Osteoporosis Risk Factors among Working Women

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Abstract Osteoporosis is a significant public health problem with serious consequences. The aim of this study was to assess the risk factors of osteoporosis among working women, and develop health educational guidelines to prevent/reduce osteoporosis at Benha City. Research design: A descriptive correlation research design was utilized to conduct the study. Setting: The study was conducted at two Toshiba Elaraby Factories, they named; Benha Toshiba Elaraby' factory at Qaluobia Governorate, and Quesna Toshiba Elaraby' factory at Elminofyia Governorate. The sample included 10% from 3650 working women (365) working women they were selected as randomly from the above mentioned setting. Tools: One tool was developed by the researchers: Osteoporosis structured interviewing questionnaire: It consisted of six parts: Part I: Concerned with socio-demographic characteristics of the working women. Part II: Concerned with the obstetric history Part III: history of osteoporosis. Part IV: Medical and family history Part V: assess the Women's' knowledge about osteoporosis disease Part VI: risk factors of osteoporosis and life style: Results of this study showed; the highest percentages of women were found within age groups from 40-49 years (36.4%). Postgraduate's education represented the highest percentage (34.8%), only 7.7 were continuous movement. and 75.3% are from rural area. 63.3% of working women had good total knowledge score. 77.8% of the study subjects are suffering from osteoporosis. 63.3% had family history of osteoporosis. This study concluded that the common risk factors identified were; family history, lack of exercises, irregular exposure to sunlight, and insufficient taken protein and vitamin D. Also; osteoporosis health guideline were needed for prevention/ reduction of osteoporosis. The study recommended community based health programs on osteoporosis that targeted a wide audience should be implemented. 3- further studies are needed to evaluate the effect of osteoporosis health guideline in the prevention of osteoporosis.

Keywords: osteoporosis, risk factors, health educational guideline

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1. Introduction

Osteoporosis is a disease in which the density and quality of bones reduce. It is a silent thief, producing no symptoms until a fragility fracture occurs. Quality of life of the individual can negatively affected by osteoporosis as all living activities of the individual was deteriorated related to pain and increased dependency on other may cause social isolation, self-esteem decrease, body image changes and depression. Moreover, Osteoporosis is a serious metabolic bone disease to negative effect on economic that causes loss of labour, loss of work and use of expensive medicine for a very long time and hospital long stay [1].

Osteoporosis is a silent "epidemic" that has become a major health hazard in recent years, afflicting over 2000 million people worldwide [2]. As projected by [3] the prevalence osteoporosis has reached to endemic proportion where approximately 75 million people in Europ and America are suffering from osteoporosis and worldwide 9 million fractures are solely due to osteoporosis every year. [4] estimated that approximately 30% of all postmenopausal

women have osteoporosis in the US and Europe. Women are 8 times more at risk of osteoporosis than men so that; abut 200 million women worldwide suffer from the disease.

Osteoporosis includes several controllable and uncontrollable risk factors. The uncontrollable factors are gender, family history, ethnicity and race, advancing age, postmenopausal status and body frame size. Environmental risk factors (controllable) include low activity level, sedentary lifestyles over many years, smoking, alcohol abuse, and inadequate diet including eating disorders, low calcium intake, low vitamin D intake. Excessive consumption of soft drinks and caffeinated drinks cause calcium loss via the kidney. Caffeine use of more than three cups of coffee every day might increase calcium excretion in the urine and it affects bone health [5].

Bone mass and bone density increase the most during childhood and adolescence in both sexes, and usually peak bone mass is maximized by the age of 30. For most women, bone mass remains stable until menopause, when the loss of estrogen in conjunction with aging is associated with a decline in bone mineral density. Studies indicate that young adults can increase their peak bone mineral density, promote long term bone health, and reduce the

risk of disease later in life by following a well-balanced diet including calcium-rich food, physical activity and health lifestyle practices [6,7].

Insufficient awareness of osteoporosis and related education are among the most important reasons for osteoporosis. A number of studies have investigated the role of knowledge in preventing the development of osteoporosis and reported that women have serious deficits in knowledge, and educational interventions are useful in increasing knowledge. Health education can decrease the overall costs of health care by preventing expensive complications of chronic illnesses. Implementation of education program is one strategy that can produce changes in osteoporosis preventive behaviors [8].

Working women are more likely to have osteoporosis because they stay along time at working place, in addition to permanently and continuously strive to take care of family, causing pressure psychologically and neurologically turns into membership worsen with passage of time as well as lack of exposure to sunlight and unhealthy food intake integrated disease [9].

Community health nurse (CHN) play an important role regarding decrease the risk of osteoporosis among working women through educating them about avoiding risk factors and maintaining healthy life style, following good nutrition, doing exercise and preventing falls among these behaviors, also increase awareness of women regarding osteoporosis symptoms that help early diagnosis of the disease, encourage help-seeking behaviors and decrease complications [10].

1.1. Significance of the Study

Osteoporosis is a disease in which the density and quality of bones reduce. It is a silent thief, producing no symptoms until a fragility fracture occurs. 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 [11].

[4] estimates that osteoporosis affects about 200 million women worldwide. This study is important because the majority of women don't realize that osteoporosis can lead to a significant loss of height, a painful stooped posture and broken hips. Women wrongly think that brittle bones and fragile body are an inevitable part of growing older. Prevention of osteoporosis is extremely important since the disease may leave a woman unable to care for herself. Everyday activities like lifting groceries or walking down stairs become difficult tasks. Women with osteoporosis may lose the independence, they have enjoyed for years because of painful fractures or disability resulting from a broken hip so community health nurse plays important role in prevention of osteoporosis.

1.2. Aim

This study aimed to 1-assess the risk factors of osteoporosis among working women, and 2-develop health guidelines to prevent/ reduce osteoporosis.

