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Knowledge, Attitude and Practice of Osteoporosis among Majmaah Population, Saudi Arabia

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ABSTRACT

Background: Osteoporosis is a major health concern among healthcare providers and relevant stakeholders. This study aims to evaluate the impact of knowledge, attitude and practices in management of osteoporosis in primary healthcare settings in Saudi Arabia.

Method: A cross-sectional study was carried out in Majmaah city during 2019 enrolling 316 individuals (aged 18-60 years). Subjects were selected using a multi-stratified random sampling technique. Questionnaires inquiring about both sociodemographic factors and osteoporosis knowledge were given to participants. Data analysis was performed using SPSS 22.0.

Results: Most of study participants were males (66.8%) while females constituted 33.2%. Out of a total score of 14 points, the mean knowledge score was 8.7 ± 3.2 points. We identified 122 (38.6%) participants with good knowledge about osteoporosis while 194 (61.4%) with poor knowledge, where 76.6% have previously heard about osteoporosis. Data analysis revealed moderate knowledge of participants about benefits of consuming preventive foods such as dairy products. Moderate percent of participants had knowledge about healthy impacts of increased activity and exercise to prevent osteoporosis.

Conclusion: We found moderate level of knowledge about osteoporosis among the general population of Majmaah, Saudi Arabia. The percentage of participants answering 75% or more knowledge related questions was 38.6% and were recorded with good knowledge level. Socioeconomic factors such as male gender, Saudi nationality, married individuals, higher educational levels and employment were significantly associated with higher level of knowledge related to osteoporosis.

Key words: Knowledge, Attitude, Practice, Osteoporosis

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INTRODUCTION

Osteoporosis is one of the major health concerns among healthcare providers and relevant stakeholders. The disease has been on the rise in various countries across the globe. Osteoporosis is one of the most common metabolic infections affecting millions of people worldwide including the Kingdom of Saudi Arabia [1,2]. Improving awareness among healthcare providers, such as physicians, is critical in the identification and provision of timely medical intervention to the affected individuals.

The disease results from modifiable factors, for instance, several studies indicated lack of adequate knowledge, awareness, and lifestyle behaviours as major cause of disease. Such factors inadvertently increase the incidents of osteoporosis. Osteoporosis is more common among women as compared to men. The disease continues to kill millions of people around the world [1]. It is associated with a remarkable reduction in bone mineral density (BMD) and significant alteration of the proteins in bone [3]. According to World Health Organization (WHO), osteoporosis is a health problem resulting from low bone mineral density up to 2.5 which is detectable by dual-energy X-ray absorptiometry. Currently, osteoporosis is one of the rapidly growing health concerns in most

Asian countries, especially in Saudi Arabia. The health problem is more prevalent among the aging population. Effective measures should aim at addressing the predisposing factors, general attitude and practices associated with management of the disease. Subsequently, adequate knowledge and adoption of positive health practices are some of the enabling factors aiding in osteoporosis management. Moreover, increasing dissemination of information through public education is another critical strategy to control disease outcomes.

Numerous studies previously reported lack of awareness as the main factor contributing to increased number of osteoporosis cases. Many of the middle-aged and older women in Saudi Arabia are still unaware of the potential risks associated with osteoporosis. In a study, approximately 76% of total 368 participants were postmenopausal and 62% had the health problem [1,2]. The awareness of the risk factors among the selected participants was mostly poor, thus, pointing the need for increased health promotional activities in minimizing the health challenge [1]. Most of the individuals were unaware of the food sources that are calcium rich. Lack of exercise and family history were identified as some of the causes of osteoporosis among many people with the disease.

Osteoporosis is linked to modifiable risk behaviors as well as non-modifiable risk factors. Some studies have indicated sedentary lifestyle and imbalanced diets as some of the factors that can be changed through behavioural adaptations [3,4]. Sex, aging and genetics are non-modifiable factors that require effective clinical interventions. Health promotion leveraging the provision of relevant knowledge and health beliefs on osteoporosis is crucial in enabling the patients to make a sound decision concerning general lifestyles and dietary modifications. A study conducted to assess the effects of knowledge, beliefs and practices on osteoporosis revealed absence of adequate knowledge for management of overall bone health [3]. Also, men were found to be more physically active as compared to their female counterparts [3–5]. Although, men were more likely to increased intake of carbonated beverages as compared to females. However, such practices do not translate into desired lifestyle modification critical in enhancing bone health. Women tend to have increased knowledge of their vulnerability to osteoporosis [6].

