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Osteoporosis Knowledge and Beliefs Among Jordanian Men at Karak City

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ABSTRACT

Aim: *Osteoporosis is a skeletal disorder in which the bones become weak, brittle, and more likely to break. This disease is excessively prevalent among women, but it may also affect the male individuals. There is a lack of studies, which have assessed men's knowledge and beliefs in Jordan about osteoporosis. Thus, this study aims to explore the level of knowledge and health beliefs regarding osteoporosis among Jordanian men at Karak city.* ***Method:*** *A descriptive and cross-sectional study was conducted after recruiting 88 men, who attended a primary healthcare centre at Karak city. Men's knowledge of osteoporosis was assessed using two instruments; "The Facts on Osteoporosis Quiz" and the "Male Osteoporosis Knowledge Quiz". Osteoporosis health beliefs were assessed using the "Osteoporosis Health Belief Scale".* ***Results:*** *Most of the selected participants reported that they have heard about osteoporosis before. The main source of osteoporosis information was mass media (43.18%), which was followed by family members or friends (25%). The studied sample scored a mean of 9.02 out of 26 with a range of 3 to 16, reflecting 34.70% of the maximum possible score. The selected participants had a low perceived susceptibility, moderate perceived seriousness, high perceived benefits of exercise and calcium intake, low perceived barriers to calcium intake compared to moderate perceived barrier to exercise, and moderate perceived health motivation.* ***Conclusion:*** *Educational interventions are required to increase men's awareness about the seriousness of osteoporosis and its impact in later life. Healthcare providers should focus more on increased awareness level about osteoporosis..*

Keywords: Attitudes, awareness, knowledge, health beliefs, osteoporosis

INTRODUCTION

Osteoporosis is regarded as an overwhelming, devastating, costly, and fatal disease, which is characterized by compromised bone strength, predisposing to an increased risk of fracture [1]. It affects the population belonging to different ages, especially postmenopausal women. The disease is also prevalent among the male individuals; however, female individuals are more prone to be suffered from osteoporosis. A study mentioned that one in five men >50 years usually experience osteoporotic fractures as compared to one in three women from the similar age group [2].

Recently, osteoporosis has become an important public health concern among male individuals because of its poor or differential prognosis. It has been evaluated that morbidity and mortality risks after a hip fracture are significantly higher among men [3]. Furthermore, the cost per osteoporosis related fracture is greater among males as compared to females [4]. There are 2 main types of osteoporosis that include primary and secondary. Up to 40% of osteoporosis among men is primary, where loss of bone mass occurs with increasing age (senile osteoporosis) or due to an unknown cause (idiopathic osteoporosis). The most common causes of secondary osteoporosis among males are exposure to glucocorticoids, primary or secondary hypogonadism (low testosterone), diabetes, alcohol abuse, smoking, gastrointestinal (GI) disease, hyper-calcinuria, low body weight (body mass index <20 kg/m^2), and immobility [5].

Better health behaviours can be utilized for preventing this disorder; however, no therapeutic intervention has been developed yet for curing osteoporosis. Evidence has suggested that the knowledge about osteoporosis may contribute to the adoption of preventive measures for osteoporosis [6,7]. Some studies have shown that health beliefs in terms of susceptibility, seriousness, barriers, and benefits are termed as significant predictors of health behaviours [8]. The determination of knowledge and health beliefs of men regarding osteoporosis can be helpful in developing effective interventions and guiding public health programs for the prevention of osteoporosis [9].

Gaines and Marx examined thirteen studies in a review from which nine were cross-sectional studies, which examined the men's knowledge of osteoporosis. Minimal knowledge about osteoporosis prevention and risk factors has been observed in men. In addition, most knowledge assessment tools were focused on women's risk factors rather than men [10]. A systematic review conducted in 2011 identified only 8 studies that assessed the health beliefs of men about osteoporosis. Results showed less perceived susceptibility and seriousness of osteoporosis, lesser perceived benefits of calcium intake, more perceived barriers to calcium intake, and increased health motivation among men as compared to women [8]. There were two studies conducted in Jordan to assess the knowledge of men regarding osteoporosis [11,12]. Amre, et al. conducted a study on 85 nursing students of fourth year, out of which 68.2% of the students were males. The results indicated poor level of knowledge about osteoporosis among men [11]. Whereas, Elayeh recruited 395 participants; out of which 29.6% were men. The results revealed moderate level of knowledge among men about osteoporosis [12]. Both of these studies did not use specific tool for men. Furthermore, there is no study conducted in Jordan to assess health beliefs regarding osteoporosis among men.

