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Original Research Article

Quality of life and associated factors among postmenopausal women in a rural village of Northern Kerala: a cross-sectional investigation

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ABSTRACT

Background: Menopause is associated with several physical, psychological, vasomotor, and sexual symptoms that can adversely affect the quality of life (QOL) of women. Evidence on menopause-related QOL from rural communities in Northern Kerala remains limited. This study aimed to assess the QOL of postmenopausal women and identify the factors associated with it.
Methods: A community-based descriptive cross-sectional study was conducted among 300 naturally postmenopausal women aged 45-65 years residing in a rural village of northern Kerala from June to November 2023. Participants were selected using simple random sampling from a community sampling frame. Data were collected using a pretested questionnaire incorporating the menopause-specific quality of life (MENQOL) questionnaire. Descriptive statistics and Chi-square tests were used for analysis, with $p<0.05$ considered statistically significant.
Results: The overall mean MENQOL score was 3.45±0.73, indicating a moderate decline in QOL. The physical domain had the highest mean score (4.12±1.64), followed by the vasomotor (3.82±1.76) and psychosocial (3.38±1.58) domains, while the sexual domain had the lowest mean score (2.48±1.32). Mild and moderate decline in QOL were observed in 42.0% and 38.0% of participants, respectively. Age, educational status, occupation, socioeconomic status, marital status, BMI, chronic diseases, and physical activity were significantly associated with QOL ($p<0.05$).
Conclusions: Postmenopausal women experienced a moderate decline in menopause-related QOL, with the physical domain being the most affected. Comprehensive primary care interventions focusing on lifestyle modification, chronic disease management, and health education may improve the QOL of postmenopausal women.

Keywords: Cross-sectional study, Menopause, Menopause-specific quality of life questionnaire, Postmenopause, Quality of life, Risk factors, Rural population, Women's health

INTRODUCTION

Menopause is a normal biological transition in a woman's life, marked by the permanent cessation of menstruation due to the loss of ovarian follicular function. According to the World Health Organization (WHO), natural menopause usually occurs between 45 and 55 years of age.[1] The American College of Obstetricians and Gynecologists reports the average age of menopause worldwide to be approximately 51 years, whereas studies conducted by the Indian Menopause Society indicate that Indian women attain natural menopause at a comparatively younger age, with a mean age of approximately 47.5 years.[2-4] As life expectancy continues to increase, women spend a substantial proportion of their lives in the postmenopausal period, making the preservation of their health and well-being an important public health priority.[3,4]

The decline in ovarian estrogen production during menopause results in a wide range of physical,

psychological, and sexual symptoms that may adversely affect women's daily lives. More than 80% of women experience one or more menopausal symptoms, although their severity and duration vary considerably among individuals.[3-6] Common manifestations include vasomotor symptoms, sleep disturbances, musculoskeletal complaints, mood changes, anxiety, depressive symptoms, urogenital problems, and sexual dysfunction. Several biological, behavioural, and socioeconomic factors, including age, body mass index, ethnicity, smoking, physical activity, dietary habits, comorbidities, and gynecological health, influence the occurrence and severity of these symptoms.[5,6]

Quality of life (QoL) has become an important indicator for evaluating the overall health and well-being of postmenopausal women because it reflects the cumulative impact of menopausal symptoms on daily functioning and life satisfaction. The WHO defines QoL as an individual's perception of their position in life within the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.[6,7] Among the available assessment tools, the menopause-specific quality of life (MENQOL) questionnaire is one of the most extensively validated instruments for evaluating menopause-related quality of life. It measures four domains of health, namely vasomotor, psychosocial, physical, and sexual, thereby providing a comprehensive assessment of the multidimensional effects of menopause on women's lives.[8,9]

