Assess Knowledge and Beliefs of Female Nursing Students toward Prevention of Osteoporosis

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Abstract: Background: Osteoporosis is a growing health problem in developing countries, especially in the Middle East. **The purpose** of this study is to assess knowledge and beliefs of female nursing student towards prevention of osteoporosis. **Design:** Descriptive research design was utilized. **Setting:** The study was conducted at the Faculty of Nursing, Benha University. **Sampling:** systematic random sample was done to select 292 female nursing students. **Two instruments were used :** A self-administered structured questionnaire was need to collect data about (1) social characteristic (2) students' knowledge about osteoporosis so Osteoporosis Health Beliefs Scale was used. **Results:** the mean age of students was 20.83 ± 1.48 years, and 87.3% of female students had poor knowledge about osteoporosis. Regarding health beliefs, 49.8% of them had low susceptibility and 79.4% had high perception regarding benefits of calcium intake for osteoporosis. **Conclusion:** the study concluded that, there was a highly statistical significant positive correlation between total knowledge score and total osteoporosis health beliefs score. **Recommendations:** A nursing intervention, health education program based on health belief model was recommended to improve knowledge and beliefs regarding prevention of osteoporosis among nursing student

Key words: Knowledge, Health Beliefs, Osteoporosis.

Introduction

Osteoporosis is one of the most common bone metabolic disorder which have been associated with significant disability and mortality (**Darba et al., 2015**). Osteoporosis is a silent skeletal disease characterized by porous bones. It is a progressive chronic skeletal disease associated with low bone mass and micro-architectural impairment of bone tissue, leading to bone fragility and increased risk of fractures (**Haq et al., 2015**).

Osteoporosis poses an economic burden globally, with an estimated nine million osteoporotic fractures worldwide. Pain as a consequence of fracture can persist for a long time, and consequently, there is an associated loss of mobility. Feeling of weakness, anxiety and fear of future fractures are all potential negative psychological outcomes resulting from osteoporotic fractures or even low bone density (**Moghimi et al., 2016**).

Osteoporosis can be classified as primary and secondary osteoporosis. Primary osteoporosis is characterized by reduction of bone mass due to the aging process. Secondary osteoporosis is caused by exogenous drugs or systemic disease affecting bone metabolism (**Andeerson, 2014**).

Osteoporosis leads to serious disability even death and cause economic disadvantages. Some risk factors are no modifiable such as gender, advancing age, heredity, race, and

family history. Modifiable risk factors such as low calcium and vitamin D intake, drinking carbonated drinks, low body mass index, sedentary work and prolonged immobilization. In addition, knowledge and health beliefs offer an opportunity for women to engage in behaviors that delay the onset or progression of osteoporosis (**Al-Muraikhi et al., 2016**).

Prevention is the most effective way to promote bone health. It is important to build and maintain strong and healthy bones throughout life. Emphasizing osteoporosis prevention comprises health education and health promotion through the aim of improving bone mass growth to prevent loss of bone later in life. The guidelines recommended preventive measures including adequate calcium and vitamin D intake through food or supplements, lifestyle changes such as exercising, weight reduction, tobacco cessation and moderate alcohol intake (**Ntiamoah, 2016**).

Nurses can design, implement and evaluate osteoporosis prevention to decrease prevalence of debilitating disease. Consequently, using osteoporosis health belief scale as a method for osteoporosis prevention through two measures, first is based on increasing knowledge about osteoporosis and second is related to preventive behavior measures that reinforce attitude and behavioral change for females (**Aparicio and Ginebra, 2015**).

The role of nurses in caring for females with osteoporosis or at risk for osteoporosis include improving females' knowledge about osteoporosis and motivating behavior change. Certain nursing actions include discussing strategies to confirm bone health in adolescents as well as young adults and older women and assessing females risk for osteoporosis and providing education

to females and their families about pharmacologic and non-pharmacologic treatment strategies (**Mirza and Canalis, 2015**).

