Evaluation of Health belief, Self-Efficacy, Perceived Risk Factors, and Awareness Regarding Osteoporosis, among Female Nursing Students in Albaha University

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Abstract: **Osteoporosis has been a common health issue among Saudi women especially in the post menopause. It is a diseases that is characterized by bone fragility and decrease in bone mass Investigation of nurses knowledge and awareness, and perception of osteoporosis among Saudi students is crucial not only to expand their knowledge about patient care but to enhance self-care behavior among them. Aim: The current study is aimed to evaluate health belief, self-efficacy, perceived risk factors, and awareness regarding osteoporosis, among female nursing students in faculty of applied medical sciences, Albaha University. Methods: This study is a descriptive study. The data was collected via a web based questionnaires using a Google Form, it composed of 54 questions. Overall knowledge score was calculated by summing up scores gained by correctly answering each of the knowledge and awareness questions. As well as Osteoporosis Self-Efficacy Scale which composed of 12 questions which contains two subscales: calcium and exercise. By simple random sampling, 93 female nursing students were selected. The questionnaires link were sending to all students who were enrolled in nursing program where every student has an equal chance of getting selected to be the part sample. The collected data were processed and analyzed by statistical package of social sciences (SPSS version 22)**

Results: according to the study results, among 93 female nursing students, the age ranged between 18 and 23 years. Analysis showed that (71.0%) students of students had a poor awareness of osteoporosis, whereas (23.7%) of students had a moderate one, whereas only (5.4%) of students had a proper awareness of osteoporosis with mean score of (12.67+0.63). There is a highly significant correlation between Students' awareness and their level of education and their age while there is no significant with their perceived risk factors.

Conclusions:

Students showed limited knowledge and self-efficacy regarding osteoporosis .this finding raises a red flag about nursing education and inform decision makers about the need to mandate educational and self efficacy improvement program in the undergraduate stage . Further assessment and efforts should be undertaken for improving the curricula to increase awareness among these students

Keywords: **Health belief, Self-Efficacy, Awareness Regarding Osteoporosis, Female Nursing Students.**

1. INTRODUCTION

Osteoporosis is a global issue that is expected to affect more population in the future (Rizzoli et al., 2011). The slow progression of diseases among elders hinder the early diagnosis and treatment. (Alwahhabi, 2015). The disease is associated with significant mortality and (Verbovoy et al., 2017). In the Kingdom of Saudi Arabia, about 34% of healthy

Saudi women, and 30.7% of men, 50-79 years of age are osteoporotic. Although studies reported increase in life expectancy among Saudi population, prevalence of osteoporosis is steadily incraesing. A major cause for osteoporosis is vitamin D deficiency which is common among Saudi citizens (Alwahhabi, 2015).

Risk factors for osteoporosis include old age, female gender , low weight, genetic factors, lack physical activity, smoking and alcohol consumption, poor diet (low vitamin D and calcium intake), low protein intake and increase sodium and phosphorus level in the blood.(ishkar Mofrad et al., 2014).

Nursing students is our future workforce and patients' counselors   (Bass et al., 2011). Students are open to knowledge and thoughts that promote behavioral change and enhance self care abilities (Zakai and Zakai, 2015). Preparing qualified nurses through education is the cornerstone to fight osteoporosis.(Ozturk and Sendir, 2011). Knowledge about osteoporosis together with awareness of healthy behavior is substantial element to prevent osteoporosis(Anderson et al., 2005) (von Hurst and Wham, 2007). In assessment of awareness about the disease is a priority in order to develop a successful osteoporosis prevention program (Kasper et al., 2001). An effective osteoporosis prevention prgrame must integrate the following topics dietary knowledge, exercise, and heath lifestyle pattern(Bass et al., 2011).

 Lifestyle modification is highly emphasized to prevent osteoporosis . Managing modifiable risk factors like exercise, increasing calcium and vitamin D intake, avoiding smoking and alcohol intake are the cornerstone in preventing osteoporosis (Bohaty et al., 2008) (Siris et al., 2004) (Uusi-Rasi et al., 2002). Adoption of healthy behavior to prevent osteoporosis needs education and self-efficacy among target population(Zhang et al., 2012; Ozturk and Sendir, 2011).