Numerous studies, such as a study by Baral et al in Nepal, found that 51.4% of menopausal women had a poor QOL.[10] Similarly, Sharma et al in India discovered that somatic, psychological, and sexual symptoms were more prevalent among rural menopausal women compared to their urban counterparts, who enjoyed a better health-related QOL.[11] Borker et al research in Kerala revealed a high prevalence (40-60%) of physical, psychological, vasomotor, and sexual disorders among menopausal women, and reported a significant association between menopausal symptoms and poorer QOL.[12] Menopausal symptoms can adversely affect physical, psychological, social, and sexual well-being, leading to a decline in the overall QOL of postmenopausal women.[12-14] The scientific rationale of the study is that identifying the determinants of QOL can facilitate early recognition of women at risk and support the development of appropriate preventive and therapeutic interventions. Despite the growing number of studies on menopause, regional variations in sociocultural characteristics, lifestyle, and healthcare accessibility necessitate context-specific evidence. Data from rural communities in Northern Kerala regarding the quality of life of postmenopausal women remain limited. The novelty of the research lies in assessing the QOL and its associated factors among postmenopausal women in a rural village of northern Kerala using the menopause-specific quality of life (MENQOL) questionnaire. The findings of this study may help guide targeted clinical management, community-based health education, and public health strategies to improve the well-being of postmenopausal women. Therefore, this study was undertaken to assess the quality of life among postmenopausal women and identify the factors associated with it in a rural village of northern Kerala.

METHODS

Study design, setting, and duration

A community-based descriptive cross-sectional study was conducted among postmenopausal women residing in a rural village of northern Kerala, India. The study was carried out in the rural field practice area affiliated with the department of community medicine of a tertiary care teaching hospital. Data collection was undertaken over a period of six months, from 1 June 2023 to 30 November 2023. Natural menopause was defined as the permanent cessation of menstruation for at least 12 consecutive months in the absence of any obvious physiological or pathological cause or clinical intervention.[2]

Study population, sample size, and sampling

Inclusion criteria: Women aged 45-65 years who had attained natural menopause, as determined by a self-reported history of amenorrhoea for at least 12 consecutive months, and who provided written informed consent to participate were included in the study.

Exclusion criteria

Women with a self-reported history of surgical menopause following bilateral oophorectomy and those currently receiving hormone replacement therapy were excluded from the study.

Sample size

The sample size was calculated based on the prevalence of poor QOL among postmenopausal women (70%) reported by Kalhan et al using the formula $n=4pq/d^2$, where p is the estimated prevalence, $q = 100 - p$, and d is the absolute precision.[14] Assuming a 95% confidence level and an absolute precision of 6%, the minimum required sample size was calculated to be 233. After accounting for a 10% anticipated non-response rate, the required sample size was 256. A total of 300 postmenopausal women were ultimately included in the study to improve the precision of the estimates.

Sampling

A sampling frame comprising 584 women aged 45-65 years residing in the study area was prepared from the available community records. Participants were selected from the sampling frame using a computer-generated random number sequence. Women were approached according to the randomized list, and those who did not satisfy the eligibility criteria, declined to participate, or

were unavailable during the survey were replaced by the next eligible woman in the randomized sequence until the required sample size of 300 participants was achieved. All enrolled participants completed the interview, and no missing data were recorded for the study variables.

Method of data collection and data analysis

Data were collected through face-to-face interviews using a pre-designed and pretested structured questionnaire consisting of three sections. The first section recorded the sociodemographic characteristics of the participants. The second section comprised the menopause-specific quality of life (MENQOL) questionnaire, while the third section obtained information on factors that could influence the QOL of postmenopausal women. The MENQOL questionnaire is a validated instrument comprising 29 items distributed across four domains: vasomotor (3 items), psychosocial (7 items), physical (16 items), and sexual (3 items).[8,9,12-14] Participants were asked to indicate whether they had experienced each symptom during the preceding month. If a symptom was present, they rated the extent to which it affected them on a seven-point scale ranging from 0 (not bothersome) to 6 (extremely bothersome). During scoring, symptoms that were not experienced were assigned a score of 1, whereas reported symptoms were scored from 2 to 8 according to their severity, with higher scores representing greater impairment in QOL. Mean scores for each domain were obtained by dividing the total score of that domain by the corresponding number of items. Based on the mean domain score, QOL was classified as Minimal impact (1.0-2.0), mild decline (2.1-2.9), moderate decline (3.0-5.5), and severe decline (5.6-8.0).[8,9,12-15]

Data were entered into Microsoft Excel and analysed using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were expressed as frequencies, percentages, means, and standard deviations. Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test, as appropriate. A p value of <0.05 was considered statistically significant.

Ethical considerations

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from the institutional ethics committee of MES Medical College, Kerala (approval number IEC/MES/UGCM06/2023), before the commencement of the study. Written informed consent was obtained from all participants prior to enrolment.

Participants were informed about the objectives of the study, assured of the confidentiality and anonymity of the collected information, and informed of their right to refuse participation or withdraw from the study at any stage without any consequences.