1.3. Research Questions

To fulfill the aim of this study the following research questions formulated: 1-What are the risk factors of osteoporosis among studied sample. 2-What is the knowledge of studied sample regarding osteoporosis? 3-What is the relationship between risk factors and osteoporosis among studied sample?

2. Subjects and Methods

2.1. Research Design

A descriptive correlation research design was utilized to conduct the study.

2.2. Setting

The study was conducted at two Toshiba Elaraby Factories, they named; Benha Toshiba Elaraby' factory at Qaluobia Governorate, and Quesna Toshiba Elaraby' factory at Elminofyia Governorate.

2.3. Subjects

The studied sample included 10% from 3650 working women (365) working women they were selected as randomly from the above mentioned setting. The study sample was selected as follow:

Factory Name	Total number of women	Number of selected women
Quesna factory	1700	170 women
Benha factory	1950	195 women

2.4. Tools of Data Collection

One tool was developed by the researchers after extensive review of the related literature.

Osteoporosis structured interviewing questionnaire: It consisted of the following six parts:

Part one: Concerned with socio-demographic characteristics of the working women included five items as age, marital status, educational level, nature of work, and place of residence.

Part two: Concerned with the obstetric history included seven items as age of menarche, having children, number of children, breastfeed, contraceptive method, menstruation, and remove the ovary.

Part three: Designed to assess history of osteoporosis which included 4 items e.g.; inflammation in the joints, difficulty in walking, lower back pain, and muscle's weakness.

Part four: Medical and family history: It included the following items: family history of osteoporosis, chronic diseases, history of falls and fractures, treatment; medications (thyroid treatment, hormonal treatment, corticosteroid, antidepressant, anticoagulant drugs and immune-suppresive).

Part five: Designed to assess the women's' knowledge about osteoporosis disease which included (27) items

divided into 3 sub items as (11) about general information about osteoporosis, (10) about risk factors of osteoporosis, and (6) about osteoprotective factors. **Scoring system;** The total knowledge scores were considered good if the score of the total knowledge ≥ 75 % (≥ 20), considered average if it is equals 50- < 75% (14-20), and considered poor if it is less than 50% (<14).

Part six: Risk factors of osteoporosis and life style e.g.; exercise smoking, alcohol and caffeine intake, appetite loss, protein eating, sun exposure, and body mass index. **Scoring system;** for each item was given as follows: 1if yes, and zero if no.

Validity test

The tools were revised for content validity by 3 juries who were experts in the Community Health Nursing Specialties, for clarity, relevance, comprehensiveness, and applicability. According to their suggestions, the modifications were applied.

Reliability test

Reliability of the tools was applied by the researcher for testing the internal consistency of the tool, by administration of the same tools to the same subjects under similar condition on one or more occasion. Answers from repeated testing were compared (test-re–test reliability). = (0.78)

2.5. Operational Design

2.5.1. Preparatory Phase

Preparation of the study design and data collection tools was based on reviewing current and past, local and international related literature about various aspects of internet addiction by using periodicals journal, magazines, books and computer search to construct the tool of the study.

2.5.2. Legal Aspect for Ethical Considerations

Oral consent was been obtained from each women before conducting the interview and given a brief orientation to the purpose of the study. They were also reassured that all information gathered would be confidential and used only for the purpose of the study. No names were required on the forms to ensure anonymity and confidentiality.

2.5.3. Pilot Study

A pilot study was conducted to assess tools clarity and applicability. It has also served in estimating the time needed for filling the form of the study. It has also served in determining the needs of women which have been taken in consideration during developing the educational health guideline. It represented 10% of the sample (36 women); they were included from the study sample.

2.5.4. Field work

Official letter from Faculty of Nursing - Benha University to Toshiba El-Araby factories were prepared and delivered to the administration of factories in Benha and Quesna/Menofyia City. Permission from administration was obtained to interviewing the working women. Oral consent of the working women was taken to participate in the study.

Data were collected throughout the period from beginning of August 2016 till January 2017. The researcher visited the selected factories from 9 am - 1 pm, and sometimes afternoon according the present of working women. Three days/week by rotation (Saturdays, Mondays and Tuesdays). The fieldwork was performed in the following sequence: In each factory, study aim and importance was clarified to the head master and studied women to gain their support and cooperation. In each factory, the researcher explained the study purpose to the women. Questionnaire sheets were distributed to women in the factory, and they were asked to fill them individually.

An educational health guideline. It consisted three phases;

Phase 1: Assessment, collected data, and detect needs of the working women.

Phase 2: Developing a health educational guideline according to needs of the working women.

Phase 3: Content of health educational guideline: Included the modifiable risk factors of osteoporosis in the forms of:

1-Alcohol and smoking prevention.

2- Balanced diet and exposure to sun.

3- Adequate physical exercises

4- Effective falls prevention.

5- Low body mass index.

6- Medical treatments affecting bone health.

7- Importance of follow up especially for post-menopausal women and those with family history of osteoporosis.

8- Periodic follow up especially in case of chronic diseases.

3. Statistical Analysis

The collected data were verified prior to computerized entry; statistical analysis was done by using the Statistical Package for Social Science (SPSS) version 20. Data were presented in tables by using mean, standard deviation, number, percentage distribution, and Pearson correlation. Statistical significance was considered at: no Significant if p->0.05, Significant if p-<0.05 and Highly Significant if p-<0.001.

4. Results

Table 1 shows that the highest percentages of women were found within age groups from 40-49 years (36.4%) and 30-39 years (24.1%) with Mean± SD = 40.15 ± 10.44. 66.3 were Married. Regarding their educational level; postgraduates represented the highest percentage followed by highly educated group (34.8% & 28.5%) respectively. 80.3% of the participants were working with moderate movement and only 7.7 were continuous movement. 75.3% were from rural area.