Thus, perception of susceptibility to osteoporosis are crucial in determining behavioral changes and implementation of a health promotion campaign. The rise in cases of osteoporosis is increasingly becoming a major concern in provision of healthcare services, especially among older patients. Many patients still lack information and awareness in the prevention and management of osteoporosis. Such factors act as barriers in the management of osteoporosis. Beliefs, practices and attitudes of both the healthcare providers and individuals at higher risks, are crucial in influencing the behaviors of the targeted population. Therefore, this proposed research study seeks to provide in-depth insights on the interplay of the identified factors in the management of osteoporosis, particularly in the Kingdom of Saudi Arabia.

The main objective of the study is to explore the impact of knowledge, attitude, and practice of osteoporosis among adult population in Majmaah city of Saudi Arabia. The study was also aimed to determine the impact of risks awareness in the management of osteoporosis, to evaluate the roles of health promotion programs in the promotion behavioral modifications and to determine the influence of beliefs on the administration of treatment for osteoporosis.

MATERIALS AND METHODS

Study design: The study was carried out in a cross-sectional survey-based design to determine the impact of beliefs, practices, and attitude of the general population within the selected study area.

Study area: The study was conducted within public settings in period of November 2019 to December 2019 using a structured questionnaire which was distributed to randomly selected participants from Majmaah city of Saudi Arabia.

Sample size and study population: Total 316 residents of Majmaah city with age 18-60 years were randomly enrolled in the study selected using a multi-stratified random sampling technique. Exclusion criteria were applied to disregard too young or too old participants i.e., individuals less than 18 years of age or more

than 60 years of age.

Data collection and analysis: In this research study, both primary and secondary data were collected using appropriate collection tools. The information collected was used in drawing key findings and conclusions of the investigation regarding the objectives. A structured questionnaire was used as data collection tool. Data was analysed using the advanced statistical method, the Statistic Package for Social Sciences (SPSS) software version 22.0.

Ethical consideration: The study was conducted in compliance with ethical practices. For instance, the research was approved from the Ethics Committee at Majmaah University (Reference number of approval and date). All the potential participants were recruited in the study after obtaining informed written consent. They were also informed about their option to withdraw their participation at any time during the study. The privacy of the participants was ensured by maintaining their anonymity in the entire survey.

RESULTS

Characteristic of the participants: This study included total 316 participants where most of them were males (66.8%) while females constituted 33.2% of the total sample population. Regarding age groups of participants, 50 were 18 to 25 years old (15.8%), 91 were 26 to 35 years old (28.8%), 91 were 36 to 45 years old (28.8%), 53 were 46 to 55 years old while 31 were more than 55 years of age (9.8%). Most of the participants were Saudi nationals (71.8%) whereas only 83 of them were identified with nationalities other than Saudi (28.2%). During the time of the study, 227 participants were married (71.8%), 48 were single (15.2%), 30 were widowed (9.5%) and 11 were divorced (3.5%). Regarding their level of education, 128 participants had either completed or currently enrolled in bachelor's degree (40.5%), 49 were secondary school students (15.5%), 48 were intermediate students (15.2%), 13 were primary school students (4.1%) and the remaining 78 have other educational qualifications (24.7%). Most of the participants were employed (69.3%) and only 30.7% were unemployed. Most of the participants had an average yearly income of 5,001 to 10,000 SR (42.1%). The reminders were indicated with an average yearly income of 3,001 to 5,000 SR (25.9%), 10,001 to 15,000 SR (17.7%), less than 3,000 SR (6.6%) and more than 15,000 SR (7.6%). The characteristic of the participants are summarized in Table 1.

