

# Menopause-Specific Quality of Life among Rural Women: A Community-based Cross-sectional Study in Kerala, India

V. L. Nissy<sup>1</sup>, Gopika Gopinathan Bhaskaran<sup>1</sup>, S. S. Lal<sup>1</sup>, G. K. Mini<sup>1,2,3</sup>

<sup>1</sup>Global Institute of Public Health, Ananthapuri Hospitals and Research Institute, Thiruvananthapuram, Kerala,

<sup>2</sup>Department of Public Health Dentistry, Saveetha Dental Colleges and Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu,

<sup>3</sup>Women's Institute for Social and Health Studies (WISHS), Women's Social and Health Studies Foundation, Thiruvananthapuram, Kerala, India

Submitted: 09-Sep-2024

Revised: 26-Nov-2024

Accepted: 22-Dec-2024

Published: 05-Apr-2025

## ABSTRACT

**Aim and Objectives:** The health of women in the menopausal age is often ignored by most healthcare programs in countries like India. The aim of this study is to estimate the prevalence and pattern of menopause-specific quality of life (MENQOL) and associated factors of rural women in Kerala, India.

**Materials and Methods:** A cross-sectional community-based study was conducted among menopausal women in the Thiruvananthapuram district of Kerala using a multistage random sampling method. We collected details of basic sociodemographic and reproductive problems using a pretested semi-structured questionnaire. MENQOL questionnaire was used to measure the quality of life.

**Results:** We surveyed 250 women in the age group of 48–60 years. The average score of the overall quality of life was  $12.4 \pm 4.3$ . The mean MENQOL score was significantly poor for those with lower socioeconomic status (SES), those who had any morbidity, those who had bad perceived health status, and inactive women compared to their counterparts. The majority of women (92%) used self-care to alleviate their menopause symptoms. Women of lower SES, with any morbidity, poor perceived health status, and inactive, were more likely to report more symptoms in all domains (vasomotor, physical, and psychological). In addition, employed women reported more vasomotor and psychological symptoms compared to their counterparts. **Conclusion:** Menopausal symptoms are common in the population studied, and self-care is the main strategy for alleviating these symptoms. It is important to educate women about common menopause symptoms and the importance of receiving proper medical care.

**KEYWORDS:** India, Kerala, menopause, quality of life

## INTRODUCTION

Menopause, the total cessation of menstruation for a period of 12 months or longer, is a typical physiological transition that middle-aged women go through.<sup>[1]</sup> Globally, women experience the natural menopause between the ages of 45 and 55 years.<sup>[2]</sup> The subsequent symptoms caused by a lack of estrogen and progesterone hormones include vasomotor symptoms (VMS), urogenital symptoms, mood swings, somatic symptoms, and a host of other symptoms such as weight gain, palpitations, crying fits, low energy, and lightheadedness.<sup>[3]</sup> Menopause is unique for every woman; some experience symptoms, while others do not. The years surrounding menopause have therapeutic implications.<sup>[4]</sup> A high proportion of

the women in low- and middle-income settings are unaware of the changes that come with menopause.<sup>[3]</sup> Menopause is associated with two major medical risks: the first is osteoporosis, which is caused by the loss of bone structure; the second is an increased risk of heart disease because of age-related increases in blood pressure, cholesterol, and weight. Some women experience severe symptoms that significantly impair their quality of life and ability to operate socially and personally.<sup>[5]</sup>

**Address for correspondence:** Dr. G. K. Mini,

Global Institute of Public Health, Ananthapuri Hospitals and Research Institute, Thiruvananthapuram - 695 024, Kerala, India.  
E-mail: gkmini.2014@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Nissy VL, Bhaskaran GG, Lal SS, Mini GK. Menopause-specific quality of life among rural women: A community-based cross-sectional study in Kerala, India. J Mid-life Health 2025;16:67-75.

### Access this article online

#### Quick Response Code:



**Website:** <https://journals.lww.com/jomh>

**DOI:** 10.4103/jmh.jmh\_171\_24

Menopause is frequently an overlooked and neglected part of a woman's life, particularly in nations where societal and gender conventions do not prioritize women's health.<sup>[6]</sup> A wide range of characteristics, such as ethnicity, culture, social background, menopausal status, attitude, education, food, genetics, occupation, and general health, influence how women experience menopause.<sup>[7]</sup> It is believed that over 85% of postmenopausal women worldwide have at some point in their lives suffered menopause-related symptoms.<sup>[8]</sup> Globally, by 2030, 1.2 billion women are expected to be peri- or postmenopausal, a number that is predicted to rise by 4.7 million a year.<sup>[9]</sup> The menopausal transition varies greatly between cultures because of variations in how symptoms are measured, the possibility of recall bias, and the location and cultural background. The prevalence of VMS varies from 22% to 63% in Asia, 36% to 50% in North America, and 47% to 74% in Europe.<sup>[10]</sup> In the United States, the incidence of VMS alone is reported to affect 40–50 million menopausal women.<sup>[11]</sup> Sixty-one percent of women in India reported VMS, which includes hot flashes and nocturnal sweats.<sup>[12]</sup> Menopausal symptoms tend to occur more frequently in postmenopausal women compared to those who are premenopausal or perimenopausal.<sup>[13]</sup>

Since the life expectancy has increased dramatically, most women now live between a significant part of their lives in the postmenopausal stage.<sup>[9]</sup> Based on the findings of the Indian Menopause Society, by 2026, India's population will reach 1.4 billion, with 173 million persons over 60 years and 103 million menopausal individuals.<sup>[14]</sup> Between 50% and 75% of women suffer VMS of menopause (VSM) and genitourinary syndrome of menopause (GSM) throughout the menopausal transition. Hormonal therapy with estrogen is the primary treatment for VSM and GSM symptoms; however, nonhormonal medications can also help.<sup>[15]</sup> The impact of menopause on health-related quality of life is a significant burden on public health care in countries like India. The objective of the study is to determine the prevalence and pattern of postmenopausal symptoms and its associations with quality of life among women in rural India.

