# Community Health Workers Knowledge and Misconceptions Surrounding Osteoporosis Prevention: A Cross-sectional Survey.

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**ABSTRACT:**

**Objective:** To assess the knowledge, awareness, and common misconceptions about osteoporosis prevention and to identify gaps in understanding among community health workers in Lahore, Pakistan.

**Methodology:** All Lady Health Workers (LHWs) in Lahore employed in the National Program for Family Planning & Primary Health Care were considered relevant populations. Primary objective was to know knowledge about prevention of osteoporosis by using a validated questionnaire "Osteoporosis Prevention and Awareness Tool" (OPAAT). Secondary objectives include attitudes, practices, and misconceptions regarding osteoporosis. This cross-sectional study was conducted from October 2023 to January 2024 after calculating sample size (n=300). The data was entered and analyzed using SPSS version 27. The Chi-square test was employed to demonstrate associations between socio-demographic variables and osteoporosis prevention, awareness, and misconceptions.

**Results:** Among study participants (n=300) most aged between 39-48 years and 68% were married. Results showed that 18.67% of LHW has low knowledge, while 52.33% were having average knowledge regarding osteoporosis prevention and awareness. We found statistically significant association (p < 0.003) between greater levels of knowledge and academic qualification.

**Conclusion**: LHWs, major community health workforce, found to have not only average knowledge regarding prevention of osteoporosis but also has false belief about; a finding that dictate a dire need for development of educational strategy for LHWs regarding this important health issue.

**Keywords:** Lady Health Workers, Osteoporosis Prevention, OPAAT Score.

## Introduction:

Osteoporosis is a bone disease that weakens bones and puts a person at risk of fractures. Understanding and implementing effective prevention strategies becomes even more critical as the global population ages.[1-3] Simply, osteoporosis is associated with the imbalance between bone resorption and formation, and post-menopausal women are particularly affected by rapid bone loss due to estrogen deficiency. Recent advances in molecular biology have elucidated critical pathways in bone healing. For example, the RANKL/RANK/OPG Pathway is essential in osteoclast genesis, leading to increased bone resorption. Additionally, WNT signaling is vital for promoting osteoblast activity and bone formation.[4,5]

Research has shown a gap between knowledge and application of osteoporosis prevention strategies. Identifying those at most significant risk, such as small, thin, white, or Asian women with early menopause, is crucial. Risk factors include older age, female gender, specific ethnicities, menopause, lifestyle factors, medications, and heredity.[6] Prevention efforts should focus on educating individuals about the importance of dietary calcium and weight-bearing exercise, and healthcare providers should develop screening methods to identify those at risk.[7] Multidisciplinary educational interventions is shown to be effective in increasing knowledge and promoting lifestyle changes.[8] Efforts should be focused on offering treatment to those at the highest risk of fracture, particularly those who have had a fragile fracture. Prevention of osteoporotic fractures in older people, particularly non-vertebral fractures, presents unique challenges, requiring both pharmacological and non-pharmacological strategies.[1,8,9]

Preventive measures focus on lifestyle changes, including dietary interventions rich in calcium and vitamin D, promoting physical activity aimed at enhancing musculoskeletal health, smoking cessation programs due to its direct negative impact on bone density, and reducing alcohol consumption because of its association with increased fracture risk through both direct skeletal effects and heightened fall risk.[10,11]

Community instruction programs that leverage experiences from well-being conviction models can significantly influence behaviors related to improvements in nutritional intake (e.g, calcium-rich diets) or participation in regular weight-bearing exercises–both essential components for maintaining optimal peak bone mass into older age.[12,13]

Risk evaluation tools that consolidate variables beyond standard BMD estimations–including genetic predispositions or specific comorbidities–are progressing towards more personalized approaches, enabling targeted preventive efforts within communities.[14]

In Pakistan, where healthcare assets are restricted and the burden of non-communicable illnesses is rising, understanding open mindfulness and misinterpretations around osteoporosis avoidance is vital for creating a focus on intercessions.[15] A social media-based survey evaluating osteoporosis knowledge among adult women indicated that only 34% of participants had good knowledge about osteoporo-

