# Knowledge and behavior of postmenopausal women regarding osteoporosis and its screening in Al-Baha region, Saudi Arabia.

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## Abstract

Background: The risk of osteoporosis and functional deterioration is challenging for Saudi women with increased disease cases. However, recent analysis has shown that Saudi women were unaware of the risk of osteoporosis, so their knowledge and attitudes toward osteoporosis risk and prevention are necessary. We aimed to assess the knowledge and attitudes of Saudi women regarding osteoporosis and its screening in Al-Baha region, Saudi Arabia.

Methods: About 464 participants (post-menopausal women) in Al-Baha region were recruited for the study to participate in the online survey. A modified osteoporosis knowledge assessment tool questionnaire was distributed online to collect data on participants' responses regarding knowledge, attitudes, and practices (KAP) of osteoporosis. Then data was transferred to apply descriptive statistics to measure the frequency and percentage of KAP factors.

Results: Most participants had good knowledge of osteoporosis and were 40-50 years old. White women are at higher risk of osteoporosis, but responses were quite uncertain. In addition, the frequency of knowledge of risk and symptoms was 89.7% and 76.3%, respectively. The percentage of knowledge and attitudes was higher for some aspects of risk and symptoms. The perceived knowledge about osteoporosis screening was positive, but actual knowledge remained uncertain. In addition, although knowledge and attitude gave significant results for some aspects of KAP factors, most participants' overall knowledge was poor.

Conclusion: The study concluded that the overall knowledge and attitudes of Saudi post-menopausal women in Al-Baha region regarding osteoporosis was poor, and therefore standard interventions must be recommended to enhance knowledge and practices.

Keywords: postmenopausal, osteoporosis, knowledge, Al-Baha, Saudi Arabia

## Introduction

A skeletal illness known as osteoporosis is defined by the reduction of bone strength and microstructural degradation of articular cartilage (1). Osteoporosis is the most prevalent bone disease which affects approximately 200 million males and females around the globe, especially those who are above 60 years of age (2). Moreover, it is known that osteoporosis occurs predominantly in postmenopausal women. It affects bone density and microarchitecture, making it more fragile, less resistant, and more prone to fracture (3). Menopause occurs when ovarian follicular activity declines, lowering estrogen and progesterone levels while increasing FSH and LH levels (4). It is usually confirmed after twelve months of amenorrhea with no other pathological or physiological cause (4). By preventing bone degradation and encouraging bone development, hormones including estrogen, testosterone, and parathyroid hormone (PTH) are important in bone remodeling (2). In women, the maximal bone density is obtained between the ages of 25 and 30. The diminished synthesis of estrogen in postmenopausal women produces considerable bone degradation (2). During menopause, estrogen deficiency impairs the bone remodeling cycle by increasing osteoclastic activity without increasing osteoblastic activity, resulting in osteoporosis. (5). Postmenopausal women with a poor understanding of osteoporosis and the screening guidelines are prone to fractures and other complications. Osteoporosis will cause fractures in approximately 50% of postmenopausal women over their lifetime (6).

Hip fractures occur in 50% of women over 50, equaling the risk of breast, uterine, and ovarian cancers combined (7). Hip fractures increase mortality by 10% to 20% within a year. The previous literature suggested that women with osteoporosis are unaware of their skeletal status (8). With the increasing aged population around the world, the significance of controlling and preventing osteoporotic fragility fractures has also increased (1). Additionally, it is estimated that by the age of 50, the chance of having osteoporosis climbs to one-third in females (9). Only 12% of postmenopausal Palestinian women have a 70% knowledge regarding osteoporosis and its risk factors (10).

Thousands of women over 50 have crippling musculoskeletal injuries yearly, and many more get pelvic, spinal, shoulder, and wrist injuries. However, these injuries are not accidental; osteoporosis is probably the reason behind them. The most prevalent form of degenerative disease, osteoporosis, is defined by reduced bone density and loss of tissue in bones, which can result in fragile and brittle bones. It is indicated that women with osteoporosis are more likely to experience injuries and fractured bones (11). Osteoporosis causes major malaise in postmenopausal women and aged people, increasing morbidity and mortality rates and the financial burden on them and their households. Knowing the populace's degree of awareness and screening of the disease is essential before beginning to work on the scope of medical problems. For this, postmenopausal women must be aware of screening procedures and learn how to deal with osteoporosis if it is to be prevented (12).

