American Research Journal of Nursing
ISSN: 2379-2922
Volume 3, Issue 1, 15 Pages

AMERICAN RESEARCH JOURNALS
An Academic Publishing House

Research Article Open Access

Effect of Preventive Program on Progression of Osteoporosis among Female Patients over 40 years at El-Fayoum City

Sharbat Thabet Hassanine[1], Hanan Elzeblawy Hassan[2*], Zainab Gazar Alkotb[3]

[1]Community Health Nursing, Faculty of Nursing, Fayoum University, Egypt
[2]Maternal & Newborn Health Nursing, Faculty of Nursing, Beni-Suef University, Egypt
[3]Geriatric Health Nursing, Faculty of Nursing, Fayoum University, Egypt
nona_nano_1712@yahoo.com

Abstract

Background: Osteoporosis is a skeletal disorder characterized by compromised bone strength, predisposing an individual to an increased risk of fracture; it is the most common bone disease in humans, representing a major public health problem. It is a silent epidemic that has become a major health hazard in recent years.

Aim: evaluate the effect of apreventive program on the progression of osteoporosis among female patients over 40 years at El-Fayoum City.

Design: A Pre-experimental design was used in this study.

Setting: data were collected from the orthopedic outpatient clinic of El-Fayoum University hospital.

Sample: A convenient sample of all the cases coming to the orthopedic outpatient clinic was included in the study.

Tools: (1) Interviewing assessment tool which included Socio-demographic assessment, medical and family history, risk factors for osteoporosis and Osteoporosis knowledge assessment tool. (2) Follow up assessment tool for the progression of osteoporosis.

Results: statistically significant correlation was found between osteoporosis and age, educational level, family history, chronic illness, postmenopausal period, recurrence pregnancy, exposure to smoking, practice exercise, drinking tea or coffee, and body mass index.

Conclusion: the study concluded that, after the application of the preventive program for the study group, they had decreased the progression of osteoporosis signs and symptoms gradually among female patients over 40 years.

Recommendation: the study recommended to Conduct continuous various educational programs for the high-risk women in the outpatient clinics to raise their awareness regarding causes, prevention & early detection and proper treatment of osteoporosis.

Keywords: osteoporosis, risk factors, preventive program.

Introduction

Osteoporosis is a systemic metabolic disease of the skeleton, characterized by adecrease of bone mass, deterioration of bone tissue and disruption of bone architecture, compromised bone strength, leading to increased fragility and fractures. Osteoporosis is a silent killer disease. As the longevity of life has increased, the prevalence of osteoporosis has increased.[1]Worldwide about 200 million women suffering from osteoporosis,

women are 8 times more at risk than men; approximately 30% of postmenopausal women have osteoporosis in the United State of America and Europe. The major complication of osteoporosis is an increase in fragility fractures leading to morbidity, mortality, and decreased the quality of life. [2]

Osteoporosis and related fractures represent a serious and global public health problem. It's estimated that 30%-50% of women and 15%-30% of men suffer an osteoporotic fracture in their lifetime. The prevalence of osteoporosis increases markedly with age. More than one-third of adult women and one in five men will sustain one or more osteoporotic fractures in their lifetime.[3]

According to ***Jacobs et al., (2012),*** osteoporosis is common among females than males due to the fact that bone loss in men starts later and the progression is slow, men also have an advantage of not having a period of rapid hormonal change and accompanying rapid bone loss. In women, the peak bone mass is lower due to hormonal changes that occur at menopause and the effect of pregnancy.[4]

Osteoporosis is a multi-factorial disease, some of the risk factors that have been described, such as age, sex, and race, are intrinsic and therefore cannot be changed; others, such as diet, lifestyle, vitamin-D deficiency, low calcium intake, limited time to sun exposure, smoking, excessive consumption of soft drinks cause calcium loss via the kidney, the consumption of certain drugs, are extrinsic and can be modified with early assessment at an early age. Moreover, the evaluation of several risk factors may be as important as the value of bone density screening.[5]

Osteoporosis is one of the diseases which are influenced by nutrition and lifestyle; it is preventable by means of adequate nutrition and sufficient physical activity. Because lifestyle practices formed early in life and may be carried into adulthood, there is an immediate need to increase osteoporosis awareness and subsequent beliefs. [6]

A balanced diet is important for bone development and maintenance, as well as for general health. Some populations, such as women over age 40, edentulous women, women with reduced appetites from any cause, or women who diet frequently or have eating disorders, may not consume adequate vitamins and minerals to maintain optimal bone mass. Older women who lose weight, purposely or not, run the risk of accelerated bone. [7]

Achieving a higher peak bone mass through exercise and proper nutrition during adolescence is important for the prevention of osteoporosis and delays bone degeneration. In recent years, there has been significant interest in the influence of diet on bone metabolism. Several studies have shown that alkaline diets (high in magnesium, potassium, fruit, and vegetables) improve bone mineral density (BMD) and prevent the loss of bone mass compared with acidic diets (protein).[8]

Lifestyle approaches alone may not be sufficient to prevent bone loss or reduce fracture risk, but they form the necessary foundation for pharmacologic approaches to the prevention or management of osteoporosis. In some cases, recommended lifestyle approaches may be sufficient. All postmenopausal women, regardless of their bone density or clinical risk factors for osteoporosis, should be encouraged to eat a balanced diet, obtain adequate calcium and vitamin D.[9]

