empower women with the knowledge and resources necessary to navigate the  
34 menopausal phase while acknowledging and incorporating their cultural and religious customs into  
35 menopausal care. Health policies should be introduced to specifically address the reproductive needs of  
36 elderly patients. By leveraging community-based support systems and healthcare infrastructure, we can

1 bridge the information gap, destigmatize menopausal experiences, and facilitate improved health outcomes  
2 for women in rural regions, thereby improving their quality of life during this transitional phase.

3

4 **SUMMARY-ACCELERATING TRANSLATION**

5 **Title:** Determining the Prevalence and Severity of Menopausal Symptoms in Post-Menopausal Women of  
6 Eluru, Andhra Pradesh using the Menopause Rating Scale (MRS)

7

8 **Main Problem to Solve:** Menopausal symptoms among rural women are often overlooked, leading to  
9 inadequate support and management strategies.

10

11 **Aim of the Study:** This study aimed to assess the prevalence and severity of menopausal symptoms  
12 among women in Eluru, Andhra Pradesh, to better understand the challenges they face during this  
13 transitional phase.

14

15 **Methods:** We interviewed post-menopausal women at the Rural Health and Training Center in Eluru  
16 between September and November 2021. We collected socio-demographic details and used the  
17 Menopause Rating Scale (MRS) to assess symptom severity.

18

19 **Results:** Among 100 women aged 45 to 60 years, joint and muscle pains were the most prevalent  
20 symptoms (82%), followed by sleep problems (64%) and anxiety (57%). Women aged 45-50 were more  
21 prone to experiencing mild to severe symptoms.

22

23 **Conclusion:** This study highlights the significant prevalence of menopausal symptoms among rural women  
24 in Eluru. Incorporation of religious and cultural sensitivity while interacting with these patients is essential.  
25 Increased awareness and education about menopause, for women and their families, are also crucial, along  
26 with the development of targeted health policies, community-based programs and health centers.

1 **REFERENCES**

- 2 1. Karmakar N, Majumdar S, Dasgupta A, Das S. Quality of life among menopausal women: A  
3 community-based study in a rural area of West Bengal. *J Midlife Health*. 2017 Jan-Mar;8(1):21.
- 4 2. Kang HK, Kaur A, Dhiman A. Menopause-specific quality of life of rural women. *Indian J Community*  
5 *Med*. 2021 Apr-Jun;46(2):273.
- 6 3. World Health Organization. Research on the menopause in the 1990s: Report of a WHO scientific  
7 group. Geneva: World Health Organization; 1996.
- 8 4. Pallikadavath S, Ogollah R, Singh A, Dean T, Dewey A, Stones W. Natural menopause among  
9 women below 50 years in India: A population-based study. *Indian J Med Res*. 2016 Sep;144(3):366.
- 10 5. Kundu S, Acharya SS. Exploring the triggers of premature and early menopause in India: a  
11 comprehensive analysis based on National Family Health Survey, 2019–2021. *Scientific Reports*.  
12 2024 Feb 6;14(1):3040.
- 13 6. Hamal M, Dieleman M, De Brouwere V, de Cock Buning T. Social determinants of maternal health:  
14 a scoping review of factors influencing maternal mortality and maternal health service use in India.  
15 *Public Health Reviews*. 2020 Dec;41:1-24.
- 16 7. Nagaraj D, Ramesh N, Devraj D, Umman M, John AK, Johnson AR. Experience and perceptions  
17 regarding menopause among rural women: A cross-sectional hospital-based study in South  
18 Karnataka. *Journal of Mid-life Health*. 2021 Jul;12(3):199.
- 19 8. Patangia B, Sathiyaseelan A, Chaudhury S. Cognitive and biological challenges of menopausal  
20 women in India. *Life Research*. 2022 Jul 1;5(3):1-8
- 21 9. Ara I, Maqbool M, Gani I. Reproductive Health of Women: implications and attributes. *International*  
22 *Journal of Current Research in Physiology and Pharmacology*. 2022 Nov 28;8:8-18.
- 23 10. Puri P, Sinha A, Mahapatra P, Pati S. Multimorbidity among midlife women in India: well-being  
24 beyond reproductive age. *BMC women's health*. 2022 Apr 12;22(1):117.
- 25 11. Bhan N, McDougal L, Singh A, Atmavilas Y, Raj A. Access to women physicians and uptake of  
26 reproductive, maternal and child health services in India. *EClinicalMedicine*. 2020 Mar 1;20.
- 27 12. Cuschieri S. The STROBE guidelines. *Saudi journal of anaesthesia*. 2019 Apr 1;13(Suppl 1):S31-  
28 4.
- 29 13. Heinemann K, Ruebig A, Potthoff P, Schneider HP, Strelow F, Heinemann LA, Thai DM. The  
30 Menopause Rating Scale (MRS) scale: A methodological review. *Health Qual Life Outcomes*. 2004  
31 Jan 16;2:1-8.
- 32 14. Armo M, Sainik S. Assessment of menopausal symptom using modified menopause rating scale  
33 among rural women of Rajnandgaon in Chhattisgarh, a Central India region. *Journal of South Asian*  
34 *Federation of Obstetrics and Gynaecology*. 2020 Sep 28;12(4):209-14.
- 35 15. Sushmitha V, Shettian N. A study on the modified menopause rating scale as a tool in the  
36 assessment of prevalence of menopausal symptoms in women of Dakshina Kannada district: a