Information on the prevention of osteoporosis is essential in controlling it. Numerous research on women's perceptions and awareness of osteoporosis have been undertaken. Previous research in the United States showed that adult and aged women had an inadequate awareness of osteoporosis (13). Moreover, it has been discovered in Israel that Jewish women who have osteoporosis are more knowledgeable about osteoporosis than women living in Arab countries. So, this study tries to evaluate the knowledge of postmenopausal women, especially the women of Al-Baha region, Saudi Arabia, regarding osteoporosis and its screening procedure (14).

Osteoporosis is a fair representation of the physiologic illness of bone deformity that has become more common as the aging population increases worldwide. It is primarily brought on by a decline in bone mass, which is then influenced by several endocrinological factors. For instance, the mass of the bone in women quickly declines after menopause due to the reduction in estrogen levels. Older women have disproportionately greater harm from bone fractures due to the estimated bone mass decline, which occurs at a rate of 4% to 5% each year within the first 3 years following menopause and 1% to 2% each year afterwards (15). Osteoporosis resulting in bone deformation has been disclosed to be the primary cause of limited physical abilities in older women. It significantly increases social and economic pressures that lead to limitations on leisure events, poor life quality, and musculoskeletal injuries. Osteoporosis also raises the risk of bone fractures, and it is estimated that about 20% of people with hip injuries die within one year. Consequently, there is a pressing necessity to create efficient osteoporosis behavioral interventions to manage bone injuries to reduce individual and societal damage in older women (16).

Managing the lowering of the bone density process is the main goal of managing osteoporosis because it is known to be a significant risk factor for injury. Research studies have found that management intervention programs involving strength exercises and other physical activities successfully managed osteoporosis in older women (17). Additionally, nutritional patterns like calcium intake or calcium in conjunction with vitamin D were successful in lowering the harm of bone injury, especially in women who are equal to or above 40 years of age. In this regard, this study aims to evaluate postmenopausal women's knowledge and behavior regarding osteoporosis and its screening in Al-Baha region, Saudi Arabia.

## Methods

**Study design and period**

A cross-sectional survey was conducted in Al-Baha region, Saudi Arabia. This study was carried out from January 2022 to June 2022.

**Study population**
The population of this study was women aged above 40 years and residents of Al-Baha region, Saudi Arabia. They have been used for drawing the sample of this study and assessing the knowledge and behavior of menopausal women regarding osteoporosis and its screening.

Ethical approval
This study was approved by the Research Ethics Committee in Faculty of Medicine, Al-Baha University with the ethical approval number (REC/PAT/BU-FM/2020/2).

**Data collection and management**
Data were collected in this study using an anonymous self-administered, reliable, pre-validated, and modified questionnaire from a previous study, Osteoporosis Knowledge Assessment Tool (OKAT) (10). The tool was used to assess study participants. The questionnaire consisted of questions on four main topics: understanding osteoporosis symptoms / risk of fracture, risk factors for osteoporosis, preventative factors against osteoporosis, and the last one treatment availability. The questionnaire was in English and was translated into Arabic for the ease of the study subjects. It comprises queries with three possible answers, such as "correct," "incorrect," and "I do not know," with the comment "I do not know" and queries with no response being regarded as erroneous. One point was given for correct responses, while 0 points were given for incorrect ones. The questionnaire was distributed among women in Al-Baha region. All participating women were informed in detail about the study aims and data confidentiality. The questionnaire required consent from the participant to participate in this study. Women who agreed to participate in the study were asked to complete the questionnaire regarding their knowledge, attitude, and practices (KAP) about postmenopausal osteoporosis. The questionnaire was designed in Arabic and contained three parts: sociodemographic data of participants, knowledge assessment questions, and screening questions. All researchers in this study performed data entry. After verification, data was transferred to the statistical database directly.

**Inclusion criteria**
Women aged equal to or above 40 years old and residents of Al-Baha region were included. Participants who agreed to participate in the current survey study and their ability to understand the questionnaire were included.

**Exclusion criteria**
Women less than 40 years of age were excluded from the study. Women who were equal to or above 40 years but were not residents of Al-Baha region were also excluded from the study. All participants who did not agree to participate were also not included in the study. Additionally, those women who gave incomplete questionnaire responses were also excluded.

