



Perception of Osteoporosis among General Population in Eastern Province, Saudi Arabia

Abdullah Al-Mula^{a*#} and Abdul Sattar Khan^b

^a College of Medicine, King Faisal University, Eastern Province, Al Ahsa, Saudi Arabia.

^b Family and Community Medicine Department, King Faisal University, Eastern Province, Al Ahsa, Saudi Arabia.

Authors' contributions

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

Article Information

DOI: 10.9734/JPRI/2021/v33i60B34618

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/80399>

Received 14 October 2021

Accepted 19 December 2021

Published 21 December 2021

Original Research Article

ABSTRACT

Background: Osteoporosis is a progressive bone disease that if not detected and treated early, it can lead to serious complications. It is a silent disease because the patient is usually asymptomatic; therefore, perception of this disease is very important.

Objectives: The aim of the study was to evaluate osteoporosis perception among general population in eastern province, Saudi Arabia.

Methods: A cross-sectional study was conducted through an online self-administered questionnaire. A modified questionnaire was used for data collection. The questionnaire assessed the understanding of symptoms, risk factors, preventive factors, and treatment availability of osteoporosis. The study included all people in eastern province, Saudi Arabia. The sample size was 391. It was conducted from September 2018 to May 2021.

Results: 61.6% of 391 participants questioned did not have a good perception of osteoporosis. There was a variability in the correct response rate, which indicates the presence of gaps in some aspects of osteoporosis perception more than the others do. The cut-off score was 50%.

Conclusion: According to the findings of the study, people in eastern province, Saudi Arabia have poor perception of osteoporosis. Therefore, efforts should be made to establish educational campaigns and use the new technologies in order to raise osteoporosis perception.

[#]Medical Intern;

^{*}Corresponding author: E-mail: Abdullah.f.a.almulla@gmail.com;

Keywords: Osteoporosis; perception; eastern province; preventive factors.

1. INTRODUCTION

Osteoporosis is a disease that affects primarily the bones making them weak and brittle — so brittle that any minor fall or even mild strains such as sneezing or minor bumps can cause a bone fracture [1]. The symptoms of osteoporosis are not clear until the occurrence of bone fracture [2]. The most common areas affected with fractures due to osteoporosis are the wrist, spine, shoulder and hip [3]. Osteoporosis is considered a serious public health concern because of its spread worldwide. Currently, it is predestined that more than 200 million humans worldwide suffer from this problem [4]. By 2050, the proportion of worldwide new cases of hip fracture is predicted to increase by 240% in women and 310% in men [5]. Therefore, even if age-adjusted incidence rates remain stable, the hip fractures worldwide will increase from 1.66 million in 1990 to 6.26 million in 2050 [6]. A statistical analysis in Saudi Arabia showed that 34% of healthy Saudi women, and 30.7% of men, 50-79 years of age are osteoporotic [7]. As the life expectancy in the Kingdom of Saudi Arabia (KSA) is reported to be increased from 45-67 years in 1960 to 75.7 years in 2013 [8], it is expected that the osteoporosis prevalence will increase even further [9]. Osteoporosis contributes to two million bone fractures and \$19 billion in related costs yearly. Experts predict that such disease will be contributed to approximately three million fractures and \$25.3 billion in costs annually by 2025 [10]. Osteoporosis has several risk factors. These include Asian or Caucasian race, advancing age, family history of osteoporosis or fragility fractures, a low body mass index, diet low in calcium and vitamin D, poor intestinal absorption of calcium, lactose intolerance, excessive caffeine or alcohol consumption; smoking, sedentary life style, and prolonged treatment with thyroid hormones, glucocorticoids, anticonvulsants, aluminum antacids, and use of anticoagulants (11-13). The ministry of health in Saudi Arabia has set some goals for the healthcare transformation strategy. One of its goals is to maximize the role of primary healthcare [14], which is highly responsible for increasing population awareness and preventing diseases. To help guiding for areas which requires educational campaigns, this study aims to assess osteoporosis perception among people in eastern province, Saudi Arabia.

2. METHODOLOGY

2.1 Study Design

A cross-sectional descriptive study was done to investigate perception of osteoporosis through an online self-administered questionnaire from September 2018 to May 2021.

2.2 Study Population

All citizens of all ages of both males and females of any educational background of eastern province of Saudi Arabia were included in the study population. The exclusion criteria were non-Arabic speakers and citizens of other parts of Saudi Arabia.

