

Knowledge, Attitude and Preventive Practice of Women Concerning Osteoporosis

Z Jalili¹, *N Nakhaee², R Askari¹, V Sharifi¹

¹Dept. of Community Medicine, Kerman University of Medical Sciences, Iran

²Neuroscience Research Center, Kerman University of Medical Sciences, Iran

(Received 30 Jun 2006; accepted 9 Apr 2007)

Abstract

Background: To determine the knowledge, attitude and preventive practice of women above 45 years old.

Methods: A total of 770 households in Kerman (southern Iran) were selected for inclusion in the study using cluster sampling from April through August 2005. The interview schedule consisted of 4 parts including questions about knowledge, attitude and practice (KAP) and also demographic questions. The average score for KAP was 9.3 out of 21, 2.6 out of 5 and 1.5 out of 6, respectively.

Results: Adequate osteoprotective exercise and sufficient calcium intake were found in 3.8% and 5.5% of subjects, respectively. A significant relationship between the score of preventive practice and all the following parameters was found: level of education, hearing about osteoporosis, knowledge score, perceived barrier to preventive actions and perceived seriousness of osteoporosis.

Conclusion: Considering the Iranian women's inaccurate or insufficient knowledge and their negative attitude to the preventive actions and their weak practice in case of prevention, it is the responsibility of health policymakers and medical associations to plan for osteoporosis education and prevention initiatives.

Keywords: *Osteoporosis, Women, Knowledge, Beliefs, Iran*

Introduction

Osteoporosis is a "silent killer" that millions of people around the world suffer from (1), and it is important due to its morbidity, mortality, adverse effects on the quality of life and the extra costs imposed to the patient and the society (2). The increase of life expectancy and so the old age of the society in developing countries such as the Middle East has led to an increase in the prevalence of osteoporosis and its following fractures in the area (3), so that 70% of the cases with hip fracture will happen in these countries in 2050 (4).

Despite emerging therapies to treat osteoporosis, prevention is still preferable for controlling the disease (3). In order to plan for the prevention of osteoporosis, sufficient information about people's health beliefs and knowledge is necessary (5), and to change the health behaviors related to modifiable risk factors of osteoporosis,

it is necessary to be familiar with the individuals' practice in case of prevention and also their cultural and socio-economical features (6).

Although the incidence of hip fracture as one of the potentially high risk complications of osteoporosis is higher in the Middle East countries comparing to other parts of Asia (3) and the rate of bone loss in Iran is similar to that of countries with a high prevalence of osteoporosis such as America and Europe (7), yet no studies have been performed to evaluate the Iranian women's knowledge, attitude and practice (KAP) about osteoporosis. It should be also indicated that despite several studies done in developed countries on the knowledge of the society about osteoporosis, the authorities still emphasize on doing such studies (8).

The present study was conducted to state the three above-indicated items KAP in Kermani women and to find the association of their knowledge,

attitude, and background characteristics with their preventive practice.

Materials and Methods

A total of 770 households in Kerman City (the capital of the largest province of the country located in southern Iran) were selected for inclusion in the study using probability-proportionate-to-size cluster sampling from April through August 2005.

To ensure that the sample is adequate, P was set to 0.5 (50%) and for a 95% confidence interval ($Z_{1-\alpha/2} = 1.96$) and precision of 0.05, the sample size was calculated 384. This was then multiplied by a design effect of 2 to take account of cluster randomization. Proportional to the number of households in the 4 districts, the appropriate number of clusters was assigned to each district. Interviewers were health volunteers who had previous experience in household health-related research. If a household had more than one eligible respondent (i.e. women above 45 yr old), only one was randomly selected. The interview schedule consisted of 4 parts including questions about KAP and also background questions (see Appendix). The content validity of the questionnaire was established by an extensive literature review and an expert panel. Background questions covered demographic, social, and economical status as well as asking whether they had heard about osteoporosis before. There were 21 questions on knowledge consisted of 2 parts for general questions and the ones about risk factors of osteoporosis. A total score for knowledge was obtained by adding the points given for each answer. For each correct answer 1 point, "I don't know" and any incorrect answer zero points were assigned.

The questions on attitude included 4 fields (9) as follows: perceived advantages (6 questions), perceived susceptibility (5 questions), perceived seriousness (4 questions) and perceived barriers (4 questions). These questions were scored according to Likert scale, from "5" as "completely agree" to "1" as "completely disagree". Alpha coefficients of the knowledge and attitude scales were .92

and .70, respectively. The questions on practice included 6 domains: taking foods containing calcium, weight bearing exercises, checking bone density, taking estrogen pills daily, and reading about osteoporosis and exposure to sunlight (10). Dietary calcium intake was assessed utilizing a modification of Kasper et al (11). We asked about common foods containing calcium and the total amount of received calcium would be calculated according to the meal size, the frequency of consumption and the amount of calcium for each meal (12), using the Iranian food composition table which was developed based on a national study (13). The total amount of calcium intake was categorized into 2 classes: over 1200 mg which meant adequate calcium intake and below 1200 mg i.e. inadequate calcium intake (14).