## Results

Demographic Characteristics
An overview of the female participants' demographic characteristics is shown in Table 1. It shows that nearly half of the participants (50.2%) belong to the age group 40 to 45 years old, whereas 27% of the participants belong to the age group of 45-50 years old, and 22% of the participants were older than 50 years. Moreover, most participants were Saudi, while only 2.4% were non-Saudi. More than half of the female respondents (57.3%) have university degrees, while 24.8% have high school degrees. Most female respondents (88.8%) were married, while 4.5% were widows, 3.9% were divorced, and 2.8% were single.

**Knowledge of postmenopausal women regarding osteoporosis and its screening**
The frequency analysis of the knowledge of postmenopausal women regarding osteoporosis and its screening is shown in Table 2. It contains percentages and frequency for correct answers. Most female participants (89.7%) correctly answered the first question (Bone fractures are more likely to occur as a result of osteoporosis). Consequently, 78.2% of female respondents correctly answered the fifteenth question (Alcohol in moderation has little effect on osteoporosis), followed by 76.3% of the female respondents who correctly answered the second question (Osteoporosis often manifests as symptoms (such as discomfort) prior to fractures).

However, the minimum percentage of the correct is found for the nineteenth statement (There is a small amount of bone loss in the ten years following menopause, 3.4%), followed by the fifth statement (Compared to women of other races, white women had the greatest risk of fracture, 17.2%), and consequently for the eighth statement (From age 50, most women can expect at least one fracture before they die, 26.7%).

The levels of knowledge among postmenopausal women are shown in Table 3. It shows that 57.98% of females have poor general knowledge about osteoporosis, whereas 38.24% of the female respondents have good knowledge, and 36.31% have excellent knowledge about osteoporosis.

**Table 1: Sociodemographic characteristic of the participants**

| | Variables | Frequency | Percent |
|---|---|---|---|
| Age | 40-45 | 233 | 50.2 |
| | 46-50 | 129 | 27.8 |
| | Older than 50 | 102 | 22.0 |
| Nationality | Non-Saudi | 11 | 2.4 |
| | Saudi | 453 | 97.6 |
| Educational level | Elementary | 48 | 10.3 |
| | High School | 115 | 24.8 |
| | Intermediate | 35 | 7.5 |
| | University | 266 | 57.3 |
| Marriage status | Divorced | 18 | 3.9 |
| | Married | 412 | 88.8 |
| | Single | 13 | 2.8 |
| | Widow | 21 | 4.5 |

**Table 2: Frequency distribution of the participants' correct answers**

| Questions (correct answer) | Frequency | Percent |
|---|---|---|
| Bone fractures are more likely to occur as a result of osteoporosis. (Yes) | 416 | 89.7 |
| Osteoporosis often manifests as symptoms (such as discomfort) prior to fractures. (Yes) | 354 | 76.3 |
| Men are more likely to have osteoporosis (No) | 287 | 61.9 |
| Smoking cigarettes may increase the risk of osteoporosis (Yes) | 199 | 42.9 |
| Compared to women of other races, white women have the greatest risk of fracture (Yes) | 80 | 17.2 |
| A fall is just as important as low bone strength in causing fractures (Yes) | 284 | 61.2 |
| The majority of women get osteoporosis by the age of 80. (Yes) | 263 | 56.7 |
| From age 50, most women can expect at least one fracture before they die (Yes). | 124 | 26.7 |
| Physical exercise of any kind is helpful for osteoporosis (No). | 103 | 22.2 |
| It is easy to tell whether I am at risk of osteoporosis by my clinical risk factors (Yes). | 203 | 43.8 |
| A person is more likely to get osteoporosis if their family has the disease (Yes). | 194 | 41.8 |
| Two glasses of milk each day may provide an adequate amount of calcium (Yes) | 263 | 56.7 |
| Sardines and broccoli are good sources of calcium for people who cannot take dairy products (Yes). | 265 | 57.1 |
| Calcium supplements alone can prevent bone loss (No) | 186 | 40.1 |
| Alcohol in moderation has little effect on osteoporosis (Yes). | 363 | 78.2 |
| High salt consumption raises the risk of osteoporosis (Yes). | 218 | 47.0 |
| There is a small amount of bone loss in the ten years following menopause (No). | 16 | 3.4 |
| After menopause, hormone treatment reduces bone loss at any age (Yes) | 116 | 25.0 |
| In KSA, there are no effective treatments for osteoporosis (No). | 112 | 24.1 |

**Table 3: Level of knowledge among participants**

| Knowledge level | Percentage |
|---|---|
| Poor | 57.98 |
| Good | 38.24 |
| Excellent | 36.31 |

Furthermore, the questions regarding osteoporosis and its screening are divided into four subgroups. The descriptive statistic of the subgroups is shown in Table 4.