RESULTS

Sociodemographic features (n=300)

Among the study participants, 62.0% were aged 56-65 years, with a mean age of 52±2.35. Nearly half were Muslims (47.3%), 89.0% belonged to nuclear families, and 74.0% had an educational level above higher secondary. Most participants were engaged in lower occupational categories (76.0%), while 53.7% belonged to the low socioeconomic status group. The majority were married (63.7%), 55.6% were overweight or obese, and 32.0% had one or more chronic diseases. Regular physical activity was reported by only 17.6% of participants, and 60.3% had one or two children (Table 1).

Table 1: Sociodemographic details of the study population (n=300).

Variables	Frequency	Percentage
Age (in years)		
45-55	114	38.0
56-65	186	62.0
Religion		
Christian	69	23.0
Hindu	89	29.7
Muslim	142	47.3
Family		
Nuclear	267	89.0
Joint family	33	11.0
Education		
Below higher secondary	78	26.0
Above higher secondary	222	74.0
Occupation		
Lower occupation	228	76.0
Higher occupation	72	24.0
Socioeconomic status (SES)		
High SES	139	46.3
Low SES	161	53.7
Marital status		
Married	191	63.7
Divorced/separated/ widowed	109	36.3
BMI		
Normal	133	44.3
Overweight/obese	167	55.6
Presence of chronic diseases		
Yes	96	32.0
No	204	68.0
Physical activity		
Regular	53	17.6
Irregular	247	82.4
Parity		
No children	17	05.6
1-2 children	181	60.3
3 or >3 children	102	34.0

The MENQOL score analysis among postmenopausal women (n=300)

The overall MENQOL score among the 300 postmenopausal women ranged from 28 to 137, with a mean score of 3.45±0.73. Based on the predefined interpretation of mean scores, the participants, on average, experienced a moderate decline in menopause-related QOL. Among the 300 study participants, 126 (42.0%) had a mild decline in QOL, while 114 (38.0%) experienced a moderate decline. A minimal impact on QOL was observed in 42 (14.0%) participants, whereas 18 (6.0%) had a severe decline in quality of life (Figure 1).

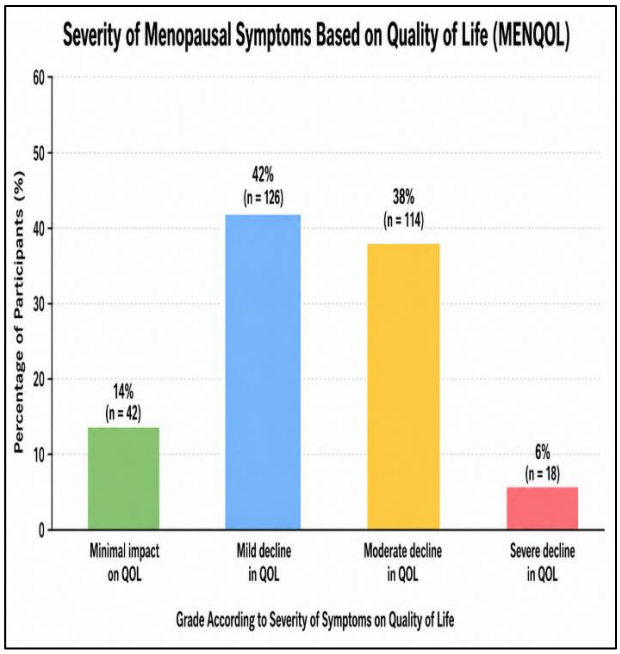

Figure 1: Severity of quality-of-life impairment among postmenopausal women based on MENQOL scores (n=300).

Table 2: Domain-wise MENQOL scores with the predominant symptom in each domain.

Domain	Most common symptoms	Average Mean±SD
Vasomotor	Hot flushes or flashes	3.82±1.76
Psychosocial	Accomplishing less than earlier	3.38±1.58
Physical	Feeling a lack of energy	4.12±1.64
Sexual	Change in sexual desire	2.48±1.32
Overall mean MENQOL score		3.45±0.73

Domain-wise MENQOL scores and symptom profile (n=300)

The overall mean MENQOL score of the participants was 3.45±0.73, indicating a moderate decline in quality of life. The physical domain had the highest mean score (4.12±1.64), corresponding to a moderate decline in QOL. The vasomotor (3.82±1.76) and psychosocial (3.38±1.58) domains also indicated a moderate decline in QOL. In contrast, the sexual domain had the lowest mean score (2.48±1.32), corresponding to a mild decline in QOL (Table 2).