Osteoporosis is an asymptomatic, early detection of the risk level for a person can help monitor wear and tear of bones and be instrumental in lowering the incidence of the disease through appropriate lifestyle modifications (diet and exercise) and medication use.[10] Early assessment and community based educational programs proved to have a profound effect on improvement of knowledge and health behavior related to osteoporosis and its care. [11]

Significance of the study

Osteoporosis poses a huge challenge in developing countries due to demographic transition and aging of the population coupled with limited availability of resources. The exact disease burden is difficult to quantify because of the paucity of data. Ethnicity affects bone density as well as fracture risk. Population-specific normative data for bone density are lacking in large parts of the world.[12]

Egyptian women have a lower bone mineral density compared to their westerncounterparts; about 28.4% of postmenopausal women in Egypt are estimated to have osteoporosis.[2] In the United States, 26% of women aged ≥65 years and >50% of women aged ≥85 years have osteoporosis. Over 1.5 million fractures per year are attributable to osteoporosis.[13]

Nurses having a vital role in the health care system as well as play an essential role in collaboration with other different health professions to determine the effectiveness of treatment.[14]So, the primary goal for maternity & community health nursing is to counsel, attain, regain or maintain the health of women, and their families in the community setting through counseling. Moreover, focus on early detection of risk factors that lead to unfavorable and undesirable health outcomes for women. [15, 16] Furthermore; early intervention such using multidisciplinary educational &behavioral approaches as teaching program management for women about relation between the nutritional status and multi-factorial predisposing factors and osteoporosis symptoms recovery is concentrated on nursing teaching and support, as well as actual treatment or at least prevent its complication.

So, Programs to increase public knowledge and awareness of osteoporosis and its outcomes are necessary for healthcare specialists and the general public in order to prevent and lower the effect of osteoporosis. Earlier diagnosis and intervention prior to the first fracture are highly desirable. So our study aims to evaluate the effect of the preventive program on the progression of osteoporosis among female patients over 40 years at El-Fayoum City.[17]

Aim of the Study

The study aims to evaluate the effect of preventive program on the progression of osteoporosis among female patients over 40 years at El-Fayoum City.

Hypothesis

Decrease progression of osteoporosis among female patients over 40 years after application of the preventive program.

Research design

A Pre-experimental design was used in this study.

Subject and Methods

Setting

The study conducted at the orthopedic outpatient clinic of El-Fayoum University hospital.

Subjects

A convenient sample of all the cases coming to the orthopedic outpatient clinic at Fayoum university hospitaland fit the criteria, were included in the study. The total number of cases was 137 women, they were recruited within a period of 8 months, under the inclusion criteria was age over 40 years and follow up of the cases by phone every 2 months for 6 months after the application of the program.

Tools of data collection

Tool I: Interviewing assessment tool

A structured Arabic interviewing sheet was designed by the researcher, after reviewing the related current and previous literature, to collect data which cover the aim of the study. It consisted of four parts as follows:

Part (1): Socio-demographic assessment tool

It contains 4 questions; it was used to assess the socio-demographic characteristics of the study group as age, marital status, educational level, occupation.

Part (2): Medical and family history tool

It contain questions related to family history related to osteoporosis, health problems, signs and symptoms of disease, duration of disease, history of falls and fractures, types of medication taken, presence of chronic illness or another health problem.

Part (3): Risk factors of osteoporosis assessment tool

It was used to assess risk factors related to osteoporosis and life style or bad habits as eating habits, smoking, exercise, caffeine or tea intake, soft drinks, appetite loss, body mass index,number of delivery, abortion, regulation of the menstrual period, pre or post-menopausal, sun exposure.

Part (4): Osteoporosis knowledge assessment tool

It contains questions related to risk factors, signs and symptoms, management and preventive measures related to osteoporosis and measures to prevent its progression. This tool is evaluated pre/post the program. The answer is marked as (0) for false answer and (1) for true answer. The total knowledge is considered satisfactory if the total score ≥ 60 % & unsatisfactory if the total score < 60%.

Tool 2: Follow up assessment tool for the progression of osteoporosis

A structured Arabic tool was designed by the researcher to assess the progress of osteoporosis related health problems, risk factors, lifestyle, continuity of osteoporosis signs and symptoms.

Administrative Design

Official letters including the title and purpose of the study were submitted to the directors of El-Fayoum University Hospital, to get approval for data collection to conduct the study.

Operational Design

The study, to be completed, had passed through different phases as follows: the preparatory phase, then the pilot study phase and lastly the fieldwork phase.

Preparatory phase

During this phase, the researchers reviewed current local and international related literature,which helped them to be more acquainted with the topic, and with the process of tools designing. Then, tools were designed and tested for validity and reliability through a pilot study.

Tool validity

The study tool was submitted to a panel of five experts in the field of community health nursing and obstetric nursing to test tool validity, suitable modifications carried out according to the panel's judgment on clarity of sentences and the appropriateness of the content.

Ethical consideration

Informed consent was taken from each female to participate in the study after explaining the purpose of the study, and its importance for her, it will haven't any harmful effect on them, the information will be confidential and they can withdraw from the study at any time.

Pilot study

A pilot study was done on 10% of the subjects who met the criteria for selection they were interviewed to test tools applicability and clarity and determine the needed time to answer the questions. According to its results, no modification was needed. The study sample included in the pilot study was excluded from the study sample.

Fieldwork

The process of data collection was carried out in the period from March 2016 and completed by October 2016, 2 days/week Sunday and Wednesday from 9am to 2pm in three phases:

Phase 1: Preparation of the program

The researchers select all the cases who diagnosed as osteoporosis for the first time or coming for follow up. The interview was after the end of the clinic for all cases who submit the inclusion criteria. The program was performed at the orthopedic outpatient clinic and follow up by phone every 2 months for 6 months, for each case.

