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Knowledge about Osteoporosis among healthy women attending a tertiary care hospital

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Abstract

Introduction: To determinate the knowledge on osteoporosis-risk factors and disease in three age groups of Pakistani women.

Methods: In this exploratory cross-sectional study, an osteoporosis knowledge assessment questionnaire (OKAT) was used to collect data and it was delivered through a face-to-face interview. Questions were asked about symptoms of osteoporosis, knowledge of risk factors, preventive factors and treatment. A convenience sample (n =320) comprising of three groups of healthy women aged 25-35 years, 36-45 years, and over 45 years was taken. The scoring range was 0 to 20. Among-group comparisions of means were analyzed by two-way ANOVA. To determine the overall influence of osteoporosis-risk factors, the multivariate analysis was used.

Results: The knowledge on osteoporosis in younger women was very poor compared to relatively older females. However, women belonging to higher socioeconomic status and better education had slightly more knowledge about osteoporosis compared to those with a low education level, regardless of age.

Conclusion: The majority of women had modest knowledge on osteoporosis. Younger women were at increased risk for low bone mass and premature osteoporosis (JPMA 58:190;2008).

Introduction

Osteoporosis is a major and growing public health problem in both sexes but particularly in women.[1,2] It is a systemic skeletal disorder, characterized by reduction of bone mass, deterioration of bone structure, increasing bone fragility, and increasing fracture risk.[3-5] It is a major cause of fractures in elderly, resulting in pain, disability, costly rehabilitation, poor quality of life, and premature death.[6]

Developing countries continue to be ill-equipped to handle burden of the disease. This coupled with poor literacy rates and lack of awareness on the risk factors and symptoms results in poor outcomes.[7]

Several risk factors for osteoporosis have been identified. These include female sex, Asian or Caucasian race, advancing age, family history of osteoporosis or fragility fractures, a low body mass index, menopause before age 45 years, prolonged amenorrhea unrelated to menopause, nulliparity, prolonged lactation, diet low in calcium and vitamin D, poor intestinal absorption of

calcium, lactose intolerance, excessive caffeine or alcohol consumption; smoking, sedentary life style, and prolonged treatment with thyroid hormones, glucocorticoids, anticonvulsants, aluminum antacids, and use of anticoagulants.[4,5,8]

A study on US women over 25 years age showed that knowledge about osteoporosis was limited.[9] Asian women living in Australia had lower calcium intake (< 800 mg/day) and their knowledge about osteoporosis was poor.[10]

There is evidence suggesting that knowledge on osteoporosis is a major contributor to osteoporosis preventive behaviour. Few studies have randomly reported levels of osteoporosis knowledge, in population-based samples.[11-14] None of these have utilized validated instruments to measure osteoporosis knowledge. Information available about the psychometric properties of the tools used was limited.

Approximately 20% of bone mass is genetically determined; however, the risk of osteoporosis can be reduced by optimizing bone mass increasing during youth, conserving bone mass during adulthood and minimizing bone mass loss during advancing age. Among most important preventive habits are a) weight-bearing exercise (e.g. going up and down stairs, jogging, aerobics, swimming, and isometrics for at least 30 minutes daily), b) diet or supplements containing adequate levels of calcium and vitamin D, and c) absence or cessation of smoking and no greater than moderate alcohol and/or caffeine consumption.[15,16]

Osteoporosis prevention programmes for the young women have the potential to reduce osteoporosis risk and thus prevent or delay the development of the disease. The rationale for early primary intervention is that attaining and maintaining strong, dense bone as a young adult is a critical factor in the prevention of osteoporosis in later life.[17] A key component in developing successful education interventions by health care professionals is understanding what women know about the disease and to what extent they practice preventive behaviours.

Knowledge of modifiable risk factors (smoking, lack of physical exercise, dietary habits, multiparity) and treatment for osteoporosis should be targeted by prevention programmes. Estimating the level of knowledge of the population can help to guide public health programmes. Some studies have revealed that education programmes for the elderly were effective in improving health promotion knowledge and behaviours.[18]

Bearing in mind the lack of reliable epidemiological data, the present study investigated osteoporosis related knowledge among Pakistani women, aged 25 years and above. The possible relationships of these variables with age, educational level, household income, family history of osteoporosis, menopause before age 45 years were studied.

Bisphosphonate therapy is very effective for the treatment of osteoporosis but prevention can reduce the burden of the disease and hence the cost of health care can be decreased significantly. Physical activity and adequate calcium intake are both important for the prevention of osteoporosis.[8]

Subjects and Methods

This was hospital based exploratory study with a cross-sectional design performed between March and August 2006. A convenience sample comprised of 300 women aged 25 years or above, visiting various outpatient departments of the Aga Khan Hospital as an attendant were included. They were selected as a reflection of the general population. If over the age of 24 years and able to give verbal consent, respondents underwent a standard questionnaire based survey. The subjects were interviewed regarding their understanding of what osteoporosis was, risk factors, symptoms and whether the treatment was available in Pakistan or not. Subjects who were already diagnosed as having osteoporosis, under the age of 25 years, unable to communicate in Urdu and/or English or were the members of the hospital staff were excluded from the study. We estimated that a sample size of 320 would be required to estimate an assumed prevalence of 0.5 of various aspects knowledge about osteoporosis at a confidence interval of 95% with an error bound of 0.05. The participation rate was 100%. Thirty one individuals were excluded because they had never heard about osteoporosis.

