A Community Based Survey to Assess the Knowledge and Preventive Practice of Osteoporosis among Menopausal Women

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Abstract- Background: Osteoporosis is a progressive metabolic bone disease characterized by decreased bone mass and density, leading to increased fragility and risk of fractures, especially among menopausal women due to oestrogen deficiency. Awareness and preventive practices play a key role in its management and prevention. Aim: To assess the level of knowledge and preventive practices related to osteoporosis among menopausal women residing in the Velakinar urban slum, Coimbatore. Methods: A descriptive cross-sectional community-based study was conducted among 50 menopausal women aged between 45 and 60 years. Participants were selected using convenience sampling. Data were collected using a pretested semi-structured questionnaire consisting of two parts: demographic data and the standardized Osteoporosis Knowledge Assessment Tool (OKAT). Descriptive and inferential statistics were used for analysis. Results:

Out of the 50 participants, 62% demonstrated poor knowledge (scored ≤8 out of 20), 28% had moderate knowledge (score 9–14), and only 10% had good knowledge (≥15). Regarding preventive practices, only 26% engaged in regular physical activity, and 34% reported adequate dietary calcium intake. A statistically significant association was found between educational status and knowledge level ($p<0.05$). Conclusion: The study highlights a substantial knowledge gap and suboptimal preventive practices among menopausal women in the selected urban slum area. Community-based educational interventions are essential to improve awareness and promote healthy lifestyle modifications to prevent osteoporosis.

Keywords: Osteoporosis, Menopausal women, Knowledge, Preventive practice, OKAT, Urban slum, Community-based study.

I INTRODUCTION

Osteoporosis is a silent, progressive metabolic bone disease characterized by low bone mass and deterioration of bone tissue, leading to increased bone fragility and risk of fractures, particularly of the hip, spine and wrist. Often referred to as the "silent disease", it typically remains undetected until a fracture occurs. (1)

Globally, osteoporosis affects over 200 million people and the incidence is expected to rise with the aging population. Women are disproportionately affected, particularly after menopause, due to a significant drop in oestrogen levels-a hormone crucial bone preservation. It is estimated that one in three women over the age of 50 will experience osteoporotic fractures in their lifetime. (2)

In many low- and middle-income countries, awareness of osteoporosis and its risk factors remains limited. The condition is often under diagnosed and undertreated, primarily due to a lack of routine screening, cultural beliefs, low literacy levels and inadequate access to health care resources. (3)

Osteoporosis is a growing global public health concern, particularly among postmenopausal women due to oestrogen deficiency which accelerates bone loss. Numerous studies have assessed knowledge and preventive practices related to osteoporosis,

highlighting considerable gaps in awareness and behaviour, especially among socioeconomically disadvantaged groups. (4)

According to the International Osteoporosis Foundation (2023), osteoporosis causes more than 8.9 million fractures annually worldwide, with one in three women over age 50 experiencing osteoporotic fractures. In India, osteoporosis affects an estimated 50 million people, primarily women, and early menopause, low body weight, poor calcium intake, and vitamin D deficiency are major risk factors. (5)

Winzenberg et al. (2003) developed the Osteoporosis Knowledge Assessment Tool (OKAT), a validated questionnaire widely used in research to assess public awareness. It assesses knowledge on risk factors, preventive measures, symptoms, and treatment. Their study demonstrated that many women had critical gaps in knowledge regarding diet, physical activity, and osteoporosis complications. (6)

Edmonds et al. (2005) conducted a study on American college women and found only 15% had high knowledge scores. They reported that women with higher education levels and better access to healthcare information had significantly better understanding of osteoporosis. Similarly, a study by Gammage et al. (2009) revealed that dietary restraint, media influence, and body image concerns often overshadow health-focused dietary choices among women. (7)

In the Indian context, Ravindran et al. (2019) conducted a study among rural postmenopausal women in Kerala. The findings indicated that only 28% of the participants had adequate knowledge, and even fewer practiced preventive behaviours. Karthik et al. (2020) in Tamil Nadu reported 65% poor knowledge scores and highlighted that only 30% of respondents consumed a calcium-rich diet regularly. These results underscore the disparity in osteoporosis awareness among urban and rural populations and emphasize the need for localized interventions. (8)

Sharma et al. (2021) demonstrated that structured community health education significantly improved knowledge among menopausal women. Their study implemented a 6-week intervention in Delhi and found statistically significant improvement in knowledge scores and behavioural intention to adopt healthy practices. (9)

Statement of the problem

A Community Based Survey to Assess the Knowledge and Preventive Practice of Osteoporosis among Menopausal Women in selected urban slum, Coimbatore.

Objectives of the study

- To assess the knowledge of osteoporosis among menopausal women using OKAT.
- To evaluate their preventive practices related to osteoporosis.
- To identify the association between knowledge level and selected demographic variables.

