ORIGINAL ARTICLE DOI: https://doi.org/10.52206/jsmc.2024.14.3.915 OPEN ACCESS

Knowledge of Osteoporosis Prevention among Community Health Workers of National Program for Family Planning and Primary Healthcare

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ABSTRACT

Background: Osteoporosis is a bone disease that weakens bones and leads to fractures. Identifying Lady Health workers' (LHWs) knowledge gaps is critical in designing appropriate training for LHWs to improve osteoporosis outcomes.
Objective: To assess lady health workers' knowledge and misconceptions regarding Osteoporosis prevention in Pakistan.
Materials and Methods: All LHWs of Sindh province enrolled in the LHWs Programme were considered relevant study populations. A cross-sectional survey was done from July 2023 through December 2023. The LHWs were selected using a simple random sampling technique, and a validated Osteoporosis Prevention and Awareness Tool (OPAAT) was adopted from a previous study. The data was gathered from a representative sample of 395 LHWs. Data was entered online on Google Forms and analyzed using SPSS version 28. Study findings were presented in frequency and percentage. The Chi-square test was used to show an association between socio-demographic and osteoporosis prevention and misconception.
Results: The survey response rate was 96%. The study found that 129 (32.65%) LHWs had low knowledge, 192 (48.61%) had average knowledge, and 74 (18.7%) had a good understanding of osteoporosis prevention and awareness. The community worker's socio-demographic features revealed a substantial representation of adults aged 29-38 years (36%), married (63%), with middle-class education levels (52%), and in the postmenopausal stage (45%). The study found a statistically significant association between higher levels of knowledge and academic qualification ($p < 0.01$).
Conclusion: The study discovered that most participants had an average understanding of osteoporosis prevention and held incorrect attitudes. The current research recommends a multidimensional approach considering socio-demographic and educational factors in bridging the LHWs' knowledge gap.
Keywords: Lady Health Workers, OPAAT Score, Osteoporosis Prevention.

This article may be cited as: Bijarani SA, Wassan SM, Ahmed J, Bashir S, Huma S, Jamali AA. Knowledge of Osteoporosis Prevention among Community Health Workers of National Program for Family Planning and Primary Healthcare. J Saidu Med Coll Swat. 2024;14(3):230-236. DOI: https://doi.org/10.52206/jsmc.2024.14.3.915

INTRODUCTION

Globally, osteoporosis is a vital health problem characterized by reduced bone mass and increased fracture risk. In Pakistan, as in many other countries, community health workers, called lady health workers (LHWs), play an essential role in primary healthcare delivery, including disease prevention and health promotion activities.[1-3] Given the extreme burden of osteoporosis and its substantial impact on morbidity and mortality rates among older adults, particularly postmenopausal women, understanding LHWs' knowledge and awareness about osteoporosis is crucial for effective community-level interventions.[3,4]

Research on osteoporosis knowledge and awareness among different groups in Pakistan reveals a general lack of understanding about the disease and its risk factors. A social-media-based survey assessed knowledge, attitude, and practice (KAP) regarding osteoporosis among Pakistani women. Although this study primarily targeted women through social media platforms rather than LHWs directly, the study highlighted significant gaps in knowledge about osteoporosis risk factors, symptoms presentation, treatment benefits, and preventive measures within the general population. This finding underscores the potential gap that might exist among LHWs who are tasked with educating these populations.[5]

Few studies on perimenopause emphasize the critical period leading up to menopause as an essential window for intervention against diseases like osteoporosis. While not directly addressing community health workers, the research provides valuable insights into the importance of healthcare providers being well-informed about conditions such as osteoporosis that significantly affect women during this life stage.[6,7] This study indirectly highlights the need for adequate training and awareness among all levels of healthcare providers, including community health workers.