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sis, with several misconceptions about its prevention and risk factors.[1] Few studies in Pakistan have assessed the knowledge and misconception surrounding osteoporosis in different settings. Current study aimed to understand and address the knowledge gaps regarding osteoporosis prevention among community health workers, which are called LHWs. A standard Osteoporosis Prevention and Awareness Tool (OPAAT) was adopted.[16]

## Methodology:

The primary objective of this study was to comprehensively investigate the level of knowledge, awareness, and prevailing misconceptions regarding osteoporosis prevention among community health workers and to identify gaps in understanding, potential areas for improvement, and strategies for enhancing osteoporosis prevention education among this vital healthcare workforce. For this cross-sectional study, community lady health workers (LHWs) were enrolled through simple random sampling. All LHWs of Lahore working with the National Program for Family Planning & Primary Health Care (N=1465) were considered total frame and relevant populations. The selection criteria included LHWs with at least three years of field experience, regardless of age, educational qualifications, and marital status. The ethical approval from the Institutional Review Board (IRB) of RLKU Medical College, Lahore (Ref# RAC/No./IRB-0011/23) obtained beforehand. The Open Epi software was used to estimate sample size using $n = [DEFF*Np(1-p)]/ [(d2/Z21-\alpha/2*(N-1)+p*(1-p)]$[17], keeping the risk for osteoporosis as 14.0%[16] with a confidence interval of 95%, margin of error 5%, the estimated sample size is 300 as shown in figure 1. A standard questionnaire titled "Osteoporosis Prevention and Awareness Tool (OPAAT)" was adopted from a previous study[16]. OPAAT tool comprises 30 questions, has 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, prevention and awareness about osteoporosis. Responses 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, 19-23, and less than 19 on the OPAAT is deemed suitable, average, and low respectively. 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.

For statistical analysis, stratification done to address confounding variables such as age, marital status, educational level, menopausal status, and OPAAT score. Participation in the survey was entirely voluntary, and respondents could withdraw consent at any point during study by choosing not to submit their responses. The study does not include any identified information. To keep confidentiality the collected electronic data was kept in an electronic format with password protected. The data was submitted online via Google Forms and analyzed using SPSS version 27.0. This data presented in frequency and percentage. The Chi-square test was used to determine an association between socio-demographic variables and osteoporosis prevention,

awareness, and misconception, keeping p value <0.05.

## Results:

The study response rate was 100%. The catchment area of sampling population ((LHWs) is presented in Figure 1.**Figure 1: Lady Health Workers (Community Workers) Catchment Area.**



Figure 1: Lady Health Workers (Community Workers) Catchment Area.
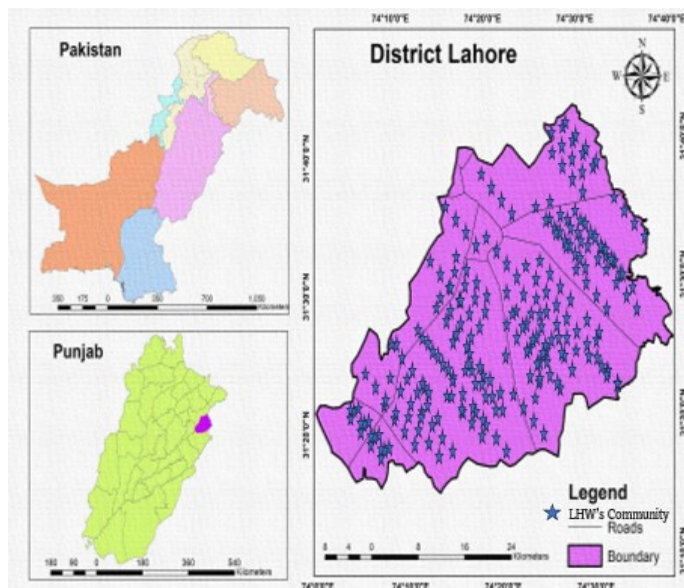
Among all 68% were married. Most of the study participants (35%) were between ages 39-48 years, followed next in frequency (32%) were between 29-38 years. Those between 49-60 years of age were 22%. Majority of study participants (48%) had completed middle school, 32% were having secondary school certificate, while 8% of LHWs had master qualification.

