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Knowledge, Awareness and Practices of Saudi Females about Osteoporosis

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Introduction: Osteoporosis is a common skeletal disease that is characterized by reduction of bone mass and loss of bone microarchitecture leading to increased risk of bone fractures.
Objective: To assess knowledge, awareness and practices of Saudi females about osteoporosis.
Methodology: Cross-sectional study for 3 months (November, December 2019 and January 2020) on random sample of 537 Saudi females, the data was collected by using a questionnaire in Arabic language, data were analyzed by means of Descriptive statistics.
Results: Among the participants, there were 43% in the age group of (18-25 years) and 19% in the age group of (26-35 years), 41% completed university education. The main source of information about osteoporosis was friends and relatives (33%). Mean score of participant's sufficient knowledge about risk factors of osteoporosis was 52%, mean score of participant's sufficient knowledge about prevention and treatment of osteoporosis was 67%, mean score of participant's sufficient knowledge about signs & symptoms of osteoporosis was 43%, mean score of participant's sufficient knowledge about diagnosis of osteoporosis was 17% and the overall mean score of sufficient knowledge about osteoporosis was 45%. About 55% of study participants previously got vitamin D screening, 46% previously got calcium screening in blood, 8% previously got screened with DXA.
Conclusion: The results of the present study indicate that the knowledge and awareness about

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osteoporosis among Saudi females are poor. The participants lacked knowledge relating to risk factors, signs and symptoms, diagnosis and prevention of osteoporosis and the practice regarding the prevention and detection of osteoporosis is poor.

Keywords: Osteoporosis; Saudi females; knowledge; awareness; practices.

1. INTRODUCTION

Osteoporosis is a common skeletal disease that is characterized by reduction of bone mass and loss of bone microarchitecture leading to increased risk of bone fractures [1-4]. These fractures might even occur during daily routine activities such as bending or raising [3]. Although, osteoporosis involves the whole skeleton, femur, vertebrae and distal radius are more prone to injury [4]. Osteoporosis is a serious disabling disease affecting approximately 10% of the United States population [5]. It is more prevalent in women than men and Caucasian or Asian races, age increase, family history of osteoporosis, previous history of bone fractures, low body mass index, menopause under the age 45, calcium and vitamin D deficiencies, smoking, low physical activity and long-term treatment with corticosteroids are some of its risk factors [6-11]. Since the occurrence and development of osteoporosis are mostly asymptomatic and it might not be diagnosed until the fracture occurrence, it is called a silent disease [3]. This disease causes increase of health care expenses, physical and psychological complications and decreased quality of life that all have negative effects on the affected individual, his/her family and the society. For this, it has been known as a major general health problem [12-13].

Weakness, lack of movement, fracture and also death can be seen in many people with osteoporosis. [14-16]. Early diagnosis is important in preventing fractures and complications that may develop due to osteoporosis. Therefore, women who are in postmenopausal period should be performed with dual X-ray absorptiometry (DXA) with careful anamnesis and physical examination [17-19]. Besides, osteoporosis is of importance because of the loss of labor force, occupation of hospital bed and use of expensive drugs for a long time. It is estimated that 50% of women and 20% of men over 50 year's age will be exposed to an osteoporotic fracture during the remainder of their lives [18,20,21].

Risk factors for osteoporosis and osteoporotic fractures can be listed as aging, low bone mass, being female, early menopause, genetic factors, weak body structure, lifestyle, nutrition, medical conditions and falling. Balance and gait disturbances, sensory loss, decreased muscle strength; visual and auditory disorders are the situations that increase the risk of falling [22-24].

Menopause is a natural phenomenon of the normal aging process characterized by a permanent discontinuation of menstruation as a result of decrease in estrogen secretion. Changes in the body due to the effects of estrogen insufficiency are observed in many women during menopause. Osteoporosis is one of these changes.

Treatment approaches for osteoporosis are mainly based on the reduction of the fracture risk by increasing the bone density. Regular exercise, intake of calcium and vitamin D and drug therapies are used for this purpose.

2. METHODOLOGY

2.1 Study Design and Population

Cross-sectional study was carried out on random sample of 537 Saudi females.

2.2 Duration

The duration of study comprised 3 months starting from November 2019 to January 2020

2.3 Inclusion and Exclusion Criteria

Inclusion criteria: The inclusion criteria comprised Saudi female, aging more than 18 years and agreeing to participate in the study.