Significance of the study

Osteoporosis is termed as a silent epidemic condition that appears to be asymptomatic until any complication, like fracture occurs. The awareness regarding the occurrence and consequences of osteoporosis is significantly low among men. Therefore, this study has assessed the knowledge and health beliefs about osteoporosis among the male population in Karak city.

Problem statement

In Jordan, there are very limited studies which have measured men's osteoporosis knowledge, and there is no such study that has assessed the health-related beliefs of men about osteoporosis. Thus, present study is specifically designed to address the knowledge and health beliefs of Jordanian men regarding osteoporosis.

METHODOLOGY

A descriptive cross-sectional study was conducted on a convenience sample of 100 men, who visited a primary healthcare centre at Karak city. The men, who understood and spoke Arabic were enrolled for the study. An oral informed consent was given by the participants. A pre-coded self-administered questionnaire was written in Arabic language. The questionnaire was filled by the data collector for the illiterate participants. Out of 100 questionnaires, 12 questionnaires were excluded because 7 of them had large amount of missing data and 5 of the respondents had never heard about osteoporosis. The final analysis was carried on sample comprised of 88 men.

The questionnaire consisted of 3 categories. The first category was about socio-demographic data that included age (years), income (JD), years of education, marital and working status, and family history of osteoporosis. Any participant who had never heard about osteoporosis was not enrolled in the study. Whereas, the participants who had heard about osteoporosis were asked to mention the source from which they heard about osteoporosis. The second category asked about knowledge of osteoporosis. The men's knowledge about osteoporosis was assessed using two instruments; "the facts on osteoporosis quiz (FOOQ)" and the "male osteoporosis knowledge quiz (MOKQ)". The FOOQ was developed by Ailinger, et al. It was initially published in 1988, and later revised in 2003 based on the National Institutes of Health (NIH) osteoporosis consensus conference in 2000. It is a 20-item questionnaire in which each item has 3 options; "true", "false" and "don't know". The quiz has a content validity index of 0.87, an internal consistency reliability of 0.76, and 6th grade reading level [13]. MOKQ was developed by Gaines, et al. to be used in combination with FOOQ. The MOKQ consisted of 6 items that mainly focused on men and osteoporosis. The Cronbach's alpha reliability was evaluated to be 0.72; whereas, the reliability of the combined FOOQ and MOKQ was 0.76 [14]. The third category of questionnaire assessed health beliefs using the "osteoporosis health belief scale (OHBS)". It was developed by Kim, et al. to measure health beliefs related to osteoporosis. It is a 42-item instrument, consisting of seven subscales addressing health beliefs. The subscales addressed susceptibility, seriousness, benefits to exercise, benefits to calcium intake, barriers to exercise, barriers to calcium intake, and health motivation. Items were rated on a five-point Likert scale ranging from strongly agree to strongly disagree. The overall reliability of the OHBS based on Cronbach's alpha co-efficient was 0.895 [15].

The permissions to use the mentioned tools were granted. Tools were translated to Arabic language, which were again translated into English language. The validity of questionnaire in Arabic language was assessed by a panel of 3 experts

in osteoporosis, one orthopaedic consultant and 2 nursing faculty members, who were specialized in adult healthcare. The panel provided suggestions to clarify some terminologies and to eliminate or modify some ambiguous questions on the basis of Jordanian culture (question 5 was replaced as it asked about alcohol that was prohibited in Jordanian culture). A pilot study was conducted with 10 men to assess the reliability, validity, and clarity of the questionnaire.

Statistical Analysis

Statistical analysis was conducted using the statistical package for social science for windows (SPSS) version 19 (SPSS, Chicago, IL, USA). Frequency and percentage values of the group variables, arithmetic means, and standard deviations were calculated.

RESULTS

A total of 88 men were included in the study. The mean age of the participants was 50.77 ± 12.77 years (range 22-73 years). The mean years of education was 10.97 ± 4.31 years (range 3-20 years). The average monthly income was 413.10 JD ± 234.52 JD. The marital status showed that 79.54% individuals were married. Similarly, 68.18% of the selected participants were working within professional settings. 94.62% of the studied men reported that they have previously heard about osteoporosis. The main source of osteoporosis information was mass media (43.18%), followed by family members or friends (25%). Only 18.18% of the participants had heard about osteoporosis from healthcare personnel and 20.45% had relatives, being diagnosed with osteoporosis (Tables 1a and 1b).

