Research Article

A Survey to Assess Osteoporosis Knowledge of the General population of Riyadh, Saudi Arabia

Samer Aladwani, Muteb Eid Alosaimi*, Saud Abdulrhman Althunayan, Ali Khalaf Alrowaidan, Sultan Mohammed Al-Abrah, Fahad Ahmed Ali Alhawas, Mohammed Abdulaziz Aloyayri, Ahmed Abdullah Almulhem

Faculty of Medicine, Department of Family Medicine, Al Imam Muhammad ibn Saud Islamic University, Riyadh, Saudi Arabia

*Email: *dr.mealosaimi @ gmail.com*

ABSTRACT

Background: *Osteoporosis refers to a disorder of the skeletal tissues that affect the density and quality of the bone. In most communities, the disorder is known to affect up to half of the population of women aged above 50 years, while affecting up to 205 of men of the similar age. Various research studies have however revealed that the majority of people are usually not aware of this condition. Normally, fractures resulting from osteoporosis can lead to disability, premature mortality or poor quality of life.This study therefore aims to assess the knowledge and awareness among adult residents of Riyadh in the Kingdom of Saudi Arabia regarding osteoporosis and its risk factors.* **Methods:** *This study was a cross-sectional, data was collected among adult residents in Riyadh in Saudi Arabia. It used stratified random sampling method for the selection of the study population. For the data collection, the study used a pre-coded self-administered questionnaire. It used SPSS software version 20 in data management and analysis.* **Results:** *385 completed the survey through the questionnaires, 41.8% were females, and 58.2% were males. From the chi-square analysis, we failed to reject the null hypothesis that there is no association between gender and awareness of risk factors associated with osteoporosis.* **Conclusion:** *Although various research studies have asserted that awareness of risk factors associated with osteoporosis is most worrisome compared to other elements such as attitude and preventive measures, this study deduces that awareness does not depend on gender or age. Instead, it agrees with assertions from other studies, which indicate that awareness is positively correlated with levels of education.*

Key words: *osteoporosis, awareness, prevention.*

INTRODUCTION

Osteoporosis refers to a disorder of the skeletal tissues that affects the density and quality of the bone. The disorder is irreversible and often leads to the fragility of the bone, increasing the risk of fractures. In most communities, the disorder is known to affect up to half of the population of women aged above 50 years, while affecting up to 205 of men of the similar age. These affected populations are usually expected to have a fracture in the bone resulting from the poor health of the bones [1]. Various research studies have however revealed that the majority of people are usually not aware of this condition. As a result, since most people are unaware of it, they fail to understand that their bones are fragile until it begins to fracture, giving it the common name of silent disease [2]. Normally, fractures resulting from osteoporosis can lead to disability, premature mortality or poor quality of life. The disorder is further known to derail affected individuals economically.

Research studies have shown that osteoporosis affects millions across the globe, making it one of the major public health concerns. With its frequency known to increase by age, the International Osteoporosis Foundation has recorded that it affects up to 10% of women aged 60 years old, up to 20% of women aged 70 years old and up to 40% of women aged 80 years old [1, 3-6]. On the same note, studies concerned with the prevalence of the condition in the Kingdom of Saudi Arabia have shown that the condition affects up to 40% of women aged between 50 and 80 years [5]. These studies have further shown that up to 24.3% of women aged between 50 and 59 years are affected by the condition while up to 62% of those aged between 60 and 69 years are also affected, and up to 73.8% of those aged between 70 and 80 years have the same condition. Although studies tend to focus on the effect of the condition on women, it is important to indicate that it does affect not only people from the female gender but also those from the male gender.

In other publications, the risk factors of osteoporosis have been found to include lifestyle behavior such as excessive alcohol intake, tobacco use, caffeine intake, deficiency in Gonadal hormone, inadequate activity and immobilization, low body weight as well as family history of osteoporotic fractures [4]. Regarding the relationship between osteoporosis and alcoholism, men are known to take more than four drinks per day, and women more than three drinks per day having been found to the at increased risk of osteoporosis. Regarding the relationship between caffeine intake and the risk of osteoporosis, research studies have shown that individuals who take more than 2.5 units of caffeine are at an increased risk of contracting the disorder [4]. On the other hand, regarding the association between body weight and the risk of the condition, research studies have shown that individuals with body weight below 58 kgs are at increased risk of the disorder [5]. Elsewhere, other research studies have also linked elements such as low calcium intake, low levels of physical activity, personal history of fracture and race to the risk of the disorder [1, 2].

In most nations where osteoporosis has become a major health issue such as the Kingdom of Saudi Arabia, the management of the condition's complications can cost a great deal of the nation's healthcare resources, considering that the most affected population (individuals from the female gender) constitute a significantly huge percentage of the total population [7]. The fundamental requirement in the management of the condition however starts with the evaluation of the existing alertness regarding the disorder, similar to steps in the management of any other health disorders [6]. Awareness, especially within target subjects, as well as knowledge among the subjects concerning the risk factors leading to osteoporosis, is often essential, not only in the management of the disorder but also in its overall prevention. Research studies have shown that there is an evidence suggesting that the awareness of the risk factors contributes to the prevention of the disorders.