Exclusion criteria: Exclusion criteria comprised Saudi males, non-Saudis, females aging less than 18 years and those who didn't completely filled the questionnaire.

Data collection tool and process: Data was collected through a researcher-made questionnaire in Arabic language containing the following parts:

Part one: To obtain socio-demographic characteristics of participants (e.g. age, social status and menopause status)

Part two: To assess knowledge of osteoporosis (including risk factors, symptoms, prevention, diagnosis and treatment of osteoporosis).

Part three: To explore practices of participants regarding osteoporosis prevention.

Part four: To explore practices of participants about osteoporosis investigations.

2.4 Statistical Analysis

All data were entered to the computer program MS EXCEL and analyzed by means of Descriptive statistics. Frequency, percentage calculated for all the participants' answers for the questionnaire with representation for the answers by either pie chart or bar chart and the mean value were calculated for total awareness.

3. RESULTS

3.1 Socio-demographic Characteristics of Female Participants

A total of 573 agreed to fill the questionnaire; among them there were 43% in the age group of (18-25 years) and 19% in the age group of (26-35 years), 39% not married, 41% completed university education and 31% completed secondary education and 94% reside in Northern Border Region. Among the married women; there were 19% have three children, 16% have two children. Only 2% of participants reached menopause and only 1% are smokers. (Fig 1a and 1b)

3.2 History of Osteoporosis among Participants

63% of the participants don't have osteoporosis, 3% have osteoporosis and 34% don't know. (Table 1)

48% of participants reported to have information about osteoporosis, the mentioned source of information was friends and relatives (33%), physician (28%), newspaper / magazines (14%), health worker (12%) and radio/TV (8%). (Fig. 2)

3.3 Knowledge and Awareness about Osteoporosis

59% of participants were aware that the probability of osteoporosis is higher in women than men, 63% were aware that risk of osteoporosis increase with age, 68% were aware that calcium deficiency in blood increase risk for osteoporosis, 72% were aware that vitamin D3 deficiency increase risk for osteoporosis, 23% were aware that consumption of corticosteroid drugs for more than one week, leads to osteoporosis, 21% were aware that genetic factor has no relationship with osteoporosis, 16% were aware that thin women get osteoporosis more than others, 42% were aware that exercise is effective in prevention of osteoporosis, 28% were aware that diet rich in salt weakens bone and increase risk for osteoporosis, 42% were aware that consumption of large amount of tea and coffee increase risk for osteoporosis, 79% were aware that soft drinks increase risk for osteoporosis, 46% were aware that cigarette smoking increases the risk of osteoporosis, 31% were aware that women with osteoporosis should be physically active and 30% were aware that women with early menopause (before 45-year-olds) are more likely to get osteoporosis (Fig. 3a).

64% were aware that foods rich in calcium may play an important role in preventing osteoporosis, 73% were aware that sun light reduces the risk of getting osteoporosis, 37% were aware that vit. B12 doesn't prevent osteoporosis and 30% believe that there's no effective treatment for osteoporosis in Saudi Arabia. 19% of study participants were aware that one of the signs of osteoporosis disease is the shortening of height after the age of 65, 60% were aware that osteoporosis cause back pain and 51% were aware that osteoporosis related fractures may occur by falling down on the carpet. 17% of participants believed that osteoporosis can't be diagnosed by blood test and 17% believed that arthrosis can't be considered as another name for osteoporosis. (Fig. 3b and 3c) we are knowing the difference between arthritis and osteoporosis but the point here to check the population of our study how can they differentiate between these diseases.

3.4 Mean Knowledge and Awareness about Osteoporosis

Mean score of participant's sufficient knowledge about risk factors of osteoporosis was 52%, mean score of participant's sufficient knowledge about prevention and treatment of osteoporosis was 67%, mean score of participant's sufficient knowledge about signs & symptoms of osteoporosis was 43%, mean score of

participant's sufficient knowledge about diagnosis of osteoporosis was 17% and the overall mean score of sufficient knowledge about osteoporosis was 45%. (Table 2)

