Bulletin of High Institute of Public Health
Vol. 37 No. 2 [2007]

Evaluation of the Impact of Educational Program on Elderly Knowledge about Osteoporosis

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Abstract Osteoporosis is a major public health affects or threatens an estimated 150 million women and men worldwide. Approximately 7% of all women aged 35-40 years and 33% of women older than 65 years have involutional osteoporosis. The World Health Organization define osteoporosis as "a skeletal disorder characterized by compromised bone strength predisposing to an increased risk of fracture." The aim of this study was to assess the elderly knowledge about osteoporosis and to evaluate the impact of educational program on elderly knowledge about osteoporosis. The study was carried out in El-Saada elderly club at Talkha, Mansura district. The study subject comprised 31 elderly visiting El-Saada elderly club regularly. A quasi experimental study was used in the study through evaluating the elderly knowledge about osteoporosis prior to the development of the educational program by using structured interview questionnaire sheet, after implementation of the program the same questionnaire was used to reassess the elderly knowledge immediately after program implementation and after one month of implementation. The results revealed a lack of knowledge which improved in the immediate post test but the knowledge declined after one month in some items. The study recommended that regular educational program should be held to increase their awareness, which helps them to catch the sign of the disease and prevent it. Key words: osteoporosis, elderly knowledge and educational program.

INTRODUCTION:

Osteoporosis is a systematic skeletal disorder, characterized by reduced bone mass, deterioration of bone structure, increase bone fragility and increased fracture risk.[1,2] This disease is a major threat to public health today and the most common bone disease world wide. By 2015, The National Osteoporosis Foundation predicts that 41 million people aged 50 years or older will have the disease unless something is done to improve diagnosis and treatment.[2] Osteoporosis affects more than 75 million people in Europe.[3] The prevalence rate of osteoporoses in Egypt was 5.237.182 persons in 2004[4

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The risk of developing osteoporosis among women doubles every 5 years, one in three women and one in eight men over the age of fifty are thought to be affected with the disease. After age 50, one in every two women and one in every four men will sustain some type of osteoporosis-related fracture [5,6].

Various risk factors are known to increase the rate of bone loss. These can be divided into three groups: Non-modfiable risk factors, modifiable risk factors and factors or causes related to other medical conditions or drug therapy. Non-modfiable causes of increased bone loss are increasing age, race**,** both sex are affected, family history, and significantly decrease of estrogen level after menopause around 25% and 75%, respectively. The bone mass in both sexes remains stable until age 45-55 years, The accelerated bone loss in women causes the loss of 25-30% of skeletal mass over 5-10 years, followed by a slower phase with stable loss rates of 0.5-1% per year. Males did not have an accelerated bone loss, but rather, a stable loss rate [7, 8]

While modifiable causes are inactivity (sedentary lifestyle), tobacco, use of colas, caffeine, reduced calcium intake, decreased production of active vitamin D, higher salt intake, and heavy alcohol intake. Medications associated with osteoporosis are glucocorticoids, drugs that induce hypogonadism, anticonvulsants, and excessively high levels of thyroid hormone. Also some diseases can increase the risk of osteoporosis: Crohn's disease, liver disease, rheumatoid arthritis, inflammatory bowel disease, lymphomas, multiple myeloma, thalassemia, acromegaly, amyloidosis, early

menopause, the removal of the ovaries, and leukemia.[8,9]

There are 2 types of osteoporosis type I (postmenopausal osteoporosis) — generally develops after menopause, when estrogen levels drop precipitously, leading to bone loss — usually in the ***trabecular*** (spongy) bone inside the hard cortical bone. Type I osteoporosis is characterized by increased bone resorption due to osteoclastic activity and is generally related to estrogen deficiency. Vertebral crush fractures and fractures of the distal radius (Colles fractures) are the main complications[10,11]. Type II osteoporosis (senile osteoporosis) occurs when there is excessive bone loss manifested after age 70 years in both women and men. Type II osteoporosis results from normal aging and is associated with a steady, 1-2% loss of cortical and trabecular bone mass each year. Age-related bone loss begins at age 35-40 years when the balance shifts to favor resorption and the skeleton begins to lose bone mass. Hip and vertebral fractures are most common in this type of osteoporosis.[12]