Self efficacy and health beliefs has been used to educational needs of osteporosis (Evenson, & Sanders, 2015). Self-efficacy is the individual's self confidence in coping with difficulties to implement healthy behavioral activities (Bandura, 1994). Positive healthy behavior needs increase in self-efficacy (Bass et al., 2011). Health belief model and OHBS are used to assesse health behavior and health beliefs (Rosenstock et al., 1988). (Evenson, & Sanders, 2015).

Young females is expected to take part in the battle against osteporosis through education.; however it is perfered to base this education on behavioral science theories (Khani Jeihooni A, Askari A, Kashfi SM, Khiyali Z, Kashfi SH, Safari O et al (2017). Increasing awareness and self-efficacy iis prerequisite for osteoporosis prevention(Sedlak et al., 2000). Therefore, the purpose of this study was to (1) assess osteoporosis awareness among female nursing students to identify where lack of knowledge which is essential for development of osteoporosis prevention programs, (2) assess perceived risk factors among them as well as its correlates, and (3) assess their osteoporosis self-efficacy as well as their health belief regarding osteoporosis.

Significance of the Study

Living in high altitude and lack of exercise are two common factors that are associated with osteoporosis among Saudi women . limited exposure to sunlight has been considered a factor as well. Fighting osteoporosis is challenging and needs combining resources . Therefore, evaluation of health belief, self-efficacy, perceived risk factors, and awareness regarding osteoporosis, among those young adult females can help to identify those females who might having poor knowledge and osteoporosis related misconception and to provide health belief and self-efficacy education. That would help to construct a future intervention to increase awareness

Aim of the Study

The current study aimed to evaluate health belief, self-efficacy, perceived risk factors, and awareness regarding osteoporosis, among female nursing students in faculty of applied medical sciences, Albaha University/ Saudi Arabia.

2. SUBJECTS AND METHODS

Design

A descriptive research design was used to achieve the aim of the study.

Sample:Simple random sampling of, 93 female nursing students were selected.

 Exclusion Criteria students were excluded from the study if they refuse to complete tools of the study.

Tools for Data Collection: Three tools were used.

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Tool I: Structured knowledge questionnaire: This tool was developed by the researchers after reviewing related literatures. It consists of two parts:

Part A: Socio-demographic and personal data sheet: it was developed by the researchers to collect preliminary personal data about each subject.

Part B: It consists of 33 items of multiple choice questions to assess female students' awareness; each question has a group of 3 and 4 answers. One point will be awarded for each correct answer; incorrect answer took zero. The higher scores will indicate higher level of knowledge. Maximum obtainable score was 33 and Nurses' total knowledge score was graded as the following three levels like high: >22- 33, moderate: > 11-22, low: $\leq$11.

Part C: It consists of 11 items used to assess female nursing students' perceived risk factors regarding osteoporosis.

Tool II: Osteoporosis Self-Efficacy Scale(OSES):is an instrument that designed to assess self-efficacy of behaviors toward osteoporosis(Horan et al., 1998, Kim et al., 1991). The OSES is a twelve items rated by individual on a 100 mm visual analogue scale to assess the confidence in performing osteoporosis preventive behaviors. The OSES has two subscales namely: OSES-Exercise and OSES-Calcium. Participants are asked to define their confidence level by placing a mark along a line connecting "not at all confident" and "very confident." Scores are obtained by measuring the distance from the left anchor to the participants mark in millimeters. The range for each question is 0–100 millimeters. Individual scores for exercise self-efficacy are determined by adding the scores for the six items provided and dividing the total by six. The highest possible individual score would be 100. The OSES has a reliability measure of α = 90(Ford et al., 2011). The possible total score range from 0 to 1200 with each subscale range score from 0 to 600. A cut-off point (858) was used to categorize the osteoporosis self-efficacy scores into two levels: low and high OSES-A levels (Abdulameer et al., 2013).