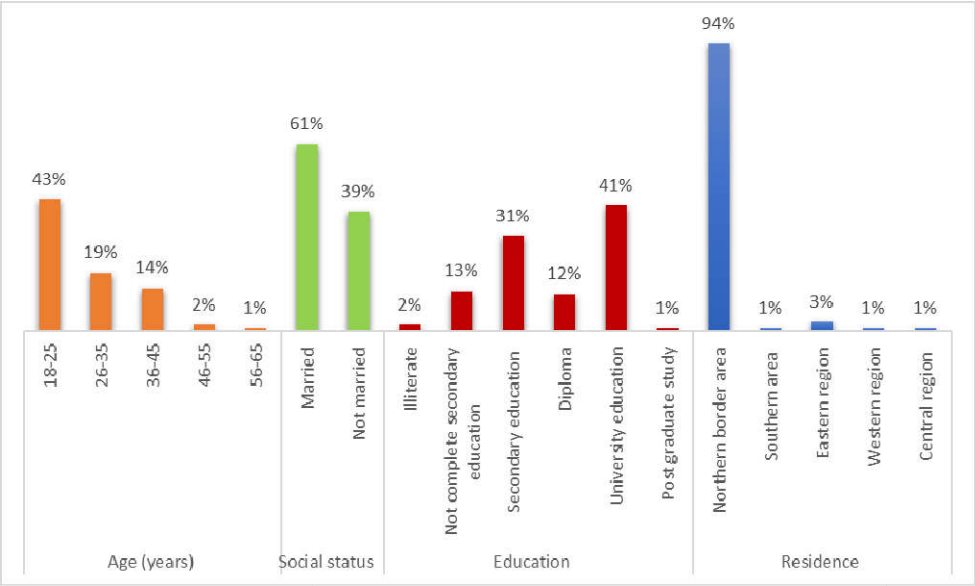

Fig. 1a. Sociodemographic characteristics of female participants

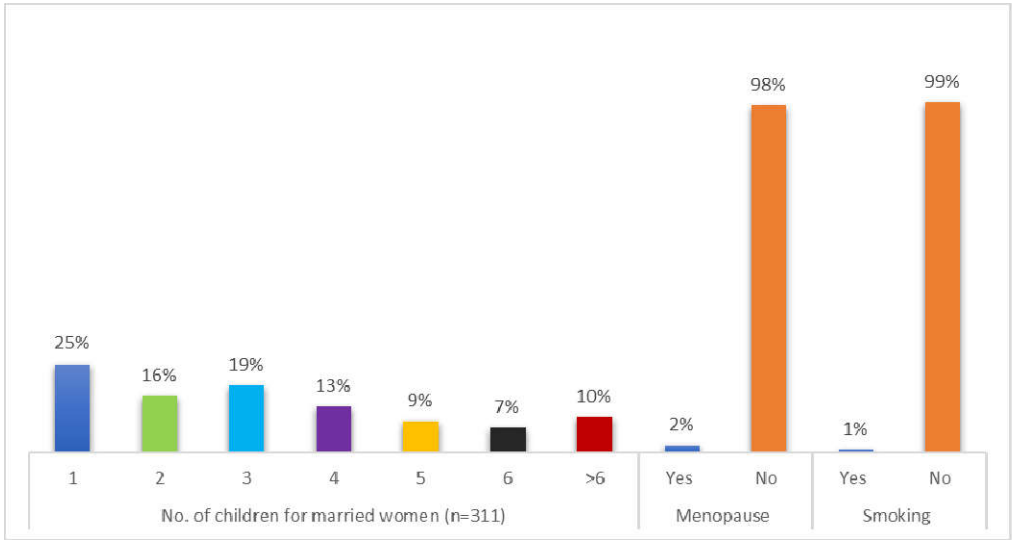

Fig. 1b. Sociodemographic characteristics of female participants

Table 1. History of osteoporosis among participants (n=537)

Variable	Categories	Frequency	Percentage (%)
Do you have osteoporosis	Yes	16	3%
	No	338	63%
	Don't know	183	34%