Significance of the problem:

Prevalence of osteoporosis varies among countries. The levels of osteoporosis and osteopenia in the Islamic Republic of Iran were 22.2% - 59.9%, respectively, in Pakistan was 55%, in Turkey was 27%–33.3%, Morocco was 31%, Egypt was 28.4%, Bahrain was 27.1%, Saudi Arabia was 23% 24% and also United Arab Emirates was 2.5% (**Malakeh and Malak, 2015**). Osteoporosis is considered a major health problem in Egypt as 6.5% of females aged 20 years and above suffers from osteopenia and 12.6% of women in the same age group suffer from osteoporosis. Egyptian women have generally lower bone mineral density compared to women in western countries (**Mohamed and tayel, 2012**). Also beliefs may conflict preventing and managing of osteoporosis. Therefore, this study was conducted to assess knowledge and beliefs of female nursing students toward prevention of osteoporosis.

Methods

Purpose of the study: The purpose of the study was to assess knowledge and beliefs of female nursing student towards prevention of osteoporosis.

Research Questions:-

• What is the level of females students' knowledge about osteoporosis?

• What are the beliefs of female students about osteoporosis?

• Is there a relationship between knowledge and beliefs of female students regarding osteoporosis?

Research design

Descriptive research design was utilized to fulfill the purpose of this study.

Setting:-

This study was conducted at the Faculty of Nursing, Benha University.

Sampling:

Systematic random sample.

Sampling size:-

A total number of 292 female students were included in the current study. The sample was selected from female nursing students in the four academic years 67 female students were selected from the first year, 77 female students from the second year, 64 female students from the third year and 84 female students from the fourth year for the academic year 2017-2018. The sample size was calculated according to the following formula (Yamane, 1967).

$$n = \frac{N}{1 + N(e)^2}$$

Where n = sample size

'N' total number of all female students in Benha faculty of nursing 2017/2018 was 1080.

Error = 0.05

Instruments

Two instruments were used for data collection:

Instrument one:
A self-administered structured questionnaire:

It was designed by the researcher after reviewing related literature. It was written in an Arabic language in the form of close and open-ended questions. It contained four parts:

▪ **First Part:** social characteristics. It contained age, academic year, marital status, father education, mother education, and residence.

▪ **Second Part:** physical characteristics, anthropometric measurements it included weight, height and Body mass index.

BMI	
< 18	Under weight
18.5 - < 25	Normal
25.0 <30	Over weight

Classification of obesity

Class I	30 < 35
Class II	35 < 40
Class III	≥ 40

▪ **Third part:** History subpart one: Menstrual history such as age of menarche, menstrual duration and regularity.
Subpart two : Family history such as history of osteoporosis and fragile fractures.

▪ **Fourth part:** Students' knowledge regarding osteoporosis.

▪ It consisted of four subparts:

❖ **Subparts one:** general knowledge regarding osteoporosis and its prevention.

❖ **Subpart two** : knowledge about healthy nutritional habits for protecting bone

❖ **Subparts three** : knowledge about practicing physical exercise

❖ **Subparts four** : knowledge about importance of sunlight.

Scoring system:

Scoring system for each item:

Complete	2
Incomplete	1
Don't know	0

Total scoring system:

Poor	< 50
Average	$50 - < 75$
Good	$\geq 75 - 100$

Instrument two:

Osteoporosis Health Beliefs likert Scale (OHBS) Scoring system**:**

The OHBS was adopted from ***Kim et al., (2013)*** and was translated into Arabic language by the researcher to assess beliefs linked to calcium intake and physical activities practice. It contains a 42-item, including seven subscales for health belief.

It consisted of (7) subparts:

▪ **Subpart one** : perceived susceptibility of osteoporosis. It contained chances of getting osteoporosis are high, more likely to develop osteoporosis, etc.

▪ **Subpart two** : perceived seriousness of osteoporosis. It contained thought of having osteoporosis scares, osteoporosis would be crippling, etc.

▪ **Subpart three** : perceived benefits of exercise. It contained exercise prevents problems from

osteoporosis, feel better when exercise, etc.

▪ **Subpart four** : perceived benefits of calcium intake. It contained calcium prevents problems from osteoporosis, Lots to gain from taking calcium, etc.

▪ **Subpart five** : perceived barriers to exercise. It contained not strong enough to exercise, no place where you can exercise, etc.

▪ **Subpart six** : perceived barriers to calcium intake. It contained calcium rich foods cost too much, calcium rich foods do not agree, etc.