**Table 4: Descriptive statistics of the subcategories of knowledge among participants.**

| | Min | Max | Mean | Std. Dev |
|---|---|---|---|---|
| Knowledge regarding osteoporosis risk factors (total possible score 7 points) | 0 | 7 | 3.502 | 0.500 |
| Knowledge regarding the symptoms and fracture risk in osteoporosis (total possible score 5 points) | 0 | 5 | 2.931 | 0.492 |
| Knowledge level regarding the treatment availability (total possible score 2 points) | 0 | 2 | 0.491 | 0.431 |
| Knowledge level regarding the preventive factors as physical activity and diet relating to osteoporosis (total possible score 5 points) | 0 | 5 | 1.795 | 0.479 |

**Table 5: Knowledge of postmenopausal women regarding osteoporosis using OKAT tool.**

| Question | Percentage of correct answers |
|---|---|
| **Knowledge regarding osteoporosis risk factors** | |
| Osteoporosis is more common in men. | 61.9% |
| Cigarette smoking can contribute to osteoporosis. | 42.9% |
| White women are at highest risk of fracture as compared to other races. | 17.2% |
| A fall is just as important as low bone strength in causing fractures. | 61.2% |
| Family history of osteoporosis strongly predisposes a person to osteoporosis. | 41.8% |
| Alcohol in moderation has little effect on osteoporosis. | 78.2% |
| A high salt intake is a risk factor for osteoporosis. | 47.0% |
| Overall Average Percentage | 50.0% |
| **Knowledge regarding the symptoms and fracture risk in osteoporosis** | |
| Osteoporosis leads to an increased risk of bone fractures. | 89.7% |
| Osteoporosis usually causes symptoms (e.g., pain) before fractures occur. | 76.3% |
| White women are at highest risk of fracture as compared to other races. | 56.7% |
| By age 80, the majority of women have osteoporosis | 26.7% |
| It is easy to tell whether I am at risk of osteoporosis by my clinical risk factors. | 43.8% |
| Overall Average Percentage | 58.6% |
| **Knowledge level regarding the treatment availability.** | |
| Hormone therapy prevents further bone loss at any age after menopause. | 25.0% |
| There is 1 effective treatment for osteoporosis available in KSA. | 24.1% |
| Overall Average Percentage | 24.6% |
| **Knowledge level regarding the preventive factors as physical activity and diet relating to osteoporosis** | |
| Any type of physical activity is beneficial for osteoporosis. | 22.2% |
| An adequate calcium intake can be achieved from two glasses of milk a day. | 56.7% |
| Sardines and broccoli are good sources of calcium for people who cannot take dairy products. | 57.1% |
| Calcium supplements alone can prevent bone loss. | 40.1% |
| There is a small amount of bone loss in the ten years following menopause. | 3.4% |
| **Overall Average Percentage** | **35.9%** |

From Table 4, it is found that most respondent females have knowledge regarding the osteoporosis risk factors (mean=3.5021). Moreover, the standard deviation value indicates less variation in the responses. Followed by this, the second highest value of the mean (mean=2.931) is found for the second criterion (knowledge regarding the symptoms and fracture risk in osteoporosis). Consequently, the fourth criterion has the third highest mean value (1.795). Finally, the third criteria (Knowledge level regarding the treatment availability), has the lowest mean value (0.493). The overall result shows that respondent women have more knowledge regarding the osteoporosis risk factors, followed by knowledge regarding the symptoms and fracture risk in osteoporosis.

Also, the percentages of the responses in each subgroup have been found and shown in the table below (Table 5). It shows that 50.0% of participants have correct knowledge regarding osteoporosis risk factors, and the overall average percentage regarding symptoms and incidence of osteoporosis was 58.6%. In addition, the overall percentage regarding preventive factors of osteoporosis was 35.9% among participants.

The assessment of knowledge on the sub-level was also assessed. The results showed more knowledge of osteoporosis, risk factors, symptoms, treatment, and preventive factors in adult's aged between 40 to 50 years old compared to adults over 50 years. The mean values of knowledge were greater in the respected age group (40-50 years) (Table 6).