Source of information about osteoporosis

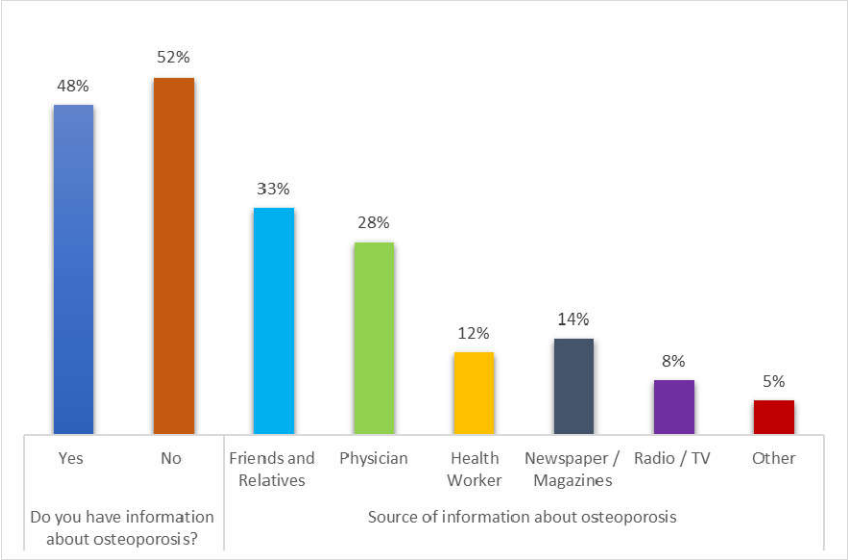

Fig. 2. Source of information about osteoporosis

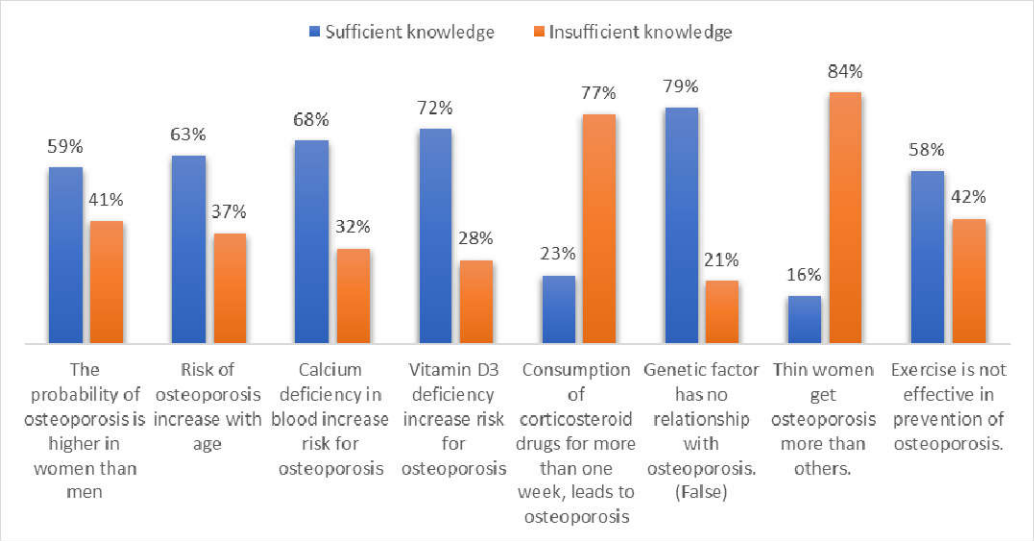

Fig. 3a. knowledge and awareness about osteoporosis risk factors

Table 2. Mean knowledge and awareness about osteoporosis (n=537)

Sentence	Sufficient knowledge		Insufficient knowledge	
	Frequency	Percentage	Frequency	Percentage
Mean score about risk factors	280	52%	257	48%
Mean score about prevention and treatment	362	67%	175	33%
Mean score about signs and symptoms	233	43%	304	57%
Mean score about diagnosis	91	17%	446	83%
Overall mean	241	45%	296	55%