Table 2 shows that; regarding obstetrical history, the mean age of menarche was 12.86 ± 0.8 year old. High percentage of women had children and breastfed their babies (56.4%, 73.2%) respectively. Also shows that, 71.3% the participants didn't use any family planning

methods, 80% of them reported the menstruation still present and only 9.3% of them removed their ovaries.

Table 3 demonstrates that more than three quarters of the studied sample 78.4% had inflammation in the joints and 63.3 % had difficulty in walking. As well as 87.4% of the studied sample had low back pain and 77.0% had weakness in their muscles.

Table 4 explains that; 63.3% of working women had good total knowledge score regarding osteoporosis while 12.6% of them had poor total knowledge score.

Figure 1 illustrates that 22.2% do not have osteoporosis while 77.8% of the study subjects are suffering from it.

Table 5 reveals that; 26.6% of the study subjects are overweight, 31% are at risk of obesity and 23.8% are obese with a mean ± SD (30.14 ± 5.46).

Table 6 reveals that; 34.6% of those without osteoporosis and 18.7% of those with osteoporosis practice exercises. Also 41.9% of those without osteoporosis and 22.5% of those with osteoporosis expose themselves to sunlight. Results find that; 58.1% of those without osteoporosis and 32.4%of those with osteoporosis eating enough protein. Regarding appetite loss; results revealed that; 33.3% of those without osteoporosis and 34.9%of those with osteoporosis were suffering from appetite loss.

Table 7 shows that; concerning passive smoking, 66.2% of those without osteoporosis and 69.7% of those with osteoporosis respectively are exposed to passive smoking. As for drinking alcohol; all studied women 100% are not drinking alcohol. While 45.7 of those without osteoporosis and 72.5% of those with osteoporosis respectively drink tea and coffee and cola.

Table 8 reveals that; 38.3% and 63.3% of the study subjects without osteoporosis and those with osteoporosis respectively have family history of osteoporosis. 55.6% of those without osteoporosis and 48.2 of those with osteoporosis have previous fracture. Also 61.7% of those without osteoporosis and 55.9% of those with osteoporosis have chronic illness.

Figure 2 illustrates that; only 2.7% of the studied sample with osteoporosis take immunosuppressive, 7.1% take antidepressant, 9% take corticosteroid, 21.4% take hormonal therapy, 43% take antiepileptic, and 67% of them take anticoagulant.

Table 9 Shows that; there were high statistically significant correlation between age, family history of osteoporosis (P < 0.001), fall down 2 years age (P < 0.05) and the presence of osteoporosis among the study working women, while there were not statistically significant correlation between education and the presence of osteoporosis among the study working women (P > 0.05).

Table 10 Shows that; there were high statistically significant correlation between drugs, hormonal therapy, smoking (P < 0.001), drinking tea and coffee (P < 0.05) and the presence of osteoporosis among the study working women.

Table 11 Shows that; there were high statistically significant correlation between eating protein, body mass index, loss of appetite (P < 0.05), exercises and the presence of osteoporosis among the study working women (P < 0.001)

Table 1. Distribution of the studied working women according to their socio-demographic characteristics (n= 365)

Socio-Demographic Characteristics	No.	%
Age in years		
< 30	57	15.6
30-	88	24.1
40-	133	36.4
50-	67	18.4
60+	20	5.5
Mean±SD = 40.15 ± 10.44		
Marital status		
Single	38	10.4
Married	242	66.3
Widowed	48	13.2
Divorced	37	10.1
Education level		
Illiterate	13	3.6
Basic education	25	6.8
Middle education	96	26.3
High education	104	28.5
Postgraduates	127	34.8
Nature of work		
Continuous movement	28	7.7
Setting for long time	44	12.0
Moderate movement	293	80.3
Residence		
Rural	275	75.3
Urban	90	24.7

Table 2. Distribution of the studied working women according to their obstetric history (n=365).

Obstetric History	No.	%
Age of menarche:- Mean ± SD =	12.86 ± 0.8	
Have children:	206	56.4
Yes		
Number of children (n= 206)	**X±SD =** 3.03 ± 1.2	
Breastfeed her babies:-		
Yes	267	73.2
No	98	26.8
Using Contraceptive method:		
No	260	71.3
IUD	20	19.2
Pills	50	21.9
Injection	35	9.6
Menstruation still present:		
Yes	292	80.0
No	73	20.0
Remove the ovary:		
Yes	34	9.3
No	331	90.7

Table 3. Distribution of the studied working women according to their history of osteoporosis (n= 365)

Present History of Osteoporosis	No.	%
Inflammation in the joints		
Yes	286	78.4
No	79	21.6
Difficulty in walking		
Yes	231	63.3
No	134	36.7
Lower back pain		
Yes	319	87.4
No	46	12.6
Muscle's weakness		
Yes	281	77.0
No	84	23.0

Table 4. Distribution of total knowledge' score of the studied working women regarding osteoporosis (n=365)

Total' Knowledge	Good		Average		Poor	
	No.	%	No.	%	No.	%
General information of osteoporosis	80	24.9	271	74.2	14	3.83
Risk factors of osteoporosis	104	28.5	159	43.6	102	27.9
Osteoprotective' factors	166	45.5	147	40.3	59	16.1
Total items	231	63.3	88	24.1	46	12.6

Table 5. Distribution of the studied working women; according to their body mass index BMI (n= 365)

Body Mass Index	No	%
20- 25.9 (underweight)	68	18.6
26-30.9 (over weight)	97	26.6
31- 35.9 (at risk of obesity)	113	31.0
36+ (obese)	87	23.8
Mean ± SD= 30.14 ± 5.46		

Table 6. Distribution of exercises, eating enough protein, loss of appetite and sun exposure among the studied working women (n = 365)

