

Effect of Educational Nursing Intervention About Osteoporosis on Adult's Knowledge

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Abstract: Osteoporosis is a worldwide health problem affecting more than 200 million people. Female are at high risk for disease because female have lower bone mass and smaller bones than men", adding menopause period lead to intense reduction into estrogen level and lose calcium more rapidly. The aim of this study is to determine the effect of educational nursing intervention about osteoporosis on knowledge of adults. A quasi experimental research design with pre posttest was utilized to achieve the aim of study. The study was conducted at orthopedic outpatient's clinic at Menoufia University Hospital. A purposive sample of 300 adult and their relative attended for orthopedic outpatient clinic were undertaken. An instructional interviewing questionnaire used to assess knowledge about osteoporosis. It consisted of 3 parts: Part one for socio demographic data, Part two for medical history and part three for knowledge about osteoporosis The studied subjects had inadequate knowledge (100%) in the pre educational intervention while after the nursing educational intervention program, three quarters of them were adequately educated, and only 25% were inadequately educated. The educational intervention has a positive effect on adult's knowledge about osteoporosis. Educational intervention about osteoporosis should be held periodically. Educational program should be published through mass media.

Keywords: Osteoporosis, Educational Intervention, Knowledge

1. Introduction

Osteoporosis is a bone disease associated with decrease bone mass and weakness of the skeleton that lead to bone fragility and fractures. It is a most common cause for disability and death, especially in post-menopausal women and advanced age in men [1]. Early diagnosis can minimize the risk of fracture and generally socio-economic load [2]

Osteoporosis is a worldwide health problem affecting more than 200 million people. Female are at high risk for disease because female have lower bone mass and smaller bones than men", adding menopause period lead to intense reduction into estrogen level and lose calcium more rapidly than men [3].

In Egypt, Osteoporosis is a measurable health problem so,

many studies about osteoporosis documented that 53.9% of postmenopausal women have osteopenia whilst 28.4% have osteoporosis [4]. While in the men 21.9% have osteoporosis, at the aged between 20-89 years [5]. On the other hand, in 2014 Mohammed documented that the percentage incidence of osteoporosis among Egyptian population is 10% [6].

Osteoporosis has risk factors, which divided into modified risk factor, non-modified risk factor. Non modified factor as gender, age, race, family history of osteoporosis, hormone, postmenopausal status and body frame size but modified risk factors as nutrition, lifestyle [7]. National osteoporosis foundation (2011) [8] stated that modified risk can be changed through life style modification. Bad lifestyle as

smoking, physical inactivity, low calcium and vitamin D intake, drinking alcohol and caffeine which lead to loss of calcium through kidney result.

The disease started “silently” and progressively, without appearance of any symptoms until fracture occurs, usually at the wrist, hip or spine. Osteoporotic fractures affect quality of life negatively and often result in pain, loss of function and, in the worse cases, death. The impact of the disease on relatives should not be ignored, as they must allocate time and energy helping a family member who lacks autonomy [9]

"Although osteoporosis affect a large numbers of adult both sex, but it consider a preventable disease, health education about osteoporosis is very essential intervention for advance knowledge which needed to encourage health life style as a primary interventions for osteoporosis prevention, as a result of extensive denomination from both adult sex unacquainted with information about osteoporosis prevention [10].

Life style modification through correct or balance diet and performing activity has an important role in reducing or eliminate risk of osteoporosis. Diet should contain micronutrients as calcium, magnesium, phosphorus, sodium, potassium, various trace elements, vitamins and macronutrients as protein and fatty acids are important elements to prevent the risks of bone fractures, these nutrients and food ingredients have a positive or negative impact on bone health [3, 5, 6].

Physical activity is the greatest important role that improving strength of bone, flexibility of joint, minimize incidence of fracture in people at high risk, weight bearing exercise as walking is the best example, three or four time per week for 30 minute has a positive effect in reducing osteoporosis [11].

Educational programs for the community awareness to osteoporosis demonstrated that a greatest achievement in acquire knowledge and developed health behavior for disease prevention, so Great responsibility rests with the nurses to contribute in prevention of osteoporosis [12].