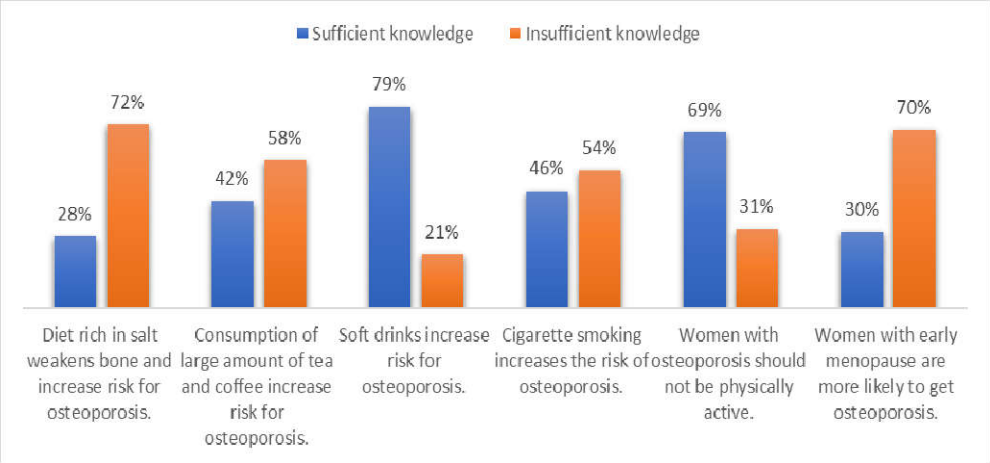

Fig. 3b. knowledge and awareness about osteoporosis risk factors

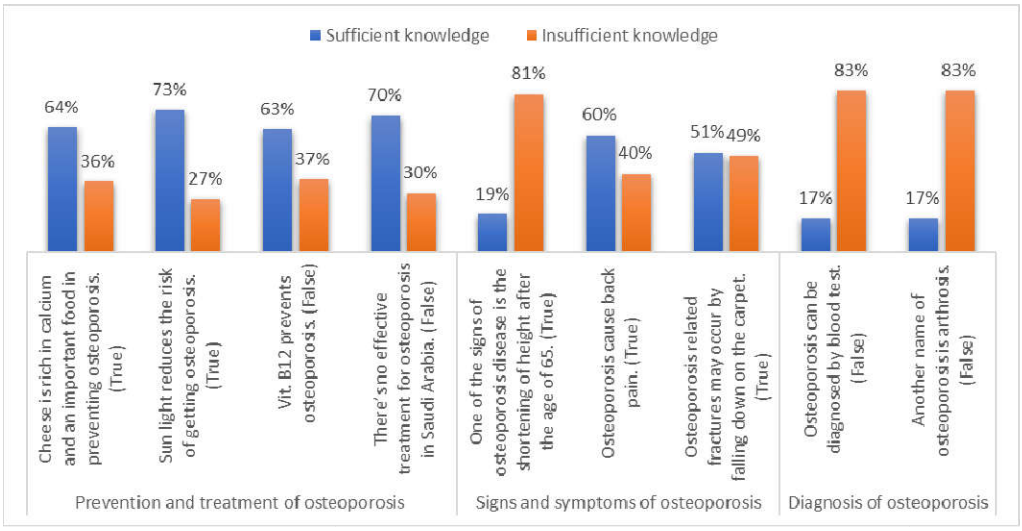

Fig. 3c. knowledge and awareness about osteoporosis

3.5 Investigations Related to Osteoporosis among Study Participants

55% of study participants previously got vitamin D screening, 46% previously got calcium screening in blood, 8% previously got screened with DXA. (Fig. 4).

Here we use Bar graph for this data display for simply and easy to interpret.

3.6 Attitudes of Participants about Investigation of Osteoporosis

55% of participants believe that investigations for osteoporosis is recommended when complain from vertebral column diseases, 31% believe that investigations for osteoporosis is recommended if taking drugs which increased risk for developing, 25% believe that investigations for osteoporosis is recommended when there's family history for osteoporosis, 14% believe that investigations for osteoporosis is recommended when being diabetic woman or if have liver, kidney or gland diseases,11% believe that investigations for osteoporosis is recommended when complain from vertebral column diseases, 5% believe that investigations for osteoporosis is recommended when reach to age 65 or older, 1% believe that investigations for osteoporosis is recommended for woman with early menopause , 1% believe that investigations for osteoporosis is recommended for menopause with presence

of at least one risk factor for osteoporosis, 1% believe that investigations for osteoporosis is recommended if taking drugs which increased risk for developing osteoporosis and 49% believe that all previous factors necessitates investigation for osteoporosis. (Fig. 5).

3.7 Causes for not Perform Screening of Osteoporosis

34% don't know the recommended screening, 31% reported that the doctor didn't order this screening for them, 15% don't know the importance of screening, 12% feared of side effects, and 8% haven't do not have available screening near them. (Fig. 6).

3.8 Practices toward Prevention of Osteoporosis

20% reported eating calcium rich foods always, 28% reported to be often, 36% sometimes, 17% rarely eat calcium rich foods. 14% reported that they always obtain exposure to sunlight for obtaining vitamin D, 21% reported to be often, 34% expose sometimes and 32% rarely expose to sun light. (Table 3)

4. DISCUSSION

The prevalence of OP and osteopenia in Saudi women, aged 20-80 years, was reported to be 27.2% and 29.8 %, respectively [25-27]. A systematic review showed that the prevalence of low bone mass (OP and osteopenia) in Saudi Arabia is 70.5% at an average age of 56 years [28-30]. Alghamdi et al. showed that among female university students in KSA, OP was present in 7% while, osteopenia was found in 32.3% [30-32]. This suggests that the prevalence of osteopenia and osteoporosis was very high and would occur earlier in Saudi women. The present study conducted aims to assess knowledge, awareness and practices of Saudi female about osteoporosis. Mean awareness score of studied subjects was 45% which is not sufficient this low rate of awareness deserves more attention [5,33,34].