- 1 cross sectional study. *International Journal of Reproduction, Contraception, Obstetrics and*  
 2 *Gynecology*. 2021 Jan 1;10(1):138-45.
- 3 16. Debnath D, Kakkar R. Modified BG Prasad socio-economic classification, updated–2020. *Indian*  
 4 *Journal of community health*. 2020 Mar 31;32(1):124-5.7. Prasad JB, Tyagi NK, Verma P. Age at  
 5 menopause in India: A systematic review. *Diabetes Metab Syndr*. 2021 Jan-Feb;15(1):373-377.
- 6 17. Prasad JB, Tyagi NK, Verma P. Age at menopause in India: A systematic review. *Diabetes &*  
 7 *Metabolic Syndrome: Clinical Research & Reviews*. 2021 Jan 1;15(1):373-7.
- 8 18. Ministry of Labour & Employment, Government of India. National Classification of Occupations-  
 9 2015 [Internet]. New Delhi: Ministry of Labour & Employment, Government of India; 2015 [cited  
 10 2023 May 22]. Available from: [URL]
- 11 19. Elliott S, Gray A. Family structures: A report for the New Zealand immigration service. Wellington:  
 12 Department of Labour, Immigration Service, New Zealand; 2000.
- 13 20. Cox D, Fafchamps M. Extended family and kinship networks: economic insights and evolutionary  
 14 directions. *Handbook of development economics*. 2007 Jan 1;4:3711-84.
- 15 21. Vijayalakshmi S, Chandrababu R. Menopausal transition among northern Indian women. *Journal*  
 16 *of Health and Allied Sciences NU*. 2013 Jun;3(02):073-9.
- 17 22. Thakur M, Kaur M, Sinha AK. Assessment of menopausal symptoms in different transition phases  
 18 using the Greene Climacteric Scale among rural women of North India. *Annals of Human Biology*.  
 19 2019 Jan 2;46(1):46-55.
- 20 23. Gyawali S, Subedi SN, Yasmin N, Pandey S. Health care seeking practice for menopausal  
 21 problems among women in Syangja District, Nepal. *Int J Health Sci Res*. 2016 Aug;6(8):247-53
- 22 24. Singh A, Pradhan SK. Menopausal symptoms of postmenopausal women in a rural community of  
 23 Delhi, India: A cross-sectional study. *J Midlife Health*. 2014 Apr-Jun;5(2):62.
- 24 25. Pandey A, Karki C, Shrivastava VR, Shrestha D, Gautam P. Study of Menopausal Symptoms using  
 25 Menopause Rating Scale at a Tertiary Care Center: A Descriptive Cross-sectional Study. *JNMA J*  
 26 *Nepal Med Assoc*. 2020 Jul-Sep;58(230):725.
- 27 26. Spagnoletti BR, Bennett LR, Keenan C, Shetty SS, Manderson L, McPake B, et al. What factors  
 28 shape quality of life for women affected by gynaecological cancer in South, South East and East  
 29 Asian countries? A critical review. *Reprod Health*. 2022 Mar 19;19(1):70.
- 30 27. Lerner-Geva L, Boyko V, Blumstein T, Benyamini Y. The impact of education, cultural background,  
 31 and lifestyle on symptoms of the menopausal transition: The Women's Health at Midlife Study. *J*  
 32 *Womens Health*. 2010 May;19(5):975-85.
- 33 28. Poomalar GK, Arounassalame B. The quality of life during and after menopause among rural  
 34 women. *Journal of clinical and diagnostic research: JCDR*. 2013 Jan;7(1):135.
- 35 29. Ayranci U, Orsal O, Orsal O, Arslan G, Emeksiz DF. Menopause status and attitudes in a Turkish  
 36 midlife female population: an epidemiological study. *BMC women's health*. 2010 Dec;10:1-4.