Phase 2: Implementation of the program

The researcher attended the clinic to meet the female cases with the doctor in the outpatient clinic; the doctor asks the mother about any problems or complications and describes the medication after the routine assessment and examination. The researcher interviewed the cases after meeting with the doctor; oral approval from the cases was obtained after explaining the purpose of the study. Issues of confidentiality were confirmed. Each client was interviewed to complete the questionnaire. Researchers faced the clients, asked them the questions in Arabic and recorded their answer in the structured interviewing questionnaire sheet. The interview was carried out in the waiting area at the orthopedic outpatient clinic it took about 20 minutes for each one. After collection of data and assessment of the risk factors, lifestyle, knowledge related to osteoporosis. The researcher started the program of osteoporosis preventive measures for all the female clients, were developed by the researcher after extensive review of related literature, by simple Arabic language, it was distributed to the study subjects, in order to help them to change their unhealthy behavior to alter the modifiable factors for osteoporosis and decrease its progression. The program session usually lasted between 45 and 60 minutes, conducted in a comfortable, quiet and dedicated time and space, the program was conducted on Sunday and Wednesday from 9am to 2pm, weekly, taking into consideration; using simple language to suit the level of the client education, a free copy of the booklet about osteoporosis preventive measures was given to each client to use it as a home reference.The osteoporosis preventive measures as prevention of active or passive smoking, cigarette smoke has an early effect on bones which increase the risk of osteoporotic fractures.[17]

As well as adequate daily calcium intake and vitamin D, exposure to sun, clients should be advised to have a calcium intake of at least 700 mg/ day (equivalent to 1 cup of milk, 300gm of yoghurt or 100 gm cheese). Vitamin D deficiency can be prevented by exposure of face, arms, and legs to sunlight for 15-20 minutes daily, also balanced diet and prevention of soft drinks can also prevent the progression of osteoporosis. [18] Adequate physical exercise and low body mass index is essential for the normal bone formation, and can decrease the osteoporosis risk, walking three to four days per week are necessary to improve vertebral bone strength, reduce the risk of falls and fractures by improving posture, balance as well as general health benefit.[19]

According to Olds, S., & Davidson, M. (2004), falls prevention is important aspect especially for post-menopausal women and persons with visual impairment or neurological problems, through home safety measures. [20] Medical treatment also can affect the bone health, some medication may have side effects that weaken bone or increase

the risk of fracture, as corticosteroids, immunosuppressant, thyroid hormone treatment, anticonvulsants and antiepileptic drugs. [21]

Also, follow-up especially for post-menopausal women, and those with afamily history of osteoporosis, chronic illness, multi pregnancy or abortion women, are greater risks of osteoporosis and need for frequent follow-up and bone mineral density tests.[18]

Phase 3: Evaluation of the program

The study group was evaluated immediately after the program, by posttest. The researchersevaluated the effect of theprogram, an improvement was observed among the study group knowledge. Follow-up was conducted by phone every 2 months for 6 months.

Results of the Study

Data were analyzed using Statistical Package for Social Science (SPSS windows) version 20. Numerical data were expressed as mean ± SD, and range. Relations between different numerical variables were tested using Pearson correlation. Probability (P-value) less than 0.05 was considered significant and less than 0.001 was considered as highly significant.

Regarding socio-demographic characteristics, ***table (1),*** among the study group; the females' age were almost ranged from 40-66 years, while more than half of the study group their age ranged from 51-60 years, with a mean age of 51.2 ± 6.8 years. It was clear from these study findings that the majority of the study group was married, and more than half of them have abasic educational level but nearly more than one-third of the study group hasan intermediate education. It is found that more than three quarters of the study group are housewives, but less than one-quarter is working.

Table 1. *Distribution of the study sample related to socio-demographic characteristics (No:137)*

	Frequency	%
Age / (years):		
40 - 50	43	31.4
51 – 60	69	50.4
60 +	25	18.2
Mean ±SD	51.2 ± 6.8	
Marital status:		
Married	115	83.9
Divorced	3	2.2
Widow	19	13.9
Educational level:		
Basic education	76	55.4
Intermediate	52	38
High	9	6.6
Occupation:		
Housewife	105	76.6
Working	32	23.4

As regards to the study group satisfactory level of knowledge related to osteoporosis, ***figure (1),*** the study revealed that the majority of the study group had satisfactory level of knowledge related to osteoporosis after the application of the preventive program compared to nearly one tenth of them had satisfactory level of knowledge before theapplication of the preventive program. Regarding to medical and family history related to osteoporosis.

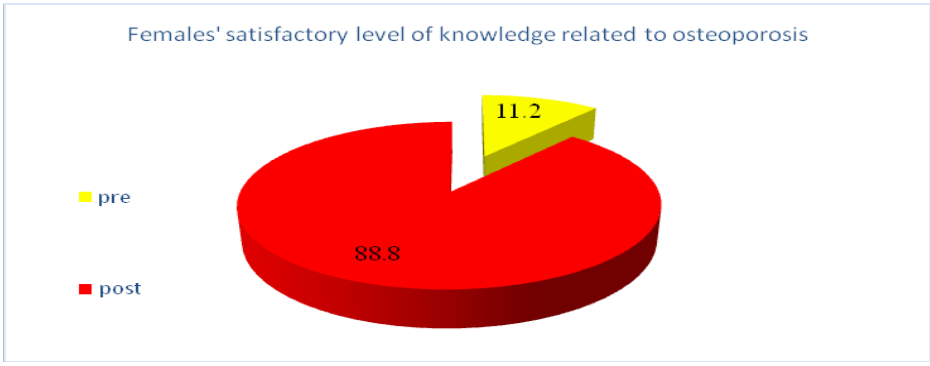

Fig1. *Distribution of females' satisfactory level of knowledge related to osteoporosis pre and post the intervention program (No:137)*

Table (2): the present study revealed that, nearly two thirds of the study group had a family history of osteoporosis, and the majority of them had a history of falls, while nearly one tenth of them had a previous fracture, and more than have of them had a chronic illness.

