



## Osteoporosis Knowledge and Related Health Behavior among Women in Jazan Region, Kingdom of Saudi Arabia

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### ABSTRACT

**Introduction:** Osteoporosis is a systemic bone disease that can be prevented to some extent by awareness of its risk factors and related health behavior. The aim of this study was to collect information about knowledge and awareness of osteoporosis among women living in Jazan and to describe the type of food habits, sociodemographic characteristics, and other osteoporosis-related health behavior.

**Materials and methods:** Self-administered questionnaires were used for data collection. The total participants were 546 women: 88 (16.1%) were health professionals and 458 (83.9%) non health professionals in the age range ≤20 to 50 years. Data collection was facilitated by a trained intern female doctor of dentistry whose task was to administer the distribution and collection of the questionnaires.

**Results:** In total, 61.9% of health professionals and 54.3% of nonhealth professionals scored highly on knowledge of osteoporosis. The respondents of osteoporosis preventive food items were also highly knowledgeable with 50.6 and 52.6% of health and nonhealth professionals respectively. About 48.1% of health professional and 44.2% of nonhealth professional scored low on knowledge of osteoporosis behavior and attitude, vitamin supplements, and sunlight exposure. The age effect on osteoporosis knowledge was 33.8% in young age group and 30.7% in old age group.

**Conclusion:** Our study shows that Jazan women were highly knowledgeable and aware about osteoporosis and its related health behavior and that health professionals and nonhealth professionals were equally aware about osteoporosis-related health matters.

**Clinical significance:** Awareness and preventive behavior of osteoporosis can prevent or slow the development of the disease.

**Keywords:** Awareness, Health-related behavior, Knowledge, Osteoporosis, Women.

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### INTRODUCTION

Osteoporosis is a systemic bone disease that affects bone mass and leads to increase in bone fragility and fracture. It is the main cause of mortality and morbidity of the elderly population.<sup>1</sup> The prevalence of osteoporosis is high in the developed nations, especially among women in increasing age. Osteoporosis has been ranked as the second disease after heart diseases for public health concern.<sup>2</sup> Worldwide, one-third of women with age range from 60 to 70 years and about two-thirds of 80-year-olds complain from osteoporosis.<sup>3</sup> Evidence showed that periodontal disease and osteoporosis are bone resorptive diseases that affect a large number of people, in particular, with old ages.<sup>4</sup>

It is suggested that osteoporosis affects periodontal disease and that both diseases shared their progression with advancing age.<sup>5-7</sup> Studies have shown that 13 to 18% of women 50 years old had osteoporosis and that this proportion increased up to 70% for women over 80 years of age.<sup>8,9</sup> Thus, in the developing nations, osteoporosis is becoming of great concern, in particular among those with increased life expectancy. This is because low trauma fracture can be associated with premature mortality.<sup>10,11</sup> The prevalence of osteoporosis in the Middle Eastern countries was low as compared with developed

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countries.<sup>10</sup> It is estimated that 2.9% bone fractures due to osteoporosis occur in the Eastern Mediterranean.<sup>2</sup> The occurrence of such fractures is unknown among Jazan women. It has been demonstrated that the occurrence of osteoporosis is for some extent preventable by increased exercise and intake of vitamin D and calcium supplement, reduction of alcohol and smoking.<sup>12,13</sup> A large body of the evidence demonstrated a connection between healthy behavior and reduced risk of osteoporosis fractures.<sup>14</sup> It has been shown that knowledge and awareness of osteoporosis and healthy behavior regarding food habits and increased exercise can slow or prevent osteoporosis fractures.<sup>15</sup> Little information is available online regarding Jazan women's preventative knowledge and behaviors, including physical exercise and type of food, which are good for osteoporosis prevention. Exploring their knowledge and behavior about osteoporosis can help establish preventive health programs for osteoporosis in the region. This study was, therefore, carried out to collect information about knowledge and awareness of osteoporosis among women living in Jazan and describes the type of food habits, sociodemographic characteristics, and other osteoporosis health-related behavior.