1.1. Significance of the Study

Every 3 seconds osteoporotic hip fracture occurs as a serious complication to osteoporosis, annually it affect 200 million women and 8.9 million client in the world had fracture by it, this fracture increase mortality and morbidity by decrease client quality of life due to, prolonged hospital admission and the client mostly treated by surgical intervention so increasing in directly and indirect cost [3, 4, 5]

1.2. Aim of the Study

To determine the Effect of Educational Nursing Intervention about Osteoporosis on Knowledge of Adults.

1.3. Research Hypothesis

There will be change of knowledge about osteoporosis after Educational Nursing Intervention.

2. Subjects and Methods

2.1. Design

A quasi experimental research design with pre posttest was utilized to achieve the aim of study.

2.2. Setting

The study was conducted at orthopedic outpatient's clinic at Menoufia University Hospital.

2.3. Subjects

A convenience sample of 300 adult and their relative attended for orthopedic outpatient clinic were undertaken who fulfilled the following inclusion criteria:

- Age (18-60 years old)
- Able to participate in the study.

Exclusion criteria: free from any signs & symptoms of osteoporosis

2.4. Tool

To achieve the aim of study one tool was utilized to collect the data:

2.4.1. Tool I

An instructional interviewing questionnaire to assess knowledge about osteoporosis. It consisted of 3 parts:

Part one; Socio demographic data which include information about age, sex, marital status, level of education.

Part two; Medical history which includes items about present of chronic disease, medication, and vitamin – information related female about menstruation.

Part three; knowledge about osteoporosis such as definition, Causes, risk factor, symptoms, prevention and treatment.

2.4.2. Scoring

The questionnaire contained, items related to the patients' demographic criteria, medical history, as well as 40 patients' knowledge assessment items each was two points Liker scale (1–2) as (2) for incorrect answer and don't know, (1) for correct and complete answer. The questionnaire was evaluated giving a total score of 1-40. The total score of each subject was categorized arbitrary into “adequate knowledge” when the patient achieved less than or equal $\leq 50\%$ of the total score, and inadequate knowledge was considered when the student achieved more than $> 50\%$ of the total score.

2.5. Methods

- The study was conducted over a period of six months from January 2016 to June 2016.
- A written Approval was obtained from responsible authorities after explanation the purpose of the study.
- Tool was constructed by the researchers after reviewing of relevant literatures and was tested for content validity by 5 experts in Medical Surgical Nursing.
- A consent was obtained from subject to gain his / her

cooperation. Each participant has a right to withdrawal from the study without any effect on their hospital routine care.

- A pilot study was carried out before starting the actual data collection. The purpose of the pilot study was to ascertain the clarity and applicability of the study tool and to identify the obstacles and problems that may be encountered during data collection. It also helped to estimate the time needed to fill in the questionnaire. Based on the results of the pilot study modifications, clarifications, omission and rearrangements of some questions were done. A pilot study was carried out on 30 adult patients and relative. The sample of pilot study was excluded from the total sample to assure the stability of the result.
- Data collection:
- The researchers organized the subjects into small group for interview, which consisted of (4-6) adult participant who fulfilled the inclusion criteria and the researchers explained the purpose of study.
- Pretest was applied to assess knowledge of participant about osteoporosis.
- The educational intervention was delivered by the researchers at one session for one hour; this session clarify information about definition, causes, risk factor, manifestation, prevention through life style modification(exercise –diet allowance and not allowance) and management of osteoporosis. Before

the researchers close the session they asked the subjects for any question or for further clarifications.

- The researchers gave each participant colored booklet illustrated information with pictures for more clarification about osteoporosis.
- The researchers followed the participants by telephone to know the next orthopedic clinic visit for interviewed them again to apply posttest questionnaire.

2.6. Statistical Analysis

Data was coded and transformed into specially designed form to be suitable for computer entry process. Data was entered and analyzed using SPSS (Statistical Package for Social Science) statistical package version 16. Graphics were done using Excel program.

Quantitative data were presented by mean (X) and standard deviation (SD). It was analyzed using student t- test for comparison between two means, and ANOVA (F) test for comparison between more than two means.