Table 2. *Distribution of medical and family history related to osteoporosis (No:137)*

Items	Yes		No	
	No	%	No	%
Family history of osteoporosis	92	67.2	45	32.8
History of falls	118	86.1	19	13.9
Previous fracture	16	11.7	121	88.3
Presence of chronic illness	73	53.3	64	46.7

The study revealed that, as regards to the females' obstetrical history, ***table (3)***, The study found that nearly about two thirds of the study group were postmenopausal, while nearly one third of them were premenopausal, in relation to number of delivery, it was found that about one third of the study group had delivered three or four times, and less than half of them had delivered five or six times. Also it was found that, one-quarter of the study group had a history of abortion, and about one-tenth of them had a recurrence abortion.

Table 3. *Distribution of the females' obstetrical history (No:137)*

	No	%
Menopausal state		
Pre-menopausal	52	38
Post-menopausal	85	62
Regular menstrual period		
Yes	32	61.5
No	20	38.5
Number of delivery		
1-2	13	9.5
3-4	46	33.6
5-6	58	42.3
7 or more	20	14.6
History of abortion		
Once	35	25.5
Recurrence	18	13.1

The study show in ***table (4)*** in relation to the females' risk factors related to osteoporosis, nearly three-quarters of the study group not eating enough protein, also the majority of them exposed to smoking, and drinking coffee or tea, but only one third of them practice exercise, while more than half of them exposed to sunlight.

Table 4. *Distribution of the females' risk factors related to osteoporosis (No:137)*

Items	Yes		No	
	No	%	No	%
Eating enough protein (twice/week)	38	27.7	99	72.3
Smoking (active or passive)	118	86.1	19	13.9
Practice exercise as walking	46	33.6	91	66.4
Drinking tea or coffee	127	92.7	10	7.3
Loss of appetite	29	21.2	108	78.8
Exposure to sunlight	78	56.9	59	43.1

Table (5)and figure (2), ***show*** that nearly half of the study group was overweight, while about one-third of them were obese.

Table 5. *Distribution of the females in relation to their body mass index BMI (No:137)*

body mass index (BMI)	No	%
20 - 25	23	16.8
25.1 - 30	66	48.2
30.1 - 35	32	23.4
35.1 - 40	16	11.6

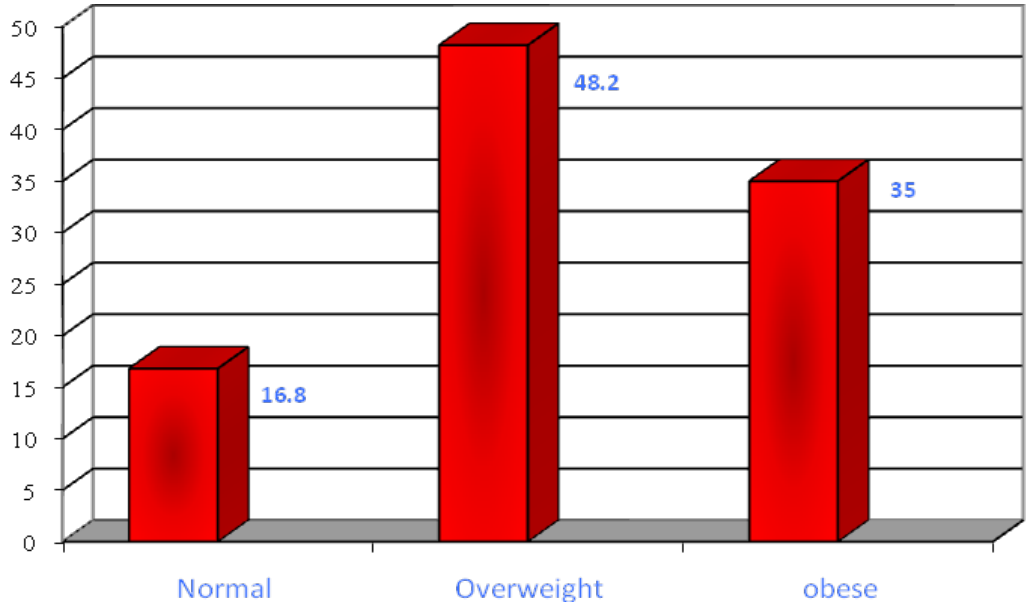

Fig2. *Percentage distribution of females in relation to their body mass index BMI (No:137)*

The study revealed that in ***tables (6,7,8),*** there is a statistically significant correlation was found between osteoporosis and age, educational level, occupation, family history, medical history as, history of falls, chronic illness, postmenopausal period, recurrence pregnancy. Also the study show that there is a statistically significant correlation was found between osteoporosis and risk factors as, eating protein, exposure to smoking, practice exercise, drinking tea or coffee, and body mass index (BMI).