## MATERIALS AND METHODS

A community-based cross-sectional study was conducted among women who attained natural menopause in rural areas of Thiruvananthapuram district, Kerala, India. The sample size was fixed as 245 based on the prevalence of menopausal symptoms as 80% in an earlier study.<sup>[16]</sup> We collected and analyzed details from 250 women aged 40 to 60 years.

The district selection was based on feasibility. One taluk was randomly selected for this study from the six taluks in the district. From the selected taluk, one panchayat was also randomly selected. In the selected panchayat, five wards were randomly chosen. A total of 250 women were obtained by surveying 50 menopausal women from each of the selected wards. A survey was conducted by selecting a central location in the chosen ward and identifying the first house. Following a clockwise direction, all houses were visited until 50 eligible women were identified. This methodology was similar to the World Health Organization's Expanded Program on Immunization cluster sampling technique.<sup>[17]</sup> A screening questionnaire was used to identify women who had natural menopause, which included questions on their menstrual status and menopause.

Data collection was performed using a semi-structured interview schedule. Details of sociodemographics, menstrual and reproductive history, healthcare-seeking behavior, and perceptions about menopause were collected. For assessing quality of life, the Menopause-Specific Quality of Life Questionnaire (MENQOL questionnaire)<sup>[18]</sup> was used. The MENQOL questionnaire was translated into local language (Malayalam) and back translated into English. It comprises 29 items evaluating the quality of life of postmenopausal women across four domains, namely vasomotor, psychosocial, physical, and sexual. The questionnaire makes use of a Likert-scale format with scores ranging from 0 to 7. A score of 0 indicates that the symptom was not experienced in the past 3 months, while a score of 1 suggests that the symptom was experienced but was not bothersome. Scores 2–7 indicate different levels of bother for each symptom experienced. Each symptom is then assigned a score between 1 and 7, and the average score for each domain is calculated. A higher score in a MENQOL subscale indicates a lower quality of life. The scores were categorized into mild (2–4), moderate (5–6), and severe (7–8) menopausal symptoms.

Women who attained surgical menopause or had serious medical conditions, as well as those who did not provide consent, were excluded from the study. The interview was conducted in local language, Malayalam. The data were collected from July to August 2021.

Data analysis was done using IBM SPSS Statistics for Windows Version 23.0 (SPSS Inc., Chicago, IL, USA). Continuous variables were analyzed using bivariate analysis, and the associations were tested with the Student's *t*-test. Statistical significance was set at  $P < 0.05$ . The ethical clearance for the study was obtained from the institutional ethics committee of the

host institution. Written informed consent was obtained from all participants before the data collection.

## RESULTS

The mean age of the participants was 56 years (standard deviation [SD]  $\pm 3$ ) ranging from 48 to 60 years. The sociodemographic characteristics of the study participants are presented in Table 1. The study reported that the majority of participants (90%) had completed a high school education or beyond, with 73% currently married. Notably, 40% of the participants were employed at the time of the survey, while half of the participants came from families below the poverty line, indicating a low socioeconomic status (SES). A higher proportion of them were Hindus (64%), followed by Muslims (21%)

**Table 1: Sociodemographic characteristics of study participants**

| Variables                | n (%)      |
|--------------------------|------------|
| Age (years)              |            |
| 40–55                    | 106 (42.4) |
| 56–60                    | 144 (57.6) |
| Education                |            |
| Primary                  | 24 (9.6)   |
| High school              | 114 (45.6) |
| Higher secondary         | 84 (33.6)  |
| Graduate/postgraduate    | 28 (11.2)  |
| Marital status           |            |
| Currently married        | 183 (73.2) |
| Others                   | 67 (26.8)  |
| Employed                 | 100 (40.0) |
| SES                      |            |
| BPL                      | 123 (49.2) |
| APL                      | 127 (50.8) |
| Caste                    |            |
| General                  | 42 (16.8)  |
| OBC                      | 142 (56.8) |
| SC                       | 66 (26.4)  |
| Morbidity                |            |
| Hypertension             | 125 (50.0) |
| Diabetes                 | 106 (42.4) |
| Hyperlipidemia           | 123 (49.2) |
| Kidney disease           | 6 (2.4)    |
| Heart disease            | 14 (5.6)   |
| Asthma                   | 50 (20.0)  |
| Perceived health status  |            |
| Bad                      | 91 (36.4)  |
| Good                     | 159 (63.6) |
| Physically active        | 52 (20.8)  |
| Delivery characteristics |            |
| Normal                   | 192 (76.8) |
| Cesarean delivery        | 47 (18.8)  |
| No delivery              | 11 (4.4)   |

BPL: Below poverty line, APL: Above poverty line, OBC: Other backward caste, SC: Scheduled caste, SES: Socioeconomic status

and Christians (15%). More than half of them (57%) belonged to other backward castes, 17% to the general community, and 26% were of scheduled castes.

The age at menopause ranged from 42 to 54 years, with a mean value of 49 years (SD  $\pm 2$ ). Majority of women (87%) reported that they had a regular menstrual cycle before menopause. Furthermore, 77% of the women had a normal delivery. Eighty-nine percent used some type of family planning method. Ten women reported a history of gynecological diseases. No one was under hormone treatment. Nearly 30% had sought help from healthcare professionals for menopausal symptoms. Currently, 92% of the subjects are using self-care practices and home remedies to alleviate their menopausal symptoms.

Regarding medical conditions, half of the participants reported to be having hypertension, 42% had diabetes, and 49% had hyperlipidemia. In addition, 20% reported asthma, 6% had heart disease, and 2% had kidney disease. More than a third of the participants (36%) rated their health status as “bad,” and only 21% reported being physically active. Nearly 53% of women reported an increase in appetite after menopause, 30% reported a decrease, and 17% reported no change in appetite.

The details of postmenopausal symptoms according to the MENQOL questionnaire are presented in Table 2. Muscle and joint pain, as well as low backache, were the most commonly reported symptoms, with 89% of women experiencing severe muscle pain and 79% reporting low backache. In addition, flatulence or gas pains were reported by 74% of the women, while 68% experienced hot flushes. Notably, none of the participants reported feeling a desire to be alone. A small proportion (7%) expressed dissatisfaction with their personal lives.

All the study participants were happy about the end of their menstrual cycles. Around 68% reported feeling less capable after menopause and 82.4% of the participants had any morbidity. On average, those with morbidity had significantly higher menopause symptoms (mean: 12) compared to those without any disease (mean: 9).