Qualitative data were presented in the form of frequency distribution tables, number and percentage. It was analyzed by chi-square (χ^2) test. However, if an expected value of any cell in the table was less than 5, Fisher Exact test was used(if the table was 4 cells), or Likelihood test (if the table was more than 4 cells). Level of significance was set as P value <0.05 for all significant tests.

3. Results

Table 1. Frequency distribution of socio-demographic data of studied sample (N=300).

Socio-demographic data	NO	%
Age:		
15-30 years	56	18.7
31-45 years	126	42.0
46-60 years	118	39.3
Sex:		
Male	97	32.3
female	203	67.7
Educational level:		
Illiterate	2	0.7
Primary	48	16.0
Secondary	188	62.7
university	62	20.7
Marital status:		
Single	39	13.0
Married	212	70.0
Widowed	39	13.0
divorced	10	3.3
Family size:		
Less than five	220	73.3
Five or more	80	26.7
Income:		
Enough and more	45	15.0
Enough to necessary needs only	179	59.7
Not enough	76	25.3
Total	300	100.0

Table 1: This table showed that, Frequency distribution of socio-demographic data of studied sample where the main

age group was 31-45 years that constituted 40% of studied sample and 18.7% for age group of 15-30 years. More than

two third of the sample were females and 62.7 of studied sample were have secondary education. About seventy three percent of the sample were have family size less than five. Income was enough to necessary needs only for 59.7 of studied sample.

Table 2. Frequency distribution of medical history of studied sample (N=300).

Medical history	NO	%
Family history of osteoporosis:		
Yes	44	14.7
No	256	85.3
Having fracture before as a result of falling:		
Yes	76	25.3
No	224	74.7
Current complain from any disease:		
Diabetes	42	14.0
Hypertension	36	12.0
Liver disease	17	5.7
Kidney disease	10	3.3
Problem in digestion	6	2.0
Other	35	11.7
More than one problem	57	19.0
Don't have	97	32.3
Taking any medication for a long time:		
Yes	119	39.7
No	181	60.3
Take vitamin or dietary supplement:		
Yes	77	25.7
No	223	74.3
Total:	300	100.0

Table 2: This table illustrated that, frequency of medical history of studied sample. Just 14.7% of the sample was having family history for osteoporosis. One quarter of the subjects were having fractures before as a result of falling. More than two third of studied sample (67.7) were complained from chronic disease in which diabetes and hypertension were most common. Sixty percent of the sample was taking medication for a long time while approximately one quarter of them were taking vitamin or dietary supplement.

Table 4. The relation between pre intervention knowledge group with post intervention knowledge group.

		Knowledge post intervention groups		Total
		Adequate knowledge (1-20)	Inadequate knowledge (21-40)	
Knowledge group pre intervention	Inadequate knowledge (21-40)	225	75	300
		75.0%	25.0%	100.0%
Total		225	75	300
		75.0%	25.0%	100.0%

NB: No statistics are computed because Knowledge group's pre intervention is a constant. The table highlighted that 100% of studied sample showed inadequate knowledge about osteoporosis pre educational intervention program,

Table 3. Female associated history (N= 203).

Items	NO	%
Is period regular?		
Yes	139	68.5
No	64	31.5
Stop of period for six months:		
Yes	37	18.2
No	166	81.8
Stop period before age of 45 years:		
Yes	8	3.9
No	195	96.1
Did hysterectomy or overectomy:		
Yes	9	4.4
No	194	95.6
Taking contraceptive pills:		
Yes	10	4.9
No	193	95.1
Total	203	100.0

Table 3: This table illustrated that, female associated risk factors. Near to third of the sample were have irregular menstruation. Females who have stopped period for six months were 18.2%, while only 3.9% of them were have their period stopped before age of 45 years. Just 4.4% were having hysterectomy or overectomy and 4.9% were taking contraceptive pills.



Figure 1. Percent distribution of pre intervention knowledge group.

Figure 1: this figure showed that, percent distribution of pre intervention knowledge group. The figure highlighted that 100% of studied sample showed inadequate knowledge about osteoporosis.

while after the nursing educational intervention program, three quarters of them were adequately educated, and only 25% were inadequately educated.