Among the vasomotor symptoms, hot flushes or flashes (44.0%), night sweats (41.0%), and excessive sweating (36.0%) were the most frequently reported. In the psychosocial domain, accomplishing less than earlier (43.0%), poor memory (40.0%), feeling anxious or nervous (35.0%), and feeling depressed or down (31.0%) were the predominant symptoms. The most commonly reported physical symptoms were lack of energy (45.0%), decreased physical strength (43.0%), decreased stamina (41.0%), and low back pain (38.0%). In the sexual domain, change in sexual desire (34.0%), vaginal dryness during intercourse (32.0%), and avoiding intimacy (30.0%) were the most frequently reported symptoms.

Association between selected sociodemographic and clinical factors and the severity of quality of life among postmenopausal women (n=300)

Age, educational status, occupation, socioeconomic status, marital status, BMI, presence of chronic diseases, and physical activity showed a statistically significant association with the severity of QOL among postmenopausal women ($p<0.05$). Women aged 56-65 years had a higher proportion of moderate to severe decline in QOL (52.7%) compared to those aged 45-55 years (29.8%) ($p<0.01$). Participants with education below higher secondary more frequently experienced moderate to severe decline in QOL (66.6%) than those with higher educational attainment (36.0%) ($p<0.01$). Similarly, women engaged in lower occupational categories (52.7%) and those belonging to the low socioeconomic status group (54.0%) had a greater proportion of moderate to severe decline in QOL compared with their counterparts ($p<0.01$). Moderate to severe decline in QOL was also more common among divorced, separated, or widowed women (53.2%), overweight or obese women (52.1%), participants with chronic diseases (64.6%), and those reporting irregular physical activity (48.2%) than in the corresponding comparison groups ($p<0.05$). Religion, type of family, and parity were not significantly associated with the severity of QOL among the study participants ($p>0.05$) (Table 3).

Table 3: Association between selected sociodemographic and clinical factors and the severity of quality of life among postmenopausal women (n=300).

Variables	Minimal effect (%)	Mild decline (%)	Moderate decline (%)	Severe decline (%)	χ^2	P value
Age (years)						
45-55 (n=114)	24 (21.1)	56 (49.1)	30 (26.3)	4 (3.5)	17.26	<0.01 *
56-65 (n=186)	18 (9.7)	70 (37.6)	84 (45.2)	14 (7.5)		
Religion						
Christian (n=69)	11 (15.9)	29 (42.0)	25 (36.2)	4 (5.8)	1.00	0.985
Hindu (n=89)	14 (15.7)	36 (40.4)	34 (38.2)	5 (5.6)		
Muslim (n=142)	17 (12.0)	61 (43.0)	55 (38.7)	9 (6.3)		
Family						
Nuclear (n=267)	35 (13.1)	110 (41.2)	106 (39.7)	16 (6.0)	3.59	0.308
Joint (n=33)	7 (21.2)	16 (48.5)	8 (24.2)	2 (6.1)		
Education						
Below higher secondary (n=78)	4 (5.1)	22 (28.2)	42 (53.8)	10 (12.8)	25.84	<0.01*
Above higher secondary (n=222)	38 (17.1)	104 (46.8)	72 (32.4)	8 (3.6)		
Occupation						
Lower occupation (n=228)	20 (8.8)	88 (38.6)	103 (45.2)	17 (7.5)	37.39	<0.01*
Higher occupation (n=72)	22 (30.6)	38 (52.8)	11 (15.3)	1 (1.4)		
Socioeconomic status						
High SES (n=139)	30 (21.6)	64 (46.0)	41 (29.5)	4 (2.9)	20.78	<0.001*
Low SES (n=161)	12 (7.5)	62 (38.5)	73 (45.3)	14 (8.7)		
Marital status						
Married (n=191)	33 (17.3)	84 (44.0)	66 (34.6)	8 (4.2)	9.04	0.030*
Divorced/separated/widowed (n=109)	9 (8.3)	42 (38.5)	48 (44.0)	10 (9.2)		
BMI						
Normal (n=133)	28 (21.1)	60 (45.1)	41 (30.8)	4 (3.0)	15.84	0.001*
Overweight/Obese (n=167)	14 (8.4)	66 (39.5)	73 (43.7)	14 (8.4)		
Chronic disease						
Yes (n=96)	6 (6.3)	29 (29.2)	49 (52.1)	12 (12.5)	26.99	<0.01*
No (n=204)	36 (17.6)	97 (48.0)	65 (31.4)	6 (2.9)		
Physical activity						
Regular (n=53)	16 (30.2)	24 (45.3)	12 (22.6)	1 (1.9)	18.02	<0.01*
Irregular (n=247)	26 (10.5)	102 (41.3)	102 (41.3)	17 (6.9)		
Parity						
No children (n=17)	3 (17.6)	8 (47.1)	5 (29.4)	1 (5.9)	3.62	0.727
1-2 children (n=181)	28 (15.5)	79 (43.6)	64 (35.4)	10 (5.5)		
≥3 children (n=102)	11 (10.8)	39 (38.2)	45 (44.1)	7 (6.9)		