To evaluate the physical activities, we interviewed the women (11) about doing weight bearing exercises such as running, jumping, jogging, playing volleyball and etc during a week. Then they were categorized into 2 classes: above 90 min of activity and below it in a week (14). Studies done based on similar criteria, have confirmed the validity of sport self-report (15). Considering the climate of the area and the geographical latitude, exposure to sunlight for 15 min at least twice a week was considered as enough vitamin D receipt (16). We tested our hypotheses about the effects of background variables, women's knowledge, and attitudes on their practice score using multivariable analysis. A multiple regression analysis (based on the stepwise variable selection method) was carried out. A probability value (P) of less than 0.05 ($P < 0.05$) was considered to be significant. Analyses were conducted using SPSS Release 13.

Results

Out of 770 women invited for the interview, 729 accepted to participate in the study (95% response rate). The mean (\pm SD) age was 52.7 (\pm 7.9). The average number of children for the studied women was 4.5 (\pm 2). About half of the studied individuals were illiterate or low educated. Nearly 60% of the studied women were postmenopausal. Other background characteristics are present in Table 1.

About 80% (581 individuals) had heard about osteoporosis mostly from media (40%) and their “friends and relatives” (34%) (Table 2).

Table 3 shows the average score of the women’s knowledge, attitude (in 4 fields) and practice (preventive acts) considering the maximum achievable score, the range of practice score was lower than that of knowledge and attitude.

Fifty one percent of the studied women confirmed the consumption of corticosteroids as the risk factor of osteoporosis, while 28% indicated genetic factors or being underweight as the risk factor (Table 4). Table 5 shows the studied women’s practice in case of preventive acts. With regard to sport activities and adequate consumption of calcium, 3.8% and 5.5% of their acts were acceptable, respectively (Table 5).

Using multivariate regression and stepwise method there was a significant relationship between the practice score and the following variables: Knowledge, education, hearing about osteoporosis, attitude to barriers of preventive practice and seriousness of the disease (Table 6). The overall regression coefficient (R^2) was 0.13, indicating that less than one fifth of the variability in the data can be explained by the model.

Table 1: Background characteristics of the studied women (n=729)

Education	n	%
Illiterate	164	22.5
Elementary	190	26.1
Intermediate	180	24.7
High school graduated	133	18.2
University educated	62	8.5
Employment status		
Housewife	555	76.1
Employed	174	23.9
Postmenopausal		
Yes	431	59.1
No	298	40.9
Ever married		
Yes	708	97.1
No	21	2.9

Table 2: Source of information for women who have heard about osteoporosis

Source of information	n	%
Friends and relatives	192	34.0
Health staff	129	22.0
Media	235	40.0
Other	25	4.0
Total	581	100

Table 3: Knowledge, attitudes and activity regarding osteoporosis among Iranian women (n=729)

Dimension*	Mean**	SD
Knowledge score (total)	44.3	21.5
Attitudes score (total)	50.9	7.4
Perceived susceptibility	53.5	12.5
Perceived severity	43.6	11.5
Perceived barriers	46.4	12.3
Perceived benefits	63.1	12.5
Preventive activity score	24.3	15.2

* A higher score indicates more knowledge, greater agreement or more activity undertaken

** Maximum attainable score = 100

Table 4: Frequency of the women who recognized the risk factors of osteoporosis correctly (n=729).

Risk factor	n	%
Cigarette smoking	456	62.6
Corticosteroid consumption	375	51.4
Sex (female)	370	50.8
Premature menopause	330	45.3
Lack of activity	330	45.3
Old age	256	35.1
Low-calcium diet	231	31.7
Genetics	208	28.5
Underweight	203	27.8

Table 5: Frequency of osteoporosis-related preventive activities among Iranian women (n=729).