Tool III: Osteoporosis Health Belief Scale (OHBS):

It was adopted from (Kim, Horan, Gendler, and Patel, 1991). Based on the Health Belief Model (HBM), the Osteoporosis Health Belief Scale (OHBS) investigates beliefs associated with exercise and calcium intake. This scale was scored using a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." The 42 items on the OHBS are divided into 7 subscales of 6 items each. The subscales include susceptibility, seriousness, benefits of exercise, benefits of calcium intake, barriers to exercise, barriers to calcium intake, and health motivation.

Questions assess the participants' perception of body build and family history as factors influencing their risk for osteoporosis as well as their chances of developing the disease. Questions regarding seriousness assess the perceived threat that osteoporosis presents to one's physical health, ability to complete daily tasks, and social status. How feelings towards oneself would change, seriousness of the disease, would you be crippled, financial expense, and fear of developing osteoporosis are assessed in this subscale. Benefits of exercise and calcium intake subscales assess belief in the efficacy of specific behaviors for preventing the occurrence of osteoporosis.

Exercise questions focus on the preventive ability of exercise, the effects of regular exercise on bone health, and how one feels when they exercise to prevent osteoporosis. Calcium intake questions focus on the belief that adequate calcium intake reduces the risk for osteoporosis and broken bones. Barriers to exercise and calcium intake considers negative aspects of osteoporosis preventive behaviors. Barriers to exercise are evaluated through questions on mental and physical ability to exercise regularly, availability of time and exercise facilities, and family discouragement. Barriers to calcium intake questions assess the cost, preference for, ability to change dietary habits, cholesterol content, and digestive response to calcium intake.

The final subscale of the OHBS, health motivation, evaluates the tendency to engage in healthy behaviors. Participants are asked to rate their diet, the importance of being healthy, desire for new health information, practice of obtaining regular health checkups, early diagnosis of health problems, and following recommendations. Possible scores for each subscale range from 6 to 30 points. Measures for the internal consistency of the OHBS are as follows: susceptibility α =82, ; seriousness α =71, ; benefits from exercise α =81, ; benefits from calcium intake α =80, ; barriers to exercise α82 =, ; barriers to calcium intake α =74, ; health motivation α =73)

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Ethics approval and consent to participate

The study protocol and ethical approval (including verbal informed consent) were approved by administrative board and head of nursing department faculty of applied medical sciences of Albaha University/ Saudi Arabia.

Method

Official letters were issued to the dean of the faculty and to the head of the nursing department, and then a written approval for carrying out the study was obtained after explaining the aim of the study. The data was collected via a web based questionnaires using a Google Form, it composed of 54 questions. Overall knowledge score was calculated by summing up scores gained by correctly answering each of the knowledge and awareness questions. As well as Osteoporosis Self-Efficacy Scale which composed of 12 questions which contains two subscales: calcium and exercise.

Statistical Analysis

Data was presented using SPSS program in numbers, percentages, mean and standard deviation (SD), t-test, Pearson correlation analysis were used for assessment of the inter-relationships among quantitative variables, and one-way anova. Statistical significance was considered at p-value

3. RESULTS

According to the study results, among 93 nursing students, the age ranged between 18 and 23 years, with a mean age of 26 ± 3.75. The majorities (54.8%) were in level 6 followed by level 8 (30.1%) and the rest in level 2 (15.1%). Eighty percent were single. About 55.9% had a moderate economic status. In regard to osteoporosis related knowledge, (68.8 %) were have a relative in their families in the health field. (65.6%) were having an access to obtaining news, information and cultural knowledge. (35.5 %) of the total sample mentioned that having two sources to retrieve information and knowledge. And the same percentage had more than 3 sources. The internet was the first resource for them (38.7%) followed by the social media (26.9%). More than half of the studied sample (59.1%) was believed that their city resident was high risk for osteoporosis.