*Statistically significant at p<0.05.

DISCUSSION

Comparison of MENQOL scores and domain-wise quality of life

The mean age of the participants in the present study (52±2.35 years) was slightly higher than the age distribution reported by Yerra et al, where most women belonged to the 46-50-year age group, and the mean menopausal age reported by Ganapathi et al. (49.59±3.09 years).[15,16] While Sudeshna Ray et al primarily reported that 77% of women had poor QOL without providing domain-wise MENQOL scores, Mukharjee et al observed that impairment in physical and psychosocial domains increased with advancing years after menopause, indicating progressive deterioration in QOL.[17,18] Karma et al reported greater impairment in the vasomotor (3.11±1.1) and psychosocial (2.89±1.3) domains than in the physical domain (2.75±1.5), whereas the present study demonstrated the highest mean score in the physical domain (4.12±1.64), similar to the findings of Yerra et al and Ganapathi et al.[15,16,19] Nissy et al also reported poor menopause-related QOL, particularly among women with lower SES and comorbidities.[20] The observed variations may be attributed to differences in age distribution, duration since menopause, comorbidity profile, and sociocultural characteristics of the study populations.

The mean age of the participants in the present study (52±2.35 years) was comparable to the age distribution reported by Krishnapriya et al and Patike et al, but slightly lower than that reported by Vasudevan et al (55.7±4.8 years).[21,22,25] Krishnapriya et al observed poor QOL in only 3.3% of women, compared with 44.0% of women experiencing moderate to severe decline in the present study.[21] Patike et al similarly identified the physical domain (4.2±3.53) as the most affected, which was comparable to the present study (4.12±1.64).[22] Gupta et al reported poorer MENQOL scores among women with obesity, chronic diseases, and unhealthy lifestyle practices.[23] In contrast, Singh et al found the sexual domain (4.51±1.22) to be the most affected, whereas it had the lowest mean score (2.48±1.32) in the present study.[24] Vasudevan et al, Surendar et al, and Senthilvel et al also reported predominant physical impairment, suggesting that differences in menopausal duration, comorbidities, and sociocultural characteristics may explain the observed variations.[25-27]

The moderate to severe decline in QOL observed in the present study (44.0%) was lower than the prevalence of poor QOL reported by Baral et al (51.4%) and Kalhan et al (70.0%), but was consistent with the findings of Sharma et al and Borker et al, who reported a high burden of somatic, psychological, physical, vasomotor, and sexual symptoms (40-60%) among postmenopausal women, emphasizing the adverse impact of menopausal symptoms on quality of life.[10-12,14] The overall mean MENQOL score in the present study (3.45±0.73) was higher than that reported by Majid et al (2.45±1.04), indicating comparatively greater impairment in QOL. Mirhaghjou et al similarly identified the physical domain (1.91±0.52) as the most affected, which is comparable to the highest physical domain score observed in the present study (4.12±1.64).[28,29] Nazarpour et al and Norozi et al demonstrated that QOL was significantly influenced by demographic and socioeconomic characteristics, supporting the multidimensional nature of menopause-related QOL.[30,31] Kamal et al reported moderate symptom severity with a mean score of 9.11±5.76, while Poomalar et al likewise observed greater impairment in the physical domain during late postmenopause.[32,33] Although Kamal et al used the menopause rating scale (MRS) instead of the MENQOL questionnaire, the findings are broadly comparable.[32] Similar findings were reported by Abdi et al, who identified the physical dimension as the most affected, whereas Charandabi et al demonstrated poorer physical functioning with advancing age.[34,35] These similarities suggest that physical symptoms consistently exert the greatest impact on postmenopausal QOL, although differences in assessment tools and population characteristics may account for variations in severity.