**Table No 1: Socio-Demographic Characteristics of the Study Participants.**

| Characteristics | | Frequency | (%) |
|---|---|---|---|
| Age (years) | 18-28 | 30 | 10.0% |
| | 29-38 | 96 | 32.0% |
| | 39-48 | 107 | 35.67% |
| | 49-60 | 67 | 22.33% |
| Marital Status | Single | 65 | 21.67% |
| | Married | 206 | 68.67% |
| | Separated / Divorced | 15 | 5.00% |
| | Widowed | 14 | 4.67% |
| Education Level | Middle School | 189 | 48.00% |
| | Secondary | 125 | 31.67% |
| | Bachelor | 49 | 12.33% |
| | Masters and above | 32 | 8.00% |
| Post-Menopausal Status | Yes | 129 | 43.00% |
| | No | 171 | 57.00% |
| OPAAT Score[16] | Low Knowledge | 56 | 18.69% |
| | Average Knowledge | 157 | 52.33% |
| | Good Knowledge | 87 | 29.00% |

**Table 2.** Association of Community Workers' Socio-demographic characteristics and level of knowledge on OPAAT Score.[16]

| | Low knowledge (OPAAT Score) | Average Knowledge (OPAAT Score) | High knowledge (OPAAT Score) | p-value |
|---|---|---|---|---|
| | n (%) | n (%) | n (%) | |
| Age (years) | | | | 0.065 |
| 18-28 | 15 (26.8%) | 35 (22.2%) | 20 (22.9%) | |
| 29-38 | 17 (30.3%) | 42 (26.7%) | 24 (27.5%) | |
| 39-48 | 14 (25%) | 43 (27.3%) | 23 (26.4%) | |
| 49-60 | 10 (17.8%) | 37 (23.56%) | 20 (22.9%) | |
| Marital Status | | | | 0.299 |
| Single | 14 (25%) | 33 (21.1%) | 18 (20.6%) | |
| Married | 16 (28.5%) | 40 (25.4%) | 26 (29.8%) | |
| Separated / Divorced | 16 (28.5%) | 46 (29.2%) | 20 (22.9%) | |
| Widowed | 10 (17.8%) | 38 (23.6%) | 23 (26.4%) | |
| Education Level | | | | 0.03 |
| Middle School | 27 (48.2%) | 55 (35.1%) | 20 (22.9%) | |
| Secondary | 22 (39.2%) | 48 (30.5%) | 29 (33.3%) | |
| Bachelors | 5 (8.9%) | 45 (28.6%) | 31 (35.6%) | |
| Masters | 2 (3.5%) | 9 (5.7%) | 6 (6.8%) | |
| Post-Menopausal Status | | | | 0.0234 |
| Yes | 32 (24%) | 51 (40%) | 46 (36%) | |
| No | 115 (67%) | 40 (23%) | 16 (10%) | |

Additionally, 57% of the participants were in the childbearing age range. Among study participants, the knowledge about awareness and concept of osteoporosis prevention found low in 18.67% (n=56), it was average among 52.33% (n=157) and only 29% (n=87) showed good understanding regarding awareness and prevention of osteoporosis as shown in table no 1.

A significant portion of female health workers demonstrated familiarity with a bone mineral density test used for diagnosing osteoporosis (87%), followed by questions related to post-menopausal women being more susceptible to osteoporosis (78%). In the second section, 64% of participants acknowledged that back pain resulted from osteoporosis, while 60% understood that it resulted in a loss of mobility (inability to move around independently). In the third section, half of the participants (56%) provided correct responses regarding the daily recommended intake of vitamin D dose through exposure to sunlight. An equal proportion had information about women's recommended daily calcium intake and that increasing tea or coffee consumption can prevent osteoporosis. The study's results indicated a significant association between a higher level of knowledge and educational level (p<0.003) as well as post-menopausal status (p<0.0234). However, the latter association was deemed weak. Additionally, characteristics like age and marital status exhibited some variation, but the statistical insignificance of these differences was noted, as shown in Table 2.