**Table 6: Knowledge of osteoporosis in the subcategories among different age groups.**

| Osteoporosis Knowledge On sub level | | | | | | |
|---|---|---|---|---|---|---|
| | Age | N | Mean | Std. Dev. | t | P-Value |
| **Knowledge regarding osteoporosis risk factors** | 40-50 Years | 362 | 0.513 | 0.239 | 2.116 | 0.035 |
| | More than 50 Years | 102 | 0.457 | 0.225 | | |
| **Knowledge regarding the symptoms and fracture risk in osteoporosis** | 40-50 Years | 362 | 0.598 | 0.264 | 1.888 | 0.06 |
| | More than 50 Years | 102 | 0.543 | 0.249 | | |
| **Knowledge level regarding the treatment availability.** | 40-50 Years | 362 | 0.265 | 0.320 | 2.54 | 0.011 |
| | More than 50 Years | 102 | 0.176 | 0.278 | | |
| **Knowledge level regarding the preventive factors such as physical activity and diet relating to osteoporosis.** | 40-50 Years | 362 | 0.359 | 0.217 | 0.012 | 0.99 |
| | More than 50 Years | 102 | 0.359 | 0.217 | | |

Also, the assessment of correct knowledge regarding osteoporosis showed different percentages of correct knowledge. About 59.9% of participants responded correctly to the knowledge of vitamin supplementation for preventing osteoporosis, and 93.1% of the participants responded to the knowledge of screening via bone mineral density, indicating their positive knowledge and attitudes toward the screening test for osteoporosis (Table 7).

**Table 7: Attitude of postmenopausal women towards osteoporosis and its screeding.**

| Question | Yes |
|---|---|
| Have you ever been diagnosed with osteoporosis by a specialist | 19.0% |
| Do you take Vitamin D or Calcium supplementation to prevent osteoporosis | 59.9% |
| Have you ever fractured a bone after the age of 40 while doing light work | 5.8% |
| Do you take estrogen-containing pills (such as birth control pills) | 19.6% |
| Have you ever heard of Bone Mineral Density screening test | 36.2% |
| Have you ever done Bone Mineral Density test | 13.4% |
| Do you think screening with Bone Mineral Density test helps early detection of osteoporosis and prevents fractures | 93.1% |

## Discussion

The objective of the current study was to evaluate the knowledge and attitudes of postmenopausal women participants in the Al-Baha region toward osteoporosis. In this regard, the knowledge regarding symptoms, risk factors, preventive factors, and perceptions toward screening was assessed. The results have therefore shown some interesting findings. Most participants were in the age group of 40-45 years (50%), followed by 45-50 years and older than 50 years of age. Studies in the literature have shown the knowledge of women in the age group 40-50 years have higher knowledge of osteoporosis risks (18). The main findings have focused on correct knowledge regarding risk factors and screening. Most of the participant's responded correctly to the related risks of osteoporosis, such as bone fractures were higher, and there is also a study found that osteoporosis entails the risk of bone fragility and fractures (12). Also, the frequency of knowledge regarding risk factors such as moderation of alcohol and cigarette smoking, leading toward osteoporosis and associated symptoms of pain, was higher. These findings were in relation to the research findings in another region of Saudi Arabia, whereby knowledge levels were found to be fair to good (19). However, the women were not certain about the amount of bone loss. Also, women's lack of knowledge of the risk of disease in relation to age and race was found to be uncertain regarding the fact that white women are at higher risk of disease incidence and fragility in their lifetime. Literature significantly measured the low bone density in white women to determine the risks of bone fractures (20). The overall knowledge levels were found to be poor (57%).

Apart from this, screening knowledge was assessed by dividing knowledge into four sub-categories: knowledge of risk, symptoms, treatment, and preventive factors. Based on the mean value, the knowledge regarding risk factors was higher, followed by symptoms, followed by the third highest knowledge level regarding preventive factors, followed by availability of treatment. Literature has shown that women undergoing densitometry have fairly sufficient knowledge regarding the prevention of osteoporosis (21). These findings are helpful in the face of the increasing prevalence of osteoporosis in Saudi Arabia. A comparatively higher prevalence among postmenopausal women was reported compared to the earlier years (22). Hence, adequate knowledge of the factors of screening is imperative in contemporary practices. Also, the values of standard deviation were lower, indicating a difference between the responses of the participants.