Table (1) & (2): showed that about (13.0%) of female nursing students had a low osteoporosis awareness level, whereas (68.0%) of them had a moderate one, whereas only (19.0%) had a high osteoporosis awareness level with mean score of (12.5 ± 5.6). The osteoporosis knowledge mean score was low especially among level I and level VII while it was the highest among students in level V. This may be due to that they already study this topic in medical surgical course in their educational plan as it could be expected that those subjects would show a high level of knowledge about this topic. Table (2) revealed a significant knowledge mean scores

Table (3): Among the 93 female nursing students, (89.4% had reported that their diet was enough and the take dairy intake you get enough calcium, (62.4% had taken vitamins and/or supplements), (77.4% had stated that they do exercise on regular base). While as, the majority (100 %, 97.4 %) never taken corticosteroid medications and had not stomach or intestinal surgery respectively. The reports of experiencing fractures or broken bones and noticing a loss of height among studied sample showed that (87.1%, 86.1% respectively). 79.6% had a family bone fractures, especially hip fractures in their family. While only 15.1% of studied sample whose diet was not enough calcium and vitamin D as well as only (22.6%) of the studied sample had not exercise on regular base

Table (4) & (5): showed levels and responses for osteoporosis self-efficacy scale (OSES), this table reveals about 78.5% were had a high self-efficacy perception among female nursing students. In more details, as it is apparent from table 4, the mean of all statements of both subscales were high which reveal a high confidence level in performing osteoporosis preventive behaviors. The mean of total OSES were 975.99 ± 124.30, which reveals a high self-efficacy perception among those female young students accomplish the require behaviors to prevent osteoporosis.

Table (6): showed that in total, 93 young adult female nursing students the mean scores of HBM structures in terms of perceived susceptibility (12.5 ± 4.2), perceived severity (11.3 ± 4.0), perceived benefits of exercise (20.3 ± 4.3) and calcium (13.5 ± 4.2), perceived barriers for both exercise and calcium were 12.9 ± 4.6 and12.5 ± 4.0 respectively, health motivation (21.1 ± 4.1) with a health belief total score was 104.1 ± 12.3**.**

Table (7): depicts the correlation of osteoporosis awareness, self-efficacy, and health belief scale scores among female nursing students. This table indicates a positive significantly high correlation existed between awareness and self-efficacy and only a significant correlation with health belief (r=0.82, r=0.77 respectively). In addition, self-efficacy had a positive highly significant correlation with health belief (r=0.70).

Table 1: Osteoporosis Awareness among Female Nursing Students (N=93):