Risk factors	Working women without osteoporosis (n= 81)		Working women with osteoporosis (n=284)	
	No.	%	No.	%
Practicing exercises				
Yes	28	34.6	53	18.7
No	53	65.4	231	81.3
Exposure to sunlight				
Yes	34	41.9	64	22.5
No	47	58.1	220	77.5
Eating enough protein				
Yes	47	58.1	92	32.4
No	34	41.9	192	67.6
Loss of appetite				
Yes	27	33.3	99	34.9
No	54	66.7	185	65.1

Table 7. Distribution of smoking, alcohol drinking, and drinking tea and coffee among the studied working women (n= 365)

| Risk factors	Working women without osteoporosis (n= 81)		Working women with osteoporosis (n=284)	
	No.	%	No.	%
Passive smoking:				
Yes	52	64.2	198	69.7
No	29	35.8	86	30.3
Drinking alcohol:				
Yes	0	0.0	0.0	0.0
No	81	100.0	284	100.0
Drinking tea and coffee and cola:				
Yes	44	54.3	206	72.5
No	37	45.7	78	27.5
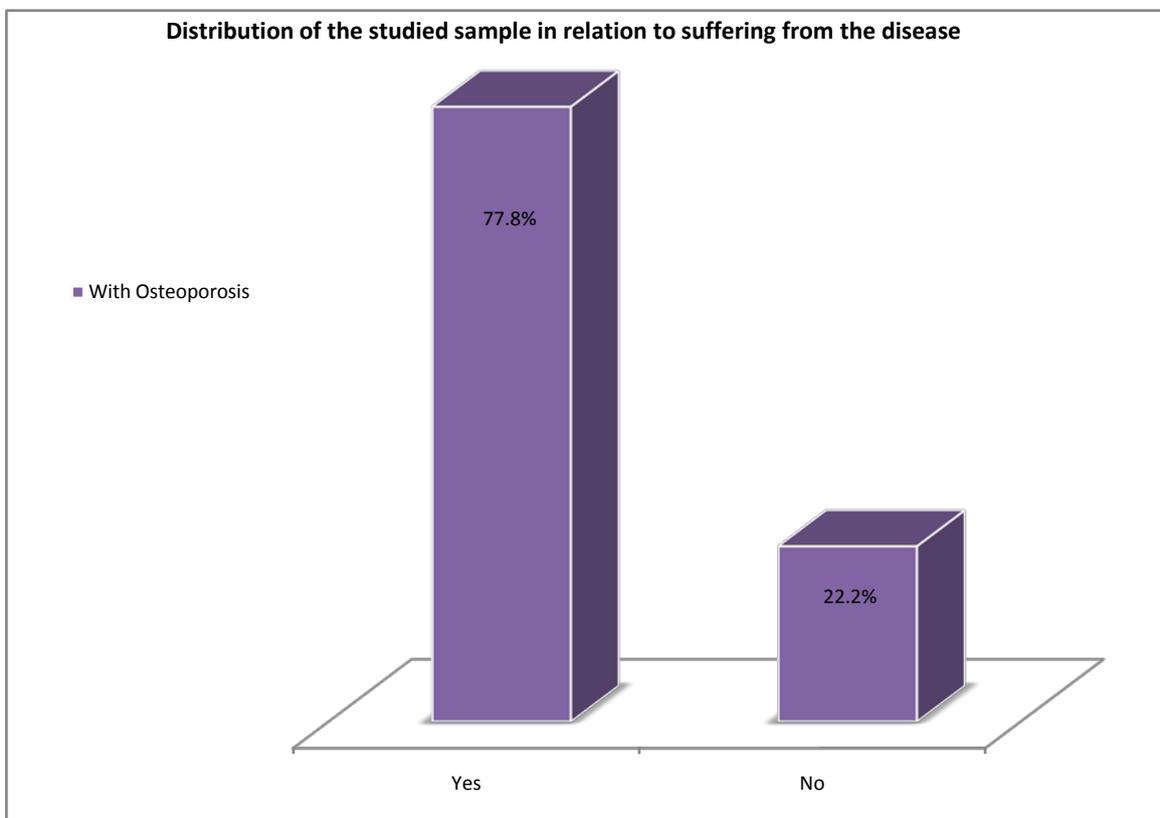
Figure 1. Percentage distribution of osteoporosis among the studied working women (n= 365)

Table 8. Distribution of family history of osteoporosis, chronic illness, falls within previous two years and previous fractures among the studied working women (n=365)

Medical & Family History	Working Women Without Osteoporosis (n=81)		Working Women With Osteoporosis (n=284)	
	No.	%	No.	%
Family history of osteoporosis	31	38.2	180	63.3
Chronic illness in form of (hypertension, diabetes, heart disease)	50	61.7	159	55.9
Fall down 2 years age	60	74.0	170	59.8
Previous fractures	41	55.6	137	48.2
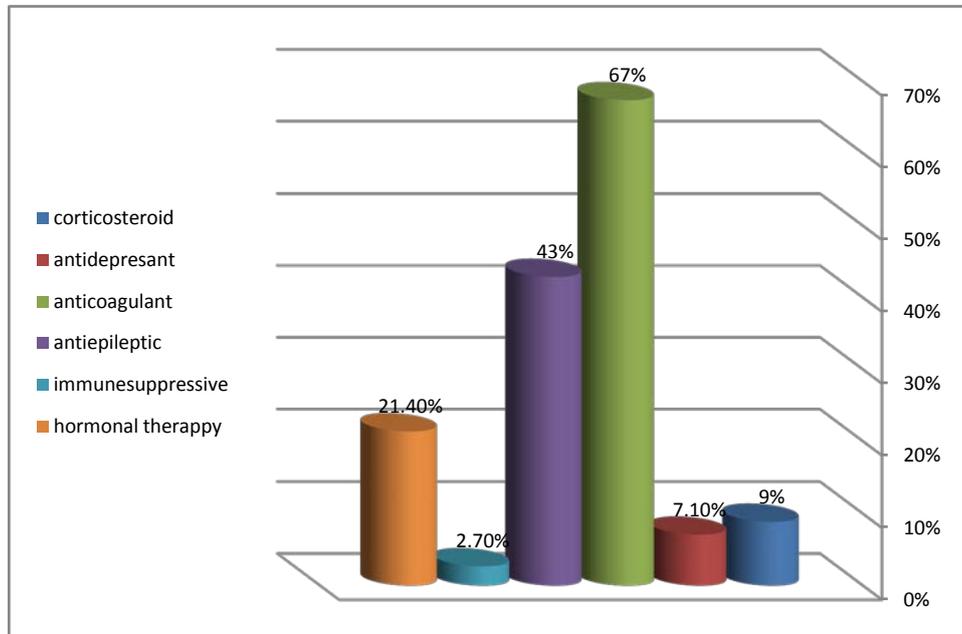
Figure 2. Percentage distribution of drugs taken among the studied working women (n=365)