Table 3 presents the association of background characteristics with the average number of postmenopausal symptoms in each domain. Women in the higher age group experienced significantly more physical symptoms while those in lower age group reported significantly higher VMS. Employed women reported significantly higher vasomotor and physical symptoms compared to their unemployed counterparts. Women with a low SES reported significantly higher symptoms in all domains except the sexual domain. Women with any morbidity had higher symptoms in all

**Table 2: Prevalence of postmenopausal symptoms**

| Postmenopausal symptoms                         | No symptom,<br><i>n</i> (%) | Mild,<br><i>n</i> (%) | Moderate,<br><i>n</i> (%) | Severe,<br><i>n</i> (%) | Prevalence of<br>symptoms, <i>n</i> (%) |
|---|-----------------------------|-----------------------|---------------------------|-------------------------|---|
| <b>Vasomotor domain</b>                         |                             |                       |                           |                         |   |
| Hot flushes                                     | 80 (32.0)                   | 18 (7.2)              | 60 (24.0)                 | 92 (36.8)               | 170 (68.0)                              |
| Night sweats                                    | 106 (42.4)                  | 14 (5.6)              | 64 (25.6)                 | 66 (26.4)               | 144 (57.6)                              |
| Sweating  | 150 (60.0)                  | 25 (10.0)             | 40 (16.1)                 | 35 (14.0)               | 100 (40.0)                              |
| <b>Psychological domain</b>                     |                             |                       |                           |                         |   |
| Dissatisfaction with personal life              | 233 (93.2)                  | 7 (2.8)               | 8 (3.2)                   | 2 (0.8)                 | 17 (6.8)                                |
| Feeling anxious or nervous                      | 167 (66.8)                  | 41 (16.4)             | 38 (15.2)                 | 4 (1.6)                 | 83 (33.2)                               |
| Experiencing poor memory                        | 123 (49.2)                  | 39 (15.6)             | 68 (27.2)                 | 20 (8.0)                | 127 (50.8)                              |
| Accomplishing less than used to                 | 209 (83.6)                  | 26 (10.4)             | 13 (5.2)                  | 2 (0.8)                 | 41 (16.4)                               |
| Feeling depressed or down                       | 199 (79.6)                  | 12 (4.8)              | 35 (14.0)                 | 4 (1.6)                 | 51 (20.4)                               |
| Impatient with other people                     | 95 (38.0)                   | 29 (11.6)             | 108 (43.2)                | 18 (7.2)                | 155 (62.0)                              |
| Wanting to be alone                             | 250 (100.0)                 | 0                     | 0                         | 0                       | 0                                       |
| <b>Physical domain</b>                          |                             |                       |                           |                         |   |
| Flatulence or gas pains                         | 66 (34.0)                   | 24 (12.4)             | 58 (29.9)                 | 46 (23.7)               | 184 (73.6)                              |
| Aching in muscles or joints                     | 27 (10.8)                   | 17 (6.8)              | 84 (33.6)                 | 122 (48.8)              | 223 (89.2)                              |
| Feeling tired or worn out                       | 77 (30.8)                   | 33 (13.2)             | 112 (44.8)                | 28 (11.2)               | 173 (69.2)                              |
| Sleeping difficulty                             | 103 (41.2)                  | 25 (10.0)             | 72 (28.8)                 | 50 (20.0)               | 147 (58.8)                              |
| Aches in back of neck or head                   | 128 (51.2)                  | 19 (7.6)              | 93 (37.2)                 | 10 (4.0)                | 122 (48.8)                              |
| Decrease in physical strength                   | 100 (40.0)                  | 51 (20.4)             | 87 (34.8)                 | 12 (4.8)                | 150 (60.0)                              |
| Decrease in stamina                             | 99 (39.6)                   | 57 (22.8)             | 82 (32.8)                 | 12 (4.8)                | 151 (60.4)                              |
| Lack of energy                                  | 100 (40.0)                  | 55 (22.0)             | 83 (33.2)                 | 12 (4.8)                | 150 (60.0)                              |
| Dry skin  | 189 (75.9)                  | 27 (10.8)             | 34 (13.6)                 | 0                       | 61 (24.4)                               |
| Weight gain                                     | 131 (52.4)                  | 33 (13.2)             | 78 (31.2)                 | 8 (3.2)                 | 119 (47.6)                              |
| Increased facial hair                           | 226 (90.4)                  | 20 (8.0)              | 4 (1.6)                   | 0                       | 24 (9.6)                                |
| Changes in appearance, texture, or skin tone    | 170 (68.0)                  | 41 (16.4)             | 39 (15.6)                 | 0                       | 80 (32.0)                               |
| Feeling bloated                                 | 89 (35.6)                   | 35 (14.0)             | 75 (30.0)                 | 51 (20.4)               | 161 (64.4)                              |
| Low backache                                    | 52 (20.8)                   | 22 (8.8)              | 115 (46.0)                | 61 (24.4)               | 198 (79.2)                              |
| Frequent urination                              | 179 (71.6)                  | 48 (19.2)             | 22 (8.8)                  | 1 (0.4)                 | 71 (28.4)                               |
| Involuntary urination when laughing or coughing | 202 (80.8)                  | 41 (16.4)             | 7 (2.8)                   | 0                       | 48 (19.2)                               |
| <b>Sexual domain</b>                            |                             |                       |                           |                         |   |
| Decrease in sexual desire ( <i>n</i> =100)      | 51 (51.0)                   | 45 (45.0)             | 4 (4.0)                   | 0                       | 49 (19.6)                               |
| Vaginal dryness ( <i>n</i> =167)                | 72 (43.1)                   | 58 (34.7)             | 30 (18.0)                 | 7 (4.2)                 | 95 (38.0)                               |
| Avoiding intimacy ( <i>n</i> =100)              | 93 (93.0)                   | 7 (7.0)               | 0                         | 0                       | 07 (2.8)                                |

domains. Women who perceived health status as poor reported higher symptoms in all domains except the sexual domain. Physically inactive women had more symptoms in the vasomotor and psychological domains. Shorter duration after menopause was significantly associated with higher VMS, while longer duration of menopause was associated with higher physical symptoms.