## MATERIALS AND METHODS

The study population was estimated as 1,000 women; from these 558 women were randomly selected for the study. These women were health and nonhealth professionals in the age range  $\leq 20$  to 50 years. Self-administered questionnaires were randomly distributed to the consenting women from each category. The questionnaires involved 38 questions that investigated the relations of sociodemographic characteristics and the effect of knowledge and awareness of causes and prevention of osteoporosis, in addition, type of food habits and its relation to osteoporosis health. Before the distribution of the questionnaires, the reliability of the constructed questionnaire was successfully tested using sample of women in our college and its teaching clinics and nearby schools.

### Measurements

Gender was assessed as male/female; age was grouped into  $\leq 20$ , 21 to 30, 31 to 40, and  $\geq 41$  years. Smoking habits were evaluated as yes/no. In addition, women were asked to respond to the 38-item questionnaire, which was designed for assessments of knowledge of causes of osteoporosis and related health behavior in terms of yes/no/do not know. Moreover, some parts of the questionnaire contained items assessing food habits, calcium intake, and exercise. The 14-item subscales of susceptibility to osteoporosis, seriousness of osteoporosis, benefits of exercise, benefits of calcium intake, etc. were stated in the form of

yes/no/do not know. A sum index of knowledge about osteoporosis per health and nonhealth professionals that range from 1 to 14 was reduced to a dummy variable with high knowledge and low knowledge based on a median split. Using the same response scale, respondents were requested to evaluate 14 knowledge items about osteoporosis per age of the respondents and osteoporosis health-related food habits.

### Statistical Analysis

Data were analyzed using Statistical Software for the Social Sciences version 20.0 (SPSS Institute Inc., Cary, NC, USA). Frequency and percentage were computed for demographic characteristics and other variables, such as age grouping and osteoporosis health-related food habits. Contingency tables were made for different variables.

## RESULTS

The respondents of this study were 548 women: 88 (16.4%) from health professionals and 458 (83.6%) nonhealth professionals respectively. The respondents of each category and sociodemographic characteristics are summarized in Table 1. Habits like smoking practiced by study respondents are also shown in Table 1; in this, only 15 (3.3%) are smokers in nonhealth professional women. The numbers and percentage distribution of osteoporosis knowledge items in relation to health professional and nonprofessional are shown in Table 2. Totally, 61.9% of health professional women scored highly in knowledge of osteoporosis, and regarding nonhealth professionals, totally 54.3% scored in knowledge items. For instance, 87 (98.9) of health professional responded yes that osteoporosis increases risk of bone fractures and about 423 (92.4) of nonhealth professionals did the same, and when health professional women had been asked if family history predisposes to osteoporosis only small portion, i.e., 20 (22.7%) of them responded by yes; similarly, 115 (25.1%) of nonhealth professionals responded by yes. To correlate the knowledge of women about osteoporosis and periodontal disease, 48 (54.5%) of health professionals and 174 (38.9%) of nonhealth professionals answered yes. According to age effect, 33.8% respondents were of young age group and 30.7% of old age. Table 3 shows the percentage distribution and numbers of the study respondents who confirmed specific causes of osteoporosis according to age groups.

The percentage distribution was 48.1% of health professionals and 44.2% of nonprofessionals, regarding osteoporosis behavior and attitude, and calcium and vitamin supplements, in addition to sun exposure. The percentage distribution of health professionals was 50.6%, and 52.6% was nonhealth professionals, regarding

**Table 1:** Percentage distribution and number of study respondents sociodemographic characteristics and habits

Sociodemographic characteristics	Health professional participants, n = 88 (%)	Nonhealth professional participants, n = 458 (%)
<i>Age (years)</i>		
≤20	0.8 (7)	10.3 (47)
21–30	65.9 (58)	43.2 (198)
31–40	26.1 (23)	45.9 (210)
41–50	0.0 (0.0)	1.1 (5)
<i>Marital status</i>		
Married	54.5 (48)	66.8 (306)
Single	54.5 (48)	29.7 (136)
Divorce/widow	2.3 (02)	3.9 (18)
<i>Educational level (years)</i>		
>10	15.9 (14)	12.1 (55)
<10	84.1 (74)	87.9 (403)
<i>Working place</i>		
College	45.5 (40)	13.9 (64)
School	7.9 (7)	51.5 (236)
Hospital	19.3 (17)	34.2 (156)
Others	27.3 (24)	0.4 (2)
<i>Habits</i>		
Smokers	0.0 (0)	3.3 (15)
Nonsmokers	100 (88)	96.7 (443)