Table 9. Correlation between age, education, family history of osteoporosis, fall down 2 years age and osteoporosis among the studied working women (n= 365)

Working Women	Osteoporosis	
	R	p- value
Age	0.36	0.000
Education	- 0.10	0.070
Family history of osteoporosis	0.22	0.000
Fall down 2 years age	0.010	0.05

Table 10. Correlation between drugs, hormonal therapy, smoking, drinking tea and coffee and the presence of osteoporosis among the studied working women (n= 365)

Working Women	Osteoporosis	
	R	P- value
Drugs		
Anticoagulant	0.216	0.00
Anticonvulsants	0.222	0.00
Hormonal therapy	0.246	0.00
Smoking	0.267	0.001
Drinking tea and coffee	0.190	0.002

Table 11. Correlation between eating protein, body mass index, loss of appetite, exercises and the presence of osteoporosis among the t studied working women (n= 365)

Working Women	Osteoporosis	
	r	P- value
Eating protein	0.266	0.001
Body mass index	0.392	0.000
Loss of appetite	-0.179	0.021
Exercises	0.377	0.000

5. Discussion

Osteoporosis has recently been recognized as a major public health problem; it is no longer confined to the growing older population but has implications for all age groups [5]. Millions of people around the world suffer from osteoporosis because it is a silent killer disease. Osteoporosis is a systemic disease characterized by decrease in skeletal bone mass. Osteoporosis makes the bones weak and liable to fractures specially the bodies of the vertebra. Risk factors fall into two main categories, modifiable, which are those we can change and fixed, those we can't change. Though there is no way to control the fixed risk factors, which include age, gender, and family history, there are strategies that can lessen their effect [4].

It was found that, the highest percentages of women were found within age groups from 40-49 (had their menopause) in more than one third and 30-39 years in about one fourth of osteoporosis women's with Mean± SD = 40.15 ± 10.44, with a high statistically significant correlation between age at menopause, and the presence of osteoporosis among the study working women, as shown in Table 1. This result was in harmony with study conducted by [2] who made a study about osteoporosis found that Mean age of participated women was 43.7 ± 1.3 years and a statistically significant correlation was found between osteoporosis among the subjects and their age. Also, the same results was revealed by [12] who showed that, two thirds of participants were 50 years old

or above. A recent study done by [13] who found that, advanced age was risk factor for osteoporosis.

Regarding the educational level of studied sample; postgraduates represented the highest percentage in more than one third of studied sample, followed by highly educated group also in more than one quarter of studied sample respectively, a statistically significant negative correlation was found between client's education and the presence of osteoporosis. Most of studied sample were working with moderate movement. This result was in harmony with study conducted by [14] who revealed that; highly educated group also in more than one quarter of studied sample and less than half of the participants were working with moderate movement. Also, this result was in harmony with study conducted by [15] who founded that, highly educated group also in less than half of studied sample and most of studied sample were working with moderate movement.

This study reveals that; three quarters of studied sample were from rural residents. In contrast to the study results [2] who founded that, more than three quarters of studied sample were from urban residents. This result might be related to the high prevalence of malnutrition in rural areas. The difference between the two studies might be related to the higher number of study subjects from rural area.

Regarding obstetrical history, the mean age of menarche was 12.86± 0.8 year old. High percentage of women had children and breastfed their babies (56.4%, 73.2%) respectively. Also, less than three quarters of the studied sample didn't use any family planning methods, most of them reported the menstruation still present and only less than one tenth of them removed their ovaries. This result was in harmony with study conducted by [14] who revealed that, the mean age of menarche was 12.86 ± 0.8 year old. High percentage of women had children and breastfed their babies (56.5%, 70.8%) respectively. Also more than three quarters of the participants didn't use any family planning methods and only 2.2% of them removed their ovaries.

Regards to participant's family history of osteoporosis, demonstrates that most of the studied sample had family history of the disease, more than three quarters of the studied sample had inflammation in the joints and two thirds had difficulty in walking. As well as most of them had low back pain and more than three quarters had weakness in their muscles. [17] who revealed that; most of working women had low back pain. It in contrast to the study results of [5] who made a study to assess osteoporosis knowledge among female adolescents in Egypt who revealed that, most of the studied sample had no family history of the disease. More than three quarters of the sample had no inflammation in the joints and only more than one third had difficulty in walking. As well as more than half of the studied sample had no low back pain and about three quarters had weakness in their muscles.

Results revealed that, two thirds of working women had good total knowledge score regarding osteoporosis while twelve percent of them had poor total knowledge score. In contrast to the study results conducted by [11,16] who conduct a study about osteoporosis who revealed that, highly percentage of the studied sample had poor total knowledge score regarding osteoporosis. The difference between the two studies might be related to the higher number of study subjects highly education. While this

result was in harmony with study conducted by [17] who revealed that, most of working women had good total knowledge score regarding osteoporosis during and post health education. The difference between the two studies might be related to the higher number of study subjects highly education.