A retrospective study in the United States of America (USA) in 2022 evaluated clinical and economic burdens associated with moderate to severe osteoarthritis pain, revealing important aspects of managing chronic musculoskeletal conditions.[8] However, focusing on osteoarthritis rather than osteoporosis directly demonstrates how chronic condition management requires comprehensive understanding amongst healthcare professionals-

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Received: March 12th, 2024 - 1st Revision: May 19th 2024
Accepted: June 06th, 2024

including those at the community level - regarding disease progression implications on patients' quality of life.[2,9,10]

A randomized trial in 2023 in Canada explored virtual frailty rehabilitation programs targeting older adults during the COVID-19 pandemic, showcasing innovative approaches towards managing conditions affecting elderly populations, such as frailty, which often coexists with or results from untreated or poorly managed osteoporosis.[11] The adaptation towards virtual interventions reflects an evolving landscape where community health workers could potentially leverage technology-enhanced solutions for education dissemination concerning preventative measures against diseases like osteoporosis within their communities.[1,12,13]

The studies on Pakistan's focusing knowledge levels regarding osteoporosis remain scarce within analyzed literature; evidence suggests substantial room for improvement across various facets related to awareness creation amongst both healthcare workers at the community level and the wider public alike. Implementing targeted educational initiatives aimed at bridging identified knowledge gaps stands out as an imperative strategy moving forward, ensuring more effective prevention strategies are employed in combating rising tide against diseases such as Osteopenia or Osteoporotic fractures, especially amongst vulnerable groups, i.e., postmenopausal women residing in rural or urban settings, across Pakistan.

In Pakistan, where improved access to healthcare service delivery is challenging, and the burden of non-communicable illnesses is rising, understanding open mindfulness and misinterpretations around osteoporosis avoidance is vital for preventive strategies.[14] A social media-based survey evaluating osteoporosis knowledge among adult women indicated that only 34% of participants had good knowledge about osteoporosis, with several misconceptions about its prevention and risk factors[5]. Few studies in Pakistan have assessed the knowledge and misconception surrounding osteoporosis in different settings. However, this is the first study to understand and address the knowledge gaps regarding osteoporosis prevention among female health workers using the standard Osteoporosis Prevention and Awareness Tool (OPAAT).[15] The research will provide a blueprint for decision-makers in Pakistan to develop targeted educational interventions, thereby enhancing the effectiveness of community health workers in promoting bone health.

MATERIALS AND METHODS

The primary goal of this study was to thoroughly investigate the level of knowledge, awareness, and common misconceptions about osteoporosis prevention among community health workers, as well as to identify gaps in understanding, potential areas for improvement, and strategies for improving osteoporosis prevention education among this critical healthcare workforce. A cross-sectional study was conducted using simple random sampling to enroll female health workers (LHWs). All LHWs in Sindh participating in the Lady Health Workers Programme for Family Planning and Primary Health Care were considered relevant study subjects, and the list of LHWs was collected from them. LHWs with at least three years of field experience were recruited regardless of age, educational qualifications, or marital status. We used OpenEpi software[16] to generate a random number list. The LHWs who were not willing to participate nor were deployed in the community (office-based job) were excluded from the study. The project was executed after seeking ethical approval from the Research Ethical Committee, LUMHS, Jamshoro (LUMHS/REC/2023/045), dated 4th June 2023. The OpenEpi software was used to estimate sample size using n = [DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)],[16] keeping the low knowledge for osteoporosis as 44%[5] with a confidence interval of 95%, margin of error 5%, the estimated sample size is 410 as shown in figure 01. However, we receive responses from 395 participants with a 96% response rate. A standard questionnaire titled “Osteoporosis Prevention and Awareness Tool (OPAAT)” was adopted from a previous study.[15] The questionnaire was validated on 30 LHWs. Cronbach's alpha coefficient was > 0.7, which is considered a good value for a questionnaire for data collection. Three well-qualified researchers checked the whole questionnaire for validity. The index of the item objectives congruence was >0.5 for each question, which is considered a satisfactory value. The questionnaire comprises four sections: 1). Section one acquired information regarding socio-demographic characteristics such as age, marital status, education level, employment status, menopausal status, etc. 2). Section 2 acquired OPAAT Score section 3. Pertains to Knowledge, Attitude, and Practice of Osteoporosis. Section 4 seeks information regarding misconceptions regarding osteoporosis prevention and awareness. Moreover, This OPAAT tool comprises 30 questions administered in English and explores knowledge of osteoporosis pathogenesis, prevention, and the impact of untreated illness. Surveys were scored with one point for each right response and 0 for wrong responses or for selecting the "don't know" option. A knowledge score of approximately 24 out of 30, 1923, and less than 19 on the OPAAT is deemed suitable, average, and low. In the current study project, the exposure of interest was knowledge regarding the prevention of osteoporosis presented through the OPAAT Score, and the outcome of interest was attitude, practice, and misconception regarding osteoporosis.