Osteoporosis is sometimes called the "silent disease", proceeded by minimal to almost zero symptoms. If the disease is not treated or prevented it may be painless until fracture occurs.[13] Most fractures created from osteoporosis take place in hip, spine, wrist, and ribs, yet the disease may affect any bone in the body which may lead to spinal deformity, height loss, chronic or sever pain, dependency, decreased lung capacity, difficulty of sleeping.[13,14] The National Osteoporosis Foundation states that osteoporosis can be prevented and can be effectively being treated before significant bone loss has occurred.

Osteoporosis can be significantly decreased by preventive measures such as stop smoking, avoid salt, avoid colas, and exercise daily [15,16]. Take an adequate dose of vitamin C (500 mg\day), vitamin D (800-1200 IU/day), calcium 1000-1500 mg/day calcium-to-protein ratio is 20:1 (mg calcium/g protein), magnesium (250 mg once or twice a day), vitamin K (500-1000 mcg/day), vitamin B-12, B6, folic acid, and avoid excessive animal meat. Although osteoporosis is often thought as an older person's disease, it can strike at any age.[17-22]

Therefore, nurses are in a position to play a pivotal role in supporting elderly and advising them about treatment and prevention of osteoporosis, as well as to make a significant contribution to research in this area and establish educational program to increase elderly awareness and to help in early detection.[23]

Aim of the study:

- To assess the elderly knowledge about osteoporosis.
- To increase elderly awareness about osteoporosis
- To evaluate the impact of educational program on the elderly knowledge about osteoporosis and its prevention.

DESIGN: A quasi experimental design was used in the study.

Setting:

The study was carried out in El-Saada elderly club at Talkha, in Mansura district on Tuesday for availability of large number of elderly in that day. The study lasted 6 months starting from January 2006 to June 2006**.**

Subjects:

The subject comprises 46 elderly out of 100 elderly who were attending El-Saada elderly club. 15 of them was excluded because 9 did not complete the program and 6 didn't came after one month for reassessment Just 31 elderly who are willing to complete the study,.

Tools of the study:

Two tools were developed to collect required data. Tool one consists of knowledge test and the second tool is the educational program.

I-Interview questionnaire:

Interview questionnaire was developed, based on the review of relevant literatures, to assess the elderly knowledge about osteoporosis. It comprises two parts:

1. Part One includes the sociodemographic data of the elderly such as age, sex, and level of education.
2. Part Two includes the essential knowledge assessment tool to assess the elderly about the diseases as regards definition, risk factors, signs and symptoms, sites, and prevention. The analysis was performed by scoring 1 for the correct response and 0 for an incorrect or don't know response. The total score of the test was 48 covering six topics namely; the nature of the disease, 31 scores (definitions of osteoporosis, occurrence, the risk factors, sites, and signs and symptoms) and 17 scores for prevention.

II-Educational program

Implement the educational program which included all topics about osteoporosis.

Methods:

1-Administrative process:

A-Official approval was obtained from the manager of the elderly club to conduct this study.

2-Development of the study tools:

a- The Structured interview questionnaire sheet was developed by researchers to assess the basic knowledge of the subject.

b- A jury was appointed to test content validity and clarity by 5 expertises in gerontology and nursing community field. The necessary modifications were done.

c- A pilot study was carried out on five elderly chosen randomly from El-Saada elderly club but excluded from the subject and are not included in the study to test feasibility of the tool.

d- Each elderly included in the study was informed about the aim of the study.

e- Oral consent was taken from the elderly engaged in the study.