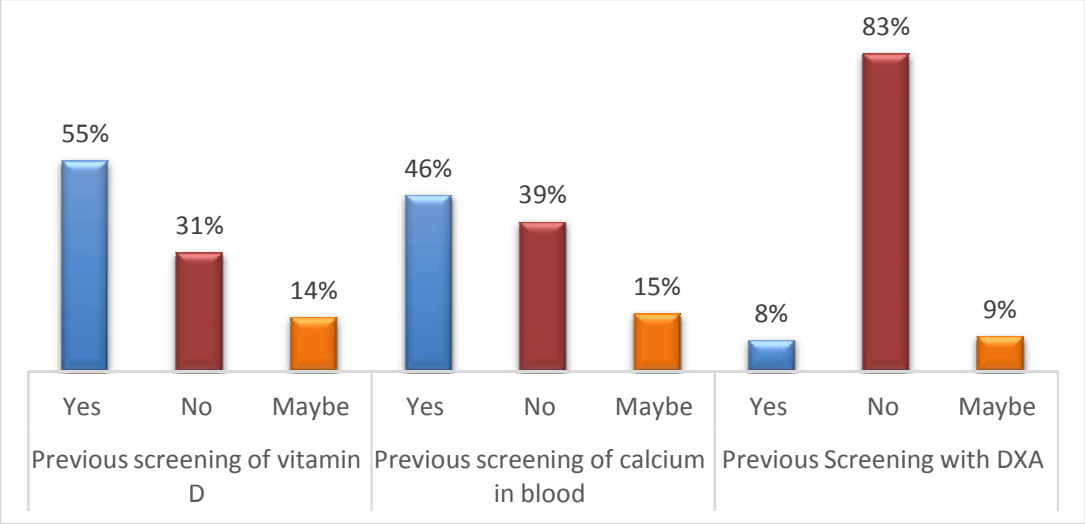

Fig. 4. Investigations related to osteoporosis among study participants

Table 3. Practices toward prevention of osteoporosis

Variable	Categories	Frequency	Percentage
Ingestion of calcium-rich foods	Always	106	20%
	Often	151	28%
	Sometimes	191	36%
	Rare	89	17%
Exposure to sunlight for vitamin D obtainment	Always	73	14%
	Often	111	21%
	Sometimes	183	34%
	Rare	170	32%