Knowledge about osteoporosis: For each of the fourteen questions that that were assigned to assess the knowledge about osteoporosis, we gave one point for answering the correct answers and zero points for the wrong answers. Then, participants who have correctly answered 75% or more of the knowledge questions (i.e., scored more than 10 points) were considered as having good knowledge about osteoporosis. Accordingly, out of a total score of 14 points, the mean knowledge score was set as 8.7 ± 3.2 points. We found that 122 (38.6%) participants were having good knowledge about osteoporosis while 194 (61.4%) were identified with poor knowledge (Figure 1).

Out of the 316 participants, 76.6% had previously heard about osteoporosis. Only 44.6% thought that family history plays a role in the development of osteoporosis while 66.5% considered old age being one of the risk factors of osteoporosis. In addition, 62.3% knew that regular physical activity can help in strengthening bone and

Table 1: Characteristics of the participants (n=450).

Variable	Categories	Frequency	Percentage
Age in years	18 - 25	50	15.80%
	26 – 35	91	28.80%
	36 – 45	91	28.80%
	46 – 55	53	16.80%
	More than 55	31	9.80%
Gender	Male	211	66.80%
	Female	105	33.20%
Nationality	Saudi Arabian	227	71.80%
	Non- Saudi	83	28.20%
Marital status	Single	48	15.20%
	Married	227	71.80%
	Divorced	11	3.50%
	Widowed	30	9.50%
Educational level	Primary	13	4.10%
	Intermediate	48	15.20%
	Secondary	49	15.50%
	Bachelors	128	40.50%
	Other	78	24.70%
Occupation	Employed	219	69.30%
	Unemployed	97	30.70%
Income	Less than 3,000 SR	21	6.60%
	3,000 - 5,000 SR	82	25.90%
	5,001 - 10,000 SR	133	42.10%
	10,001 - 15,000 SR	56	17.70%
	Above 15,000 SR	24	7.60%

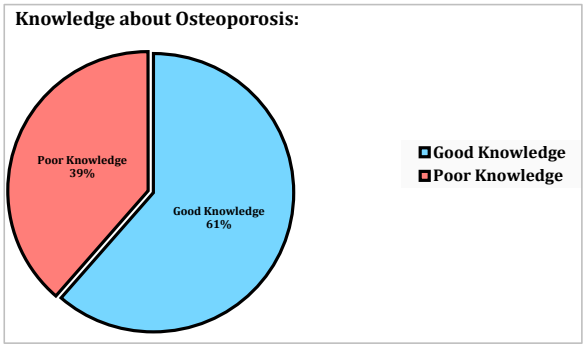

Figure 1: Knowledge about osteoporosis (N=316).

Table 2: Knowledge about osteoporosis.

Knowledge	Yes	No
Have you ever heard about Osteoporosis?	242 (76.6%)	65 (20.6%)
Family history play no role in the development of osteoporosis	159 (50.3%)	141 (44.6%)
Old age is one of the risk factors for the development of osteoporosis	210 (66.5%)	82 (25.9%)
Sunlight is important for absorption of calcium in the body	228 (72.2%)	71 (22.5%)
Calcium supplementation is a critical aspect of dietary modification	240 (75.9%)	57 (18.0%)
Routine radiological investigations are not important in the management of osteoporosis	123 (38.9%)	164 (51.9%)
Regular physical activity can help in strengthening bone and prevent osteoporosis	197 (62.3%)	79 (25.0%)
Having three days of exercise per week can help in improving the healthy bones	202 (63.9%)	74 (23.4%)
Low dairy product-based food can prevent osteoporosis.	154 (48.7%)	143 (45.3%)
Drinking Milk can help in prevention of Osteoporosis	241 (76.3%)	58 (18.4%)
Osteoporosis has no significant sign and symptoms during the early phases of the health condition	193 (61.1%)	92 (29.1%)
Osteoporosis can lead to loss of Height	166 (52.5%)	122 (38.6%)
Lifestyle and diet contributes to the development of osteoporosis	199 (63.0%)	86 (27.2%)
There is a screening test for Osteoporosis	188 (59.5%)	86 (27.2%)

preventing osteoporosis while 63.9% believed that exercising physical activities three days per week can sufficiently help in improving the healthy bones. Furthermore, 75.9% thought that calcium supplementation is a critical aspect of dietary modification, 72.2% knew that sunlight is important for the absorption of calcium in the body and 76.3% had knowledge about efficacy of dairy diet in prevention of osteoporosis. Only 38.9% said that routine radiological investigations are important in the management of osteoporosis. In addition, 48.7% disagreed with the statement that "low dairy product-based food can prevent osteoporosis". Our results also showed that 61.1% knew that osteoporosis has no significant sign and symptoms during the early phases of the health condition and 52.5% said osteoporosis can lead to height loss. Lastly 63% stated that lifestyle and diet contribute to the development of osteoporosis and 59.5% indicated that there is screening test for osteoporosis (Table 2).