3-Program development:

a- The result of pretest was used to assess the target group. The educational program covers all topics of osteoporosis, Namely: osteoporosis definition, risk factors, signs and symptoms, most affected sites, methods of prevention, and health teaching about diet, exercise, and vitamin D.

b- The program consists of 4 sessions divided on two days every session half hour. The program was repeated two times throughout two weeks for two groups of elderly one group included 15 elderly and the other group included 16 elderly.

c- A variety of interactive teaching techniques that encourage interactive group discussions, interactive lecture, and brainstorming. Trainers used power point presentation, flip chart, and distributed handouts

d- Reassess the elderly knowledge by using the same interview questionnaire, immediately after implementation of the program and after one month from the end of the program

Statistical Analysis

Data were analyzed using SPSS software version 13.0. The Kolmogorov-Smirnov test was used to examine the normality of the shape of knowledge score distribution. As the distribution was not normal, so non-parametric measures were used. The median together with median minimum and maximum were used rather than the mean. The Wilcoxon Signed Ranks test was used for paired comparison of knowledge score before and after intervention. The Mann-Whitney test was used for comparison of the median change in percentage knowledge score between the study groups. All reported *p* values are two-tailed. The level of significance was set at 0.05[24]

RESULT

Table (1) revealed the distribution of the studied elderly to their personal characteristics. As regards to age, the majority of the studied group was female (87.1%) and the minority was male (12.9%.) Regarding to age, 83.9% of them were categorized as young-old group and 16.1% categorized as Middle-old group while no one was categorized as old-old group. as Regards marital

status, the majority of the studied sample was widowed(61.3%) and the minority was not married (3.2%).Concerning their educational level, almost half of the sample had university degree while only 3.2% was illiterate and nearly three-quarters (74.2%) were housewives**.**

Table (2) shows the different knowledge scores in studied elderly related to osteoporosis topics before and after assessment, the knowledge scores regarding to base line definition, method, signs, symptoms, and sites ranged from 0-100% while the knowledge related to risk factors ranged from 55.6-88.9% while prevention ranged from 33.3-100% The knowledge at the first followup was increased to 100% regarding to definition, signs and symptoms, sites and prevention while risk factors ranged from 61.1-100 % but the method ranged from 33.3-100%.

Concerning second follow up, the knowledge declined but still significant in several items namely: definition, method of prevention, and risk factors.

Figure (1) represents knowledge of elderly before and after the educational program. This figure revealed that there was lack of knowledge related to the majority of topics namely: pathphysiology, risk factors, manifestations, location, and prevention except in definition they were aware of it before the program. While there was gain of knowledge of all topics after educational program in the first assessment. But a decline in knowledge was noticed related to risk factors in the second assessment

Table (3) demonstrates the relation between elderly knowledge score and personal characteristics. None of the factors showed significant effect on

knowledge score except education. The faculty level showed significantly higher median score (72.45%) in comparison to the secondary level or lower educational level (53.06%). On the other hand, the change in knowledge level whether at first follow-up visit or at one month did not show any statistical significant difference by sociodemographic factors.

DISCUSSION

Osteoporosis is a disease reaching epidemic proportions in the elderly population especially among postmenopausal women. Women of all ethnic and racial origins are affected, as men and younger women.[2,5] The risk of osteoporosis increases after the age of 65 and fracture risk doubles for each additional 5-10 years of age. International Osteoporosis Foundation World Congress 2002[5] revealed that the fight against osteoporosis is a fight to liberate millions of people, over 200 million people worldwide suffer from this disease, and the majority of them were women that profoundly restrict life's opportunities[5,25]. Healy 2000[26] illustrated that the first priority lies in prevention of osteoporosis.

The present study revealed lack of knowledge among elderly related to osteoporosis topics including types of osteoporosis, signs and symptoms, sites affected and preventive measures which is agreed with other studies in El-Salvador 2004[27], African-American women[28], USA, North Europe[29], and Canadian which illustrated that the elderly women have poor knowledge about the osteoporosis.[30] On the other hand, the study in Salvador 2004[27] showed that women with secondary or higher education obtained significantly higher total knowledge scores. This was

in agreement with the present study which showed that higher educational level showed significant higher median score.