With the life expectancy in the Kingdom of Saudi Arabia expected to increase in the coming years, and analysis showing that the prevalence of osteoporosis affects up to 30% of the population aged above 50 years, bone heath is expected to continue being a major issue [8]. Although the management of disorders such as osteoporosis depends on the awareness of the risk factors, few studies have been done tailored for residents of the Kingdom of Saudi Arabia. This scarcity in local studies discussing awareness levels of the risk factors associated with osteoporosis can be linked with the possibility of increased prevalence among Saudi Residents. This study therefore aims to assess the knowledge and awareness among adult residents of Riyadh in the Kingdom of Saudi Arabia regarding osteoporosis and its risk factors [4].

MATERIALS AND METHODS

Study Design
This study was a cross-sectional one, where descriptive observational data was collected among adult residents in Riyadh in the Kingdom of Saudi Arabia.

Sampling Procedure
In the selection of the study population, stratified random sampling method was used [6]. The city was stratified into different regions [1]. Two malls were randomly selected from each of the regions, and participants were selected randomly for the study. A total of 385 respondents were recruited for the study, constituting both males and females aged above 18 years of age [2]. There was no upper limit in age as the study was focussed more on aged respondents.

Data Collection

For the data collection, the study used a pre-coded self-administered questionnaire, which was given to the respondents to complete [2]. The questionnaire's structure was formed from a thorough review of literature before being polished by testing the tool in a pilot study with 25 respondents. The tool, which was also reviewed by orthopedic specialists, contained two parts. The first part was focussed on collecting demographic information including age category and the gender of the respondents [2]. For the demographic factors, the questionnaires collected information on age and gender, which were considered to be essential since they are mostly used in the analysis of the prevalence of the condition. These demographic factors were useful in creating clusters for analysis [7]. The second part consisted of nineteen questions. Each of the questions focussed on the assessment of participants' awareness of the risk factors linked with osteoporosis [9]. This part of the questionnaire inquired about knowledge and identification of osteoporosis, perception of the risk factors associated with the condition as well as the general knowledge of the condition.

Responses to the knowledge questions involved yes, no, or do not know. The latter option—I do not know—was included as one of the responses to avoid instances where participants would guess. The true answers for the correct answers were scored as 1 while incorrect and "do not know" answers were scored as 0 [10]. The total knowledge score, therefore, was ranged between 0 and 19, with 0 being the least score, while 19 being the highest score.

Data Analysis

For this study, SPSS software version 20 was used in data management and analysis, with demographic feature being summarized in descriptive summary measures [11]. Continuous variables were expected to be expressed in terms of statistics such as mean and standard deviation. The analysis used chi-square tests to evaluate the association between the characteristics of participants and the knowledge of risk factors associated with osteoporosis [12]. The analysis also included the use of t-test to compare the means of scores between females and males; while, the difference in means was tested using ANOVA [9]. For the tests, a *p*-value of 0.05 was used as the alpha level of significance to measure the statistical significance against the exact *p*-values that were calculated.

Ethical Considerations

This study sought approval from King Saud University's Institutional Review Board before carrying on with procedures of data collection. The participants were given the freedom to choose to participate, with an allowance to withdraw from the study at whichever time they choose to stop participating. Since the study was operated on exclusively voluntary participation, no incentives were given to the respondents. The respondents who consented to participate in the study were then given a questionnaire to complete [13]. In the case they decided to withdraw, there was no penalty or loss of benefit expected. As a part of ethical consideration, this study anonymized the questionnaire by avoiding the collection of personal data such as names and locations [14]. As a result, the study assured the participants' exclusive confidentiality.

RESULTS

Out of 400 individuals that were expected to participate in the study, 385 completed the survey through the questionnaires, giving a response rate of up to 96%. Out of the respondents, 41.8% were females, and 58.2% were males. Of the female participants, 20.4% were aged between 18 and 25 years old; 19.8% were aged between 26 and 35 years old; 17.3% were aged between 36 and 45 years old; 21.7% were aged between 46 and 60 years old; and the remaining 20.4% were aged above 60 years old. Of the male respondents, 16% were aged between 18 and 25 years old; 16.9% were aged between 26 and 35 years old; 22.3% were aged between 36 and 45 years old; 17.4% were aged between 46 and 60 years old; and the remaining 27.25 were aged above 60 years.

Of the survey population, 49.1% of the females and 41.5% of the males were aware that the disorder leads to an increased bone fracture risk. 43.5% of female respondents and 37.1% of males knew that the disorder does not portray symptoms such as pain. 44.7% of females and 33.9% of male respondents knew that having an elevated mass of peak bone at the closing stages of childhood provides safety against developing the disorder. 40.4% of females and 45.5% of male respondents were aware that cigarette smoking leads to developing osteoporosis. 42.9% of females and 40.6% of male respondents knew that white women are at an increased risk of bone fracture than women of other races. 36% of females and 45.1% of male respondents knew that by age 80, many women end up having the disorder. 46% of females and 41.1% of male participants knew that from age 50, the majority

of women expect not less than one bone fracture before death. 36% of females and 42.4% of male respondents knew that not any type of physical exercise is favourable for the disorder. 29.8% of females and 38.8% of male participants knew that they could tell whether they are at risk of osteoporosis by their clinical risks. 42.2% of females and 36.6% of male participants knew that family history of the disorder strongly inclines an individual to the condition.