Factors associated with the knowledge of osteoporosis: To investigate the impact of the sociodemographic factors on the level of knowledge of the studied population, we conducted a chi-square test to find the statistically significant factors. We observed that gender, nationality, marital status, level of education and occupation showed a p-value less than 0.05. Generally, we identified that higher percentage of males showed good knowledge about osteoporosis when compared to females (43.6% vs 28.6% respectively). Also, 44.1 of the Saudi nationals have good knowledge about osteoporosis compared to the 24.7% of the non-Saudi nationals. Higher percentage of employed individuals showed good knowledge as compared to unemployed individuals (44.3% vs 25.8% respectively). We also found that married individuals and bachelor's degree holders were having the highest level of knowledge when compared with other groups (Table 3).

DISCUSSION

Osteoporosis is a global health problem, and its prevalence is quickly increasing around the world. In Kingdom of Saudi Arabia (KSA), an epidemiological study showed that about 34% of healthy Saudi women, and 30.7% of men who

Table 3: Factors associated with the knowledge about osteoporosis (the percentages were calculated within each studied group).

Studied group	Knowledge about osteoporosis				p-value*
	Good knowledge		Poor knowledge		
Age	N	%	N	%	
18–25	13	26.00%	37	74.00%	0.231
26-35	39	42.90%	52	57.10%	
36–45	36	39.60%	55	60.40%	
55–55	24	45.30%	29	54.70%	
>45	10	32.30%	21	67.70%	
Gender					
Male	92	43.60%	119	56.40%	0.014
Female	30	28.60%	75	71.40%	
Nationality					
Saudi	100	44.10%	127	55.90%	0.002
Non-Saudi	22	24.70%	67	75.30%	
Marital status					
Single	14	29.20%	34	70.80%	0
Married	103	45.40%	124	54.60%	
Divorced	1	9.10%	10	90.90%	
Widowed	4	13.30%	26	86.70%	
Educational level					
Primary	1	7.70%	12	92.30%	0.006
Intermediate	14	29.20%	34	70.80%	
Secondary	14	28.60%	35	71.40%	
Bachelors	62	48.40%	66	56.60%	
Other	31	39.70%	47	60.30%	
Occupation					
Employed	97	44.30%	122	55.70%	0.003
Unemployed	25	25.80%	72	74.20%	
Income					
Less than 3,000 SR	5	23.80%	16	76.20%	0.07
3,000-5,000 SR	41	50.00%	41	50.00%	
5,001-10,000 SR	48	36.10%	85	63.90%	
10,00 -15,000 SR	22	39.30%	34	60.70%	
Above 15,000 SR	6	25.00%	18	75.00%	

were 50 to 79 years of age are suffering from osteoporosis [7]. Currently, with the reported increase in life expectancy in Saudi Arabia from 45-67 years in 1960 to 74.9 years in 2017 [8], the prevalence of osteoporosis is expected to increase furthermore. Many lifestyle factors play a significant role in the high prevalence of this disease, with lack of physical activity, low calcium intake, higher prevalence of vitamin D deficiency and hormonal changes being among the most common risk factors that can lead to increased weakness and fragility of bone associated with loss of bone tissue. Also, loss in bone tissue significantly increases after menopause due to a decrease in estrogen levels in the women body [9]. In Saudi Arabia alone, there is approximately 8,768 femoral neck fractures each year costing billions of moneys, therefore, bone health is becoming a serious concern in Saudi Arabia [10]. Lack of awareness about the causes of osteoporosis, negligence towards bone health and the absence of preventive behaviors among the population at risk of osteoporosis development are making the early control of osteoporosis a challenge and thus, contributing towards the increased burden of disease [11].