### Discussion:

Our study aimed to determine the complexities surrounding osteoporosis prevention knowledge, awareness, and prevailing misconceptions among Lady Health Workers (LHWs) working under National Program for Family Planning & Primary Health Care (N=1465) in Punjab, Pakistan. The study provided insight into the current understanding among the community health workforce. There is currently little information regarding community workers' knowledge, awareness, and understanding of osteoporosis. The OPAAT tool[16] assessed LHWs' knowledge of osteoporosis prevention and revealed a range of awareness. Remarkably, more than half of the subjects showed average knowledge, and a sizable percentage (29%) showed excellent awareness of osteoporosis prevention. The LHW community's knowledge assets are highlighted by identifying specific areas of strength, such as familiarity with bone mineral density testing and understanding of post-menopausal women's susceptibility to osteoporosis.[3,6,11]

The socio-demographic profile of LHWs offered a contextual backdrop for our findings. The predominant representation of individuals aged 39-48 years and those aged 29-38 years underscores the importance of tailoring educational interventions to various age groups within the workforce. Marital status and educational qualifications also surfaced as influential factors, carrying implications for targeted training programs.

Analysis of the OPAAT Score tool revealed specific knowledge gaps, providing valuable guidance for targeted educational initiatives. Notably, a significant percentage of LHWs showed awareness of the role of vitamin D and calcium intake in osteoporosis prevention. However, there is potential for improvement in understanding the effects of osteoporosis on mobility and the recommended daily intake of essential nutrients. This indicates that individuals with higher education and relevant work experience will have a better understanding of osteoporosis.[18,19]

The awareness regarding critical factors influencing bone health, including the significance of dietary calcium and the contribution of physical activity to bone density maintenance, was found to be significantly lacking. Additionally, there was a prevalent misunderstanding regarding the effects of menopause on the acceleration of bone loss.[10,11] Such misconceptions could result in insufficient preventive strategies against osteoporosis among women in Pakistan.[1,15] This study highlights the urgent need for thorough educational initiatives aimed at addressing particular cultural beliefs and practices that affect osteoporosis prevention behaviors in the country. It also stresses the importance of utilizing digital platforms to effectively

disseminate accurate information, as these platforms have proven successful in reaching a wide range of demographic groups.[3]

The findings of the research indicate that enhancing education and health may play a crucial role in reducing the risk of osteoporosis.[20,21] The study identified a statistically significant correlation between higher educational attainment and increased levels of expertise among LHWs. This underscores the vital importance of outreach initiatives aimed at raising awareness about osteoporosis prevention. Although no significant link was found with post-menopausal status, it underscores the necessity of creating educational materials tailored to the specific challenges associated with different life stages. The prevention of osteoporosis requires a comprehensive approach that integrates community wellness activities targeting modifiable lifestyle factors alongside personalized treatment that aligns with an individual's risk profile.[2,9,14]

The results of current research emphasize the critical necessity for focused educational programs aimed at addressing the identified knowledge deficiencies and dispelling prevalent misconceptions among LHWs. By customizing strategies according to factors such as age, marital status, and educational background, the effectiveness of these educational efforts can be significantly enhanced, thereby enabling LHWs to play a vital role in osteoporosis prevention within their communities. This study is pivotal in comprehending the gravity of the issue and in tackling the knowledge gaps related to osteoporosis prevention among LHWs. The findings provide a framework for the creation of specialized educational interventions, ultimately increasing the effectiveness of community health workers in advocating for bone health across Punjab, Pakistan.

### Conclusion:

The Lady Health Workers (LHWs) involved in the National Program for Family Planning and Primary Health Care in Punjab exhibited a fundamental to limited understanding of osteoporosis prevention, with many participants holding misconceptions about the condition. These results highlight the importance of implementing targeted interventions, particularly educational initiatives tailored to specific segments of the LHW community. Such programs have the potential to address existing knowledge deficiencies, thereby enhancing the role of Community Health Workers in the prevention of osteoporosis. Upon reviewing the implications of this study, it is clear that a comprehensive approach that takes into account socio-demographic factors can significantly enhance the effectiveness of educational interventions in this critical area of healthcare.

### Conflict of Interest

The authors declare no conflict of interest.

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