The stratification was performed during the study to adjust for variables such as age, marital status, educational level, menopausal state, and OPAAT score. The survey's initial page requested digital authorization for the enrollment of the participant. Participation in the survey was entirely voluntary, and respondents could opt out at any point in time by not submitting their responses. The study does not contain any identifying information. However, the obtained data was stored electronically and password-protected.

The data was collected online via Google Forms and processed with SPSS version 28. The data was presented as frequency and percentage. The Chi-square test assessed the relationship between socio-demographic characteristics and osteoporosis prevention, awareness, and misperception, with a p-value < 0.05.

RESULTS

The study response rate was 96%. The catchment area (community) of the Community health workers officially recognized as Lady Health Workers (LHWs) is presented in Figure 01.

The OPAAT Tool was employed to assess healthcare workers' awareness and understanding of osteoporosis prevention. The study revealed that 129 (32.65%) LHWs had low knowledge, 192 (48.61%) had average knowledge, and 74 (18.7%) had good knowledge of osteoporosis prevention and awareness, as illustrated in Figure 02.

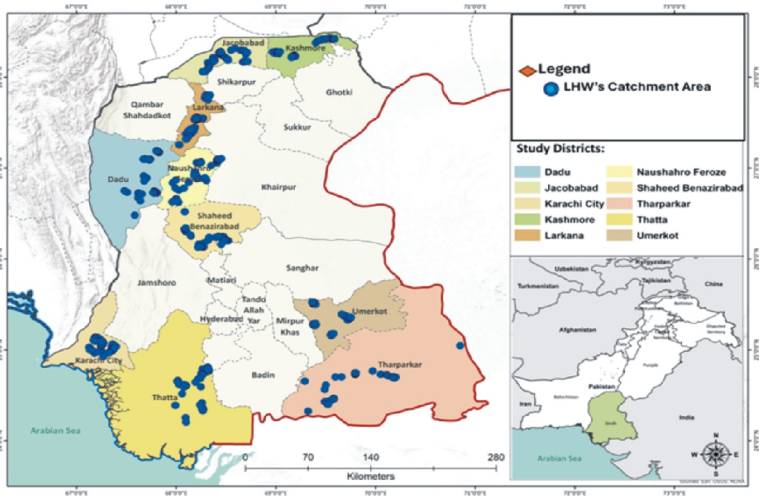

Figure 01. Lady Health Workers (Community Workers) Catchment Area

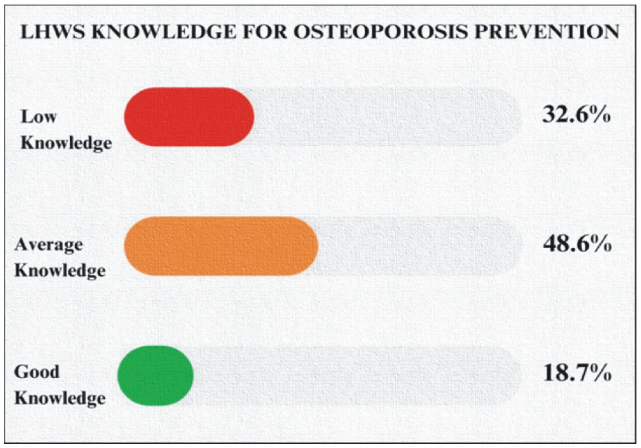

Figure 02. Community Workers Knowledge regarding Osteoporosis measured on OPAAT Tool