II MATERIALS AND METHODS

A community-based descriptive cross-sectional study was conducted to assess the knowledge and preventive practices of osteoporosis among menopausal women residing in the Velakinar urban slum of Coimbatore. The study population included 50 menopausal women aged between 45 and 60 years, selected using a convenience sampling technique. Data collection was carried out through a face-to-face interview using a structured tool comprising two sections: the first part included demographic information such as age, education, occupation, and lifestyle habits; the second part employed the Osteoporosis Knowledge Assessment Tool (OKAT), a validated 20-item questionnaire designed to assess knowledge on osteoporosis risk factors, prevention, and treatment. Each correct response on the OKAT was scored as one point, with total scores categorized as poor (0–8), moderate (9–14), and good (15–20). Additionally, participants were assessed for preventive practices such as calcium intake, physical activity, and sunlight exposure.

Data were analyzed using descriptive statistics to summarize knowledge levels and practices, and inferential statistics (Chi-square test) were applied to explore associations between knowledge and selected demographic variables.

Permission to use the tools was sought from the experts through email. In the majority of occasions, the questionnaires were collected in their own mother tongue.

Ethical consideration

Ethical approval was obtained from the Institutional Ethics Review Board and formal approval was

obtained from the Velakinar Urban PHC Doctor, Coimbatore to conduct the study in the urban slum and also from the local community leaders. The researcher has followed fundamental ethical principles like the right to freedom from harm and discomfort, respect for human dignity. The researcher gave full freedom to the participant to decide voluntarily whether to participate in the study or to withdraw from the study and the right to ask questions at any time during the course of the study. One visit was made to meet the menopausal women and distribute the consent and assent forms, later on two visits were made for data collection, hence minimum of three visits were made for each participant. The investigator has maintained the participants' privacy throughout study. The investigator has administered the same questionnaire for all the menopausal women

Statistical Analysis

The data from the proforma were entered in Microsoft excel 2016 and analyzed using Statistical Package for Social Sciences (SPSS) version 17.0.

III RESULTS

Socio-demographic Characteristics

The study included a total of 50 menopausal women from the Velakinar urban slum in Coimbatore, aged between 45 and 60 years. Among them, 34% were in the age group of 45–50 years, 42% belonged to the 51–55 age group, and 24% were aged between 56–60 years. In terms of educational status, 40% of the women were illiterate, 30% had completed primary education, 20% had attained secondary education, and only 10% had studied up to higher secondary or beyond. A majority of the participants (60%) were homemakers, followed by 28% who were engaged in daily wage labor, and the remaining 12% in other informal occupations. Most of the women (84%) lived in nuclear families, and 16% belonged to joint families. Regarding dietary habits, only 34% of the participants reported regular consumption of calcium-rich foods such as milk, greens, or pulses, while the rest had irregular or insufficient intake. In terms of lifestyle, only 26% engaged in regular physical activity, and 38% had routine exposure to sunlight. Notably, 92% reported abstaining from tobacco and alcohol use. These socio-demographic details highlight a population with limited educational attainment and access to health-promoting behaviors, indicating a critical need for targeted awareness and intervention programs.

Distribution of Knowledge Level (Based on OKAT Scores)

Osteoporosis Knowledge Assessment Tool (OKAT), a validated 20-item questionnaire designed to assess knowledge on osteoporosis risk factors, prevention, and treatment.

Each correct response on the OKAT was scored as one point, with total scores categorized as poor (0–8), moderate (9–14), and good (15–20). The resulting score was interpreted as follows

Table 1: Distribution of Knowledge levels (Based on OKAT Scores). N=50

S. No	Level of knowledge	Category	Percentage (%)
1	Poor Knowledge	0-8	62%
2	Moderate Knowledge	9-14	28%
3	Good Knowledge	15-20	10%

Figure 1: Preventive Practices Followed by Participants

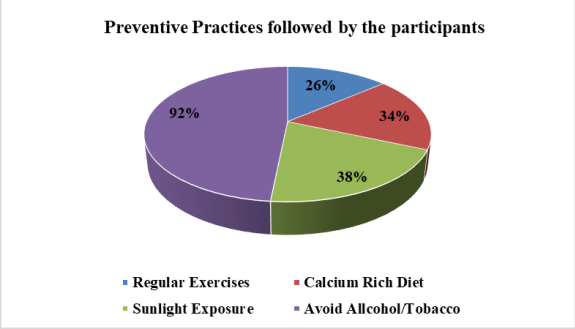

Figure 2: Association between Education and Knowledge Level

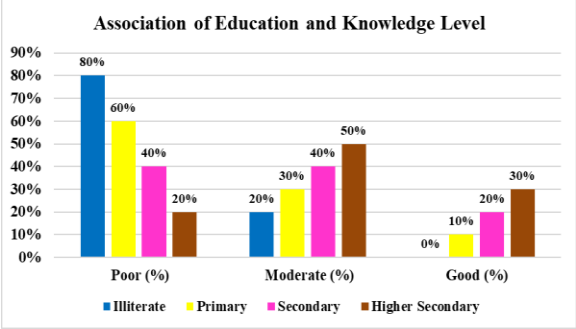

Table 2: Statistical Association between Education and Knowledge

Variable	χ^2 Value	df	p-value	Significance
Education vs Knowledge	11.23	6	0.003*	Significant

Note: Asterisk (*) denotes significance at $p < 0.05$.