Additionally, besides frequency, the percentages of correct knowledge were assessed. The average percentages of knowledge regarding risk factors and symptoms were >50% and 38% for the knowledge of preventive factors, such as physical activity and diet-related factors, respectively. Our findings were contrasted with earlier studies in the KSA, which found a high perceptibility and low knowledge of preventive factors (23). However, the changing perceptions and evolution of women's knowledge over the years show the positive attitudes of women toward the prevention and care of osteoporosis. Moreover, the percentages over the sub-level categories were also reported, indicating the age-related knowledge variations among participants. It was found that females in the age range 40-50 years have the best knowledge of risk factors, symptoms, availability of treatment, and prevention of osteoporosis. The Saudi Ministry of Health reported that women's risk and prevalence of osteopenia and osteoporosis are higher in the age above 50 years . The knowledge of these risks and symptoms development is therefore necessary for the respective group at the risk of susceptibility (25). In this regard, the present findings showing good knowledge in women younger than the target period of developing osteoporotic symptoms may show positive signs of adopting preventive behaviors and availing treatment.

Relating to the previous assessment of good knowledge about risk and symptoms, it would have an effect on the knowledge and attitudes toward screening and prevention. For instance, 59.9% of women have appropriate knowledge of vitamin supplementation, and 93% of women agreed to the fact that bone mineral density can effectively detect the risk of osteoporosis. The current literature has emphasized that the measurement of bone mineral density is a proper diagnosis of osteoporosis (25). Also, this measure has been used to assess bone fragility in patients with other comorbidities, such as arthritis and celiac disease (26). In Saudi Arabia, the gold standard for determining bone mineral density (BMD) in the case of osteoporosis is a dual x-ray absorptiometry test. This approach can also be used to find age-related changes in BMD, which would further facilitate the assessment of osteoporosis in the target group vs. Saudi's reference data (27). However, despite the positive responses of participants toward the efficacy of bone mineral density as screening test for osteoporosis, a low percentage of participants have heard of the screening test. This indicates concerns regarding barriers or lack of availability of the screening test. Overall, the current research found that postmenopausal women had sufficient knowledge about osteoporosis. However, the knowledge of screening and practices remained uncertain to date and necessitates increased attention of researchers and clinical practices to incorporate this component into the practical setting.

However, the study has some limitations in terms of generalizability and quality of findings (28). First, the study was specifically conducted in the region of Al-Baha, where the findings cannot be interpreted for the whole context of the KSA, such that a more generalized population must be assessed for knowledge and practices to develop standards that can be applied in general practice settings. Second, the findings have considered risk, symptoms, screening tests, and preventive factors as measures for assessing knowledge and attitudes. For the demographic factors, age and race were specifically focused on. However, there is a possibility of certain barriers that can affect women's knowledge and attitudes toward osteoporosis risk and screening. For instance, women's perceived barriers to

participating in exercises, dietary behaviors, lack of motivation, and attitudes of healthcare professionals are additional barriers that can prevent women from gaining adequate knowledge and may negatively influence preventive behaviors and attitudes (18).

## Conclusion

The present study highlighted the interesting realities against research questions. First, the knowledge of post-menopausal women in Al-Baha region regarding different aspects of osteoporosis was fair, but the overall average knowledge remained poor among participants. Second, the percentage of perceived knowledge was good regarding risk, symptoms, screening, and preventive factors. However, actual knowledge among women about the term bone mineral density as a screening tool for osteoporosis remained uncertain. Throughout the assessment, participants have shared mostly their perceived knowledge, and therefore a significant level of uncertainty is the limitation for Saudi women gaining access to effective prevention and treatment care. About 464 women participants responded to the survey, with most of them in the age range of 40-50 years, similar to our target age since the development of symptoms can occur around this age. Besides, a racial difference in the development of symptoms showed that white women are more susceptible to osteoporosis in the region. However, limitations were found because of the need to assess other sociodemographic factors that can interfere with knowledge and attitudes. These were not assessed since the scope of the study was mainly focused on assessing the knowledge of women. The assessment of knowledge toward disease risk and prevention is a significant approach prior to looking for standards of practices such that it shifts the attention of researchers and clinicians toward an important area of discussion. In this regard, the overall behavior of women regarding osteoporosis care and prevention was a significant determinant of their needs and preferences, and their potential knowledge and perceptions determined the significance of reducing the risk of the prevalence of osteoporosis.

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