2.3 Sample Size

Using a 95% level of confidence, 5% confidence interval and population of (5,028,753) according to the Saudi General Authority for Statistics. The sample size was (391). It was done using a random sampling method.

2.4 Data Collection

The questionnaire was obtained from a similar study previously conducted in Saudi Arabia, which used Osteoporosis Knowledge Assessment Tool (OKAT) [15] with some modifications. The Arabic version of OKAT was found to be validated and objective questionnaire that reliably measures osteoporosis knowledge [16]. OKAT assesses the knowledge of symptoms, risk factors, preventive factors, and treatment availability of osteoporosis. The distribution of the questionnaire was done online through social media. The questionnaire was formulated using Google forms. The first page of the questionnaire clearly described the study title, aim and target group for participation in the study.

2.5 Statistical Analysis

Data analysis and coding was done using SPSS software package version (23.0). The data was analyzed as frequency and percentage to describe the correction response rate. One score was set for every correct answer in each item of the questionnaire with a total score of 13 to evaluate the participants' perception of

Table 1. Frequencies and percentages of the responses (n=391)

Item	True		False		I don't know	
	n	%	n	%	N	%
1. Osteoporosis leads to an increased risk of bone fractures	370	94.6	6	1.5	15	3.8
2. Osteoporosis usually causes symptoms (e.g., pain) before fractures occur	286	73.1	26	6.6	79	20.2
3. Having a higher peak bone mass at the end of childhood gives no protection against the development of osteoporosis in later life	75	19.2	104	26.2	212	54.2
4. Osteoporosis is more common in men	49	12.5	209	53.5	133	34
5. Cigarette smoking can contribute to osteoporosis	235	60.1	36	9.2	120	30.7
6. Any type of physical activity is beneficial for osteoporosis	188	48.1	99	25.3	104	26.6
7. It is easy to tell whether I am at risk of osteoporosis by my clinical risk factors	176	45	87	22.3	128	32.7
8. Family history of osteoporosis strongly predisposes a person to osteoporosis	140	35.8	151	38.6	100	25.6
9. There is no effective treatment for osteoporosis in KSA	55	14.1	145	37.1	191	48.8
10. Sardines and broccoli are good sources of calcium for people who cannot take dairy products	245	62.7	15	3.8	131	33.5
11. Calcium supplements alone are enough to prevent bone mass loss	73	18.7	214	54.7	104	26.6
12. High consumption of salt increase the risk of osteoporosis	113	28.9	67	19.4	202	51.7
13. Two cups of milk a day are enough for the daily body need for calcium	210	53.7	67	17.1	114	29.2

Table 2. Key answer of items in Table 1 and correct response rate

Item number	Correct answer	Correct response rate (%)
1	True	94.6
2	False	6.6
3	True	19.2
4	False	53.5
5	True	60.1
6	False	25.3
7	True	45
8	True	35.8
9	False	37.1
10	True	62.7
11	False	54.7
12	True	28.9
13	True	53.7

osteoporosis. The cut-off score to label a participant as having good or poor perception was 50%. We consider the middle point as median for cut-off point because there was no reference available in literature of cut-off point for assessing awareness.

3. RESULTS

A total number of 391 participants from eastern province, KSA, participated in the study. Table 1 summarizes the responses of the participants for each of the 13 items in the provided questionnaire. The items covered different aspects of the disease including the signs, symptoms, prevention, risk factors, and treatment availability in Saudi Arabia. The answer key of the items in the questionnaire with the correct response rate are presented in Table 2. There was a variety in the correct response rate of each item by the participants, which indicates the presence of gaps in some aspects of the studied issue. The highest correct response rate was 94.6% noted in item one concerning that osteoporosis increases the risk of fractures. The lowest correct response rate was 6.6% reported for the item related to osteoporosis symptoms. The correct response rate of the rest of the items was variable ranging from 19.2% – 62.7%. The overall status of osteoporosis perception among the study participants is presented in Table 3.

Table 3. Participants' osteoporosis status of perception in frequencies and percentages (n=391)

Perception status	n	%
Good perception	150	38.4
Poor perception	241	61.6

4. DISCUSSION

Osteoporosis is a progressive bone illness that causes significant changes in the biologic material of bones and, as a result, structural distraction of bones, affecting millions of people worldwide from various ethnic groups. The disease's worst consequence is bone fragility, which requires long-term treatment and medical supervision, particularly in the elderly [17]. Osteoporosis is estimated to be responsible for ninety percent of all elderly white women hip and spine fractures [18]. However, this disease can be easily treated or managed if diagnosed early [19]. This is highly dependent on the disease perception among the general population,

because if people are aware of a particular disease, they are more likely to follow measures to prevent it from happening to them, or to seek medical attention for check-ups [20].