## DISCUSSION

The purpose of this study was to ascertain the prevalence of menopausal symptoms in postmenopausal women in Kerala as well as variables related to the quality of these women's lives. The age at which Indian women naturally enter menopause was estimated to be 46.2 years, with regional variation (east: 47.3, west: 46.2, north: 45.5, south: 46.1, and center: 47.8 years).<sup>[19]</sup> The mean age of menopausal patients in our study (49 years)

is slightly higher in comparison to other studies carried out in various parts of India, including Maharashtra (45.8 years)<sup>[20]</sup> and Aligarh (Uttar Pradesh) (46.5 years),<sup>[21]</sup> and is in par with that reported from Mangalore (49.8 years),<sup>[22]</sup> Bengaluru (49.3 years),<sup>[23]</sup> and Kerala (48.8 years).<sup>[16]</sup> Other Asian nations such as Thailand (48.7),<sup>[24]</sup> Singapore (49.1 years),<sup>[25]</sup> and Malaysia (51.2 years)<sup>[1]</sup> have menopausal average mean ages that were comparable to those in our study.

Menstrual cycle irregularities may be a symptom of underlying health problems such as thyroid abnormalities, polycystic ovarian syndrome, or hormone imbalances. Even modifiable risk factors, such as smoking, obesity, and stress, are significantly associated with menstrual cycle irregularity.<sup>[26]</sup> In our study, 13% reported a history of irregular menstrual cycles. Among the study participants, 89% used some type of family planning method. The high prevalence

**Table 3: Association of background characteristics with symptoms reported**

| Characteristics               | Mean ( $\pm$ SD) number of pot-menopausal symptoms |                 |                 |                  |                 |
|-------------------------------|--|-----------------|-----------------|------------------|-----------------|
|                               | Total  | Vasomotor       | Psychosocial    | Physical         | Sexual          |
| Age (years)                   |  |                 |                 |                  |                 |
| 40–49                         | 12 $\pm$ 4   | 2.07 $\pm$ 1.01 | 1.91 $\pm$ 1.38 | 7.72 $\pm$ 2.94  | 0.68 $\pm$ 0.73 |
| 50–60                         | 12 $\pm$ 4   | 1.37 $\pm$ 1.22 | 1.88 $\pm$ 1.47 | 8.63 $\pm$ 3.06  | 0.54 $\pm$ 0.72 |
| <i>P</i>                      | 0.996  | <0.001          | 0.857           | 0.020            | 0.117           |
| Employed                      |  |                 |                 |                  |                 |
| Yes                           | 13 $\pm$ 4   | 1.84 $\pm$ 1.08 | 2.17 $\pm$ 1.57 | 8.35 $\pm$ 3.01  | 0.59 $\pm$ 0.75 |
| No                            | 12 $\pm$ 4   | 1.53 $\pm$ 1.24 | 1.71 $\pm$ 1.30 | 8.18 $\pm$ 3.07  | 0.61 $\pm$ 0.72 |
| <i>P</i>                      | 0.102  | 0.046           | 0.013           | 0.666            | 0.806           |
| SES                           |  |                 |                 |                  |                 |
| BPL                           | 14 $\pm$ 4   | 1.88 $\pm$ 1.21 | 2.45 $\pm$ 1.59 | 9.17 $\pm$ 2.85  | 0.56 $\pm$ 0.74 |
| APL                           | 11 $\pm$ 3   | 1.43 $\pm$ 1.13 | 1.35 $\pm$ 1.00 | 7.35 $\pm$ 2.96  | 0.63 $\pm$ 0.72 |
| <i>P</i>                      | <0.001   | 0.003           | <0.001          | <0.001           | 0.460           |
| Morbidity                     |  |                 |                 |                  |                 |
| Any morbidity                 | 13 $\pm$ 4   | 1.72 $\pm$ 1.17 | 2.00 $\pm$ 1.43 | 8.62 $\pm$ 2.96  | 0.65 $\pm$ 0.74 |
| No                            | 9 $\pm$ 3  | 1.31 $\pm$ 1.21 | 1.38 $\pm$ 1.31 | 6.50 $\pm$ 2.80  | 0.38 $\pm$ 0.61 |
| <i>P</i>                      | <0.001   | 0.038           | 0.009           | <0.001           | <0.001          |
| Perceived health status       |  |                 |                 |                  |                 |
| Bad                           | 15 $\pm$ 4   | 1.92 $\pm$ 1.25 | 2.49 $\pm$ 1.45 | 10.28 $\pm$ 2.65 | 0.57 $\pm$ 0.79 |
| Good                          | 11 $\pm$ 3   | 1.50 $\pm$ 1.13 | 1.55 $\pm$ 1.31 | 7.08 $\pm$ 2.61  | 0.62 $\pm$ 0.69 |
| <i>P</i>                      | <0.001   | 0.007           | <0.001          | <0.001           | 0.596           |
| Physical activity             |  |                 |                 |                  |                 |
| Active                        | 11 $\pm$ 4   | 1.34 $\pm$ 1.15 | 1.28 $\pm$ 0.95 | 7.55 $\pm$ 3.29  | 0.57 $\pm$ 0.77 |
| Inactive                      | 13 $\pm$ 4   | 1.73 $\pm$ 1.19 | 2.05 $\pm$ 1.49 | 8.42 $\pm$ 2.95  | 0.61 $\pm$ 0.72 |
| <i>P</i>                      | 0.002  | 0.035           | 0.001           | 0.066            | 0.066           |
| Duration of menopause (years) |  |                 |                 |                  |                 |
| 2–6                           | 12 $\pm$ 4   | 1.87 $\pm$ 1.08 | 1.77 $\pm$ 1.35 | 7.83 $\pm$ 2.94  | 0.62 $\pm$ 0.71 |
| $\geq 7$                      | 13 $\pm$ 4   | 1.44 $\pm$ 1.25 | 2.00 $\pm$ 1.50 | 8.64 $\pm$ 3.09  | 0.58 $\pm$ 0.74 |
| <i>P</i>                      | 0.302  | 0.004           | 0.208           | 0.036            | 0.691           |