- 1 30. Bernis C, Reher DS. Environmental contexts of menopause in Spain: comparative results from  
2 recent research. *Menopause*. 2007 Jul 1;14(4):777-87.
- 3 31. Joshi A, Dhapola M, Kurian E, Pelto PJ. Experiences and perceptions of marital sexual  
4 relationships among rural women in Gujarat, India. *Asia Pac Popul J*. 2001;16(2):177-94.
- 5 32. Anukriti S, Herrera-Almanza C, Pathak PK, Karra M. Curse of the Mummy-ji: the influence of  
6 mothers-in-law on women in India. *American Journal of Agricultural Economics*. 2020  
7 Oct;102(5):1328-51.
- 8 33. Bheenaveni RS, Punyamurthy C, Methri S. Health Beliefs and Practices Among Subaltern Women:  
9 An Ethnographic Account From Rural Telangana, India. *Contemporary Voice of Dalit*. 2024 Apr  
10 29:2455328X241240813.
- 11 34. Mackey S, Teo SS, Dramusic V, Lee HK, Boughton M. Knowledge, attitudes, and practices  
12 associated with menopause: a multi-ethnic, qualitative study in Singapore. *Health care for women  
13 international*. 2014 May 4;35(5):512-28.
- 14 35. Hunter MS, Gupta P, Papitsch-Clark A, Bhugra D, Sturdee D. Culture, country of residence and  
15 subjective well-being: A comparison of South Asian mid-aged women living in the UK, UK  
16 Caucasian women and women living in Delhi, India. *International Journal of Culture and Mental  
17 Health*. 2008 Jun 1;1(1):44-57.
- 18 36. Ouzounian S, Christin-Maitre S. What is menopause? *Rev Prat*. 2005 Feb 15;55(4):363-8.
- 19 37. Susanti HD, Sonko I, Chang PC, Chuang YH, Chung MH. Effects of yoga on menopausal  
20 symptoms and sleep quality across menopause statuses: A randomized controlled trial. *Nursing &  
21 Health Sciences*. 2022 Jun;24(2):368-79.
- 22 38. Lee MS, Kim JI, Ha JY, Boddy K, Ernst E. Yoga for menopausal symptoms: a systematic review.  
23 *Menopause*. 2009 May 1;16(3):602-8.
- 24