Table 6. *The correlation between age, education, occupation, and osteoporosis*

Study variables	R	p
Age	0.214	0.001
Education	- 0.101	0.070
Occupation	0.112	0.060

Table 7. *The correlation between family, medical, obstetrical history andosteoporosis*

Study variables	R	p
Family history	0.195	0.060
History of falls	0.124	0.017
Chronic illness	0.112	0.060
Postmenopausal	0.184	0.012
Recurrence pregnancy	0.131	0.019

Table 8. *The correlation between females' risk factors related to osteoporosis and osteoporosis*

Study variables	R	p
Eating enough protein (twice/week)	- 0.175	0.041
Smoking (active or passive)	0.256	0.001
Practice exercise as walking	0.267	0.001
Drinking tea or coffee	0.121	0.023
Body mass index (BMI)	0.135	0.032

Regards to ***figure (3)***,it show that there were improvement of the study group in relation to the progress of signs and symptoms, Follow up of females progression rate of osteoporosis signs and symptoms done every 2 months after the application of the program, it show decrease in the progression rate of osteoporosis among the study group.

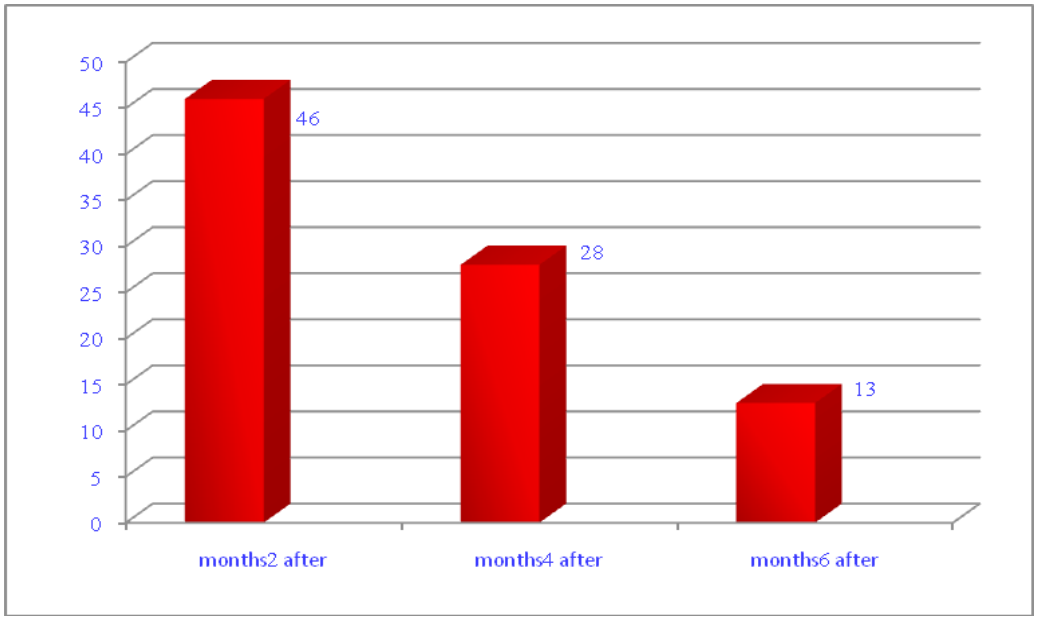

Fig3. *Follow up of females progression rate of osteoporosis signs and symptoms (No:137)*

Discussion

Osteoporosis is a growing major public health problem with impacts on quality and quantity of life that cross medical, social, and economic lines.[22] It is a systemic metabolic disease of the skeleton, characterized by adecrease of bone mass and impaired microarchitecture of bone tissue, leading to increased fragility and fractures. Some of the risk factors that have been described for osteoporosis, such as age, sex, and race, are intrinsic and therefore cannot be changed; others, such as diet, lifestyle, situations that increase the risk of falls, or the consumption of certain drugs, are extrinsic and can be modified. Moreover, the evaluation of several risk factors may be as important as the value of bone density screening. [23, 24]

The first step in the prevention of osteoporosis in women should be to make them aware of the risk factors. Adequate calcium and vitamin D intake, through diet and/or supplements, however, is critical for prevention of fractures in women with established osteoporosis because it constitutes a serious public health problem, which impacting families, communities, and health care services, it is associated with substantial excess morbidity. ***Alqahtani, (2014)*** and ***Yeap, (2010)***, reported that osteoporosis is considered as a major and growing public health problem in both sexes but particularly in women.[25, 26]

The results of the present study revealed that more than half of the study group their age ranged from 51-60 years, with a mean age of 51.2 ± 6.8 years. This result is highly supported by ***Kahsay et al., (2014),*** in Ethiopia; their study revealed that 51.5% of clients with osteoporosis were in the age group of 50-60 years. Also, the study found that there was a statistically significant correlation between the study group and their age. [27]On the same line, a recent study was done by ***Asaoka et al., (2015),***in Japan found that advanced age was a risk factor for osteoporosis. [28]

It was clear from these study findings that more than half (55.4%) of the study group have a basic educational level but nearly more than one third (38.0%) of the study group have an intermediate education. In accordance with the study done by ***Alquahtani, (2014),*** in Tabuk, found that, 58.7% of women who had osteoporosis can read and write only, also **Perez et al., (2014),** who made a study to assess risk factors of osteoporosis in Spanish women, revealed that osteoporosis was significantly associated with poor educational level. [25, 29]