Table 1(a) Mean and SD of socio-demographics characteristics of participants (n=88)

Variables	Mean	SD	Minimum	Maximum
Age (years)	50.77	12.77	22	73
Education (years)	10.97	4.31	3	20
Monthly Income (JD)	413.1	234.52	100	1350

Table 1(b) Socio-demographics characteristics of participants

Characteristics	Frequency (n)	Percent (%)
Married	70	79.54
Working	60	68.18
Heard about osteoporosis (n=93)	88	94.62
Source of information	**Frequency (n)**	**Percent (%)**
Mass media	38	43.18
Reading/Internet	12	13.63
Health care personnel	16	18.18
Family/Friends	22	25
Has relatives diagnosed with osteoporosis	18	20.45

Osteoporosis knowledge quiz scores

The study identified below average knowledge level among the surveyed Jordanian men. The results of the knowledge quizzes are presented in Table 2. The combined FOOQ/MOKQ has 26 items. A correct response for each item was assigned a score of "1", and incorrect response or "Don't Know" response was assigned a score of "0". The possible score ranges between 0 and 26. The studied sample scored a mean of 9.02 ± 2.90 with a range of 3 to 16, reflecting 34.70% of the maximum possible score and only 13.63% from these scores achieved 50% or more. Within the FOOQ, 6 items were identified to be related to women [4,7,10,15-18]. The mean number of questions, answered correctly, for these 6 items was 2.01 ± 1.018 or 33.52%. After excluding the questions related to women, the mean total score of FOOQ became 5.32 ± 1.94 out of 14 which reflect 38.06% of the maximum score. The mean number of questions answered correctly of the MOKQ was 1.68 ± 1.11 or 28.03% correct (Table 2).

Table 2 Mean and SD of FOOQ and MOK (n=88)

Variables	Mean	SD	Minimum	Maximum	percent
FOOQ (20 questions)	7.34	2.64	1	13	36.7
FOOQ without 6 women questions	5.32	1.94	0	10	38.06
Women 6 Question	2.01	1.18	0	4	33.52
MOKQ	1.68	1.11	0	5	28.03
Combined FOOQ and MOKQ	9.02	2.9	3	16	34.7

Table 3 illustrated the sample responses on combined knowledge quizzes (FOOQ and MOKQ). A closer assessment to Table 3 represented that 14 questions [3-5,7,9-12,14-19] of the total 20 questions of FOOQ were answered correctly by less than 50% of the individuals (Table 3). Out of 14 questions, 6 were directly related to health issues of women. The lowest scoring items in FOOQ were question 16 "walking has a great effect on bone health" (11.36%), and 19 "Children 9 to 17 years of age get enough calcium from one glass of milk each day to prevent osteoporosis" (12.5%). Six questions were answered correctly by 50% or more of the studied men. Question number 6, "The most important time to build bone strength is between 9 and 17 years of age", was correctly answered by 71.59% of respondents. Whereas, question number 2 "high impact exercise (weight training) improves bone health" was correctly answered by 69.3% of the respondents. Question number 6, "The most important time to build bone strength is between 9 and 17 years of age", was correctly answered by 71.59% of respondents followed by question number 2 "high impact exercise (weight training) improves bone health" that was correctly answered by 69.3% of respondents (Table 3).

Table 3 Percentage of correct and incorrect responses on combined knowledge quizzes (FOOQ and MOKQ) (n=88)