Activity	N	%
Direct exposure of face and hands to sunlight for more than 30 minutes a week	643	88.2
Reading materials about osteoporosis	229	31.4
Checking bone mass density	69	9.5
Hormone replacement therapy	49	6.7
Adequate calcium consumption (more than 1200 mg daily)	40	5.5
Adequate osteoprotective exercises (more than 90 minutes a week)	28	3.8
Adequate calcium consumption and sport activities (both)	4	.6

Table 6: Factors found to be related to osteoporosis preventive activity based on multivariate and stepwise linear regression analysis*

Factor	Beta	P
Level of education	.16	0.001
Hearing about osteoporosis	.11	0.004
Knowledge score	.09	0.03
Perceived barriers to preventive actions	-.15	0.001
Perceived seriousness of osteoporosis	.09	0.02

* The overall regression coefficient (R^2) was 0.13

Discussion

One of the ways to prevent osteoporosis in the society is to use population-based interventional approaches in order to decrease the risk factors of osteoporosis. To do these approaches, it is necessary to have information about the knowledge, attitude, and practice of the society (17). This is a population-based study with a high participation rate, and the data have been collected through household interviews done by trained interviewers.

More than one-fifth of the studied women had not heard about osteoporosis before, whilst about one-half of the American-African and Hispanic women (18), one-third of the Singapore-Chinese (19) and 90% of the Canadian (20) and Turkish (21) women had heard of osteoporosis. The main information sources for the women assessed in this study were the media and their friends or relatives. Also for the African-American (18), Cana-

dian (20), and Chinese (19) women, television and radio had the most important role.

The knowledge score for the studied population was obtained 44.3 out of 100 (44%) that was indicative of their insufficient information. A study of 447 Taiwanese women (aged 40 years and older) showed that the average score of their knowledge was 35% of the achievable score (10). This score was 61% for the 20-79 yr old Swedish women (22) and 63% for the 21-60 yr old Turkish (21). Considering the unacceptable knowledge of the studied individuals more attention should be devoted to Information, Education and Communication (IEC) programs concerning osteoporosis. More than 50% of the studied individuals recognized cigarette smoking, corticosteroids, and female gender as the risk factors of osteoporosis correctly; but most of them did not indicate about being underweight, hereditary factors, low calcium consumption, old age, and lack of activities as risk factors. The above results show the necessity of education on the risk factors of osteoporosis; because when there is not enough knowledge about risk factors, one does not consider them as serious threats and so does not look for prevention and treatment (17, 23).

In a study conducted in Singapore, 86% indicated low-calcium diet as the risk factor (19), while 32% of the American women stated corticosteroid consumption. Instead, more than 68% of the Americans indicated low-calcium diet and lack of activities (20). As a whole, the Iranian women's information about the risk factors

of osteoporosis was less than that of other countries. In case of beliefs, the highest and the lowest scores were respectively related to the perceived barriers and the perceived benefits. However, in a study conducted on 40-95 yr old women in Philadelphia, the perceived barriers showed fairly the lowest agreement (24) and in a study performed in Taiwan, the lowest score of attitude was related to the perceived susceptibility (10). Such differences might be due to different cultures or statements. According to the health belief model, the subtraction of perceived barriers to preventive actions from perceived benefits of preventive actions is a source that potentially increases the probability of doing preventive acts (23). The results of this study indicate that the women's beliefs are completely in contrary to the desired situation that means perceived benefits are stronger than perceived barriers. Therefore, it seems that the resultant of these two beliefs might weaken the preventive practices. As a whole the mean attitude score was 51 out of 100 (Table 3) which is representative of an untoward view among Iranian women. The two main preventive acts (regular exercise and enough calcium consumption) were found in a low percentage of the studied individuals (Table 5) and just 0.6% did both actions adequately while the corresponding figure was 7% in a study performed on American college women (11). In a study (18), 8% of the African-American and Hispanic women had adequate calcium intake and 44% of them exercised at a minimal level whereas 20% of the Iranians living in Australia exercised adequately (25) which might be indicative of the influence of culture and socioeconomic factors on preventive behaviors (17, 23). Nearly 10% of the studied women had checked bone mass density as recommended by their physician. Lower percentage (i.e. 2.7%) was found in a community sample of Taiwanese women (10). More than 80% had enough exposure to sunlight that seems to be related to the regional climate rather than a specific preventive act. It should also be indicated that many preventive behaviors such as nutrition and sport are not specified for osteoporosis,

but may be indicative of preventive behaviors and treatment for other conditions (24). As a whole the practice score showed the most worrisome situation comparing to the two other domains (i.e., knowledge and attitude) (Table 3). The multivariate linear regression analysis showed a significant relationship between preventive practice and only 2 of the background characteristics i.e. level of education and previous knowledge on osteoporosis. Similar findings were obtained in the studies conducted in Norway and Singapore (19, 26). There was also a significant relationship between women's practice score and the score of their knowledge and attitude especially perceiving a high degree of barrier to preventive action (Table 6). In some studies, preventive activity had no significant relationship with the score of knowledge and attitude (11); but many other studies confirmed the influence of knowledge (8, 10, 26) and attitude (10, 24) on preventive practice. Considering the Iranian women's inaccurate or insufficient knowledge and their untoward attitude to the preventive acts of osteoporosis, it is the re-sponsibility of health policymakers and medical associations to plan for osteoporosis education and prevention initiatives.