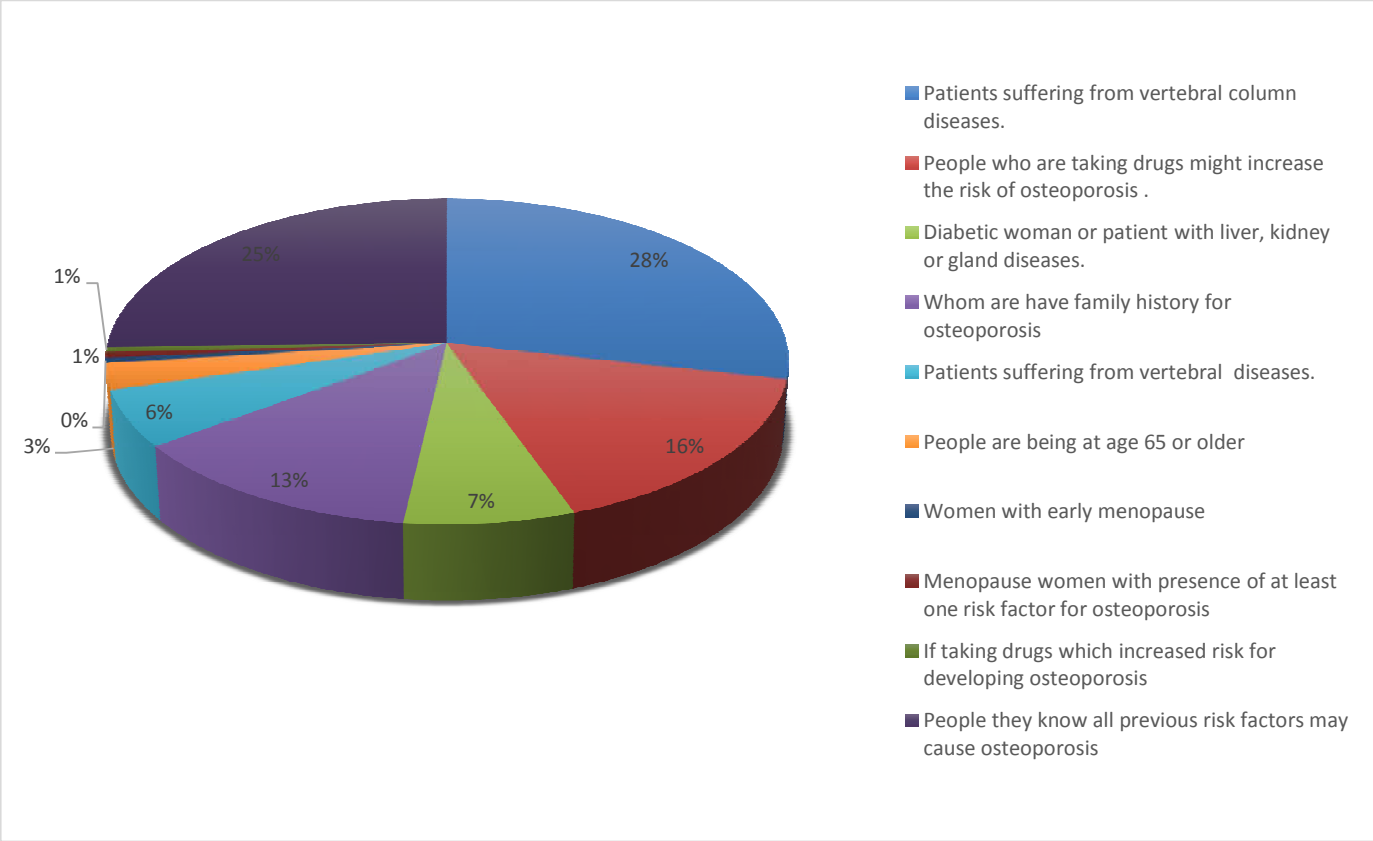

Fig. 5. Attitudes of participants about investigation of osteoporosis

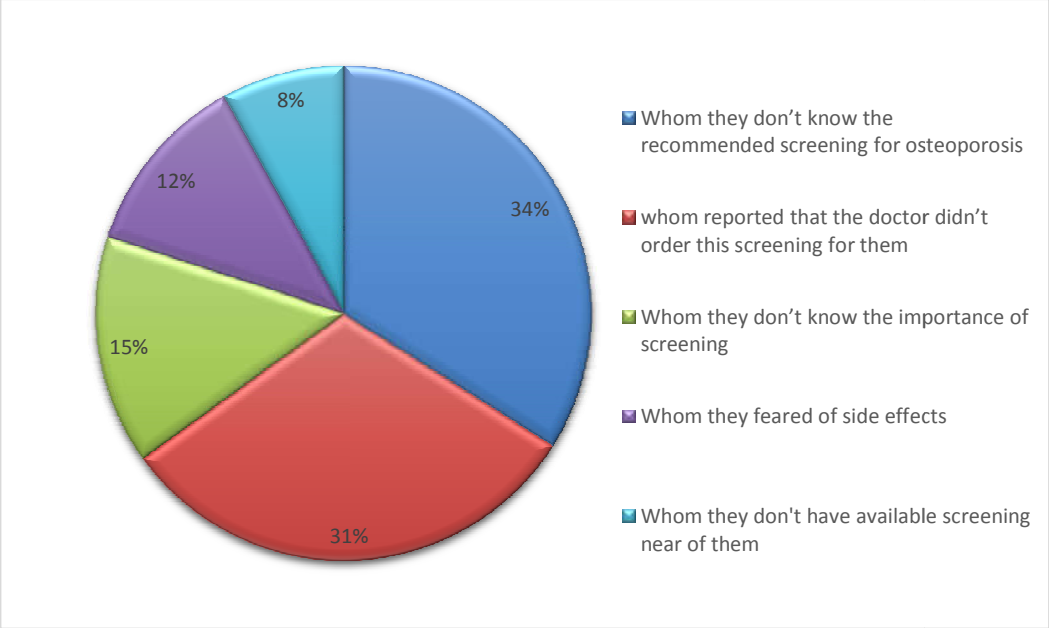

Fig. 6. Causes for not perform screening of osteoporosis

The results obtained indicate that significant part of our subjects had no adequate awareness of general aspects of osteoporosis in a way that large percentage (83%) of them mistook osteoporosis with arthrosis and a great number (83%) had no information about its diagnosis [35-36]. From all participants, 48% reported to have information about osteoporosis, the mentioned source of information was friends and relatives (33%), physician (28%), newspaper / magazines (14%), health worker (12%) and radio/TV (8%) [8,15,37,38]. In Barzanji et al study, the most important source of information was TV (58.6%) followed by relatives and friends (30.0%), while health workers (15.4%) had no considerable role in providing information about osteoporosis [33]. According to Wahba et al, the most important sources of information were respectively participants' mothers, relatives and friends (38.4%), TV (30%), while physicians (10.0%) had a little role [28].

In the present study compared to Jalili et al study, awareness of participants toward the role of female gender (59%), genetics (79%) and advancing age (63%), early menopause (30%), corticosteroids (23%) in occurrence of osteoporosis was better, but our participants had less information about the role of cigarette smoking (46%) [39].

In regard to the risk factors of osteoporosis, as compared to Zhang et al study, our participants' awareness of the role of female gender, of early menopause and cigarette smoking was lower [40].

Alexandraki et al has reported low rate of awareness toward cigarette smoking, advancing age and corticosteroid consumption as risk factors of osteoporosis [41]. In relation to awareness of preventing factors of osteoporosis, our participants' awareness of the role of exposing to sunlight, exercise and cheese consumption was relatively good. In Azizzadeh Foroozy et al. study, participants had very good awareness of the role of exposing to sunlight and dairy products like cheese as a source of calcium in osteoporosis prevention (more than 95% correct answers to both items) [42]. In another study in Singapore, more than half of nurses had awareness of the beneficial role of exercise in bone health and more than 70% had information about the amount of daily milk and its products that should be consumed by menopause women [40].

A review of the results of several studies in different parts of the world shows that unfortunately in many cases, awareness of osteoporosis is not good, while this disease in addition to having a high prevalence rate, especially in women, has several complications that eventually affect both the patient and the patient's relatives. The results indicated that