Results revealed that, more than three quarters of studied sample who have osteoporosis had history of osteoporosis with high statistically significant correlation. On the same line, the study done by [18] revealed a significant association between family history and the prevalence of osteoporosis. Also this finding was similar to the study done by [19] where osteoporosis was significantly associated with family history that increase the probability of developing osteoporosis. In contrast with the study results of [5] who revealed that, most of the studied sample had no family history of the disease. This difference could be attributed to the sample selection.

Overweight and obesity were prevalent among the studied sample, it's found that, less than one quarter of them being overweight and obese with a mean ± SD (30.14 ± 5.46). This result was in harmony with study conducted by [14] who revealed that, quarter of them being overweight and obese with a mean ± SD (27.8±5.6). Also, this result was in harmony with study conducted by [2] who revealed that, quarter of them being overweight and obese with a mean ± SD (30.00 ± 6.87). The explanation of [20] indicated that, excessive fat mass may not protect humans from osteoporosis and in fact, increased fat mass is associated with low total bone mineral content and high –fat diet, often a cause of obesity, has been reported to interfere with intestinal calcium absorption and therefore contributing to low calcium absorption. The researchers of the present study agree with Cao's explanation.

Regarding practicing exercises, slightly more than one third of patients without osteoporosis and around twenty percent of those with osteoporosis were practicing exercises. A statistically significant correlation was found between exercises and the presence of osteoporosis among the study working women. These results supported by the study conducted by [21] who found that, most of study working women with osteoporosis did not exercise regularly. On the same line, the study done by [22] who revealed a higher prevalence of osteoporosis amongst Indians as compared to the individuals from more developed countries and this prevalence's in early growth years of life and lack of physical training in youth is responsible for the large share of this prevalence. Might be related to the least confidence in performing exercise and lack of community support for women to exercise. Physical exercise requires strong determination and many Egyptian women neglect it when they encounter obstacles such as violating social codes.

This study reveals that; less than half of studied sample without osteoporosis and only twenty percent of studied sample with osteoporosis were exposing themselves regularly to sunlight. In the same context, a study done by [23] who revealed that, sun exposure was among the risk factors for osteoporosis. [24] revealed significant correlation between the incidence of osteoporotic vertebrae and exposure to sunlight. Also, this result was in harmony with study conducted by [2] who revealed that, less than half of studied sample without osteoporosis and only

thirteen percent of studied sample with osteoporosis were exposing themselves regularly to sunlight. According to [15] usually 10-15 minutes exposure of the hands, arms and face two or three times a week is enough to satisfy the body's vitamin D requirement.

Results revealed that, one quarter of those with osteoporosis and more than half of those without osteoporosis were eating enough proteins with a high statistically significant correlation between eating protein and the presence of osteoporosis among the study working women. In the same context, a study done by [23] found the risk factors for osteoporosis as reported by the respondents as lack of intake of dairy products. The study done by [24] revealed a significant correlation between the incidence of osteoporotic vertebrae and dairy, white meat consumption.

Regarding appetite loss; results revealed that slightly more than one third of study working women without osteoporosis and more than one third those with osteoporosis were suffering from appetite loss. This result was in harmony with study conducted by [2] who revealed that, more than one third of study working women without osteoporosis and less than one third those with osteoporosis were suffering from appetite loss.

Concerning passive smoking, more than two thirds of clients without osteoporosis and more than two thirds those with osteoporosis respectively are exposed to passive smoking. There were a statistically significant correlation between smoking and the presence of osteoporosis among the studied working women. Study by [23] on the occurrence of risk factors for osteoporosis. Almost the same results were found by [25] found that, smokers were few in both cases and the controls. Literatures from UJK, Australia, and USA Europe also indicated that, cigarette smoking is a risk factor for the development of osteoporosis, the reason is that nicotine and toxins in cigarettes affect bone health from many angles. Cigarette smoke generates huge amounts of free radicals molecules that attack and overwhelm the body's natural defenses. The result is a chain-reaction of damage throughout the body, including cells, organs, and hormones involved in keeping bones healthy [15].

Results revealed that, all studied women are not drinking alcohol. In contrast to the study results conducted by [2] who revealed that, slightly more than one third of clients without osteoporosis and almost one quarter of clients with osteoporosis were drinking alcohol with a statistically significant correlation. This may be attributed to the fact that many people hesitated to tell the truth about the frequency and amount of alcohol intake due to high religiosity in the study area.

Results revealed that, less than half of clients without osteoporosis and about three quarters those with osteoporosis were drinking tea, coffee and cola respectively. A statistically significant correlation was found between drinking tea and coffee and the presence of osteoporosis among the study working women. The study done by [25] revealed that, more than three quarters of the cases and more than three quarters controls consume coffee<2cups a day but no significant association was found between caffeine intake and osteoporosis. This might be the fact that, yet caffeine intake increases urinary calcium output and it is among the risk for osteoporosis that leads to fractures.

Results revealed that; more than one third of studied women without osteoporosis and two thirds with osteoporosis respectively have family history of osteoporosis was significantly associated with family history that increases the probability of developing osteoporosis. Finding was similar to the study done by [19] who showed that significantly associated with family history that increases the probability of developing osteoporosis.

Results revealed that, more than half of those without osteoporosis and less than half of those with osteoporosis have been falling down during the previous two years ago and have fracture previous two years ago with a statistically significant correlation. The same results were reported by [26] who revealed that, were women fracture occurred more frequently in those with a history of falling in the year prior to the survey. Also, the same results were conducted by [2] who revealed that, about two third of those with osteoporosis have been falling down during the previous two years and slightly less than half of those also had pervious fractures two years ago with a statistically significant correlation.