▪ **Subpart seven** : perceived health motivation. It contained eat a well-balance diet, look for new health information, etc.

Scoring system:

The OHBS uses a 3-point Likert scale to rate the items from disagree "1" to agree"3". The probable range of scores for each subscale is 6 to 18 with a possible total score ranges from 42 to 126. For the five subscales, higher scores indicating extremely healthy beliefs. But for the two subscales concerning barriers, higher scores indicate more negative health beliefs.

Content Validity and Reliability of the tools:

The tools were reviewed for comprehensiveness, appropriateness, and legibility by an expert panel consisting of three experts in obstetrics and women health nursing. The panel ascertained the face and content validity of the tools. The reliability was done by Cronbach's Alpha coefficient test which revealed that each of the two tools consisted of

relatively homogenous items as indicated by the moderate to high reliability of each tool. The internal consistency of knowledge was 0.85. The total 42-items HBM was 0.92, with breakdowns by category: perceived susceptibility to osteoporosis was 0.82, perceived seriousness of osteoporosis was 0.81, perceived benefits to exercise was 0.75, perceived benefits to calcium intake was 0.73, perceived barriers of barriers to exercise was 0.84, perceived barriers to calcium intake was 0.78, and health motivation was 0.79.

Ethical consideration:
❖ Each student was informed about the purpose and benefits of the study at the beginning of interview and time throughout the study.
❖ An oral consent was obtained from each female student before starting the data collection.
❖ Each female student was informed that, participation is voluntary and each female student had a choice to continue or withdraw from the study.

Pilot study

The pilot study was carried out on 10% of the total sample (29 female students) to test the clarity and applicability of the study instruments as well as the estimation of the time needed to fill the questionnaire. No modifications were done.

Procedure

1) An official letter was sent from the Dean of Benha faculty of nursing containing the title, methods and the study technique, to obtain the official agreement to conduct the study to the chair persons of the different departments in the Faculty of Nursing, Benha University.
The study started of October, 2017 to the end December, 2017.
2) The researcher visited the presentational settings from 9 am to 2 pm, three days per week (Sunday, Tuesday and Thursday).
3) At the beginning of the researcher greeted the females data collection, introduced herself to each female included in the study, explained the purpose of the study and provided the female with all information about the study and taken oral consent. Each student was asked to complete a self-administered questionnaire and osteoporosis health belief scale. The average time needed for the sheet was around 20-25minutes, the average number interviewed 10-12 students/day.
4) The researcher stayed with the students at the time of filling the questioner.
5) Anthropometric measurements were collected and recorded by the researcher (weight was determined in kilograms and height was measured in centimeters.

IV. Statistical Analysis:-

Data was verified prior to computerized entry. The statistical package for social sciences (SPSS version 20) was used for that purpose, followed by a data tabulation and analysis. Descriptive statistics were applied (e.g., mean, standard deviation, frequency, and percentages).

Test of significance (Chi-square, Fisher exact test, Independent test and Anova test), Pearson correlation coefficients were used. A statistical significant different was considered if $P \leq 0.05$. A highly statistical significant different was considered if $P < 0.001$

Results

Table (1): Distribution of the studied sample according to their sociodemographic characteristics (n=292)

Socio demographic characteristics	No	%
Age (years)		
18-19	62	21.2
20-21	126	43.2
22-23	104	35.6
Mean ± SD	20.83 ± 1.48	
Academic year		
First	67	22.9
Second	77	26.4
Third	63	21.6
Fourth	85	29.1
Marital status		
Single	234	80.1
Married	58	19.9
Residence		
Rural	185	63.4
Urban	107	36.6
Family' monthly income		
Enough	65	22.3
Not enough	227	77.7

Table (1) shows that 43.2% of the studied sample were between 20-21 years old with the mean age 20.83 ± 1.48 years. Regarding academic year, 29.1% of the studied sample were in the fourth year, 80.1% of the studied samples were single and 63.4% were living rural area. As for family monthly income, more than three quarters of them (77.7%) were not enough.
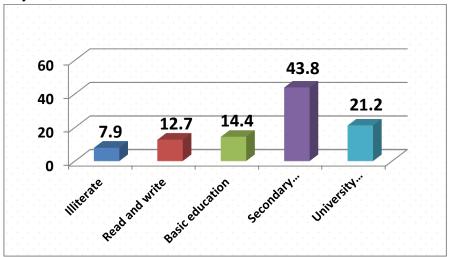
Figure (1): Distribution of the studied sample according to their mother' education (n=292)