The socio-demographic profile of the community workers revealed a substantial participation of individuals aged 29-38 (35.44%) and 39-48 (29.26%), with the 49-60 age group accounting for 25.56% of the participants. Regarding marital status, the majority (62.53%) were married, while 21.27% were single, 8.86% divorced, and 7.34% were widowed. Regarding academic accomplishments, 51.65% of the health workers attended middle school, with 30% holding a secondary school certificate. A mere 5.82% of health workers held master's degrees. In addition, 44.81% of the participants were post-menopausal, as shown in Table 01.

The OPAAT Score instrument consists of 30 questions, as shown in Table 2. In the first section, which focuses on knowledge-related inquiries, a significant portion of female health workers demonstrated familiarity with: the perception that the bone mineral density test is high in radiation (70%), followed by questions about bone loss monitoring, and the fact that a bone mineral density test is performed once a month. In the second segment, 45% of participants acknowledged that back pain was caused by osteoporosis, while 43% comprehended that it resulted in a loss of mobility. In the third component, 40% of participants accurately indicated the daily recommended consumption of vitamin D dose by exposure to sunlight, Table 2 shows that approximately 37% of health workers were aware of the recommended daily calcium intake for women and that increasing tea or coffee drinking can help prevent osteoporosis.

Table 01. Socio-Demographic Characteristics of the Study Participants

Participants Characteristics		Frequency (n=395)	Percentage (%)
Age (years)	1828	38	9.62
	2938	140	35.44
	3948	116	29.36
	4960	101	25.56
Education Level	Middle School	204	51.65
	Secondary	122	30.89
	Bachelor	46	11.65
	Masters and above	23	5.82
Marital Status	Single	84	21.27
	Married	247	62.53
	Separated / Divorced	35	8.86
	Widowed	29	7.34
Post Menopausal Status	Yes	177	44.81
	No	218	55.19

Table 02. LHWs Osteoporosis prevention and misconception Score on OPAAT tool[15]

What can you tell me about osteoporosis?	(n=395) Correct responses	
	f	%
1.Osteoporosis keeps bones vulnerable and extra brittle and may lead to fracture.	249	63.037
2.Osteoporosis is part of aging, and everyone is at risk.	199	50.37
3.Osteoporosis happens because bone erodes quicker than it is formed.	121	30.63
4.Osteoarthritis and Osteoporosis are not the same names used to describe the similar disease.	196	49.62
5.Osteoporosis is often symptomless.	206	52.15
6.Post-menopausal females are not a risk factor for osteoporosis	103	26.07
7.Osteoporosis is not a curable disease.	122	30.88
8.A bone mineral density test is used to diagnose osteoporosis.	203	51.39
9.Unless I fracture my bones, I do not need a bone mineral density test.	225	56.96
10.The test is high in radiation for assessing bone mineral density.	279	70.63
11. To monitor bone loss, a bone mineral density test is performed once a month	256	64.81
If osteoporosis is left untreated, what will happen?	**f**	**%**
12. Tooth loss is the result of Osteoporosis	155	39.24
13. Hunchback or loss of height is the result of Osteoporosis	146	36.96
14. The main presentation of osteoporosis includes swelling of fingers and or Joint pain	76	19.24
15. Back pain results from Osteoporosis	178	45.06
16. I unable to walk by myself (Osteoporosis results in loss of mobility)	169	42.78
What can you tell me about osteoporosis prevention (misconceptions)	**f**	**%**
17. Milk, yogurt, Spinach, yellow dhal, and cheese foods high in calcium comprise	133	33.67
18. Walking quickly (weight-bearing activity) helps minimize bone loss.	98	24.81
19. Vitamin D intake occur by exposing skin to sunlight for 10-15 minutes daily	157	39.75
20. Increase intake of Tea and coffee may help preventing osteoporosis.	135	34.18
21. The recommended intake of calcium for women is 1,000 mg daily	149	37.72
22. The Glucosamine intake could prevent osteoporosis	86	21.77
23. Osteoporosis could be prevented by calcium supplements	123	31.13
24. Comfortable shoes with solid grip prevent falls	130	32.91
25. It is too late to increase intake of calcium consumption considerably ahead of the 18 years age	144	36.45
26. Exercise damage bones	74	18.73
27. Poor eyesight can lead to falling	123	31.14
28. Some drugs (such as high blood pressure, sleeping tablets) may reduce the risk of falling	95	24.05
29. Underweight prevent osteoporosis	113	28.60
30. Daily intake of calcium supplements leads to kidney stones	79	20