Comparison of menopausal symptom profile

The prevalence of hot flushes (44.0%) and night sweats (41.0%) in the present study was lower than that reported by Ganapathi et al (60.7%) and Nissy et al (68.0%), whereas lack of energy (45.0%), decreased physical strength (43.0%), and low back pain (38.0%) were also less frequent than the corresponding findings of Ganapathi et al (85%, 92%, and 96%, respectively).[16,20] Mukharjee et al observed that vasomotor and sexual symptoms predominated during the early postmenopausal period, whereas physical and psychosocial symptoms increased with longer duration since menopause.[18] Karma et al similarly identified hot flushes, poor memory, tiredness, and reduced sexual desire as the leading symptoms across the four MENQOL domains, which is comparable to the symptom pattern observed in the present study.[19] Differences in symptom frequencies may be related to variations in menopausal duration, health-seeking behaviour, and symptom perception.

The frequency of hot flushes in the present study (44.0%) was higher than that reported by Patike et al (33.2%) and Surendar et al (27.1%), but lower than the 75.3% reported by Vasudevan et al and Senthilvel et al.[22,25-27] Similarly, night sweats (41.0%) were markedly higher than the 4.0% reported by Patike et al but lower than the 58.0% observed by Vasudevan et al and Senthilvel et al.[22,25,27] The prevalence of change in sexual desire (34.0%) was comparable with Krishnapriya et al (40.0%) but considerably lower than that reported by Singh et al (93.6%).[21,24] Likewise, lack of energy (45.0%) and low back pain (38.0%) were less frequent than the corresponding findings of Singh et al, who reported tiredness in 84.8% and low backache in 86.6%, and Surendar et al, who observed back pain in 49.6% of women.[24,26] These differences may be attributed to variations in symptom perception, health-seeking behaviour, duration since menopause, and population characteristics.

The prevalence of hot flushes in the present study (44.0%) was lower than that reported by Kamal et al. (49.2%), whereas change in sexual desire (34.0%) was considerably lower than the 98.7% reported by Majid et al and the 93.6% reported by Poomalar et al.[28,32,33] Similarly, lack of energy (45.0%) and low back pain (38.0%) occurred less frequently than the physical and mental exhaustion (69.6%) reported by Kamal et al and the low backache (79.0%) and muscle-joint pain (77.2%) reported by Poomalar et al.[32,33] Mirhaghjou et al also identified joint and muscle pain as the predominant physical complaint.[29] These variations are likely attributable to differences in menopausal duration, cultural perceptions of symptoms, healthcare accessibility, and study methodology.

Comparison of factors associated with quality of life

The significant associations of QOL with age, educational status, occupation, socioeconomic status, BMI, chronic diseases, marital status, and physical activity observed in the present study are broadly consistent with previous reports. Yerra et al reported significant associations with age, education, socioeconomic status, occupation, and duration since menopause, while Ganapathi et al found

significant relationships between sociodemographic variables and all MENQOL domains ($p<0.05$).[15,16] Sudeshna Ray et al identified lack of regular exercise (AOR 2.88), financial dependency (AOR 2.50), and menopause duration >5 years (AOR 4.82) as predictors of poor QOL.[17] Similarly, Mukharjee et al reported significant associations with education, occupation, and years since menopause, whereas Nissy et al found poorer QOL among women with low socioeconomic status, comorbidities, and physical inactivity.[18,20] These findings collectively suggest that both biological and socioeconomic factors influence menopause-related QOL across different populations.

The significant associations observed between QOL and educational status, occupation, socioeconomic status, marital status, BMI, chronic diseases, and physical activity in the present study were comparable with previous reports. Krishnapriya et al identified family type as the only significant determinant, whereas Gupta et al found poorer QOL among women with obesity, chronic diseases, and unhealthy lifestyle practices ($p<0.001$).[21,23] Vasudevan et al similarly reported significant associations with BMI, educational status, socioeconomic status, and marital status ($p<0.05$), while Surendar et al demonstrated significant associations between age at menopause and vasomotor as well as psychosocial symptoms.[25,26] Senthilvel et al also reported educational status, socioeconomic status ($p<0.01$), and marital status ($p<0.05$) as significant determinants of menopause-related QOL.[27] Overall, these findings indicate that both biological and modifiable socioeconomic factors consistently influence QOL among postmenopausal women across different settings.