BPL: Below poverty line, APL: Above poverty line, SES: Socioeconomic status

of family planning method among participants indicates a strong level of reproductive health awareness in this population. However, the absence of hormone treatment in any participant is noteworthy. This could suggest lack of awareness, potential misconceptions about hormone replacement therapy (HRT), or unavailability of the treatment options. A history of gynecological disorders was reported by 10 women. Nearly 30% of women sought medical assistance for menopausal symptoms. Currently, the majority (92%) is relieving their menopausal symptoms at home and through self-care methods. Indian women usually do not seek medical attention because they believe that menopausal symptoms are a natural physiological byproduct of aging. Family commitment and the cultural taboo against discussing sexual and reproductive issues because of social stigma are the primary causes of these attitudes.<sup>[27]</sup>

Severe menopausal symptoms were linked to lower educational level and low SES. Lower economic position has previously been identified by Li *et al.* as the primary factor causing the increased severity of

menopausal symptoms.<sup>[28]</sup> Women who are literate and employed have higher quality of life, as literacy and employment are often linked to higher incomes, which improve overall health and reduce symptoms through improved nutrition and overall health. Women with lower levels of education are unaware of the majority of symptoms, which results in a lower number of symptoms being reported. Conversely, women with higher levels of education tend to be better informed, visit the doctor more frequently, and have greater access to basic amenities, which makes them more aware of their needs.<sup>[29]</sup> In our study, women in the below poverty line group experience an average of three additional symptoms than the women in the above poverty line group. This difference is statistically significant ( $P < 0.001$ ) for all symptom domains except sexual symptoms.

Women tend to gain weight while going through menopause, which results in a decrease in lean body mass, an increase in belly fat, and a marked decrease in energy expenditure. This phase is marked by

increased insulin resistance and hyperinsulinism, which are exacerbated by elevated levels of free fatty acids and pro-inflammatory cytokines in the plasma as well as a relative hyperandrogenism.<sup>[30]</sup> Among our study participants, 49% had hyperlipidemia. The few studies that have been conducted on the relationship between lipid profiles and the years following menopause have yielded inconclusive results. High-density lipoprotein cholesterol (HDL-C) levels were reported to decline with an increase in the number of years following menopause.<sup>[31]</sup> Furthermore, the ratio of total cholesterol to HDL-C rises with the onset of menopause and is thought to be a more accurate predictor of cardiovascular illnesses than total cholesterol.<sup>[32]</sup> However, Yu *et al.* reported that after controlling for confounding variables such as age, education, smoking, and alcohol use, there was no association between the number of years following menopause and lipid profile.<sup>[33]</sup> The changes in atherogenic lipid profiles are mostly responsible for the increased risk of cardiovascular diseases (CVDs) associated with menopause.<sup>[34,35]</sup> Dyslipidemia is a major risk factor for the onset of CVD and is strongly linked to the development of diabetes and hypertension.<sup>[36]</sup>

Around 50% of the study population reported having hypertension and 40% having diabetes. It is evidenced that the prevalence of hypertension and CVD is significantly lower in premenopausal women compared to the male population of the same age.<sup>[37-39]</sup> There is little doubt that the perimenopausal and postmenopausal periods have a higher prevalence of hypertension; however, views on how the menopause contributes to the development of hypertension are not unanimous.<sup>[39,40]</sup> Furthermore, 20% reported having asthma; it has been observed that menopause is linked to an accelerated deterioration in lung function.<sup>[41]</sup> Estimates indicate that the prevalence of asthma in menopausal women is 15%–22% of all women with asthma.<sup>[42,43]</sup> Women's asthma prevalence peaked around menopause,<sup>[44]</sup> and there is literature contradicting information about the likelihood of developing asthma after menopause.<sup>[45]</sup> Women who experienced severe menopause symptoms have higher incidence and prevalence of postmenopausal asthma.<sup>[46]</sup> In addition, the lack of atopy or a family history of asthma is frequently indicative of menopause-related asthma development.<sup>[47,48]</sup> Because of visceral obesity, atherogenic dyslipidemia, disruption in glucose homeostasis, nonalcoholic fatty liver disease, and hypertension, a woman experiencing menopause is predisposed to an increased risk of CVD.<sup>[37]</sup> Hence, 6% of the study participants who reported heart disease is a significant concern.

Of the participants, 21% were physically active, and 36% perceived their health as “bad.” Women showed and maintained a significant decline in physical activity beginning 2 years before menopause. During the menopausal transition, there is a correlation between decreasing circulating estrogen levels and physical inactivity.<sup>[49]</sup> Various studies suggested the positive association of physical activity with cardiovascular health and the metabolic risk factor profile. Research indicates that consistent physical activity reduces both visceral and total body fat, enhances insulin sensitivity, averts dyslipidemia, and lowers both systolic blood pressure and diastolic blood pressure.<sup>[50-52]</sup> Sedentary postmenopausal women exhibit reduced lower limb muscle velocity, strength, and resistance.<sup>[53]</sup> A sluggish move is also brought on by muscle weakness and reduced cardiopulmonary capacity<sup>[54]</sup> and reduced stability also contributes to a decrease in the frequency of walking throughout everyday activities, which results in extended periods of inactivity.<sup>[55]</sup> A high amount of physical activity can help alleviate menopausal symptoms.<sup>[56,57]</sup>