The current study explored the osteoporosis perception among people in eastern province, KSA, using a 13-item questionnaire with a cut-off score of 50%. There was a variety in the correct response rate of each item by the participants, which indicates the presence of gaps in some aspects of osteoporosis perception. This study revealed that 61.6% of 391 subjects questioned did not have a good perception of osteoporosis. These results are similar to another study conducted in Tabuk, KSA 62% [21]. Some other parts of the world have also reported low levels of osteoporosis knowledge like Malaysia 79.4% [22] and Pakistan 49% [23]. One study conducted in Jeddah, KSA, reported a high osteoporosis perception among university students [24], which was explained by the existence of an osteoporosis awareness and prevention campaign in the university. This reveals the significance of educational campaigns for such an important issue.

This study reveals that only 6.6% of 391 participants have a good perception of the signs and symptoms of osteoporosis, which indicates the presence of a huge gap in this vital part of the disease knowledge. This gap is present in other similar studies conducted in different parts of KSA. One study targeted Saudi females attending Security Forces Hospital, Riyadh, KSA showed that only 12.8% of all participants have a good perception of osteoporosis signs and symptoms [25]. Another study targeted female patients at the obstetrics and gynecology clinics in Prince Mishari Hospital, Albaha, KSA revealed that only 17% of all participants are aware of the signs and symptoms of osteoporosis [26].

The significance of evaluating the general population perception of different parts of the disease is to know which parts should be more focused on when planning to apply different strategies to raise osteoporosis perception among people.

5. CONCLUSION

The findings of this study reveal that osteoporosis perception of people in eastern province, KSA, is low, which matches with some local and international literature. In the level of a single participant, osteoporosis perception is

variable, which indicates that some of the participants have a strong knowledge of some aspects along with very poor knowledge of other aspects. In light of such low osteoporosis perception, steps should be taken to raise osteoporosis perception among people in eastern province, KSA. Establishing educational campaigns and creating educational short videos to be shared through social media will be of a great worth in raising osteoporosis perception.

6. LIMITATIONS OF THE STUDY

The socio-demographic data of the participants were not investigated in this study. Such data is very important to highlight the common factors between the participants who have the same level of osteoporosis perception to understand the reasons behind their poor knowledge, such as low educational level, low yearly income, etc. Another missed part in the study was to ask about the source of the participant's information. This is important to know the most commonly used source of information to be utilized when planning to share educational contents to increase the awareness of the public. Future studies are encouraged to add socio-demographic data in their variables as well as asking about the participant's source of information.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

The ethical approval of the current study was obtained from the research committee and ethics at college of medicine, King Faisal University, Saudi Arabia. All data were handled confidentially and used for the purpose of research only.

ACKNOWLEDGEMENT

The authors gratefully thank dr. Sayed ibrahim for his contribution in data analysis. We would also like to thank everyone who has helped us in distributing and filling the questionnaire.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Raisz LG. Pathogenesis of osteoporosis: concepts, conflicts, and prospects. *J Clin Invest* 2005;115(12):3318–25.
2. Lewiecki, M. Management of osteoporosis. *Clinical and Molecular Allergy*;2004.
3. Osteoporosis Canada. Osteoporosis facts and statistics. *Osteoporosis Canada*;2019. Available at: <https://osteoporosis.ca/fast-facts/>.
4. Cooper C, Campion G, Melton L. Hip fractures in the elderly: A world-wide projection. *Osteoporosis Int.* 1992;2(6): 285-89.
5. Gullberg B, Johnell O, Kanis J. World-wide projections for hip fracture. *Osteoporosis Int.* 1997; 7(5):407-13.
6. Sambrook, P. and Cooper, C. Osteoporosis. *Lancet.* 2006;368(9529).
7. Sadat-Ali, M., Al-Habdan, I., Al-Turki, H. and Azam, M. An epidemiological analysis of the incidence of osteoporosis and osteoporosis-related fractures among the Saudi Arabian population. *Ann Saudi Med.* 2012;32(6):637-41.
8. World Health Organization. Saudi Arabia; 2013. Available:<<http://www.who.int/countries/sau/ar/>>.
9. Alwahhabi, B. Osteoporosis in Saudi Arabia. *Saudi Med J.* 2015;36(10):1149-50.
10. National Osteoporosis Foundation. Learn what osteoporosis is and what it's caused by. *Learn*; 2015. Available:<https://www.nof.org/patients/what-is-osteoporosis/>.
11. Osteoporosis prevention, diagnosis, and therapy. *NIH.* 2000;17(1).
12. Habiba U, Ahmad S, Hassan L. Predisposition to osteoporosis in postmenopausal women. *Journal of the College of Physicians and Surgeons.* 2002;12(5).
13. Sultan A, Khan D, Mushtaq M, Hassan A. Frequency of osteoporosis and its associated risk factors in postmenopausal women in clinical practice at Rawalpindi. *Pakistan Journal of Pathology.* 2016; 3(2006).
14. Saudi Ministry of Health. Healthcare transformation strategy. *Health*; 2019. Available:<https://www.moh.gov.sa/en/Ministry/vro/Pages/Health-Transformation-Strategy.aspx>.