As for the current study subject's occupation, It is found that more than three quarters (76.6%) of the study group are housewives, on the same line, ***Asaoka et al, (2015)***, found that 78.4% of were housewives, from the researcher point of view the large number of the housewives can increase their liability for osteoporosis due to lack of movement, also the study group from rural areas which might be contributes to the development of osteoporosis. [28] This view is in accordance with ***Kahsay et al., (2014),***who found that rural residents were 1.93 times more likely to develop osteoporosis, which might be related to high prevalence of malnutrition in rural areas.[27]

As regards to the study group satisfactory level of knowledge related to osteoporosis,the present study illustrated that the majority (88.0%) of the study group had satisfactory level of knowledgerelated to osteoporosis after the application of the preventive program compared to nearly one-tenth (11.2%) of them had satisfactory level of knowledge before the application of the preventive program. This finding was nearly equal with the study reported by ***El-Sharqawi (2015),*** who studied 650 women, to assess their satisfactory level of knowledge toward osteoporosis, and therelationship between their level of knowledge and progression of osteoporosis, revealed that there was an improvement of the level of knowledge after taking a comprehensive program, to increase their awareness about osteoporosis, also foundsignificant correlation between the satisfactory level of knowledge and progression of osteoporosis.[9]

Regarding family history related to osteoporosis, the present study revealed that nearly two thirds (67.2%) of the study group had a family history of osteoporosis. This result supported by ***Prasad et al., (2013),*** in

India, revealed a significant association between family history and the prevalence of osteoporosis. [30] On the same line, the study done by **Perez et al.*, (2014),*** on Spanish women, where osteoporosis associated with the family history that increase the probability of osteoporosis.[29] Also,***Jakobsen et al., (2013),*** who studied the risk factors of osteoporosis among populations in Greenland, found that the risk factors of osteoporosis as reported by the respondent were family history.[31]

The present study illustrated that the majority (86.1%) of the study group had a history of falls; the same results were reported by ***Gale et al., (2012),*** in Edinburgh, where more than three-quarters of the study sample experience a previous recurrent fall down. [32]Our results found that more than half (53.3%) of the study group had a chronic illness, this result is supported by ***Prasad et al., (2013),*** where a significant association between the estimated risk factors like chronic illness such as diabetes, hypertension, and ischemic heart disease, lack of exercise, family history and the prevalence of osteoporosis. [30] Also,a study was done by ***Jakobsen et al., (2013)***, found that osteoporosis was significantly associated with chronic diseases that increase the probability of developing osteoporosis. [31]

As regards to the females' obstetrical history, the study shows that nearly about two thirds (62.0%) of the study group were postmenopausal, while nearly one third (38.0%) of them were premenopausal. This finding is accepted from ***Alqahtani, (2014),*** in Tabuk showed that 66.1% of the study sample was postmenopausal. [25] In the same context, ***Jakobsen et al., (2013),*** in Greenland, revealed that age at menopause was among the risk factors for osteoporosis. [31]According to ***National Osteoporosis Foundation, (2009),*** Estrogen is a female hormone that plays an important role in the health of women, one of its benefits is that it protects women's bones and helps keep them strong and healthy, but when estrogen level drop; many women lose bone density. As result, bones may not be strong. For midlife women, the drop in estrogen that happens with menopause can lead to rapid bone loss causing osteoporosis.[33]

In relation to the number of delivery, it was found that about one third (33.6%) of the study group had delivered three or four times, and less than half (42.3%) of them had delivered five or six times. This result is highly supported by ***Kahsay et al., (2014),*** in Ethiopia revealed that recurrence delivery and abortion are major risk factors for early progression of osteoporosis.[27] On the same line ***Jahanbin, Aflaki&Ghaem, (2014),*** revealed a positive relationship between multi pregnancy and osteoporosis.[34]

Regarding the females' risk factors related to osteoporosis. The study shows that the majority (92.7%) of the study group were drinking coffee or tea. This study is in accordance with the study done by ***Kahsay et al., (2014),*** in Ethiopia revealed that, 77.7% of the study sample consume coffee or tea, and there was association between tea or coffee intake and osteoporosis, yet its consumption increase urinary calcium output and increase risk of osteoporosis that leads to fractures. [27]The study illustrated that, the majority of the study group exposed to smoking. This finding is accepted from ***Jakobsen et al., (2013), and Kahsay et al., (2014),*** they stated 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, it generates huge amounts of free radicals molecules that attack and overwhelm the body's natural defenses. [31, 27]

The present study illustrated that nearly three quarters (72.3%) of the study group not eating enough protein. In the same context, a study done by ***Londono et al., (2013),*** who found that risk factors for osteoporosis as reported by the respondents as lack of protein intake.[35] On the same line ***Jahanbin, Aflaki&Ghaem, (2014),*** in Iran revealed a significant correlation between the incidence of osteoporosis and dairy, white meat consumption. [34]Regarding practicing exercise, only one third (33.6%) of them practiced exercise, a significant association was found between lack of exercise, with the prevalence of osteoporosis. Also, the study was done by ***Etemadifar et***

al., (2013), in Iran found that the majority of the study sample didn't exercise regularly, a statistically significant correlation was found between osteoporosis and practicing exercise.[36] On the same line, the study was done by ***Gaur et al., (2015)*** on young Indian adults revealed a higher prevalence of osteoporosis amongst Indians as compared to the individuals from more developed countries.[37]

Results show that nearly half (48.2%) of the study group were overweight, while about one third (35.0%) of them were obese, this means that overweight and obesity were prevalent among the study group with astatistically significant correlation between osteoporosis and obesity. This result was supported by ***Asaoka et al., (2015),*** found that osteoporosis was significantly associated with weight gain, in fact, increase fat mass is associated with low total bone mineral density and 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. [28]