Figure (1) reveals that less than half (43.8%) of the studied sample's mother education had secondary education.
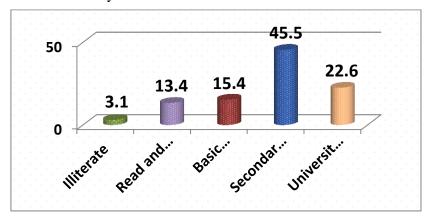
Meanwhile, 7.9% of them were illiterate.

Figure (2): Distribution of the studied sample according to their father' education (n=292)

Figure 2 shows that, fathers of less than half 45.5% of the studied sample had secondary education, 3.1% of

father were illiterate and 22.6% had university education.

Table (2): Mean anthropometric measurements of the studied sample (n=292)

Anthropometric measurements items	Minimum	Maximum	Mean ± SD
Weight (kg)	50.00	83.00	67.17 ± 7.71
Height (cm)	154.00	172.00	164.34 ± 3.85
Body mass index (kg/m^2)	20.70	32.42	24.90 ± 3.04

Table 2 shows the anthropometric measurements of the studied sample. It shows that, means of weight and height were 67.17±7.71kg, 164.34 ±

3.85 cm respectively, and the mean of body mass index was 24.90 ± 3.04 kg/m^2.

Figure (3): **Distribution of the studied sample according to their body mass index (n=292)**

Figure 3 illustrates that more than half (51.4%) of sample studied were overweight. Only 1.4% of them were obese class I.

Table (3): Distribution of the studied sample according menstrual history (n=292)

Menstrual history	No	%
Age at menarche (years)		
12-13	203	69.5
14-15	58	19.9
16-17	31	10.6
Mean ± SD	12.93 ± 1.47	
Duration of menstrual flow (days)		
≥ 2	10	3.4
3-5	219	75.0
≥ 6	63	21.6
Mean ± SD	4.36 ± 0.93	
Regularity of menstruation		
Regular	240	82.2
Irregular	52	17.8
In case of irregularity taken any drugs (n=52)		
No	52	100.0

Table 3 shows that mean age of menarche was 12.93 ± 1.47 years, the mean duration of menstrual flow was 4.36 ± 0.93 days. Regarding regularity of menstruation, less than one quarter (17.8%) of them had irregular menstruation. All of them not take any drugs during their irregular menstruation.
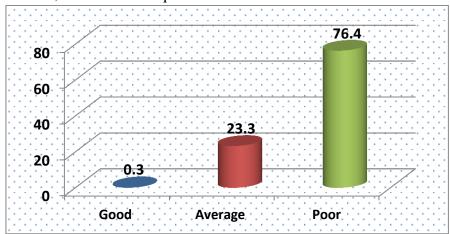

Figure (4): Distribution of the studied sample according to level of total knowledge score regarding osteoporosis (n=292)

Figure (4) shows that 76.4% of the studied sample had poor knowledge regarding osteoporosis and only 0.3% of the studied sample had good knowledge regarding osteoporosis.
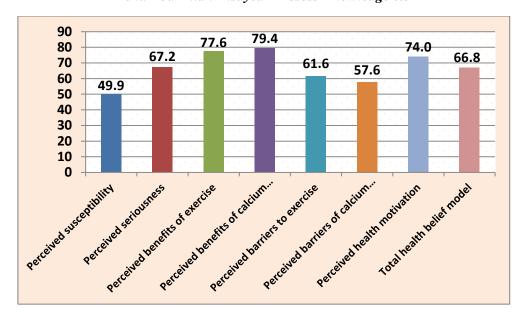
Figure 5: Distribution of the studied sample according to osteoporosis health beliefs subscales (n=292)

Figure (5): shows that **Distribution of the studied sample according to osteoporosis health beliefs**. The total health belief model score was found to be 66.8%. The highest subscale score was perceived benefits of calcium intake (79.4%) and perceived benefits of exercise (77.6%). The lowest subscale score was for the perceived susceptibility (49.9%) and perceived barriers of calcium intake (57.6%).