Table 5. Effect of socio-demographic data on knowledge total score post intervention groups.

		Knowledge post intervention groups		Total	P value
		Adequate knowledge (1-20)	Inadequate knowledge(21-40)		
Age groups	15 - 30 years	26 46.4%	30 53.6%	56 100.0%	X ² =36.6, P=0.000 HS
	31 -45 years	94 74.6%	32 25.4%	126 100.0%	
	46 -60 years	105 89.0%	13 11.0%	118 100.0%	
sex	male	74 76.3%	23 23.7%	97 100.0%	X ² =0.12, P=0.72 NS
	female	151 74.4%	52 25.6%	203 100.0%	
Education level	illiterate	0 .0%	2 100.0%	2 100.0%	LR*=8.9, P=0.03 Sig.
	primary	36 75.0%	12 25.0%	48 100.0%	
	secondary	137 72.9%	51 27.1%	188 100.0%	
	university	52 83.9%	10 16.1%	62 100.0%	
Marital status	single	16 41.0%	23 59.0%	39 100.0%	LR*=73.5, P=0.000 HS
	married	170 80.2%	42 19.8%	212 100.0%	
	widowed	39 100.0%	0 .0%	39 100.0%	
	divorced	0 .0%	10 100.0%	10 100.0%	

Table 5. Continue.

		Knowledge post intervention groups		Total	P value
		Adequate knowledge (1-20)	Inadequate knowledge(21-40)		
Residence	rural	83 77.6%	24 22.4%	107 100.0%	X ² =0.59, P=0.44 NS
	urban	142 73.6%	51 26.4%	193 100.0%	
Family size	less than five	171 77.7%	49 22.3%	220 100.0%	X ² =9.7, P=0.008 Sig.
	more than five	54 67.5%	26 32.5%	80 100.0%	
	enough and more	25 55.6%	20 44.4%	45 100.0%	
Income	Enough to necessary	146 81.6%	33 18.4%	179 100.0%	X ² =13.8, P=0.001 Sig.
	needs only	54 71.1%	22 28.9%	76 100.0%	
	not enough	225 75.0%	75 25.0%	300 100.0%	

Table 5: This table illustrated that, Effect of socio-demographic data on knowledge total score post intervention groups. There was a statistical significant difference related to age where the great percentage of adequate knowledge

was among age group of 46-60 years. About eighty percent of married subject were have adequate knowledge. Also more than three thirds of studied sample who were have adequate knowledge their families were less than five members.

Table 6. Effect of attending educational program about osteoporosis on post intervention knowledge groups.

		Knowledge post intervention groups		Total	P value
		Adequate knowledge (1-20)	Inadequate knowledge (21-40)		
Attend educational program	yes	63 86.3%	10 13.7%	73 100.0%	X ² =6.6 P=0.01 Sig.
	no	162 71.4%	65 28.6%	227 100.0%	
	Total	225 75.0%	75 25.0%	300 100.0%	

Table 6: this table showed that, effect of attending educational program about osteoporosis on post intervention knowledge groups. Majority of the sample who had attended

an educational program about osteoporosis were having adequate knowledge.

Table 7. Relation between knowledge post intervention groups and physical activity.

Physical activity after nursing intervention		Knowledge post intervention groups		Total	P value
		Adequate knowledge (1-20)	Inadequate knowledge(21-40)		
physical activity is low	Yes	107 47.6%	43 57.3%	150 50%	X ² =2.2 P=0.14 NS
	No	118 52.4%	32 42.7%	150 50%	
	Transportation	27 12.0%	6 8.0%	33 11.0%	
Going to work by:	walking	106 47.1%	42 56.0%	148 49.3%	X ² =2.1 P=0.35 NS
	walking and transport	92 40.9%	27 36.0%	119 39.7%	
	walking for 30 min daily	93 41.3%	0 .0%	93 31.0%	
Most activity is:	walking more than30 min daily	132 58.7%	75 100.0%	207 69.0%	LR=78.8 P=0.000 HS
		225	75	300	
Total		100.0%	100.0%	100.0%	

Table 7: this table revealed that, Relation between knowledge post intervention groups and physical activity. There was a statistical significant difference related to walking as a type of physical activity.