The study revealed that, less than two thirds of those without osteoporosis and more than half of studied sample with osteoporosis were having chronic illness in the form of hypertension, diabetes and heart disease. This finding is similar to the study done by [18] were a significant association was found between chronic disease such as diabetes, hypertension, ischemic heart disease and the prevalence of osteoporosis. Also [27] showed that, the most common medical problem encountered were type two diabetes mellitus followed by thyroid health problems, rheumatoid and kidneys diseases. Also, this result was in harmony with study conducted by [14] who revealed that, twelve percent had history of diabetes and hypertension.

Regarding the drugs taken among the study working women, two point seven percent of the studied samples were taking immune-suppressive drugs. Also, the same results were conducted by [2] who revealed that, around two percent of the study subjects were taking immune-suppressive drugs. According to [28,29] revealed that, post transplantation, bone mineral density increases the risk of fractures and consequently, reduces quality of life and increases mortality.

The current study revealed that, seven point one of studied sample were taking antidepressant. [30] revealed that, tee greater the severity of depression, the lower the Bone Mineral Density. These finding are further supported by a meta-analysis of 20 studies on the relationship between depression and osteoporosis, which found that depressed patients had lower BMDat all sites versus controls (spine, femoral neck, and total femur) which is likely to increase fracture risk. In the same context, the study done by [31] identified in their review article that, antidepressant treatments that act on serotonin pathways may therefore be expected to have some impact on bone, bone mass, and fracture rates. This might be the link between depression, antidepressant use, and osteoporosis is becoming more widely understood, and there is mounting evidence for an effect of depression and antidepressants on fracture rates.

The current study revealed that only less than one tenth percent of those with osteoporosis were taking corticosteroid treatment. [4] oral corticosteroids used in a number of

different chronic diseases contribute to an increased prevalence of osteoporosis and an increased incidence of fracture. Also, the study done by [24] revealed a significant correlation between the incidence of osteoporotic vertebrae and thyroid disorders, and drugs including corticosteroids. Also, the same results were conducted by [2] revealed that, only minority of those with osteoporosis were taking corticosteroid treatment.

Results revealed that, less than one quarter of the studied sample were taking hormonal therapy. While less than half of the studied sample were taking antiepileptic or anticonvulsants drugs with a high statistically significant correlation between drugs, hormonal, antiepileptic or anticonvulsants drugs and the presence of osteoporosis among the study working women. The same results were conducted by [2] who revealed that, around half of the studied women with osteoporosis were taking antiepileptic or anticonvulsants drugs with a high statistically significant correlation. *According to* [32] hormonal, antiepileptic or anticonvulsants drugs may cause bone loss, but the mechanisms are unclear. There is accelerated vitamin D metabolism, but anticonvulsants also may have direct inhibitory effects on osteoblast differentiation, and valproate and carbamazepine have anti-drogenic effect.

Results revealed that, more than two third of those with osteoporosis were taking anticoagulants with a high statistically significant correlation between anticonvulsants drugs and the presence of osteoporosis among the study working women. Study results were supported by [33,34] found that, long –term use of warfarin was associated with a 25% increased risk osteoporotic fracture. Among those with long-term use warfarin was most strongly associated with vertebral fractures. The correlation between warfarin use and fracture differed in men and women, long-term warfarin use was significantly associated with osteoporotic fractures in men but not women. Researchers of the present study agree with this explanation. Additionally, oral anticoagulant effects on bone metabolism are controversial. Anticoagulants are vitamin K antagonists that interfere with gamma-carboxyglutamate formation, and consequently inhibit the accumulation of osteocalcin in the extracellular matrix [31].

Overweight and obesity were prevalent among the studied sample, and slightly more than one third of patient's with osteoporosis were suffering from loss of appetite with a high statistically significant correlation between loss of appetite, body mass index and the presence of osteoporosis among the study working women. On the same line, the study done by [25] revealed that, BMI of the cases and controls was almost similar. In addition, a significant difference was found in the weight of the study participants with a p-value of 0.004. The same results were conducted by [2] who revealed that, a statistically significant correlation between osteoporosis and obesity and appetite loss.

6. Conclusion

The study concluded that the common risk factors identified were; family history, lack of exercises, irregular exposure to sunlight, and insufficient taken protein and vitamin D. Also; osteoporosis health guideline were needed for prevention / reduction of osteoporosis.

7. Recommendations

Based on the findings of the present research the following recommendations are suggested: 1- increase women's awareness of osteoporosis risk factors and preventive behaviors. 2- community based health programs on osteoporosis that targeted a wide audience should be implemented. 3- further studies are needed to evaluate the effect of osteoporosis health guideline in the prevention of osteoporosis.

References

[1] Shahbo G., Abd El-Rahman M & El-Mowafy R. (2016). Evaluation of Knowledge and Self-Efficacy about Osteoporosis Perception among Females in the Faculty of Nursing in Port-Said, Egypt. *International Journal of Caring Sciences.* 9 (1). 72.

[2] Ismail, M., El-Shair, E. & Sharaa, H. (2015). Osteoporosis health guidelines to prevent its silent progression among male and female Attending Cairo University Hospital. Egyptian Nursing Journal. Available at:enj@nursing .cu.edu.eg. Accessed on: February 2. 2017.

[3] World Health Organization (WHO, 2012). Scientific group on the assessment of Osteoporosis at primary health care level. Summary meeting report. Available at: www.who.int/chp/topics/Osteoporosis.pdf. Accessed on 25 April 2016.

[4] International Osteoporosis Foundation. (2016). Osteoporosis fact Sheet 1-25p. Available at: http://www.nof.org/professionals/clinical-guide-lines. Accessed on: March 21/2017.

[5] Hossien Y., Tork H & El- Sabeely A. (2014). Osteoporosis knowledge among female adolescents in Egypt. American Journal of Nursing Science. 3(2): 13-17.

[6] Yang Y., Wang BQ., Fei Q., Meng Q., Tang H., & Li JJ N. (2013). Validation of an Osteoporosis Self assessment Tool to Identify Primary Osteoporosis and New Osteoporotic Vertebral Fractures in Postmenopausal Chinese Women in Beijing. BMC Musculoskelet Disord14: 271.