S.No.	Question	Correct Answer	Correct %	Incorrect %	Don't know %
1	Physical activity increases the risk of osteoporosis	F	52.27	37.73	10
2	High impact exercise (weight training) improves bone health	T	69.32	18.18	12.5
3	Most people gain bone mass after 30 years of age	F	20.69	50.57	28.74
4	Low weight women have osteoporosis more than heavy women	T	19.32	55.68	25
5	Prolonged use of corticosteroids is a risk factor for osteoporosis	T	17.86	63.1	19.05
6	The most important time to build bone strength is between 9 and 17 years of age	T	71.59	14.77	13.64
7	Normally, bone loss speeds up after menopause	T	43.18	27.27	29.55
8	High caffeine combined with low calcium intake increases the risk of osteoporosis	T	51.14	23.86	25
9	There are many ways to prevent osteoporosis	T	44.19	24.42	31.4
10	Without preventative measures 20% of women older than 50 years will have a fracture due to osteoporosis in their lifetime	T	47.73	20.45	31.82
11	There are treatments for osteoporosis after it develops	T	30.68	26.14	43.18
12	A lifetime intake of low calcium and vitamin D does not increase the risk of osteoporosis	F	37.5	50	12.5
13	Smoking does not increase the risk of osteoporosis	*F	50.57	27.59	21.84
14	Walking has a great effect on bone health	F	11.36	48.86	39.77
15	After menopause, women not on estrogen need about 1,500 mg of calcium (for example, 5 glasses of milk) daily	†T	19.32	65.91	14.77
16	Osteoporosis affects men and women	T	42.05	34.09	23.86
17	Early menopause is not a risk factor for osteoporosis	F	31.82	36.36	31.82
18	Replacing hormones after menopause cannot slow down bone loss	F	17.05	51.14	31.82
19	Children 9 to 17 years of age get enough calcium from one glass of milk each day to prevent osteoporosis	F	12.5	60.23	27.27
20	Family history of osteoporosis is not a risk factor for osteoporosis	F	51.14	27.27	21.59
21	Small frame/low weight men have osteoporosis more than larger framed/heavier men	T	13.64	22.73	62.5
22	Bone loss increases in men after the age of 70 years	T	57.95	25	17.05

23	Without preventive measures 25% of men older than 50 years will have a fracture because of osteoporosis in their lifetime	T	25	15.91	59.09
24	After the age of 50 years, men need about 1,200 mg of calcium daily (4 cups of milk daily)	T	32.95	14.77	52.27
25	Low testosterone levels are not a risk factor for osteoporosis (male hormone)	F	17.05	50	32.95
26	Hormone treatment for prostate cancer decreases the risk of osteoporosis	F	21.59	7.95	70.45

The perceptions of participants regarding susceptibility to osteoporosis, seriousness of osteoporosis, benefits of exercise, benefits of calcium intake, barriers to exercise, barriers to calcium intake, and health motivation are presented in Table 4. Generally, score 5 is assigned to strongly agree, 4 to agree, 3 to undecided, 2 to disagree, and 1 to strongly disagree. But in the current study, strongly agree and agree are combined together as "agree"; whereas, strongly disagree and disagree are combined together as "disagree".

Table 4 Percentage of disagree, neutral and agree responses from the osteoporosis health belief scale (n=88)

Statement	Level of Agreement				
	‡D	§U	‖A	Mean	SD
Susceptibility					
Your chances of getting osteoporosis are high	68.1	13.6	18.3	2.08	1.14
Because of your body build, you are more likely to develop osteoporosis	52.3	29.5	18.2	2.51	1.06
It is extremely likely you will get osteoporosis	60.1	22.7	17.2	2.28	1.07
There is a good chance you will get osteoporosis	62.5	22.7	14.8	2.18	1.09
You are more likely than average to get osteoporosis	57.5	26.4	16.1	2.29	1.11
Your family history makes it more likely that you will get osteoporosis	52.2	30.7	17.1	2.35	1.08
Seriousness					
The thought of having osteoporosis scares you	19.3	17.1	63.6	3.51	1.24
If you had osteoporosis would be crippling	36.3	17.2	46.5	2.98	2.98
Your feelings about yourself would change if you got osteoporosis	23.9	12.4	63.7	3.3	1.26
It would be very costly if you got osteoporosis	20.5	18.1	61.4	3.42	1.26
When you think about osteoporosis you get depressed	15.9	22.7	61.4	3.65	1.22
It would be very serious if you got osteoporosis	20.5	19.3	60.2	3.56	1.15
Benefits of Exercise					
Regular exercise prevents problems that would from osteoporosis	26.1	22.7	51.2	3.36	1.19
You feel better when you exercise to prevent osteoporosis	19.3	19.3	61.4	3.5	1.33
Regular exercise helps build strong bones	12.5	10.2	77.3	3.82	1.11
Exercising to prevent osteoporosis also improves the way your body looks	14.9	18.4	66.7	3.7	1.14
Regular exercise cuts down the chances of broken bones	26.1	15.9	58	3.38	1.14
You feel good about yourself when you exercise to prevent osteoporosis	17.1	13.6	69.3	3.59	1.19
Benefits of Calcium Intake					
Taking enough calcium prevents problems from osteoporosis	28.4	2.3	69.3	3.33	1.47
You have lots to gain from taking in enough calcium to prevent osteoporosis	25.2	11.2	63.6	3.32	1.25
Taking in enough calcium prevents painful osteoporosis	16.1	14.7	69.2	3.55	1.04
You would not worry as much about osteoporosis if you took in enough calcium	21.6	5.7	72.7	3.7	1.08
Taking in enough calcium cuts down on your chances of broken bones	16.2	7.6	76.2	3.7	1.11
You feel good about yourself when you take in enough calcium to prevent osteoporosis	11.4	10.2	78.4	3.74	0.95
Barrier in Exercise					
You feel like you are not strong enough to exercise regularly	19.3	13.6	67.1	2.23	1.17
You have no place where you can exercise	11.4	5.7	82.9	1.78	1.06