Study subjects were surveyed using a valid and reliable (OKAT) questionnaire with good psychometric properties.[19] The tool had questions on four basic themes: (1) understanding (symptoms and risk of fracture) of osteoporosis (2) the knowledge of risk factors for osteoporosis (3) knowledge of preventive factors as physical activity and diet relating to osteoporosis and (4) treatment availability. The questionnaire was in English, it was translated into Urdu for the ease of the study subjects.

Data were obtained at the time of interview, which were performed by a member of the research team. Prior training in interview techniques was obtained for the study. Each staff interviewer subsequently participated in several practice sessions to ensure accurate transcription of responses.

Among the demographic information was household income. It was classified into two categories; If the monthly income was below rupees 10,000 (low socioeconomic status) and otherwise good socioeconomic status. Other

information collected was level of education (matric, intermediate or above), residential status (posh versus ordinary), year since menopause, smoking history, family history of osteoporosis and/or fracture and source of acquisition of knowledge.

A 20 item questionnaire, each item having true, false and don't know options was used. The analysis was performed by scoring 1 for a correct response, 0 for incorrect and don't know. The total score could range from 0-20.

Knowledge was computed as a continuous variable using the cumulative score for each subject based on correct responses to 20 questions. Posh areas were defined as planned, well structured residential schemes with basic facilities of living (clean drinking water, safe drainage system, powered with electricity, schooling system and provided primary health facility).

Statistical Analysis

All variables were entered into Statistical Package for Social Sciences (SPSS) version 14.0. Means and standard deviations were calculated for continuous variables and frequencies for categorical variables. Univariate analysis was performed by t-test for independence to determine the factors associated with knowledge. To study the effect of different age score with other variables were assessed by using Two-way ANOVA.

Results

Approximately 320 potential respondents were approached. 20 subjects refused to participate in the survey. The response rate was 94%. Thirty one subjects were excluded because they never had heard about osteoporosis. Two hundred and sixty nine women completed the survey with approximately equal representation among the age groups spanning 25-78, with slightly more in the above 45 years age group. The Characteristics of subjects are given in Table 1.

Frequency of women with higher education (graduate and above) decreased with age. Increased frequency of higher education was observed in younger age group (25-35 years). Household income reported that most women (78.8%) were in the range of middle class socioeconomic status (> 10,000 but <30,000 Pak rupee). In all age groups, one fourth of interviewed women reported a family history of osteoporosis and 19.70% had history of prior fractures. Only 5.1 % (n=4) had early menopause (before age 45 years). Majority of the women (97.76%) were not smokers.

The mean score on the osteoporosis quiz was 11.04 ± 2.72. On average, the respondents had correct answers on

Table 1. Descriptive data according to women's age group (n=269).

Characteristcs		25-35 years (n=85)	35-45 years (n=78)	>45 years (n=106)
Age mean (sem)		29.6 (0.33)	40.8 (0.3)	53.6 (0.65)
Education Level	None	0	3 (3.8)	2 (1.9)
	Matric	6 (7.1)	8 (10.3)	36 (34.0)
	Inter	12 (14.1)	26 (33.3)	26 (24.5)
	Grad	67 (78.8)	41 (52.6)	42 (39.6)
Socioeconomic Level	<Rs.10,000	16 (18.8)	18 (23.1)	23 (21.7)
	>Rs.10,000	69 (81.2)	60 (76.9)	83 (78.3)
Menopause	Yes	0	4 (5.1)	24 (22.6)
Before age	No	85	74 (94.9)	82 (77.4)
45 years	Yes	3 (3.5)	1 (1.3)	2 (1.9)
History of smoking	No	82 (96.5)	77 (98.7)	104 (98.1)
Family history of	Yes	17 (20.0)	16 (20.5)	32 (30.2)
osteoporosis	No	68 (80.0)	62 (79.5)	74 (69.8)
History of	Yes	13 (15.3)	15 (19.2)	25 (23.6)
fractures	No	72 (84.7)	63 (80.8)	81 (76.4)

Table 2. Osteoporosis knowledge scores according to knowledge dimensions and women's age-groups.

Knowledge about osteoporosis ¥	25-35 years n=85	36-45 years n=78	>45 years n=106	p
Symptoms related	4 (5)	4 (5)	4 (5)	0.41
Knowledge of Risk factors	2 (3)	2 (3)	2 (3)	0.76
Knowledge of Preventive factors	3 (3)	3 (3.25)	3 (3)	0.17
Treatment related	0 (1)	0 (0)	0 (1)	0.06

¥ All values are median and 75th percentile (in brackets) of reached scores in each knowledge areas, per each age group.