As regards to risk factors associated with osteoporosis the present study revealed that more than fifty percent of elderly have knowledge about risk factors, which was different from other study carried out in Mexico[31], which found that the women had lack of knowledge about risk factors, the main focus was menopause is the only cause associated with osteoporosis. While other studies in USA & North Europe revealed that most of the studied women were not aware about risk factors of osteoporosis.[29]

It was observed in the present study that the elderly people located in two categories young–old 60-74 and middle-old 75-84 but no one was old-old (85+) this may be due to that the expectancy at birth in Egypt is 70.1 years at 2004[32].

Osteoporosis and associated fracture became a chronic burden on individual and society, therefore, it is important to increase community and elderly awareness about osteoporosis and the prevention which can be done through educational program. There lore educational program have been identified as a crucial strategy in the prevention[23].

This study demonstrates that educational program increases elderly knowledge and awareness about osteoporosis and its prevention which agree with the previous studies. Also they indicted that educational program provides a basis of knowledge about osteoporosis. In addition, two studies were done in Hong Kong 2006[33,34], revealed positive effect of osteoporosis

educational program on women and men knowledge. This is in agreement with the present study which illustrated that the elderly knowledge and awareness increased after educational program regarding osteoporosis items, but the knowledge declined in second assessment regarding to risk factors only which indicates that although their ability to retained knowledge decreased with age they still aware that disease threatens the public and threatens the elderly so it is as important to take preventive action toward osteoporosis.

CONCLUSION

The study concluded that the elderly people had lack of knowledge related to osteoporosis**,** while a positive effect was noticed after the educational program there was declined in knowledge related to risk factors at second assessment. As regard as sociodemographic factors. None of the factors showed significant effect on knowledge score except education, the faculty level showed significantly higher. Also the change in knowledge level whether at first follow-up visit or at one month did not show any significant difference by sociodemographic factors.

REOMMENDATIONS

1-Education messages targeted to postmenopausal women that identify risk factors, promote regular exercise and physical activity, intervention, and treatment strategies are recommended

2-Its suggested to provide each elderly with booklet containing types of osteoporosis, sites, signs , symptoms, risk factors, and prevention.

3- The study is recommended that osteoporosis education campaigns should be directed at families as well as individuals, to educate children about the importance of calcium in the diet, whether as dairy products or in other calcium-rich

products such as Soya milk, vegetables,

and fruits

Table 1: Distribution of the studied elderly according to their personal characteristics

Personal characteristics	Frequency N=31	%
Gender		
Female	27	87.1
Male	4	12.9
Age		
Young-old 60-74	26	83.9
Middle-old 75-84	5	16.1
Total	31	100
marital status		
widow	19	61.3
married	11	35.5
not married	1	3.2
Education		
illiterate	1	3.2
primary school	4	12.9
preparatory school	1	3.2
secondary or middle school	9	29.0
faculty education	16	51.6
Occupation before retirement		
housewife	23	74.2
employee	8	25.8

N.B There was not any one have 85years old or more old-old-85

Table 2: The difference of knowledge scores in studied elderly related to osteoporosis topics before and after educational program