While assessing the effectiveness of the program; it was found that therewas an improvement of the study group in relation to the progress of signs and symptoms.Follow-up of females' progression rate of osteoporosis signs and symptoms done every 2 months after the application of the program, it shows a decrease in the progression rate of osteoporosis among the study group. This improvement may be a result of the wide varieties usage of educational methods as audiovisual materials, videos, lectures, and discussion as well as Arabic booklet which distributed at the end of sessions to be available to them everywhere and every time. [38] It is important that the educational materials be complete and accurate and that they be made available in a culturally and linguistic appropriate format.[39, 40] This is in line with EdgarDale's or the NTL's Pyramid of Learning as cited by Masters K. (2013) as the pyramid illustrated that individuals can retain 10% of what he read and 20% of what he sees and hear (audiovisual). The same author added that, ones can retain 50% of what he learned by discussion.[41, 42] In this respect, Masters K. (2013) &Yehetal. (2011) mentioned that it is widely cited that people will remember about 10% of what they hear, and about 20% of what they read.[41, 43]In the same line, our finding is agree with a study in the United State of America, conducted by ***Olds, S., & Davidson, M, (2014),*** who mentioned that after the application of osteoporosis preventive guidelines, there is an improvement of level of knowledge, as well as, more than half of the study sample had a satisfactory level of knowledge related to osteoporosis and had less progression of osteoporosis complication, signs and symptoms. [44]

Conclusion

The study concluded that the common risk factors identified were; family history, lack of exercise, exposure to smoking, drinking tea or coffee, body mass index, chronic illness, recurrence pregnancy, age at menopause was among the risk factors of osteoporosis. The research hypothesis illustrated that, after the application of the preventive program for the study group, they had decreased the progression of osteoporosis signs and symptoms gradually among female patients over 40 years after follow up every 2 months.

Recommendation

Based on the findings of the present research, the following recommendations are suggested:

1. Conduct continuous various educational programs for the high-risk women in the outpatient clinics to raise their awareness regarding causes, prevention & early detection and proper treatment of osteoporosis.

2. Design a simply illustrated guideline booklet in the Arabic language forthe high-risk group, about the effect of the preventive measure on the management of osteoporosis.

3. Replication of this study on a larger sample, on a broad area and different settings of the study is recommended in order to generalize the results.

References

1. Ball. Obstetric Nursing: Caring for Women. 4th ed. Upper Saddle River, N.J.: Pearson/Prentice Hall; 2012: 83.
2. The International Osteoporosis Foundation (IOF), (2014): Available at http://www.iofbonehealth.org/facts-statistics#category-28.
3. Bulechek S., & Ray R. Maternal and Neonatal Care.Journal of Obstetric, Gynecologic and Neonatal Nursing, 2007; 33(4), 563.
4. Jacobs K., Oldenburg B., Frendin S., &JonesG.The Design of a Valid and Reliable Questionnaire to Measure Osteoporosis Knowledge in Women, the Osteoporosis Knowledge Assessment Tool (OKAT). BMC Musculoskeletal Disorder, 2012; 4: 1-7.
5. Bureau S.& USAID.Maternal Child Health National Center for Health Statistics, Mortality Statistics branch.2012. http://www.mchb.hrsa.gov/ Child Health USA.
6. MiuraS., YagiM.,Saavedra R., & YamamotoN.An Epidemiological Analysis of the Incidence of Osteoporosis and Osteoporosis-Related Fractures, comparative study between male and females, 2010; 32: 637-641.
7. Clark M.Community Health Nursing, Advocacy for population health, Pearson Education, USA, 2008: 62-68.
8. Fouda G.Effect of health guidelines on progression of osteoporosis. International Journal of Gynecology and Obstetrics, 2014; 47(2): 99-108.
9. El-SharqawiL. The Higher Council for Academic Research Center.Women health in Egypt, 2015.
10. DeoK., NayakL., &RajpuraO.Women Knowledge, Attitude and Practices about Osteoporosis Prevention. World Journal of Medical Sciences, 2013; 11: 422-431.
11. HerrodA., Osteoporosis risk factors. Journal of Obstetric, Gynecologic, and Neonatal Nursing, 2015; 21(6):465-470.
12. Ahmed F. A model for initial care of osteoporotic women. Journal of Reproductive Medicine, 2013; 46(4): 409-426.
13. American College of Obstetricians & Gynecologists.Reproductive Health & complementary therapy application.2014; 552-567.
14. Hassan H. Infertility profile, psychological ramifications and reproductive tract infection among infertile women, in northern Upper Egypt. Journal of Nursing Education and Practice. 2016; 6(4): 92-108. https://doi.org/10.5430/jnep.v6n4p92.
15. Sheha E., Hassan H., Gamel W. Association between pre-pregnant overweight and obesity and periodontal disease during pregnancy: a cross sectional study. International Journal of Studies in Nursing, 2018; 3(1): 1-21. doi:10.20849/ijsn.v3i1.207.
16. Louise L. and Blue C. Public Health Nursing (Leadership, Policy and Practice), Delmar Cengage Learning, United State, 2008; 489.
17. Johnson S. New technology of reproductive system. Journal of Obstetric, Gynecologic and Neonatal Nursing, 2014; 45(7): 678-90.
18. Rebagliato M., Hemandez I., & Florey C.Journal of Epidemiological Community Health, 2011; 48 (1): 36-40.
19. Katz J, Lee C., Kozuki N., Lawn E.Mortality risk in menopausal woman low-income and middle-income countries: a pooled country analysis. Lancet, 2015; 382 (9890): 417-425.