The primary symptoms of menopause reported in an earlier study from Kerala were in the physical domain (70.5%), followed by psychosocial (56.7%), vasomotor (49.3%), and sexual dysfunction (10.2%).<sup>[58]</sup> According to our findings, menopausal women's physical, vasomotor, and psychological dimension had the highest MENQOL, while their sexual dimension had the lowest. In corroboration with our findings, an earlier finding from Malaysia reported the most prevalent and severe symptoms as joint and muscle discomfort (84.3%), followed by anxiety (71.4%), physical and mental discomfort (67.2%), hot flashes, and sweating (67.1%).<sup>[59]</sup> The most common menopausal symptoms in Sri Lankan women were hot flashes, physical and mental tiredness, and joint pain in the muscles.<sup>[60]</sup> Furthermore, Ashrafi *et al.* (2010) reported that the most prevalent menopausal symptoms in Iranian women were hot flashes, joint and muscle discomfort, and night sweats.<sup>[61]</sup> Various studies reported increased VMS, which is consistent with our findings. Furthermore, it appears that reproductive hormones are important in this regard. Hormone levels drastically shift during this time, including a decrease in severe estrogen, which causes VMS<sup>[62,63]</sup> as hot flashes and night sweats, as 68% of study participants reported having hot flashes, and 58% had night sweats. The most commonly reported physical symptoms in our study were low backache and muscle and joint pain, with 89% of women reporting severe muscular pain similar to that reported by Ceylan and Özerdoğan.<sup>[64]</sup> A sharp decrease in estrogen during menopause results in physical complaints,<sup>[64]</sup> and in our study, 79% reported having low backache. More than half (51%) of the study participants

reported poor memory, which is consistent with the findings from an earlier study.<sup>[65]</sup> Contradictory to the above, it was reported that feeling nervous or anxious was the most severe symptom among menopausal women.<sup>[66]</sup> In addition, 74% of our study participants reported to be having gas pains or flatulence, and 7% of respondents reported that they were unhappy with their personal lives.

A combination of factors, such as age, the length of time after the menopause, employment position, SES, perceived health, and physical activity, can influence menopause symptoms. Women who are younger, employed, or have gone through menopause earlier tend to have higher VMS. Physical symptoms are more prevalent among women who are older, employed, have gone through menopause for a longer period of time, with a lower socioeconomic situation, are morbid, or poor perceived health status. These findings align with the results from Iran, which found a substantial correlation between menopausal symptoms and factors such as working status, educational attainment, activity level, and menopausal duration.<sup>[66]</sup> According to a Tehran study, women with higher levels of education experienced more menopausal symptoms than women with lower levels.<sup>[67]</sup> Several research have also demonstrated how the degree of menopausal symptoms is influenced by one's employment situation.<sup>[25,68]</sup>

From the present study, it is evident that women from poorer socioeconomic backgrounds experienced more severe menopausal symptoms across most domains, regular physical activity is essential for reducing menopausal symptoms, including vasomotor and psychological ones. The most common physical complaints that considerably reduced women's quality of life were low back pain, bloating, and muscle and joint pain. Menopausal symptoms were worsened by the existence of chronic illnesses; older women reported greater somatic symptoms, whereas younger women mostly experienced VMS.

The findings of the study are subject to the limitations associated with cross-sectional studies. Further qualitative research could provide additional insights into the quality of life and postmenopausal symptoms. The study has a limitation in generalizability, as some participants were excluded from specific interventions, such as HRT, which aimed to improve menopausal symptoms, due to contraindications that prevented them from using these treatments. Kerala state is characterized by minimal distinctions between urban and rural areas. Generalizing the results of this study to other states in India requires careful consideration, as Kerala has the highest female literacy rate and reported the highest

proportion of institutional deliveries in the country. There is also a possibility of underreporting of postmenopausal symptoms in this study. However, it is important to note that the study used a representative sample from the community in Kerala state, India, where the majority of deliveries take place in hospitals. The state has also reported the best reproductive health indicators in the country. One of the main strengths of our study is that all interviews were conducted by a single investigator.

## CONCLUSION

This community-based study provides valuable insights into the prevalence and impact of menopausal symptoms among postmenopausal women in rural Thiruvananthapuram, Kerala, India. The study reported a high prevalence of menopausal symptoms, especially in the psychological and physical categories, which have a substantial impact on women's quality of life. The severity of menopausal symptoms was associated with age, occupation, socioeconomic level, and preexisting medical disorders. Even though the symptoms were common, a sizable percentage of women relied primarily on home remedies and self-care rather than seeking professional medical attention. It is important to educate women about common menopause symptoms and the importance of receiving proper medical care. Increasing access to healthcare services for postmenopausal women is highly needed. Promoting healthy lifestyle practices such as regular physical activity, a balanced diet, and stress management can help reduce menopausal symptoms and enhance overall well-being.

## Acknowledgments

This study was conducted as a part of the Master of Public Health (MPH) dissertation work of the first author (NVL) under Kerala University of Health Sciences (KUHS) at the Global Institute of Public Health (GIPH), Thiruvananthapuram, Kerala, under the guidance of the corresponding author (MGK).

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Rahman SA, Zainudin SR, Mun VL. Assessment of menopausal symptoms using modified Menopause Rating Scale (MRS) among middle age women in Kuching, Sarawak, Malaysia. *Asia Pac Fam Med* 2010;9:5.
2. Karmakar N, Majumdar S, Dasgupta A, Das S. Quality of life among menopausal women: A community-based study in a rural area of West Bengal. *J Midlife Health* 2017;8:21-7.
3. Chedraui P, Blümel JE, Baron G, Belzares E, Bencosme A, Calle A, *et al.* Impaired quality of life among middle aged