**Table 3:** Percentage distribution and number of study respondents who confirmed specific causes of osteoporosis according to age groups

Osteoporosis knowledge items	Age group ≤30 years participants, n = 311 (%)	Age group ≤31 years participants, n = 237 (%)
Osteoporosis increases risk of bone fractures	91.6 (285)	95.4 (226)
Osteoporosis symptoms, e.g., pain	80.1 (249)	73.3 (173)
Osteoporosis affects periodontal disease	37.9 (118)	44.3 (105)
Osteoporosis is more common in men	3.2 (10)	2.1 (5)
Cigarette smoking contributes to osteoporosis	53.9 (107)	65.7 (131)
Osteoporosis is common in women	80.0 (249)	88.6 (209)
A fall is important in causing fractures	89.6 (263)	86.5 (205)
Women at 50 years can develop osteoporosis	49.9 (153)	59.9 (142)
Physical activity is beneficial for osteoporosis	58.7 (264)	76.7 (181)
Clinical risk factors tell of risk of osteoporosis	41.2 (127)	46.2 (108)
Family history predisposes to osteoporosis	26.9 (83)	22.5 (53)
Osteoporosis is bone loss in 10 years of menopause	49.8 (153)	57.4 (135)
Hormone therapy prevents bone loss after menopause	23.1 (71)	22.5 (53)
There are no treatments for osteoporosis available	28.9 (86)	32.5 (77)

**Table 2:** Percentage distribution and number of study respondents who confirmed specific causes of osteoporosis according to health and nonhealth-related professionals

Osteoporosis knowledge items	Health professional participants, n = 88 (%)	Nonhealth professional participants, n = 458 (%)
Osteoporosis increases risk of bone fractures	98.9 (87)	92.4 (423)
Osteoporosis symptoms, e.g., pain	81.8 (72)	76.2 (349)
Osteoporosis affects periodontal disease	54.5 (48)	38.9 (174)
Osteoporosis is more common in men	1.1 (1)	2.6 (12)
Cigarette smoking contributes to osteoporosis	60.2 (53)	53.3 (244)
Osteoporosis is common in women	89.8 (79)	82.3 (377)
A fall is important in causing fractures	64.8 (57)	84.7 (388)
Women at 50 years can develop osteoporosis	84.1 (74)	51.9 (238)
Physical activity is beneficial for osteoporosis	53.4 (47)	40.8 (187)
Clinical risk factors tell of risk of osteoporosis	22.7 (20)	25.1 (115)
Family history predisposes to osteoporosis	70.5 (62)	48.9 (224)
Osteoporosis is bone loss in 10 years of menopause	84.1 (74)	80.6 (369)
Hormone therapy prevents bone loss after menopause	62.5 (55)	51.7 (237)
There are no treatments for osteoporosis available	38.6 (34)	31 (142)

osteoporosis prevention food items. In this regard, the scores of respondents for milk intake as good item for osteoporosis prevention were high for both groups: 89.8% health professionals and 85.8% nonprofessionals and about the same percentages in relation to sun exposure and osteoporosis prevention. This high knowledge among the respondents may have good implication for feeding policy of their children as a part of the prevention strategy for osteoporosis. The percentages of the respondents who confirmed specific behavior and attitude toward osteoporosis prevention are shown in Table 4.

**Ethical Considerations**

Ethical approval was obtained from the Research Office. A written informed consent was obtained from the participants. They were told that knowledge gained from this survey may lead to prevention of osteoporosis and that their information for this research will be confidential and will not be disclosed to others.

**DISCUSSION**

Information about osteoporosis knowledge and related health behavior of women in Jazan region has not been



**Table 4:** Percentage distribution and numbers of study respondents who confirmed specific behavior and attitude toward osteoporosis prevention