Table 03. Association of Community Workers' Socio-demographic characteristics and level of knowledge on OPAAT Score

Characteristics	Low knowledge (OPAAT Score)	Average Knowledge (OPAAT Score)	High knowledge (OPAAT Score)	P-value
	n (%)	n (%)	n (%)	
Age (years)	35 (27.1)	45(23.4)	18 (24.3)	**0.074**
1828	32 (24.8)	49 (25.5)	19 (25.6)	
2938	29 (22.4)	41 (21.3)	22 (29.7)	
3948	33 (25.5)	57 (29.6)	15 (20.2)	
4960				
Marital Status	30 (23.2)	35 (18.2)	19 (25.6)	**0.358**
Single	71 (55.1)	126 (65)	36 (48.6)	
Married	13 (10.1)	16 (8.3)	10 (13.5)	
Separated / Divorced	15 (11.6)	15 (7.8)	9 (12.1)	
Widowed				
Education Level	55 (42.6)	89 (46.3)	35 (47.2)	
Middle School	45 (34.8)	69 (35.9)	24 (32.4)	**0.015**
Secondary	20 (15.5)	20 (10.4)	13 (17.5)	
Bachelors	9 (6.9)	14 (7.2)	2 (2.7)	
Masters				
Post Menopausal Status	64 (49.6)	86 (44.8)	27 (36.5)	**0.0321**
Yes	65 (50.4)	106 (55.2)	47 (63.5)	
No				

As illustrated in Table 03, a significant association was observed between higher levels of knowledge, educational achievement ($p<0.05$), and post-menopausal status ($p<0.05$). However, the latter relationship was regarded as weak. Furthermore, age and marital status showed no significant difference ($p>0.05$) with regard to the osteoporosis knowledge.

DISCUSSION

Our study aimed to determine the osteoporosis prevention knowledge, awareness, and common misunderstandings among Lady Health Workers (LHWs) working under the National Programme for Family Planning and Primary Health Care in Sindh, Pakistan. The study shed light on the present understanding among community health workforces. There is little information on community workers' knowledge, awareness, and understanding of osteoporosis.

Previous studies on the general population in Pakistan revealed that 22% had low knowledge, 44% had average knowledge, and 34% had good knowledge of osteoporosis[5], whereas, in Iran, the understanding regarding osteoporosis showed poor (41%), moderate (46%), and good levels (13%)[17]; our results showed some inconsistency with both studies due to differences in the study population (community workers vs. general population). As in our study, 18.7% of LHWs showed a good understanding of osteoporosis prevention and awareness, which indicates that it needs improvement. In comparison, half of them have average knowledge. On the other hand, 32.6% of respondents with low levels of expertise still demonstrate that a large proportion of the workforce may not be well-equipped to distribute very important information for preventing and knowing how to detect osteoporosis in the community. This knowledge gap may affect the effectiveness of community health intervention programs aimed at reducing the risk of osteoporosis among the population.[9,18] This could identify that awareness programs related to osteoporosis should be designed according to educational profiles and stages in life. Considering that over half of the health workers had only gone through primary school and a remarkable proportion was in post-menopausal years, educational interventions targeting this group of people must consider the educational level and the relevance of osteoporosis information to one's health. A high level of knowledge is positively and significantly correlated with education attainment, thus leaving no room for doubt about the constant need to focus on education through continuous education and training programs. Many of the participants(36.5%) reported being post-menopausal, which is a crucial factor in understanding the relevance of osteoporosis and its management. Compared to 27.8% in a study on general population in Pakistan.[5] The weak relationship between knowledge and post-menopausal status is self-explanatory and would only work with personal health status as a motivator to acquire osteoporosis knowledge. That means there should be some outside incentives or support for health education.[19, 20] However, there are some misconceptions among the LHWs, such as