4. Discussion

Regarding to Scio demographic data, the current study presented that the majority of participant were female, most of them at the age 31 to 60 years old. This was agreement with Kahsay, et al., 2013 [13] who stated that more than half of sample in this study were female at the age of 40 to 50 years old. This may be women at a high risk of osteoporosis due to reduction of estrogen which lead to decrease calcium in bone & also with the aging process bone become thinner which is predisposing factor to osteoporosis. The present study stated that, three quarter of studied sample had no history of fracture. This was consistent with National Institute of Heath, 2015 [14] who stated that people who had past history of fracture liable to osteoporosis disease over the age of 50 years old.

As regarded to knowledge of subjects, the present study assessed knowledge about osteoporosis before and after educational intervention, it found 100% of participant had inadequate knowledge while post intervention three quarter of them had adequate knowledge, this result was in the same line with Tahir et al; 2016 [15] who stated that the mean knowledge score was improved post intervention. In addition to Sanaeinasab, 2013 [16] who revealed that the mean knowledge score was significantly improved after educational intervention. This may discussed as educational intervention help to open mind and allow the participant to discuss with the researchers about any information related to the disease, which led to increase knowledge of participant.

Concerning effect of socio-demographic data on

knowledge total score of post intervention groups, the current study showed that related to age the most of participant at the age of 45 years old and more had adequate knowledge, this result was similar to result of Rodzik, 2008 [17] who found that the older people had improvement of knowledge score than younger. This is due to their biggest and great concern for study and Facebook and have no block to listen to an educational program, while the older people in need of this information in addition to that they have enough time to attend the educational program

Regarding gender the present study clarified that there was no significant difference between women and men regarding knowledge. This result was in contrast with Werner, 2005 [18] who stated that women had adequate knowledge than men. This may be due to number of attended men less than women as they represent about one third of the sample in the present study.

Regarding educational level the current study revealed that there was significant difference related to level of education and knowledge of osteoporosis. This result was in agreement with Etemadifar, 2013 who presented that women with a higher education level have significantly better knowledge about osteoporosis than women with a lower educational level. While this result was contrast with May, et al 2010 [19] who found that, there was no significant correlation between education level and osteoporosis knowledge. This is probably due to the greater level of education led to the understanding and the acquisition of information

The present study revealed that there was significant difference related to marital status and knowledge of osteoporosis, married participant had higher adequate knowledge than other. This result was in the same line with Zakai, 2015 [20] who presented that married subjects were more knowledgeable about osteoporosis than single. This is due to married women had loss of calcium during pregnancy

& delivery, so women especially married had careful attention about any information about osteoporosis,

Regarding to income; the current study showed that there was significant difference related to income & knowledge, sample had enough & low income had better information. This result was consistent with the study by Zakai, 2015 [20] this study revealed that participant included in study that fall in the low economic level have a better knowledge about osteoporosis. This result explained as these groups of participant always go to hospitals or clinics to seek them; so, they can gain information by a doctor and nurse. Furthermore, information obtained from the researcher

The current study illustrated that participant who attended educational program had adequate knowledge rather than not attended. This result was in the same line with Werner, 2005 [18] who noted that people who previously received knowledge were more knowledgeable about the disease than those who hadn't any information previously.

Regarding physical activity the present study revealed that, there was a statistical significant difference related to walking as a type of physical activity post educational nursing intervention. This result was agreement with Bonaiuti et al; 2002 & Yamazaki. 2004, [21, 22] who stated that, the majority (86.5%) of the studied sample knew that walking had an important role in healthy bone; it has impact on bone density. In addition to Hossein, 2014 [23] who described that walking build a stronger bones and muscles and can be used to increase strength, flexibility and balance. Also stated that, Participant identified that regular exercise can protect against osteoporosis, but this knowledge did not translate to practices.

5. Conclusion

The educational intervention was successful in building the information and knowledge about osteoporosis. After educational intervention three quarter of the subjects become have adequate knowledge rather than before intervention.

Recommendation

Educational intervention about osteoporosis should be held periodically. Educational program should be published through mass media.

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