IV DISCUSSION

The present study aimed to assess the knowledge and preventive practices related to osteoporosis among menopausal women residing in an urban slum setting using the standardized Osteoporosis Knowledge Assessment Tool (OKAT). The findings revealed that a majority (62%) of the respondents had poor knowledge, while only 10% demonstrated good understanding of osteoporosis. These results are consistent with prior research indicating widespread lack of awareness about osteoporosis among women, particularly those from low socioeconomic and educational backgrounds.

The low levels of knowledge observed in this study can be attributed to factors such as limited formal education, poor access to health information, and inadequate public health communication in slum areas. This is supported by the significant association found between educational status and knowledge level ($p = 0.003$), emphasizing the role of education in health literacy. Similar findings were reported by Karthik et al. (2020), who found that 65% of postmenopausal women in Tamil Nadu had poor osteoporosis knowledge, and by Ravindran et al. (2019) in rural Kerala. (10)

Preventive practices in the current study were also suboptimal. Only 26% of women engaged in regular physical activity, 34% consumed calcium-rich diets regularly, and 38% had sufficient sunlight exposure. These figures highlight a concerning gap between awareness and health behaviour, which has also been noted in earlier studies. For instance, Ho-Pham et al. (2010) reported that despite knowledge about osteoporosis being limited, behavioural change remained low even among those who were aware of the disease. The high abstinence from tobacco and alcohol (92%) among participants is encouraging, though it may be influenced by cultural norms rather than osteoporosis-specific awareness. (4)

The findings underscore the urgent need for culturally appropriate, community-based health education interventions targeting menopausal women in urban slum areas. Community health nurses and primary health workers can play a pivotal role in conducting awareness sessions, promoting behavioural change, and linking women to preventive services such as bone density screenings and nutritional supplementation programs.

Moreover, integrating osteoporosis education into existing women's health initiatives and leveraging local health volunteers could enhance the reach and effectiveness of such programs. Given that menopause is a critical window of opportunity for intervention, strengthening knowledge and preventive action during this period could significantly reduce the risk of osteoporotic fractures and improve quality of life in later years.

In summary, the discussion reflects how educational and behavioural gaps continue to contribute to osteoporosis risk among vulnerable groups. These findings align with global and national evidence and provide a strong rationale for implementing structured, grassroots-level interventions to improve osteoporosis outcomes among postmenopausal women.

Limitations:

- Small sample size limits generalizability
- Self-reported practices may introduce bias

Future Implications:

- Incorporate osteoporosis education into community health outreach
- Regular screening camps for early detection and referral

V CONCLUSION

The present community-based cross-sectional study was conducted to assess the knowledge and preventive practices of osteoporosis among 50 menopausal women in the Velakinar urban slum of Coimbatore using the Osteoporosis Knowledge Assessment Tool (OKAT). The findings clearly indicate that the majority of the participants had poor knowledge regarding osteoporosis, with significant gaps in understanding about its causes, risk factors, and preventive measures. Only a small percentage of

women demonstrated good knowledge, and even fewer were practicing effective prevention strategies such as regular calcium intake, physical activity, and sunlight exposure.

The study also found a statistically significant association between the participants' educational status and their level of knowledge, indicating that women with higher educational attainment had better understanding of osteoporosis. This highlights the crucial role that literacy and access to health information play in promoting preventive health behaviour.

Furthermore, the findings reveal that despite being at high risk, many menopausal women in low-income urban settings are not taking adequate steps to prevent osteoporosis. Cultural beliefs, lack of awareness, economic constraints, and limited access to healthcare services may all contribute to this deficiency.

The results underline the urgent need for comprehensive, community-level health education programs tailored to menopausal women, particularly in underserved areas like urban slums. Community health nurses, ASHA workers, and local health volunteers should be mobilized to conduct awareness campaigns, provide nutritional counselling, encourage physical activity, and promote early screening and treatment for osteoporosis.

This study provides valuable baseline data and reinforces the importance of public health interventions to empower women with the knowledge and tools necessary to protect their bone health during and after menopause. Integrating osteoporosis education into existing maternal and women's health services could lead to sustained improvement in health outcomes for this vulnerable population.

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VII Conflict of Interest: None declared

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IX CONTRIBUTORS

SK: Conceptualization of the study, collection, analysis of the data, finalized the manuscript and will act as the guarantor of the paper; AR: Writing the manuscript NG: Edited and critically evaluated the manuscript.

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