The analysis in our study revealed that only 38.6% of the study population can be considered with good knowledge about osteoporosis as evident by correctly answering more than 75% of the questions while 61.4% are considered to have poor knowledge about osteoporosis. Although, 76.6% of the participants had previously heard about osteoporosis, inferring that general knowledge about osteoporosis in studied population is moderate. This contrasts with previously reported study reporting increased prevalence of osteoporosis disease

primarily due to low level of awareness about the disease among the general population and referring it as a 'silent disease' [12].

Even though genetic factors are an important determinant of bone density, however, lifestyle and other environmental factors like low physical activities, low intake of calcium and vitamin D and smoking are all other unhealthy variables that can lead to development of osteoporosis [13]. Knowledge concerning the healthy foods was determined by responses to specific questions related to risk factors of osteoporosis, including the importance of consuming milk and dairy products and the role of calcium supplementation. Data analysis revealed that participants had moderate knowledge about the effects of diet components in preventing the outcomes and development of disease. For instance, our results showed that 75.9% thought that calcium supplementation is a critical aspect of dietary modification while 76.3% believed that consuming milk can help in prevention of osteoporosis.

Our results also indicated that moderate percent of participants had knowledge about the health effects of increased physical activity and exercise on the prevention of osteoporosis. For that matter, majority of participants (62.3%) knew that regular physical activity can help in strengthening bone and preventing osteoporosis. It has been well established that sedentary lifestyle which neglects physical exercise leads to decrease in bone density and mass, whereas mechanical loading through exercise and active lifestyle increases bone mineral density [14]. Some studies have reported a positive correlation between the lean body mass and bone density, which suggested that the muscle applies mechanical powers on the bone and is subsequently can be considered as metabolically dynamic organ influencing bone health [15].

To identify the effect of the socioeconomic status on the level of awareness of the participants, we conducted chi-square test to reveal the statistically significant results. Our data revealed that males were generally more aware about osteoporosis as 43.6% of them are having a good knowledge about osteoporosis compared to 28.6% of females (p=0.014). This contrasts with what was reported in a previous study carried out in Riyadh city of Saudi Arabia presenting female gender being associated with good knowledge about osteoporosis [16]. We also noted an association between the nationality of the participant and respective level of awareness. Our result indicated that 44.1% of the Saudi nationality holders had good knowledge compared to 24.7% non-Saudi nationality holders (p=0.002). Furthermore, current findings also pointed out that education level was significantly associated with the level of knowledge and awareness in given population. It was observed in our data analysis that percentage of participants with good knowledge about osteoporosis improved with increasing level of education. Participants enrolled in or with complete bachelor's degree programs were recorded with highest level of knowledge (48.4%) compared to other groups (p=0.006). These findings were consistent with previously reported data in Saudi population presenting a positive association between the level of education and the knowledge of disease [16]. Moreover, some other studies in Saudi Arabia had demonstrated positive correlation between high education and female gender and osteoporosis knowledge [17].

Lastly, we also noted statistically significant association between the level of knowledge and the employment status and marital status. Generally, employed individuals were observed with highest level of knowledge about osteoporosis compared to non-employed individuals. This is in consistency with the previous findings in a study reporting the association of awareness about osteoporosis and different types of occupations among the pre- and post-menopausal women and highlighted increased awareness level in women holding professional jobs [18]. We also found that married individuals had significantly better level of osteoporosis knowledge when compared with other participants (p=0.003). Our results did not find any association between the level of knowledge and age groups and income (p>0.05).

CONCLUSION

In conclusion, data of this study revealed moderate level of knowledge about osteoporosis among general population of Majmaah, Saudi Arabia. We identified 38.6% of the participants with sufficiently good level of osteoporosis knowledge as they could answer 75% or more

questions correctly. The outcomes of our study indicated that socioeconomic factors such as gender, nationality, marital status, level of education and occupation are significantly correlated with the level of knowledge about the disease. Our analysis indicated that male gender, Saudi nationality, married status, higher educational levels and employment were significantly associated with higher knowledge of osteoporosis.

STUDY LIMITATIONS

The study relied on a smaller sample population (316 research participants) from a limited study area that might be inadequate to provide an accurate representation of awareness level among entire population of Saudi Arabia.

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