The significant associations of QOL with educational status, occupation, socioeconomic status, BMI, marital status, chronic diseases, and physical activity observed in the present study were comparable with previous reports. Majid et al found significant associations with occupation, socioeconomic status, smoking, exercise, postmenopausal stage, and Omega-3 supplementation ($p<0.01$).[28] Mirhaghjou et al identified age, education, employment, BMI, physical activity, and comorbidity as significant predictors, while Nazarpour et al reported significant correlations with education ($r=0.207$), monthly family income ($r=0.218$), parity ($r=-0.165$), and duration of menopause ($r=-0.127$).[29,30] Norozi et al similarly reported significant associations with age, education, marital status, and employment.[31] Kamal et al identified education, occupation, marital status, parity, and postmenopausal duration as significant determinants, whereas Abdi et al and Charandabi et al highlighted occupation, income, chronic diseases, and marital status as important predictors of QOL.[32,34,35] These findings collectively emphasize the multifactorial determinants of menopause-related QOL across different populations.

The present study has certain limitations. As it employed a cross-sectional design, causal relationships between the identified factors and quality of life could not be established. The study was conducted in a single rural field practice area, which may limit the generalizability of the findings to other settings. In addition, the use of self-reported information may have introduced recall and social desirability bias, particularly for sensitive symptoms included in the MENQOL questionnaire. However, the use of a validated assessment tool and probability sampling strengthens the reliability of the study findings.

CONCLUSION

Overall, postmenopausal women in the present study experienced a moderate decline in menopause-related quality of life, with the physical domain being the most affected, followed by the vasomotor and psychosocial domains. QOL was significantly influenced by several sociodemographic and clinical factors, indicating that menopause is a multidimensional health issue shaped by biological, lifestyle, and socioeconomic determinants. These findings emphasize the importance of comprehensive assessment and early identification of women at risk in order to facilitate timely interventions and improve their overall well-being. Health education, promotion of regular physical activity, optimal management of chronic diseases, and appropriate psychosocial support should be integrated into routine primary healthcare services for postmenopausal women. Community-based screening and counselling programmes may further enhance awareness, encourage healthy ageing, and improve menopause-related QOL.

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REFERENCES

1. Gibbs RS, Karlan BY, Haney AF, Nygaard IE. Danforth's obstetrics and gynecology. 14th edn. Philadelphia: Lippincott Williams and Wilkins; 2008:1063-1072.
2. World Health Organization. Menopause. 2024. Available from: https://www.who.int/news-