Your spouse or family discourages you from exercising	51.2	15.9	32.9	2.75	1.29
Exercising regularly would mean starting a new habit which is hard for you to do	27.3	11.3	61.4	2.43	1.18
Exercising regularly makes you uncomfortable	37.5	6.8	55.7	2.77	1.31
Exercising regularly upsets your everyday routine	36.3	6.8	56.9	2.66	1.39
Barriers in Calcium Intake					
Calcium rich foods cost too much	77.27	7.95	14.77	1.86	1.08
Calcium rich foods do not agree with you	71.59	10.23	18.18	2.1	1.09
You do not like calcium rich foods	63.64	10.23	26.14	2.36	1.2
Eating calcium-rich foods means changing your diet which is hard to do.	67.05	10.23	22.73	2.41	1.22
In order to eat more calcium-rich foods you have to give up other foods that you like	70.14	13.95	15.91	2.09	1.15
Calcium rich foods have too much cholesterol	48.86	20.45	30.68	2.69	1.25
Health Motivation					
You eat a well-balance diet	35.2	23.9	40.9	3	1.28
You look for new information related to health	29.5	15.1	55.4	3.03	1.16
Keeping healthy is important for you	10.3	19.2	70.5	3.76	0.92
You try to discover health problems early	21.6	12.5	65.9	3.56	1.06
You have a regular health check-up even when you are not sick	38.7	21.6	39.7	2.89	1.11
You follow recommendations to keep healthy	22.7	10.7	66.6	3.26	1.15

‡D: Disagree; §U: Undecided; ||A: Agree

The means and standard deviations were calculated based on 5 point Likert scale scoring system. Similarly, mean scores for each of the seven subscales is shown in Table 5. Each subscale had a possible score range of 6 to 30. Table 5 represents that the studied men had a low perceived susceptibility with mean score 13.66 ± 3.57 that reflected 46% of maximum possible score. Moderate perceived seriousness was estimated with mean score 20.41 ± 5.83 reflecting 68% of maximum possible score. Whereas, high perceived benefits of both exercise and calcium intake with mean score of 22.31 ± 5.17 and 22.34 ± 5.53 respectively was recorded. Furthermore, perceived health motivation has been observed as 22.50 ± 3.62, indicating high perceived health motivation (Table 5).

Table 5 Mean and standard deviation for osteoporosis health belief subscale

Subscale	min	max	Mean	(SD)	%	Interpretation
Perceived Susceptibility	7	23	13.66	3.57	46	Low perceived susceptibility
Perceived Seriousness	8	30	20.41	5.83	68	Moderate perceived seriousness
Perceived Benefits of Exercise	9	30	22.31	5.17	74	High perceived benefits
Perceived Benefits of Calcium Intake	6	30	22.34	5.53	74	High perceived benefits
Perceived Barriers to Exercise	6	25	21.37	5.22	49	Moderate perceived barriers
Perceived Barriers to Calcium Intake	6	23	13.52	4.18	45	Low perceived barriers
Perceived Health Motivation	10	25	22.5	3.62	65	High perceived health motivation