Variables	Total knowledge score	
	r	p
Total osteoporosis health beliefs score	0.653	0.000**

** A very highly statistical significant difference (P ≤ 0.001)

Table 4 displays that there was a very highly positive statistical significant correlation between total knowledge score and total osteoporosis health beliefs score.

Discussion

Osteoporosis has recently been recognized as a major public health problem by some governments and health care providers. Nurses have a major responsibility to initiate as well as impart primary and secondary osteoporosis prevention education to patients and the public.

Regarding knowledge score of the studied sample about osteoporosis the present study revealed that; more than one half of the female' students had poor knowledge regarding osteoporosis, more than half of the female' students had poor knowledge regarding healthy nutritional habits for protecting bone, and more than two third of the female' students had poor knowledge regarding practicing physical exercise. Low level of knowledge about osteoporosis was

due to the studied women did not know that osteoporosis is a dangerous disease and believed that this disease is not as dangerous as heart diseases and cancers because of it is silent nature disease. This result agrees with **Hossein, (2014),** who studied osteoporosis knowledge, practice and prevention among female adolescent in El-Minia-Egypt. This study found that 63.4% of participants had poor knowledge about osteoporosis but 94.6% of them were aware of the benefits of exercise in osteoporosis prevention.

In relation to perceived seriousness of osteoporosis, the findings of the present study revealed that slightly more than one half of studied female' students disagreed osteoporosis could be crippling and slightly more than one third of the female' students disagree that feelings about oneself would change. On other hand, less than half of female' students had agree that osteoporosis was scare you, and may can depressed. On other hand, one half of the female' students agreed that it was very costly if they got osteoporosis. These findings are incongruent with **Sanaeinasab et al (2013),** who studied the effectiveness of education using the health belief model in preventing osteoporosis among female student's.

Regarding perceived barrier exercise for osteoporosis, the present study showed that less than two thirds of the female students disagreed that to start new habits to prevent osteoporosis. They felt that physical exercise make them uncomfortable and upset the daily routine. Less than one half thought the family discourages doing exercising. On other hand, slightly less than two third of the female' students agreed that there were no suitable place for exercise. This study disagree with **Malakeh and Malak (2015**), who studied the effect of osteoporosis health education program based on health beliefs towards osteoporosis among Jordanian female

teachers. This result found that more than two quarters of sample agreed no place where can exercise, one third of the teachers agreeing perceived exercise barriers regarding this subscale.

As regarding Correlation coefficient between total knowledge and total osteoporosis health beliefs score of the studied sample, the finding of present study displayed that there was a positive statistically significant correlation between total knowledge score and total osteoporosis health beliefs score. This result agrees with **Elsabagh et al, (2015),** who studied osteoporosis knowledge and Health Beliefs among employees of Tanta University, This result found there was a significant positive correlation between knowledge and health beliefs model.

Conclusion

On the light of the current study finding, it was concluded that; the knowledge of osteoporosis among females nursing students could be considered poor toward osteoporosis prevention. Furthermore, the highest subscale score was the perceived benefits of calcium intake and for the perceived benefits of exercise. The lowest mean subscale score was the perceived susceptibility and the perceived barriers of calcium intake.

Recommendations

Based on the findings of the current study, the following recommendations can be suggested:-

❖ Designing and implementing nursing intervention based on health belief model for improving knowledge and beliefs regarding prevention of osteoporosis among nursing student.

❖ Messages directed to women to should emphasize on the importance of high dietary calcium intake, and

vitamin D, weight-bearing exercise, decreased use of caffeine in prevention of osteoporosis.

❖ Further studies need to be performed to :

❖ Assess knowledge and health beliefs regarding prevention measure of osteoporosis among other age groups and male students.

❖ Assess health behaviors of the nursing student regarding prevention of osteoporosis.

❖ Training of health care professionals is also important with stresses on the importance of physical exercises, adequate intake of diet rich in calcium and vitamin D and how to suspect the disease.

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