- women: A multicentre Latin American study. *Maturitas* 2008;61:323-9.
4. Sivapragasam R, Rajini S, Rajalakshmi S, Priyanga K, Rajesh V, Priyadharshini R. A community-based cross-sectional study about the quality of life in postmenopausal women in rural Puducherry. *Indian J Community Med* 2020;45:96-9.
  5. Senthilvel S, Vasudevan S, Anju PS, Sukumaran A, Sureshbabu J. Assessment of symptoms and quality of life among postmenopausal women in a tertiary care hospital in Kochi, South India: A hospital-based descriptive study. *J Midlife Health* 2018;9:185-90.
  6. Borker SA, Venugopalan PP, Bhat SN. Study of menopausal symptoms, and perceptions about menopause among women at a rural community in Kerala. *J Midlife Health* 2013;4:182-7.
  7. Akhtar N, Gupta RK, Bala K, Mengi V, Gupta C. Menopausal symptoms in rural middle aged women: A community based cross sectional study. *Int J Reprod Contracept Obstet Gynecol* 2018;7:3678-83.
  8. Woods NF, Mitchell ES. Symptoms during the perimenopause: Prevalence, severity, trajectory, and significance in women's lives. *Am J Med* 2005;118 Suppl 12B: 14-24.
  9. WHO Scientific Group Report. World Health Organisation (WHO). WHO Technical Report Series. Scientific Group on Research on the Menopause in the 1990s. Research on the Menopause: Report of a WHO Scientific Group. Geneva: WHO; 1996. p. 866.
  10. Palacios S, Henderson VW, Siseles N, Tan D, Villaseca P. Age of menopause and impact of climacteric symptoms by geographical region. *Climacteric* 2010;13:419-28.
  11. United States Census 2000. Census 2000 Profile. U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau; 2000. p. 2-5. Available from: <http://www.census.gov/>. [Last accessed on 2024 Aug 15].
  12. Ganapathy T, Al Furaikh SS. Health-related quality of life among menopausal women. *Arch Med Health Sci* 2018;6:16-23.
  13. Rathnayake N, Lenora J, Alwis G, Lekamwasam S. Prevalence and severity of menopausal symptoms and the quality of life in middle-aged women: A study from Sri Lanka. *Nurs Res Pract* 2019;2019:2081507.
  14. Unni J. Third consensus meeting of Indian Menopause Society (2008): A summary. *J Midlife Health* 2010;1:43-7.
  15. Crandall CJ, Mehta JM, Manson JE. Management of menopausal symptoms: A review. *JAMA* 2023;329:405-20.
  16. Resmi S, Bindu A, Benny PV. Climacteric symptoms among women residing in rural area of Kerala state- a cross sectional study. *Clin Epidemiol Glob Health* 2020;8:1341-4.
  17. World Health Organization. Vaccination Coverage Cluster Surveys: Reference Manual. Geneva: World Health Organization; 2018.
  18. Hilditch JR, Lewis J, Peter A, van Maris B, Ross A, Franssen E, *et al.* A menopause-specific quality of life questionnaire: Development and psychometric properties. *Maturitas* 1996;24:161-75.
  19. Ahuja M. Age of menopause and determinants of menopause age: A PAN India survey by IMS. *J Midlife Health* 2016;7:126-31.
  20. Aarti K. Age of menopause and menopausal symptoms among urban women in Pune, Maharashtra. *J Obstet Gynecol India* 2011;61:323-6.
  21. Khan S, Shukla MK, Priya N, Ansari MA. Health seeking behaviour among postmenopausal women: A knowledge, attitude and practices study. *Int J Community Med Public Health* 2016;3:1777-82.
  22. Thomas T, Kamath N, Kumar A, D'Silva F, Shetty PK. Prevalence and severity of menopausal symptoms among women – A community-based cross-sectional study. *Online J Health Allied Sci* 2021;20:2.
  23. Madhukumar S, Gaikwad V, Sudeepa D. Community based study on perceptions about menopausal symptoms and quality of life of post menopausal women in Bangalore rural. *Int J Health Sci Res* 2012;2:49-56.
  24. Peeyananjarassri K, Cheewadhanaraks S, Hubbard M, Zoa Manga R, Manocha R, Eden J. Menopausal symptoms in a hospital-based sample of women in Southern Thailand. *Climacteric* 2006;9:23-9.
  25. Chim H, Tan BH, Ang CC, Chew EM, Chong YS, Saw SM. The prevalence of menopausal symptoms in a community in Singapore. *Maturitas* 2002;41:275-82.
  26. Bae J, Park S, Kwon JW. Factors associated with menstrual cycle irregularity and menopause. *BMC Womens Health* 2018;18:36.
  27. Bhutani S, Bhutani J, Bhutani P. Social issues in post menopausal women. *J Midlife Health* 2013;4:68-9.
  28. Li L, Wu J, Pu D, Zhao Y, Wan C, Sun L, *et al.* Factors associated with the age of natural menopause and menopausal symptoms in Chinese women. *Maturitas* 2012;73:354-60.
  29. Singh P, Vyas S, Vallabh V, Nautiyal R, Srivastava A, Semwal J. A study to assess the prevalence and factors affecting menopausal symptoms among middle-aged females in the Garhwal region of Uttarakhand. *J Midlife Health* 2023;14:237-45.
  30. Cerdas Pérez S. Menopause and diabetes. *Climacteric* 2023;26:216-21.
  31. Cagnacci A, Cannoletta M, Palma F, Zanin R, Xholli A, Volpe A. Menopausal symptoms and risk factors for cardiovascular disease in postmenopause. *Climacteric* 2012;15:157-62.
  32. Ko SH, Kim HS. Menopause-associated lipid metabolic disorders and foods beneficial for postmenopausal women. *Nutrients* 2020;12:202.
  33. Yu W, Hu X, Yang L, Pan W, Deng H, Chen X, *et al.* Duration of reproductive years and time since menopause were associated with metabolic syndrome in postmenopausal parous women of Chinese ancestry. *Menopause* 2020;27:216-22.
  34. Anagnostis P, Bitzer J, Cano A, Ceausu I, Chedraui P, Durmusoglu F, *et al.* Menopause symptom management in women with dyslipidemias: An EMAS clinical guide. *Maturitas* 2020;135:82-8.
  35. Mishra SR, Chung HF, Waller M, Mishra GD. Duration of estrogen exposure during reproductive years, age at menarche and age at menopause, and risk of cardiovascular disease events, all-cause and cardiovascular mortality: A systematic review and meta-analysis. *BJOG* 2021;128:809-21.
  36. Jeong J, Kim M. Awareness and related factors of dyslipidemia in menopausal women in Korea. *Healthcare (Basel)* 2022;10:112.
  37. Anagnostis P, Lambrinoudaki I, Stevenson JC, Goulis DG. Menopause-associated risk of cardiovascular disease. *Endocr Connect* 2022;11:e210537.
  38. Su D, Song A, Yan B, Guo Q, Gao Y, Zhou Y, *et al.* Circadian blood pressure variations in postmenopausal females with hypertension. *Int Heart J* 2018;59:361-6.
  39. Liu S, Ding T, Liu H, Jian L. GPER was associated with hypertension in post-menopausal women. *Open Med (Wars)* 2018;13:338-43.
  40. Oh GC, Kang KS, Park CS, Sung HK, Ha KH, Kim HC, *et al.* Metabolic syndrome, not menopause, is a risk factor for hypertension in peri-menopausal women. *Clin Hypertens* 2018;24:14.
  41. Simpson ER. Sources of estrogen and their importance. *J Steroid Biochem Mol Biol* 2003;86:225-30.
  42. Akinbami LJ, Moorman JE, Bailey C, Zahran HS, King M,