20. Olds S., & Davidson M. Maternal newborn nursing & women health care, 7th ed. Mosby: London, 2004; 760-780.

21. Schuett S., &Foxall M. Women health and general developmental issues. Journal of Obstetric Gynecology and Neonatal Nursing, 2012; 25(1): 55-60.

22. Camacho P., Petak S., Binkley N., Clarke B., Harris S. American association of clinical endocrinologists and American college of endocrinology, Clinical practice guidelines for the diagnosis and treatment of postmenopausal osteoporosis – 2016: AACE/ACE Guidelines. Endocrine Practice, 2016; 22 (4):1-42.

23. The National Center for Health Statistics. The New Egyptian Journal of Medicine, 2009; 30 (4): 30-39.

24. VictoraG., AdairL., Fall C.Maternal and child health care, consequences for adult health and human capital. Lancet, 2014; 371(9609): 340-57.

25. AlquahtaniS.A study of knowledge of women toward osteoporosis in primary care in king Abdulaziz military hospital in Tabuk.International Journal of Medical Science and Public Health, 2014; 3(7).doi: 10.5455/ijmsph.2014.210420141.

26. Yeap M. Menopause and women health, past and present perspectives. Climacteric, 2010; 9(6): 421-429.

27. KahsayB., GasheE., DebessaiG., Tegegne A., &Tsigabu-Bezabih A. Risk factors of osteoporosis among adults in Ethiopia, the case of Tigrai region; A case control study. Journal of Public Health and Epidemiology, 2014;6 (2):92-100.

28. Asaoka D., Adami S., Gehlbach S. &ChapurlatD. Risk factors for osteoporosis in Japan: is it associated with Helicobacter pylori? Therapeutic and Clinical Risk Management, 2015; 381-391

29. Perez M.Assessing osteoporosis risk factors in Spanish menopausal women. Gynecological and Endocrinology Journal, 2014; 27(10):807-813.

30. Prasadl., PathakS., Piyush K., SyedM., &Peeyuusha D.The prevalence of osteoporosis and associated factors among health care professionals.Pravara Med Rev, 2013; 2(3).

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

32. GaleR., DennisonM., Edward M., SayerA.& Cooper C. Symptoms of anxiety or depression and risk of fracture in older people: the Hertfordshire Cohort Study; Archives of osteoporosis, 2012;7(1-2): 59-65.

33. National Osteoporosis Foundation. Hormones and Healthy Bones. Helping Midlife Women Make Better Choices for Healthy Future, 2009.

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

35. LondonoJ., Valencia P., SantosM., GutierrezF., Baquero R., &Valleonate R. Risk factors and prevalence of osteoporosis in premenopausal women from poor economic backgrounds in Colombia. International Journal of Women's Health, 2013; 5: 425-430.

36. EtemadifarR., NourianM., EsfahaniF., Shemshaki H., NourbakhshM. &Zarezzadeh A. Relationship of knowledge about osteoporosis with educational level and life habits. World Journal of Orthopedic, 2013; 4(3): 139-143

37. GaurS., Jakheria S., Chaturvedi S., Moolchandani D., Khajjia H. RaoJ., A study to reveal the effect of different factors on peak bone mass, of evidence based medical & health care, 2015;2(7).

38. Hassan H. Effectiveness of a structured teaching program on anxiety and perception regarding toxoplasmosis among seropositive pregnant women in Northern Upper Egypt. Clinical Nursing Studies. 2018; 6(1): 1-19. https://doi.org/10.5430/cns.v6n1p1

39. Foulon W., Naessens A., &DerdeP. Evaluation of the possibilities for preventing congenital toxoplasmosis. Am J Perinatol, 1994; 11, 57-62. http://dx.doi.org/10.1055/s-2007-994537.

40. PawlowskiS., Gromadecka-Sutkiewicz M., Skommer J., Paul M., Rokossowski H., Suchocka E., &Schantz M. Impact of health education on knowledge and prevention behavior for congenital toxoplasmosis: the experience in Poznan, Poland. Health Educ Res, 2001;16:493-502. http://dx.doi.org/10.1093/her/16.4.493.

41. Masters K. Edgar Dale's Pyramid of Learning in medical education: A literature review, Medical Teacher, 2013; 35(11): e1584-e1593, doi: 10.3109/0142159X.2013.800636.

42. Hassan H., Mohamady Sh., &Abd El-Gawad N. Protocol for improving nursing performance towards placental examination at labor units. Clinical Nursing Studies, 2017; 5(2): 1-11. http://dx.doi.org/10.5430/cns.v5n2p1.

43. Yeh M-K, Hsieh H-C, Chang S-H, Chen R, Tsai H-Y. Problem-based learning achievement of K-12 students participating in a nanotechnology hands-on works exhibition in Taiwan. Int J Cross-Discip Subjects Educ, 2011; 2(3):480-486.

44. Olds S., & Davidson M.Osteoporosis Health Beliefs and Self-Care Behaviors, An Exploratory Investigation. Journal of American Pharmacists Association, 2014; 46: 356-364.

Citation: **Sharbat Thabet Hassanine, Hanan Elzeblawy Hassan, Zainab Gazar Alkotb** *"Effect of Preventive Program on Progression of Osteoporosis among Female Patients over 40 years at El-Fayoum City". American Research Journal of Nursing. 2017; 3(1): 1-15.*