Osteoporosis behavior professional and attitude items	Health	
	professional participants, n = 88 (%)	Nonhealth participants, n = 458 (%)
To prevent osteoporosis, calcium intake is important	33 (29)	20.3 (93)
Broccoli is a good source of calcium	40.9 (36)	27.3 (125)
Calcium supplements prevent bone loss	15.9 (14)	18.6 (85)
High-impact exercise improves bone health	45.5 (48)	56.8 (260)
<i>Osteoporosis prevention food items</i>		
Milk intake is good for osteoporosis	89.8 (79)	85.8 (393)
Yoghurt	69.3 (61)	73.1 (335)
Bread	13.6 (12)	16.8 (77)
Macaroni	11.4 (10)	9.6 (44)
Meat	26.1 (23)	23.1 (106)
Fish	57.9 (51)	65.9 (302)
Egg	65.9 (58)	71.8 (329)
Cheese	71.6 (63)	63.9 (293)
Potatoes	11.4 (10)	12.9 (59)
Vegetables and salads	64.8 (57)	69.4 (316)
Cruciferae (Broccoli, cabbage, brussels)	64.8 (57)	68.9 (316)
Fruits	60.2 (53)	69.7 (319)
Vitamin supplement	63.6 (56)	56.3 (258)
Sun exposure	89.9 (79)	85.6 (392)

previously published online. This study was, therefore, carried out to collect such information among people to help preventive health program of osteoporosis and its related health behavior. Therefore, women of this study were selected because they were living in Jazan region and in the field of health or nonhealth sectors. In this study, all the categories of women were treated as having equal knowledge in the field of osteoporosis for comparative purposes. Our study indicated that the respondents correctly completed the questionnaire, which indicated their keen interest on osteoporosis matters.

Osteoporosis yields high individual health care costs for treatment, as well as high social costs because of potential dependency and high economic impact.<sup>16</sup> Studies have indicated that osteoporosis is to a great extent a preventable disease.<sup>17</sup> However, currently, there is no cure, but there are measures that can prevent or slow the development of the disease. Thus, knowledge and awareness of its related health behavior can influence what actions women should take to prevent osteoporosis. Nursing interventions of osteoporosis have primarily consisted of education to encourage or preventive exercise and healthy nutrition to decrease major risk factors.<sup>18</sup> Previous research findings on osteoporosis have less focus on knowledge of preventive behavior of young women.<sup>19</sup>

Our study findings show that respondents were highly knowledgeable about osteoporosis and its health-related behavior. However, knowledge does not always translate into positive behavior changes without considering other psychological variables that could affect behavior. According to the health belief model used in a variety of studies, healthy behaviors can occur if an individual believes in personal susceptibility to a condition.<sup>20</sup> Moreover, it has been indicated that in order for health education programs to be successful in changing behavior, the program must match the need of the population. Determining what specific population of women know and believe about osteoporosis can help determine strategy for interventions that will be effective in encouraging preventive health behaviors toward reducing the risk of osteoporosis morbidity and mortality. Our study shows that health professional women were more knowledgeable than nonhealth professionals in that osteoporosis can affect periodontal disease. Evidence indicated that bone loss due to osteoporosis is considered as a risk factor for periodontal bone loss.<sup>6</sup>

This study was conducted by using instruments designed to measure osteoporosis knowledge and related health behavior. Therefore, women in our study were divided into health and nonhealth professionals, because health professionals are closer to public and private health sectors which continuously provide with health information. However, the results of this study show that both groups were equally knowledgeable about osteoporosis and related health behavior. This might be due to the effect of health programs in multimedia. Respondents of this study were also divided into women with younger age and older age. The main objective of the age grouping was to describe the relationship between osteoporosis knowledge and behavior and the effect of age, because increased peak of bone mass loss is usually achieved at the age of 35 years.<sup>21</sup>

The finding of this study demonstrated that the differences of ages have no significant effect on the knowledge of osteoporosis of both groups. This might be because the age range of both groups was so small. Focusing on osteoporosis prevention for young women is consistent with the objectives for health promotion and disease prevention.<sup>22</sup> In this study, the information gained can provide the basis for developing cost-effective health education programs to prevent osteoporosis among women in this region. Our study findings of osteoporosis knowledge among women of Jazan were also comparable to the findings of other studies.<sup>23</sup> Despite the cultural differences with other studies, women in our study were highly knowledgeable about osteoporosis preventive food items including milk intake, cheese, fish, and eggs. However, women in our study showed less knowledge

of exercise as preventive measure of osteoporosis because this specific item in our knowledge measurement might be less relevant to their culture.

## CONCLUSION

This study shows that women of Jazan were highly knowledgeable about osteoporosis and its health-related behavior. Thus, based on our study findings, we recommend the establishment of the preventive education program of osteoporosis that addresses osteoporosis preventive knowledge and related health behavior and that osteoporosis is to a great extent a preventable disease.

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