- Johnson CA, *et al.* Trends in asthma prevalence, health care use, and mortality in the United States, 2001-2010. NCHS Data Brief 2012;94:1-8.
43. Foschino Barbaro MP, Costa VR, Resta O, Prato R, Spanevello A, Palladino GP, *et al.* Menopausal asthma: A new biological phenotype? Allergy 2010;65:1306-12.
44. van den Berge M, Heijink HI, van Oosterhout AJ, Postma DS. The role of female sex hormones in the development and severity of allergic and non-allergic asthma. Clin Exp Allergy 2009;39:1477-81.
45. Zemp E, Schikowski T, Dratva J, Schindler C, Probst-Hensch N. Asthma and the menopause: A systematic review and meta-analysis. Maturitas 2012;73:212-7.
46. Songür N, Aydın ZD, Öztürk O, Sahin U, Khayri U, Bircan A, *et al.* Respiratory symptoms, pulmonary function, and reproductive history: Isparta menopause and health study. J Womens Health (Larchmt) 2010;19:1145-54.
47. Zein J, Comhair S, Bleecker E, Busse W, Calhoun W, Castro M, *et al.* The effect of aging and menopause on asthma severity in women. Chest 2014;145:22A.
48. Leynaert B, Sunyer J, Garcia-Esteban R, Svanes C, Jarvis D, Cerveri I, *et al.* Gender differences in prevalence, diagnosis and incidence of allergic and non-allergic asthma: A population-based cohort. Thorax 2012;67:625-31.
49. Lovejoy JC, Champagne CM, de Jonge L, Xie H, Smith SR. Increased visceral fat and decreased energy expenditure during the menopausal transition. Int J Obes (Lond) 2008;32:949-58.
50. Warburton DE, Nicol CW, Bredin SS. Health benefits of physical activity: The evidence. CMAJ 2006;174:801-9.
51. Lakka TA, Laaksonen DE. Physical activity in prevention and treatment of the metabolic syndrome. Appl Physiol Nutr Metab 2007;32:76-88.
52. Wewege MA, Thom JM, Rye KA, Parmenter BJ. Aerobic, resistance or combined training: A systematic review and meta-analysis of exercise to reduce cardiovascular risk in adults with metabolic syndrome. Atherosclerosis 2018;274:162-71.
53. Morales S, Gómez-Cabello A, González-Agüero A, Casajús JA, Ara I, Vicente-Rodríguez G. Sedentarism and physical fitness in postmenopausal women. Nutr Hosp 2013;28:1053-9.
54. Verghese J, Wang C, Allali G, Holtzer R, Ayers E. Modifiable risk factors for new-onset slow gait in older adults. J Am Med Dir Assoc 2016;17:421-5.
55. Busch Tde A, Duarte YA, Pires Nunes D, Lebrão ML, Satya Naslavsky M, dos Santos Rodrigues A, *et al.* Factors associated with lower gait speed among the elderly living in a developing country: A cross-sectional population-based study. BMC Geriatr 2015;15:35.
56. Dąbrowska-Galas M, Dąbrowska J, Ptaszkowski K, Plinta R. High physical activity level may reduce menopausal symptoms. Medicina (Kaunas) 2019;55:466.
57. Ibrahim ZM, Ghoneim HM, Madny EH, Kishk EA, Lotfy M, Bahaa A, *et al.* The effect of menopausal symptoms on the quality of life among postmenopausal Egyptian women. Climacteric 2020;23:9-16.
58. Sajitha S. Menopause Related Symptoms and Correlates: A Community Based Cross Sectional Study in Kollam District, Kerala. Masters in Public Health. Achutha Menon Center for Health Science Studies, Sree Chitra Tirunal Institute for Medical Sciences and Technology. Thiruvananthapuram. Kerala, India; 2017.
59. Jahanfar S, Abdul Rahim A, Shah Reza B, Nor Azura I, Sharifah D, Siti R. Age of menopause and menopausal symptoms among Malaysian women who referred to health clinic in Malaysia. Shiraz E Med J 2006;7:1-9.
60. Waidyasekera H, Wijewardena K, Lindmark G, Naessen T. Menopausal symptoms and quality of life during the menopausal transition in Sri Lankan women. Menopause 2009;16:164-70.
61. Ashrafi M, Ashtiani SK, Malekzadeh F, Amirchaghmaghi E, Kashfi F, Eshrati B, *et al.* Symptoms of natural menopause among Iranian women living in Tehran, Iran. Iran J Reprod Med 2010;8:29-32.
62. Fallahzadeh H. Quality of life after the menopause in Iran: A population study. Qual Life Res 2010;19:813-9.
63. Barati M, Ahmadpanah M, Shirahmadi S, Bashirian S, Parsa P, Holsboer-Trachsler E, *et al.* Differential impact of sociodemographic variables on the quality of life of menopausal Iranian women. Avicenna J Neuro Psycho Physiol 2016;3:35-43.
64. Ceylan B, Özerdoğan N. Menopausal symptoms and quality of life in Turkish women in the climacteric period. Climacteric 2014;17:705-12.
65. El Shafie K, Al Farsi Y, Al Zadjali N, Al Adawi S, Al Busaidi Z, Al Shafae M. Menopausal symptoms among healthy, middle-aged Omani women as assessed with the Menopause Rating Scale. Menopause 2011;18:1113-9.
66. Kalahroudi M, Mahboubeh T, Sadat Z, Saberi F, Karimian Z. Prevalence and severity of menopausal symptoms and related factors among women 40-60 years in Kashan, Iran. Nurs Midwifery Stud 2012;1:88-93.
67. Rostami A, Ghofranipour F, Ramezanzade F, Kazemnejad A. The effect of health education on knowledge, attitude and quality of life during menopausal period. Daneshvar Peseshki 2003;11:19-23.
68. Delavar MA, Hajiahmadi M. Factors affecting the age in normal menopause and frequency of menopausal symptoms in Northern Iran. Iran Red Crescent Med J 2011;13:192-8.