Table 1: Chi-Square Tests for The Association Between Gender and Awareness of Osteoporosis Risk Factors

	Value	Degrees of freedom	*p*-value
Pearson Chi-Square	5.648[a]	12	.933
Likelihood Ratio	6.096	12	.911
N of Valid Cases	385		
a. 9 cells (34.6%) have expected count less than 5. The minimum expected count is .42.			

From Table 1 above, the association between gender and awareness of risk factors associated with osteoporosis is computed as 5.648, with a *p*-value of 0.933.

Table 2: Symmetric Measures for The Association Between Gender and Awareness of Osteoporosis Risk Factors

		Value	*p*-value
Nominal by Nominal	Phi	.121	.933
	Cramer's V	.121	.933
N of Valid Cases		385	
a. Not assuming the null hypothesis.			
b. Using the asymptotic standard error assuming the null hypothesis.			

From Table 2 above, it can be seen that the crammer's V computation is given as 0.121 with a *p*-value of 0.933.

DISCUSSION

From the descriptive statistics, it can be seen that more females were aware that osteoporosis leads to an elevated risk of fracturing the bone as compared to their male counterparts. It can also be seen that more females knew that the disorder does not cause symptoms such as pain as compared to their male counterparts. The study continues to indicate that more females knew that having an increased peak mass of the bone at the closing stages of childhood provides safety against developing the condition as compared to their male counterparts. It further asserts that more females than males were aware that white women are at an increased risk of fracturing their bones than women of other races [2]. It also suggests that more females than males are aware that from the age of 50, most women anticipate at least one bone fracture before death [1]. On the other hand, the study results assert that more males than females are aware that they could tell whether they are at risk of osteoporosis by their clinical risks [15]. In general, the descriptive statistics from the study outcome showed that there is a variance in the levels of awareness regarding the risk elements linked with the disorder by gender [11].

In a bid to confirm the claim that gender affected the awareness levels on the risk factors associated with osteoporosis, chi-square test was conducted [6]. From the chi-square analysis given in Table 1 above, the *p*-value can be seen to be greater than the given alpha level of significance, which was provided as 0.05. For chi-square analysis, we were interested in testing the hypothesis that there is no association between gender and awareness of risk factors associated with osteoporosis. With the computed *p*-value greater than the alpha level of significance, we failed to reject the null hypothesis that there is no association between gender and awareness of risk factors associated with osteoporosis [2]. It therefore asserts that being male or female did not affect the level of awareness that an individual had regarding the risk factors associated with osteoporosis.

Other studies have however shown that awareness about the risk factors associated with osteoporosis is affected by levels of education. From these studies, awareness is positively correlated to the level of education such that highly educated individuals are more aware of the risk factors associated with osteoporosis as compared to less-educated adividuals [3]. From this study, it can be deduced therefore that among highly educated individuals, the level of awareness is expected to be equal across gender groups, such that females of the stratum of highly educated individuals will be as aware of the risk factors as their male counterparts [14]. At the same time, it is

asserted that males in a stratum of lowly educated individuals are bound to be as unaware of the risk factors as their female counterparts.

Other studies that have gone further to investigate parameters, such as the source of awareness among Saudi residents, have shown that the main source of awareness is the media. These studies, however, show that not all information in the media was accurate. Regardless of the level of accuracy, however, health care providers were found to only contribute to 18% of knowledge among residents of the Kingdom of Saudi Arabia [15]. Although this study did not delve much into attitudes scores towards osteoporosis, studies that have investigated attitude scores have shown that high attitude scores are related to perceived benefits and self-efficacy. Low attitudes were perceived as barriers to awareness of risk factors associated with the condition. It is such attitudes that determine the level of awareness among some of the populations, with the majority of these populations not seeing the perceived benefits of looking into risk factors associated with the condition [1]. Studies that have investigated preventive measures concerning osteoporosis have shown that awareness can be a pivotal aspect of guiding its prevention. Such studies indicate that up to one-eighth of Saudi nationals are in the dark regarding the disorder, making its prevention quite hard.

CONCLUSION

In conclusion, although various research studies have asserted that awareness of risk factors associated with osteoporosis is most worrying as compared to other elements such as attitude and preventive measures, this study deduces that awareness does not depend on gender or age. Instead, it agrees with assertions from other studies, which indicate that awareness is positively correlated with the levels of education. The correlation between awareness and education levels can be backed up since the level of education contributes to the exposure that one can get regarding media understanding. This study can, therefore, be used as a stimulating aspect for further research studies to realize what causes the substantial variance between awareness in males and females in the Kingdom of Saudi Arabia. Therefore, future studies can be geared towards evaluating other attitudes related to preventive behavior as well as their determinants. This study also suggests that healthcare providers can be sought more regarding patient education regarding the disorder as a means of raising awareness and aiding its prevention.

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