DISCUSSION

This study was conducted in Jordan, in order to explore the knowledge level and to determine health beliefs regarding osteoporosis among Jordanian men, using a tool designed especially for men. The present study has revealed below average knowledge level among the surveyed Jordanian men. The studied men scored a mean of 9.02 on the 26-knowledge item or 34.70% correct. A similar observation was reported by Chinese researchers, who rated the level of knowledge about osteoporosis among elderly Chinese men as 32% to 36% using “osteoporosis knowledge test (OKT)” [16]. Average knowledge level was estimated at 2 studies conducted by Gaines, et al. who researched men’s knowledge on osteoporosis in the United States using a combination of FOOQ and MOKS. Mean scores were 13.1 and 12.6 respectively [14,17]. Other studies using different tools obtained better results. For instance, a study conducted by Doheny and couthors estimated that 72% of the surveyed men in USA scored correctly between 60%

and 70% on OKT [18]. Moreover, Magnus, et a. study at Norway and Janiszewska, et al. study at Poland represented an average level of knowledge among men about osteoporosis and its risk factors using designed questionnaire on men osteoporosis knowledge and risk factors [19,20].

It is worthy to ensure that using different tools for osteoporosis knowledge assessment made it difficult to perform comparison between studies. This phenomenon may explain the variation in the results, besides other multiple environmental, cultural, and social factors [9]. In general, the current findings reflected the lack of awareness of osteoporosis as a public health issue in Jordan. Most of the men heard about osteoporosis from mass media, family members, and friends. Sometimes, these resources provide inaccurate or incomplete information. For instance, 71.59% of respondents knew that the most important time to build bone strength is between 9 and 17 years of age; however, only 12.5% knew that one glass of milk is not enough for this age group. These findings suggested that men are not familiar with either the recommended daily calcium intake for children and adolescents or the amount of calcium contained in one glass of milk. Moreover, most of the men did not knew that walking has a minimum effect on the bone density, which is consistent with studies concluded by Gaines, et al. [14,17].

The results of this study represented low perceived susceptibility among men. Such findings were also consistent with past literature [21-24]. This might be because osteoporosis is usually described as a women's disease; therefore, most of the men will not perceive osteoporosis as a risk. Another explanation could be the silent nature of osteoporosis. It has been assumed that most individuals do not perceive themselves to be at risk of a disease until they begin to experience physical symptoms [25]. It is evident that men enrolled in the current study did not perceive osteoporosis to be a highly serious disease with severe consequences. They perceive it as a moderate serious disease, which is similar to the findings of other studies [16,18,26].

The recruited men perceived a high dietary calcium intake to be beneficial for the prevention of osteoporosis. Similar perceived calcium benefit scores were also reported by past literature [16,18,21,26]. Participants reported low perception of barriers to calcium intake. Doheny, et al. and Ford et al. found comparable perceived calcium barrier scores of 13.2 ± 3.6 and 12.07 ± 4.68, respectively [18,24]. It is apparent that 77% of participants did not perceive cost of dairy foods as a barrier to dietary calcium intake. In addition, 72% of participants did not believe that calcium-rich foods "disagreed with them". This was expected as many cultural Jordanian dishes are dairy based, such as yoghurt and butter. On the other hand, 49% of the participants believed that calcium-rich foods are high in cholesterol, which may act as a barrier to enough dietary calcium intake.

The participants were aware about the benefits of exercise. 77% agreed that regular exercise is helpful in building strong bones; although, they experienced moderate number of barriers in their life that limit exercise. 83% of the participants reported that absence of place to exercise was the major barrier. The male individuals of current study have appeared to be highly motivated about their health; 70.5% agreed that maintenance of good health is important to them. Such findings were also similar to the outcomes reported by other studies [16,18,26]. Higher health motivation is regarded as an important trigger for implementing relevant public health promotions for osteoporosis prevention in men.

CONCLUSION

This study has supported previous research, which has indicated that men generally have poor level of knowledge regarding osteoporosis. Men do not perceive themselves to be susceptible to osteoporosis, and believe that osteoporosis is a not a serious disease. The poor scores about the osteoporosis knowledge suggested that osteoporosis education severely lacks among the male population. The results of this study can play a significant role for the development of preventive programs and early diagnosis of osteoporosis. Education interventions are required to increase men's awareness regarding the seriousness of osteoporosis and its impact in later life. Healthcare providers need to focus on osteoporosis education among the male population in Karak city. Therefore, future studies must be based on targeting the healthcare professionals to deliver education about osteoporosis for the people visiting health care clinics.

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