CHARACTERISTICS	Osteoporosis Awareness					
	Yes		No		I don't know	
	N	%	N	%	N	%
1. Have you ever heard the name of osteoporosis?	70	75.3	11	11.8	12	12.9
2. Did anyone close to you have been diagnosed with osteoporosis?	30	32.3	49	52.7	14	15.1
3. Osteoporosis is a common disease in KSA	19	20.4	48	51.6	26	28.0
4. Increased bone mass during adolescence is the main factor in primary prevention of osteoporosis	35	37.6	30	32.3	28	30.1
5. The main clinical manifestation of osteoporosis is vertebrae and hip fractures	48	51.6	17	18.3	28	30.1
6. Osteoporosis may lead to death	19	20.4	48	51.6	26	28.0
7. The elderly get osteoporosis more than young people	51	54.8	29	31.2	13	14.0
8. Osteoporosis is more common in men	22	23.7	52	55.9	19	20.4
9. Osteoporosis is more common in some races	25	26.9	28	30.1	40	43.0
10. Smoking may lead to osteoporosis	22	23.7	43	46.2	28	30.1
11. Exposure to the sunlight may lead to osteoporosis	38	40.9	34	36.6	21	22.6
12. Drinking tea and coffee cannot prevent osteoporosis	23	24.7	35	37.6	35	37.6
13. Osteoporosis may be hereditary	35	37.6	23	24.7	35	37.6
14. Diary consumption will prevent osteoporosis	29	31.2	26	28.0	38	40.9
15. Lack of sufficient physical activity leads to osteoporosis	28	30.1	31	33.3	34	36.6
16. People with osteoporosis should not participate in vigorous physical activities	39	41.9	36	38.7	18	19.4
17. Menopause increases the risk of osteoporosis	36	38.7	29	31.2	28	30.1
18. Some medicines may lead to osteoporosis	36	38.7	25	26.9	32	34.4
19. Vitamin D intake is recommended to prevent osteoporosis	49	52.7	19	20.4	25	26.9
20. Vitamin K is essential for osteoporosis prevention	31	33.3	34	36.6	28	30.1
21. Taking female hormones after menopause would prevent osteoporosis	35	37.6	31	33.3	27	29.0
22. In women, bone density test should be done until age of 65 years	30	32.3	40	43.0	23	24.7
23. Hyperthyroidism may increase the risk of osteoporosis	33	35.5	29	31.2	31	33.3
24. Osteoporosis usually causes symptoms (e.g., pain) before fractures occur.	34	36.6	31	33.3	28	30.1
25. A fall is just as important as low bone strength in causing fractures.	40	43.0	30	32.3	23	24.7
26. Any type of physical activity is beneficial for osteoporosis.	21	22.6	43	46.2	29	31.2
27. Family history of osteoporosis strongly predisposes a person to osteoporosis.	37	39.8	28	30.1	28	30.1
28. An adequate calcium intake can be achieved from two glasses of milk a day.	34	36.6	27	29.0	32	34.4
29. Sardines and broccoli are good sources of calcium for people who cannot take dairy products.	25	26.9	41	44.1	27	29.0
30. There are no effective treatments for osteoporosis available.	20	21.5	35	37.6	38	40.9
31. 1Alcoholism is a predisposing factor to osteoporosis.	44	47.3	22	23.7	27	29.0
32. Osteoporosis is considered a silent disease.	34	36.6	31	33.3	28	30.1
33. High dairy intake can prevent osteoporosis.	27	29.0	26	28.0	40	43.0

Table 2: Knowledge Levels and Scores among Female Nursing Students in Frequency & Distribution regarding Osteoporosis Awareness (N=93):

Nursing Student Knowledge	INTERPERTATION OF SCORING	%	x-P-T value
Knowledge levels	Low	13.0	11.2*
	Moderate	68.0	
	High	19.0	
	Mean ±SD =12.5 ± 5.6		2.29*

NS: none significant   *= significant at 0.05

Table 3: Osteoporosis Perceived Risk Factors among Female Nursing Students:

Osteoporosis Perceived Risk Factors (N=93)	Yes		No	
	N	%	N	%
1. Have you experienced any fractures or broken bones?	12	12.9	81	87.1
2. Have you noticed a loss of height?	13	13.9	80	86.1
3. How is your diet, especially dairy intake? Do you think you get enough calcium? Vitamin D?	79	84.9	14	15.1
4. Do you take any vitamins or supplements?	58	62.4	32	37.6
5. How is your balance? Have you experienced any falls?	16	17.2	77	82.8
6. Do you have a family history of osteoporosis?	41	44.1	52	55.9
7. Has anyone in your family had bone fractures, especially hip fractures in your parents?	19	20.4	74	79.6
8. Have you ever had stomach or intestinal surgery?	2	2.1	91	97.4
9. Have you taken corticosteroid medications (prednisone, cortisone) as pills, injections or creams?	0	0.0	93	100
10. Do you exercise on regular base	72	77.4	21	22.6

Table 4: Responses for Osteoporosis Self-Efficacy Scale (OSES) among Female Nursing Students (N=93):

Statement	Confidence level	
	Mean	SD
Exercise subscale:		
1- Begin a new or different exercise program	78.34	14.69
2- Change your exercise habits	82.31	13.37
3- Put forth the effort required to exercise	80.63	10.69
4- Do exercises even if they are difficult	79.08	11.71
5- Exercise for the appropriate length of time	76.95	10.41
6- Do the type of exercises that you are supposed to do	80.51	12.11
OSES Exercise Subscale	477.82	23.66
Calcium subscale:		
1- Increase your calcium intake	81.90	10.94
2- Change your diet to include more calcium rich food	81.43	11.80
3- Eat calcium rich foods as often as you are supposed to do	85.13	13.45
4- Select appropriate foods to increase your calcium intake	85.43	10.73