15. Alshareef SH, Alwehaibi A, Alzahrani A, Faghih A, Alkenani A, Alfentoukh M, Almohaidb M, Alsebayel, Y. and Alasbali, M. Knowledge and awareness about risk factors of osteoporosis among young college women at a university in Riyadh, KSA. *Journal of Bone Research*. 2018; 06(02).
16. Sayed-Hassan RM, Bashour HN. The reliability of the Arabic version of osteoporosis knowledge assessment tool (OKAT) and the osteoporosis health belief scale (OHBS). *BMC Research Notes*. 2013;6(1).
17. Pouresmaeili F, Kamali Dehghan B, Kamarehei M, Yong Meng G. A comprehensive overview on osteoporosis and its risk factors. *Ther Clin Risk Manag*. 2018;14:2029–49.
Available:<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6225907/#box1-tcrm-14-2029>.
18. Melton LJ 3rd, Thamer M, Ray NF, Chan JK, Chesnut CH, Einhorn TA, Johnston CC, Raisz LG, Silverman SL, Siris ES. Fractures attributable to osteoporosis: report from the National Osteoporosis Foundation. *J Bone Miner Res*. 1997;12(1):16-23.
19. Manejias E. Osteoporosis detection and treatment options. *Hospital for Special Surgery*;2009.
Available:https://www.hss.edu/conditions_osteoporosis-detection-treatment-options.asp.
20. Roche. Disease awareness and access to healthcare. *Disease*; 2021.
Available:<https://www.roche.com/sustainability/access-to-healthcare/our-approach/disease-awareness.htm>.
21. Mirghani H. Osteoporosis knowledge and attitude assessment among females aged 15-25. years in Tabuk, Saudi Arabia. *Indian Journal of Basic and Applied Medical Research*. 2016; 5(4).
22. Amin S. Assessment of knowledge level on osteoporosis among a private university students in Malaysia. *Imperial Journal of Interdisciplinary Research*. 2017; 3(3).
23. Bilal M, Haseeb A, Merchant AZ, Rehman A, Arshad MH, Malik M, Rehman AHU, Rani P, Farhan E, Rehman TS, Shamsi US, Aminah S. Knowledge, beliefs and practices regarding osteoporosis among female medical school entrants in Pakistan. *Asia Pacific Family Medicine*. 2017;16(1).
24. Zakai H. Awareness about osteoporosis among university students in Jeddah, Saudi Arabia. *Int J Clin Lab Res*. 2015; 4(2).
25. Alqahtani G, Alghamdi A. Assessment of osteoporosis knowledge among adult Saudi females attending the family medicine department at Security Forces Hospital, Riyadh, Saudi Arabia. *Journal of Family Medicine and Primary Care*. 2021;10(3):1209.
26. Abdullah Almilaibary, Abdulmajeed A. Alzahrani, Bader A. Alzahrani, Waleed S. Alzahrani, Mohammed S. Alghamdi, Ziad E. Alzahrani. Awareness level about osteoporosis among females whom visiting OB/Gyn in Albaha region, KSA. *Medical Science*. 2020; 24(102):861-869

© 2021 Al-Mula and Khan; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:

<https://www.sdiarticle5.com/review-history/80399>