Subscales	**Baseline**	**First follow-up**	**Second follow-up**	Wilcoxon Signed Ranks Test		
	Median (Min - Max)	**Median** (Min - Max)	**Median** (Min - Max)	1 *Vs* 2	1 *Vs* 3	2 *Vs* 3
Definition	**100** 0 – 100	**100** 100 – 100	**100** 66.67 – 100	3.13*	1.06	3.00*
Types	**33.33** 0 – 100	**66.67** 33.33 – 100	**66.67** 33.33 – 100	2.91*	4.21*	2.36*
Risk factors	**55.56** 55.6 - 88.89	**100** 61.11 – 100	**61.11** 55.6 – 100	3.21*	1.94	1.33
Sign& symptoms	**5.00** 0 – 100	**100** 100 – 100	**100** 0 – 100	3.85*	1.73	2.40*
Sites	66.67 0 – 100	**100** 100 – 100	**100** 0 – 100	3.57*	1.60	2.25*
Prevention	**94.44** 33.33 – 100	**100** 100 – 100	**100** 33.33 – 100	3.23*	1.30	2.38*
Total	**69.39** 28.57 - 93.88	**97.96** 81.63 - 100	**85.71** 30.61 - 100	4.30*	2.28*	1.67

- P < 0.05 (Significant)

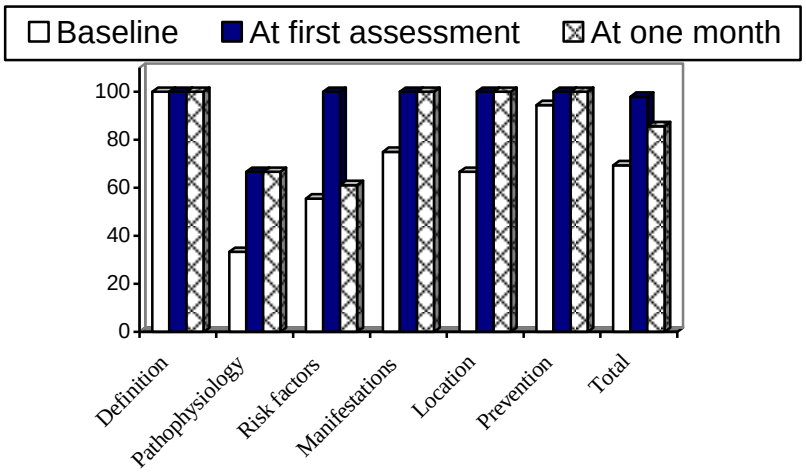

Figure 1 knowledge of elderly before and after the educational progra

Table 3: The relation between elderly knowledge score before and after program and there characteristics

Characteristics		n	Base line	First follow-up - Baseline	Second follow-up - First follow-up
			Median(Min/ Max)	**Median**(Min/ Max)	**Median**(Min/ Max)
Total		31	69.39(28.57 / 93.88)	22.45(-8.16/71.43)	-4.08(-55.10/18.37)
Age	Young old Middle-old	26 5	69.39(28.57/89.80) 75.51(44.90/93.88)	25.51(-8.16/71.43) 12.25(6.12/55.10)	-4.08(-55.10/18.37) 0(-14.29/18.37)
Mann-Whitney test			0.59	0.46	1.19
Sex	Male Female	4 27	67.35(44.90/93.88) 69.39(28.57/89.80)	23.47(6.12/55.10) 22.45(-8.16/71.43)	-9.18(-14.29/0) -4.0816(-55.10/18.37)
Mann-Whitney test			0.50	0.00	0.33
Education	Below secondary secondary or higher	6 25	61.22(44.90/81.63) 71.43(28.57/93.88)	29.59(0/55.10) 20.41(-8.16/71.43)	1.02(-55.10/18.37) -4.08(-51.02/18.37)
Mann-Whitney test			0.40	0.23	1.49
Marital status	Married Unmarried	11 20	67.35(38.78/93.88) 70.41(28.57/89.80)	32.65(-8.16/61.22) 21.43(0/71.43)	-4.08(-51.02/6.12) -4.08(-55.10/18.37)
Mann-Whitney test			0.06	0.12	0.71
Occupation before retirement	Housewife Employee	23 8	67.35(28.57/89.80) 81.63(44.90/93.88)	28.57(-8.16/71.43) 16.33(0/55.10)	-4.08(-55.10/18.37) -9.18(-16.33/2.04)
Mann-Whitney test			1.76	0.93	0.48

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