5- Stick to a diet which gives an adequate amount of calcium	83.23	12.78
6- Obtain foods that give an adequate amount of calcium even when they are not readily available	81.05	13.03
OSES Calcium Subscale	498.17	25.6
Total OSES	975.99	124.30

Table 5: Self-efficacy Levels among Female Nursing Students (N=93):

Self-efficacy	F	%
Low	20	21.5
High	73	78.5

Table 6: Osteoporosis Health Belief Scale Scores among Female Nursing Students

Subscale (6–30 possible points)	Mean ± SD	t-p value
Susceptibility	12.5±4.2	4.66*
Seriousness	11.3±4.0	3.11*
Benefits of exercise	20.3±4.3	6.08*
Benefits of calcium	13.5±4.2	4.10*
Barriers of exercise	12.9±4.6	9.60*
Barriers of calcium	12.5±4.0	4.68*
Health motivation	21.1±4.1	2.19*
Health belief total score (42–210 possible points)	104.1±12.3	5.08*

Table 7: Correlation Matrix of Osteoporosis Awareness, Self-Efficacy, and Health Belief Scale Scores among Female Nursing Students (N=93):

Items	Awareness	Self-Efficacy	Health Belief
Awareness	1.00		
Self-Efficacy	0.82**	1.00	
Health Belief	0.77*	0.70**	1.00

4. DISCUSSION

In KSA, Osteoporosis is considered a major health problem. It was expected to affect more people worldwide than ever by 2050 (International Osteoporosis Foundation, 2010). Its incidence ranges from 50-60% among Saudi females where 58% of the Saudi women is expected to have low bone mineral density (18% had osteoporosis and 40% had osteopenia) (Oommen & AlZahrani, 2014). The current study examined osteoporosis knowledge, perceived risk factors, self-efficacy and heath belief among female nursing students. Students at level IV were found to have greater knowledge of osteoporosis and of the influence that exercise and calcium have on this disease. In the present study, the knowledge level of most participants was found to be moderate, with health beliefs at a desirable level. This came in accordance with the findings of Xie et al. and Tan et al.,(2009); Xie, Zhao, Wu, & Su (1997) Tavakoli et., (2016). However, in the study conducted by Nazni et al. on athletes, who pay more attention to their nutrition, the level of knowledge was found to be high Nazni and Vimala (2010).

In regard to their perceptions of susceptibility to and seriousness of osteoporosis , the students agreed that they take a balanced diet especially dairy intake, they get enough calcium and Vitamin D (84.9%) and 44.1% of them have a family history of and considered it as an influential risky factors . The female nursing students reported significantly greater self-efficacy for exercise as well as calcium intake in the prevention of osteoporosis regardless their educational level. More over our findings were consistent with those of Oommen & AlZahrani (2014) who revealed that very few Saudi women do regular exercise, also The researchers affirmed lack of exercise, decrease vitamin D intake as major factors

5. CONCLUSION

This study showed a moderate awareness regarding osteoporosis. Therefore, this awareness of nursing students in this study could be upgraded by the initiation of an effective and creative educational program, increasing the risk reducing behaviors and good coping strategies. These results were very frustrating since these nursing students are considered as the educated and productive counselors for the future. It was expected that they have a higher awareness regarding osteoporosis.

6. RECOMMENDATION

This study recommends educational modules to improve students' knowledge and self efficacy. Moreover further assessment and efforts should be undertaken for improving the curricula to impart awareness among these students as well as mass media communication for increasing public awareness especially in young age girls . Furthermore, increasing osteoporosis self-efficacy among young age girls in all dimensions (exercise and calcium intake) is warranted as changing lifestyle and healthy behaviors will have a greater impact on the prevalence of osteoporosis

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