Table 3. Total knowledge scores obtained by women in different age groups.

Source	MS*	F**	p
Age	39.32	5.72	0.004
Socioeconomic status	97.11	14.13	<0.001
Age-Socioeconomic status	40.60	5.90	0.003
Age	2.15	0.29	0.74
History of smoking	28.98	3.93	0.04
Age-history of smoking	3.22	0.43	0.64
Age	1.40	0.195	0.82
Friend source	27.53	3.82	0.05
Age-friend	20.60	2.86	0.05

* Mean score

** Fischer exact

general knowledge of osteoporosis items.

The sub-scores per knowledge dimensions about osteoporosis and age groups are shown in Table-2. The total scores of knowledge regarding osteoporosis were similar in the three age groups (median 9 in all age groups). Most of the interviewed women had enough knowledge about osteoporosis regarding the concept of the disorder, its risk factors, symptoms and sex-related factor, irrespective of age. Conversely, these women had a lesser knowledge score on the treatment of osteoporosis than other examined dimensions.

In all three groups, women with high socio-economic status obtained significantly higher total knowledge scores (p=0.003) than women with lower economic status. There was a significant relation between age and source of knowledge obtained from friends (p=0.05) as shown in Table 3.

Discussion

The total scores regarding four knowledge osteoporosis dimensions were similar in all age groups of interviewed women Median (Range): 11 (0-17) out of a possible 20 points. A similar study found Taiwanese women with a mean score of 15 out of 44 points related to six osteoporosis knowledge dimensions,[20] whereas surveyed American women of three age groups got knowledge scores from 32 to 44 points out of 183.[9] In all cited cases, the obtained scores indicate that knowledge about osteoporosis is poor or limited among surveyed subjects so health educational programs and health services regarding osteoporosis are necessary for Pakistani women, as is also suggested for Taiwanese [20] and American women [9] of all ages.

The present results also indicate that Pakistani women with higher socioeconomic status have significantly better knowledge of osteoporosis than women with a low socioeconomic status, regardless of age. Similarly, another study found that better educated Chinese women in Singapore knew more about osteoporosis compared to the less educated ones.[21] A previous study has likewise found that osteoporosis-related knowledge is independent of age.[9] Our two way ANOVA indicated that the most effective predictors of osteoporosis-related knowledge were household income. However, there was no significant difference in the scores of highly educated and low educated women in our study.

However, total knowledge about osteoporosis may not lead to an improvement in lifestyle; it is necessary to know more about some specific aspects of osteoporosis risk factors and to acquire healthy habits to reduce the risk for low bone mass. Previous studies likewise found that knowledge on osteoporosis does not correlate with risk-reducing life habits.[9,22] These authors suggested that osteoporosis-related knowledge among women of their sample was limited; the information was not fully understood or poorly internalized. They also suggested that it is unlikely that this type of knowledge will provide a basis for decisions about life style or unhealthy habits.[9] These comments are perhaps similarly applicable to the subjects in our study. The results of other previous studies are consistent with the view that osteoporosis-related knowledge is often poorly integrated and internalized, and does not lead to improved health behaviours.[22-25]

The difference between our results in Karachi, Pakistan and those obtained in the study of Caucasian women in the US[9] may, at least in part, reflect differences in standard of living between these two countries. Specifically, the generally higher incomes in the US may be associated with a healthier diet, higher educational level, better access to healthcare, and better public education about general health and the prevention of diseases like osteoporosis.

The key practical implications of this study suggest the setting up of primary healthcare programmes regarding osteoporosis for Pakistani women as has also been suggested for Taiwanese women[20] and Hispanic and African-American women.[23] Training of healthcare professionals, is also important and special attention has to be given to the following aspects of osteoporosis prevention:

a)   The type and frequency of physical exercise.

b)   Diet-related risk factors, including inadequate intake of calcium, vitamin D, and phosphorus; also the adverse effects of drinking coffee or other low-calcium drinks instead of milk or milk-based drinks.

c)   The importance of monitoring menstruation frequency, since normal circulating estrogen levels and normal menstrual cycles are important for maintaining normal bone metabolism.

In addition, it is important to start health education programmes focusing on integration and internalization of knowledge on osteoporosis.

Although our results indicate that many women have modest knowledge about osteoporosis concerning risk factors and preventive behaviours, this knowledge often does not translate to appropriate changes in healthy life habits. This is seen as a weak association between total osteoporosis scores and exercise or calcium intake.

Finally, we would suggest that osteoporosis education campaigns should be directed at families and individuals, to provide within-family education of children about the importance of a healthy diet.

Conclusion

It is concluded that Pakistani women from a higher socioeconomic status have a significantly better knowledge about osteoporosis than women of lower socioeconomic status, regardless of age. However, this knowledge did not improve life style or preventive habits for osteoporosis.

Acknowledgements

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