participants have lower knowledge about signs, symptoms and diagnosis of osteoporosis compared with their knowledge about risk factors, prevention, treatment. In Chen et al study, the awareness of participants toward symptoms and also the diagnosis and treatment of osteoporosis was less than other aspects [40].

Mean score of knowledge on different aspects of osteoporosis among participants was 45% which is not sufficient at all, this low rate of awareness deserves more attention. In another study in Saudi Arabia by Barzanji et al, mean awareness score of Riyadh citizens was 13.6 out of 24 [33]. Additionally, our result is somewhat consistent with a study conducted in different regions in the Kingdom of Saudi Arabia in which 78% of the participant never heard of osteoporosis [43].

Of course, this problem is not limited to Saudi Arabia, other studies that have been performed on different groups of subjects have reported similar results; for example, In Jalili et al study, the awareness score of studied women had been 44.3% [44].

Terrio et al have studied the awareness of three age groups toward osteoporosis reported low rate of awareness in all groups [45] and Chen et al in their study in Taiwan reported low rate of awareness in all studied groups with score of 34.16 out of 50 [46]. In a Singaporean study, mean awareness score of studied nurses toward osteoporosis was 14.5 [40]. another study showed, the awareness of physiotherapists toward osteoporosis was moderate [44]. Azizzadeh Foroozi et al, too, have reported low rate of awareness toward osteoporosis among teachers in Iran [42].

5. CONCLUSION

The results of the present study indicate that the knowledge and awareness about osteoporosis among Saudi females are poor. The participants lacked knowledge relating to risk factors, signs and symptoms, diagnosis and prevention of osteoporosis and the practice regard prevention and detection of osteoporosis is poor. In order to improve bone health and encourage preventive measures against osteoporosis, the first step is to increase awareness and practice in at risk groups. Health awareness campaigns about osteoporosis among Saudi females should be initiated to disseminate information. Educating women of all ages concerning the preventive measures of osteoporosis is certainly warranted.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s). Saudi female participants' population was informed about the nature of the study. Participants were informed that their participation in the study is voluntary and their information used only for study purpose and consent obtained from each participant.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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