room/fact-sheets/detail/menopause. Accessed on 5 June 2024.
3. American College of Obstetricians and Gynecologists. The menopause years. Available from: https://www.acog.org/womens-health/faqs/the-menopause-years. Accessed on 5 June 2024.
4. Unni J. Third consensus meeting of Indian Menopause Society (2008): a summary. J Midlife Health. 2010;1(1):43-7.
5. 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(9):3678-83.
6. Pallikadavath S, Ogollah R, Singh A, Dean T, Dewey A, Stones W. Natural menopause among women below 50 years in India: a population-based study. Indian J Med Res. 2016;144(3):366-77.
7. Teoli D, Bhardwaj A. Quality of life. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2024.
8. 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(3):161-75.
9. Lewis JE, Hilditch JR, Wong CJ. Further psychometric property development of the menopause-specific quality of life questionnaire and development of a modified version, MENQOL-Intervention questionnaire. Maturitas. 2005;50(3):209-21.
10. Baral S, Kaphle HP. Health-related quality of life among menopausal women: a cross-sectional study from Pokhara, Nepal. PLoS One. 2023;18(1):e0280632.
11. Sharma S, Mahajan N. Menopausal symptoms and its effect on quality of life in urban versus rural women: a cross-sectional study. J Midlife Health. 2015;6(1):16-20.
12. Borker SA, Venugopalan PP, Bhat SN. Study of menopausal symptoms and perceptions about menopause among women in a rural community of Kerala. J Midlife Health. 2013;4(3):182-7.
13. Monteleone P, Mascagni G, Giannini A, Genazzani AR, Simoncini T. Symptoms of menopause: global prevalence, physiology and implications. Nat Rev Endocrinol. 2018;14(4):199-215.
14. Kalhan M, Singhania K, Choudhary P, Verma S, Kaushal P, Singh T. Prevalence of menopausal symptoms and its effect on quality of life among rural middle-aged women (40-60 years) of Haryana, India. Int J Appl Basic Med Res. 2020;10(3):183-8.
15. Yerra AK, Bala S, Yalamanchili RK, Bandaru RK, Mavoori A. Menopause-related quality of life among urban women of Hyderabad, India. J Mid-Life Health. 2021;12(2):161-7.
16. Ganapathy T, Al Furaikh SS. Health-related quality of life among menopausal women. Arch Med Health Sci. 2018;6(1):16-23.
17. Ray S, Dasgupta A. An assessment of QOL and its determining factors of post menopausal women in a rural area of West Bengal, India: a multivariate analysis. Int J Med Public Health. 2012;2(4):12-9.
18. Mukherjee S, Som N, Roy S. Menopause-specific quality of life and attitude towards menopause among a group of postmenopausal women living in the city of Kolkata, India. Post Reprod Health. 2025;31(1):23-31.
19. Karma D, Saini S, Singh S, Sehgal DK. Quality of life among post-menopausal women in rural area of Punjab. J Med Sci Clin Res. 2018;6(1):32471-7.
20. 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(1):67-75.
21. Krishnapriya PB, Ann S, Sneha CD, Sneha PS, Saji SA, Sona PR, et al. Assess the quality of life among postmenopausal women. Int J Adv Nurs Manage. 2023;11(1):41-6.
22. Patike PB, Seshadri JG, Ankitha CR, Garg R. To assess the quality of life using menopause-specific quality of life questionnaire among menopausal women in a tertiary care hospital. J Mid-life Health. 2025;16(4):410-5.
23. Gupta G, Kumari R, Mishra P, Gupta B. Factors associated with quality of life among menopausal women in Lucknow- a cross-sectional study. J Mid-Life Health. 2023;14(4):257-64.
24. Singh K, Rawat S, Dhutraj P, Gokhe SS. Epidemiological study of health profile and quality of life of postmenopausal women in the urban field practice area of a teaching medical institute in a metropolitan city. J Fam Med Prim Care. 2024;13(8):2873-9.
25. Vasudevan S, Senthilvel S. A prospective and cross-sectional study on quality of life among postmenopausal women in a coastal semi urban area of India. Int J Sci and Med Res. 2022;2(3):14-21.
26. Surendar R, Durgapriya G, Arthi M, Srikanth S. Quality of life among post-menopausal women in rural Puducherry. Public Health Rev. 2019;6(3):112-8.
27. 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 Mid-Life Health. 2018;9(4):185-90.
28. Barati M, Akbari-Heidari H, Samadi-Yaghin E, Jenabi E, Jormand H, Kamyari N. The factors associated with the quality of life among postmenopausal women. BMC Women's Health. 2021;21(1):208.
29. Mirhaghjou SN, Niknami M, Moridi M, Pakseresht S, Kazemnejad E. Quality of life and its determinants in postmenopausal women: a population-based study. Appl Nurs Res. 2016;30:252-6.
30. Nazarpour S, Simbar M, Ramezani Tehrani F, Alavi Majd H. Factors associated with quality of life of postmenopausal women living in Iran. BMC Women's Health. 2020;20(1):104.

31. Norozi E, Mostafavi F, Hasanzadeh A, Moodi M, Sharifirad G. Factors affecting quality of life in postmenopausal women, Isfahan, 2011. J Educ Health Promot. 2013;2(1):58.
32. Kamal NN, Seedhom AE. Quality of life among postmenopausal women in rural Minia, Egypt. East Mediterr Health J. 2017;23(8):527-33.
33. Poomalar GK, Arounassalame B. The quality of life during and after menopause among rural women. J Clin Diagn Res. 2013;7(1):135.
34. Abdi N, Solhi M. Quality of life in postmenopausal women in Tehran. Iran J Health Educ Health Promot. 2014;2(2):87-96.
35. Mohammad-Alizadeh-Charandabi S, Rezaei N, Hakimi S, Montazeri A. Predictors of health-related quality of life in postmenopausal women: a population-based study. J Caring Sci. 2012;1(4):201.

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