overestimating radiation and the fact that the testing is done frequently. This clearly identifies the need for educational interventions to change misinformation and create awareness based on correct knowledge. Recognizing such symptoms and risk factors of osteoporosis, including back pain and loss of mobility, reveals some basic awareness that has already been laid out and that further learning could continue to build upon. In relation to the above, lower awareness of recommended daily vitamin D and calcium intakes, coupled with various notions on the preventive role of tea or coffee consumption, consequently indicate a clear picture regarding areas needing to be underlined with focus during future training programs.[9,21]

Further, the study found a strong association between a higher level of knowledge and educational attainment, suggesting that educational interventions could be particularly successful in increasing osteoporosis knowledge. Therefore, the weak association of age and marital status points toward knowledge acquisition as a factor that may not be influenced a lot by these demographic factors. Hence, educational programs must be open for all LHWs without any difference due to age or marriage. The results further highlight the need for focused educational and training programs that close the gap in osteoporosis knowledge among community health workers in Pakistan.[5] This will work through focusing on correcting misconceptions, providing accurate information on risk factors, symptoms, and prevention strategies to be made relevant to the socio-demographic and educational backgrounds of the LHWs, thus having a great impact on the level of their ability to contribute towards the prevention and management of osteoporosis in their communities.[1, 17] Results also indicate that continuous professional development for the CHWs, especially those with low educational backgrounds, would build momentum in the community towards changed health outcomes. Such research could dig into the effectiveness of specific educational interventions among community health workers and their impact on the practice of knowledge about osteoporosis, prevention, and management practice.[22,23] In contrast to our study findings, the results regarding osteoporosis knowledge and awareness among various demographics in Pakistan have mixed results. For example, A study showed consistent results that young women were more aware of osteoporosis but did not adopt healthy behaviors to avoid it.[24] On the other hand, a study found that female medical school entrants in Karachi lacked information and did not engage in preventative activities.[25] However, both studies emphasize the need for increased education and awareness programs, particularly for health workers, to bridge this knowledge gap and promote preventive measures.

CONCLUSION

The LHWs working for the National Programme for Family Planning and Primary Health Care Sindh had a basic to limited knowledge about osteoporosis prevention, and numerous participants had misconceptions surrounding it. These findings emphasize the significance of targeted interventions, primarily educational efforts geared to certain groups within the LHW community. Such programs can bridge existing knowledge gaps, thus strengthening Community Health Workers' roles in osteoporosis prevention. As we evaluate the implications of this study, it becomes evident that a holistic approach that considers socio-demographic characteristics can considerably improve the effectiveness of educational interventions in this essential healthcare domain.

Ethical Consideration

This study was approved by the ethical board of Primary Health Care in Sindh, Pakistan.

Funding

There is no role of any funding agency in this study.

Conflict of interest

Authors declare no conflict of interest

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DATA SHARING STATEMENT: The data that support the findings of this study are available on request from the corresponding author. The data is not publicly available due to privacy or ethical restrictions.

AUTHORS' CONTRIBUTION

The following authors fullfill authorship criteria as per ICMJE guidelines;

Bijarani SA, Wassan SM: Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.

Ahmed J, Bashir S: Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work.

Huma S: Analysis and interpretation of data, drafting the manuscript, final approval, agreed to be accountable for all the work.

Jamali AA: Analysis and interpretation of data, critical revision,final approval, agreed to be accountable for all the work.