[7] McLendon A & Woodis C. (2014). A Review of Osteoporosis Management in Younger Premenopausal Women. Women's Health 13 (73): 5977.

[8] Zhang, Y., Li X., Wang, D., Guo, X., & Guo X. (2012). Evaluation of educational program on osteoporosis awareness and prevention among nurse students in China, Nursing and Health Sciences 14: 74.

[9] Anbarasi, P., Ajith, A & Stella, S. (2015). Assess the level of knowledge Prevention Osteoporosis among Working Women, Journal DOI, 4(10), Accessed on: 13March 2016.

[10] Allender, J., Rector, C & Warner, K. (2014). Community & public health nursing promoting the public's health, 8thed, Wolte Kluwe Health, China, P.808.

[11] Wahba S., Abd El-Shaheed A., Tawheed M., Mekkawy A & Arrafa A. (2010). Osteoporosis knowledge, beliefs, and behaviors among Egyptian female students. JASMR. 5: 173-80.

[12] Alqahtani S. (2014). A study of knowledge of women toward osteoporosis in primary care in Tabuk. International Journal of Medical Science and public health: vol (3), issue 7.

[13] Asaoka D. (2015). Risk factors for osteoporosis in Japan: is it associated with Helicobacter pylori? Therapeutics and clinical Risk Management: 11 381-391.

[14] Quasim, B., Hassan, K., Saad &Amin, Z. (2015). Assessment of adult women level of awareness and attitude about the risk factors for osteoporosis. Available at: Afr. J. Nurs. Midwifery. Online at www. International schatore Journal. Vol2 (6).PP.358-346. August.

[15] Abed El-Rahman, M., Abo El Matty, G.,& El-mowafy, R. (2016). Evaluation of knowledge and self-efficacy about osteoporosis perception among females in the Faculty of Nursing in Port-Said, Egypt. International Journal of Caring Sciences January-April 2016 Volume 9 (1) 78.

[16] Cram P., Schlechte & Chrstensen A. (2006). A randomized trial to assess the impact of direct reporting of DXA scan results to

patients on quality of osteoporosis care. J Clin Densitom, 9(4): 393-398.

[17] Abd El Hameed A., Emam H., Fouad W& Abd ElMohsen A. (2008). Evaluation of health education intervention program for female employees towards osteoporosis. J Appl Sci Res.; 4: 863-8.

[18] Prasad D., Pathak R., Piyush K., Syed A., & Peeyusha D. (2010). The prevalence of osteoporosis and associated factors among health care professioals. Pravara Med Rev: 2(3).

[19] Perez A., Palacios S., Garcia C & Perez M. (2011). Assessing osteoporosis risk factors in Spanish menopausal women. Gynecological and Endocrinology Journal: 27(10):807-813.

[20] Cao J. (2011). Effect of obesity on bone metabolism. Journal of Orthopedic Surgery and Research: 6: 30.

[21] Etemadifar M., Nourian S., Esfahani M., Shemshaki H., Nourbakhsh M. & Zarezadeh A. (2013). Relationship of knowledge about osteoporosis with education level and life habits. World Journal of Orthopedic: Jul18, 4(3)139-143.

[22] Gaur T., Jakheria S., Chaturvedi S., Moolchandani D., Khajja H & Rao H.(2015) A study to Reveal the Effect of Different Factors on Peak Bone Mass. Of Evidence Based Med& Health care: Vol. 2, Issue7, Feb 16.

[23] Jakobsen A., Laurberg P., Vestergaard P. & Andersen S. (2013). Clinical risk factors for osteoporosis are common among elderly people in Nuuk, Greenland. International Journal of Circumpolar Health: 72: 10.

[24] Jahanbin, I., Aflaki E. & Ghaem H. (2014). Women's Health Bulletin: 1 (1): e (18960).

[25] Kahsay A., Gashe F., Debessai Z., Tsigabu-Bezabih A. & Tegegne A. (2014). Risk factors of osteoporosis among adults in Ethiopia, the case of Tigrai region: A case control study. Journal of Public Health and Epidemiology: Vol.6 (2), pp.92-100 February.

[26] Gale C., Dennison E., Edwards M., Sayer A. & Cooper C. (2012). Symptoms of anxiety or depression and risk of fracture in older people: the Hertfordshire Cohort Study Archives of osteoporosis: vol.7, no1-2, pp.59-65.

[27] Al Attia H., Abu Merhi A. & Al Farhan M. (2008). How much do the Arab females know about osteoporosis? The scope and the sources of knowledge. Clin Rheumatol.. 27: 1167-70.

[28] Stein E., Ebeling P. & Shane E. (2007). Post-transplantation osteoporosis. Endocrinol Metab Clin North Am.36 (4):937-63.

[29] Kulak, C., Borba, V., Kulak Junior, J. & Custodio M. (2014). Bone disease after transplantation: osteoporosis and fractures risk. Arq Bras Endocrinol Metab: 58/5.

[30] Diem, S., Blackwell T., & Stone K. (2007). Depressive symptoms and rates of bone loss at the hip in older women. Jam Geriatr Soc, 55: 824-31.

[31] Mazziotti G., Canalis E & &Giustina A. (2010). Drug-induced osteoporosis: Mechanisms and clinical Implications. The American Journal of Medicine; 123: 877-884.

[32] Petty M & Wark B. (2007). Anti-epileptic medication and bone health. Osteoporos Int.18:129-142.

[33] Gage B., Birman-Deych E., Radford M., Nilasena D & Binder E. (2006). Risk of osteoporotic fracture in Elderly patients Taking Warfarin. Results From the National Registry of Atrial Fibrillation 2 Arch Intern Med; 166: 241-246.

[34] Rizzoli R. (2012). Antidepressant medication and osteoporosis. Bone.