1 **TABLES AND FIGURES**

2

3 Table 1. Socio-demographic Characteristics of the Respondents.

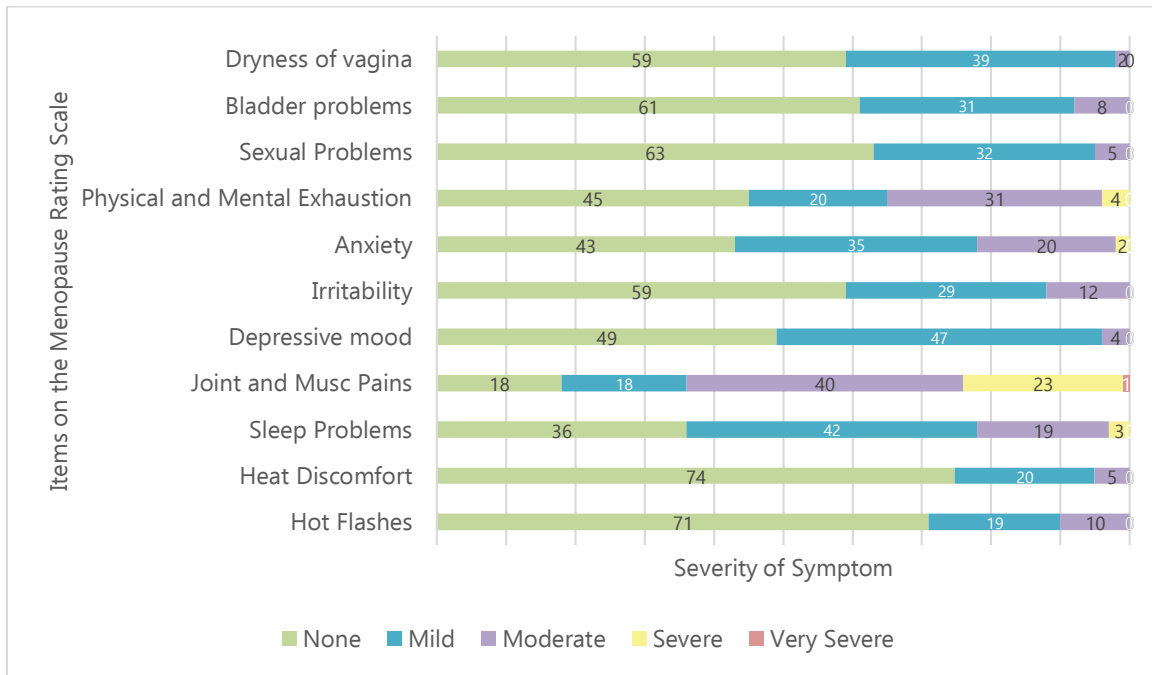
<b>Characteristic</b>	<b>n (%)</b>
<b>Age Groups (years)</b>	
45-50	37
50-60	30
>60	33
<b>Occupation</b>	
Homemaker	31
Unskilled Worker	55
Semi-Skilled Worker	10
Skilled Worker	2
Professional	2
<b>Income per month (INR)*</b>	
<1,129 (Lower class)	6
1,130-2,259 (lower middle class)	14
2,260-3,765 (middle class)	23
3,766-7,532 (upper middle class)	53
>7,533 (upper class)	4
<b>Type of Family</b>	
Joint	39
Nuclear	61

4

5 \*Categories are according to the revised classification of BG Prasad's socioeconomic status for 2020.

1 Figure 1. Severity of Symptoms Reported by Participants in the Menopause Rating Scale.

2



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1 Table 2. Grading of Severity of Symptoms on the MRS.

<b>Grading</b>	<b>n (%)</b>
<5	31
5-10	37
11-15	28
>15	4

2

3

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1 Table 3. Total Number of Respondents who Reported the Item as a Problem.

Item	n (%)
Somatic (Mean=3.3, SD=1.9)	
Hot Flashes	29
Heat Discomfort	25
Sleep Problems	64
Joint and Muscle Pains	82
Psychological (Mean=2.8, SD=2.5)	
Depressive mood	51
Irritability	41
Anxiety	57
Physical and Mental Exhaustion	55
Urogenital (Mean=1.3, SD=1.6)	
Sexual Problems	37
Bladder problems	39
Dryness of vagina	41

2

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Table 4. Association between Socio-Demographic Characteristics and Grades of Severity.

<b>Variables</b>	<b>Grades of Severity (n)</b>			
<b>Type of Family</b>	<b>None</b>	<b>Mild</b>	<b>Moderate</b>	<b>Severe</b>
<b>Joint</b>	10	15	13	1
<b>Nuclear</b>	21	20	17	3
<b>P Value*</b>	0.08			
<b>Per Capita Income</b>	<b>None</b>	<b>Mild</b>	<b>Moderate</b>	<b>Severe</b>
<b>&lt;1,129</b>	2	4	0	0
<b>1,130 – 2,259</b>	7	2	5	0
<b>2,260 – 3,765</b>	9	8	5	1
<b>3,766 – 7,532</b>	12	21	18	2
<b>&gt;7,533</b>	1	0	2	1
<b>P Value</b>	0.3661			
<b>Age Groups</b>	<b>None</b>	<b>Mild</b>	<b>Moderate</b>	<b>Severe</b>
<b>45-50</b>	10	9	16	2
<b>50-60</b>	11	12	6	1
<b>&gt;60</b>	10	14	8	1
<b>P Value</b>	0.0098			

2

3 \*P value <0.05 was considered significant.