Acknowledgements

This research was funded by the Deputy for Research (HSR Council) of Kerman University of Medical Sciences.

References

1. Parsons LC (2005). Osteoporosis in incidence prevention, and treatment of the silent killer. *Nurs Clin North Am*, 40(1): 119-33.
2. Melton LJ III (2003). Adverse Outcomes of Osteoporotic Fractures in the General Population. *J Bone Miner Res*, 18:1139-41.
3. Memon A, Pospula WM, Tantawy AY et al. (1998). Incidence of hip fracture in Kuwait. *Int J Epidemiol*, 27(5): 860-65.
4. Cooper C, Campion G, Melton LJ (1992). Hip fractures in the elderly: A worldwide projection. *Osteoporosis Int*, 2: 285-89.

5. Wallace LS (2002). Osteoporosis prevention in college women: application of the expanded health belief model. *Am J Health Behav*, 26(3): 163-72.
6. Varena M, Binelli L, Zucchi F, Ghiringhelli D, Gallazzi M, Sinigaglia L (1999). Prevalence of osteoporosis by educational level in a cohort of Postmenopausal women. *Osteoporos Int*, 9(3): 236-41.
7. Larijani B, Hossein-Nezhad A, Mojtahedi A, et al. (2005). Normative data of bone Mineral Density in healthy population of Tehran, Iran: a cross sectional study. *BMC Musculoskelet Disord*, 2; 6(1): 38.
8. Werner P (2005). Knowledge about osteoporosis: assessment, correlates and outcomes. *Osteoporos Int*, 16(2): 115-27.
9. Sedlak CA, Doheny MO, Jones SL (1998). Osteoporosis prevention in young women. *Orthop Nurs*, 17(3): 53-60.
10. Yu S, Huang YC (2003). Knowledge of, attitudes toward, and activity to prevent osteoporosis among middle-aged and elderly women. *J Nurs Res*, 11(1): 65-72.
11. Kasper MJ, Peterson MG, Allegrante JP, Galsworthy TD, Gutin B (1994). Knowledge, beliefs, and behaviors among college women concerning the prevention of osteoporosis. *Arch Fam, Med* 3(8): 696-702.
12. Anderson JJ (2004). Nutrition and bone health. In: Mahan LK, Escott-Stump S. *Krause's Food, Nutrition, & Diet Therapy*, 11th edition. Philadelphia: Saunders, pp: 642-66.
13. Sarkissian N, Azar M (1980). *Food composition tables of Iran*, 1st ed. Islamic Republic of Iran, Institute of Nutrition Sciences and Food Technology, pp: 14-32.
14. Weaver CM (2000). Calcium requirements of physically active people. *Am J Clin Nutr*, 72(2 Suppl): 579S-84S.
15. Washburn RA, Montoye HJ (1986). The assessment of physical activity by questionnaire. *Am J Epidemiol*, 123(4): 563-76.
16. Holick MF (2002). Vitamin D: the underappreciated D-lightful hormone that is important for skeletal and cellular health. *Curr Opin Endocrinol Diabetes*, 9: 87-98.
17. Green LW, Kreuter MW (2005). *Health program Planning: An Educational and Ecological Approach*, New York: McGraw-Hill, pp: 67-80.
18. Geller SE, Derman R (2001). Knowledge, beliefs, and risk factors for osteoporosis among African-American and Hispanic women. *J Natl Med Assoc*, 93(1):13-21.
19. Saw SM, Hong CY, Lee J, et al. (2003). Awareness and health beliefs of women towards osteoporosis. *Osteoporos Int*, 14(7): 595-601.
20. Juby AG, Davis P (2001). A prospective evaluation of the awareness, knowledge, risk factors and current treatment of osteoporosis in a cohort study of elderly subjects. *Osteoporos Int*, 12:617-622.
21. Ungan M, Tumer M (2001). Turkish women's knowledge of osteoporosis. *Fam Pract*, 18(2): 199-203.
22. Waller J, Eriksson O, Foldevi M, et al. (2002). Knowledge of osteoporosis in a Swedish municipality- a prospective study. *Prev Med*, 34(4): 485-91.
23. Becker MH, Haefner DP, Kasl SV, et al. (1997). Selected psychosocial models and correlates of individual health-related behaviors. *Medical care*, 15(5): 27-46.
24. Hsieh C, Novielli KD, Diamond JJ, Cheruva D (2001). Health beliefs and attitudes toward the prevention of osteoporosis in older women. *Menopause*, 8(5): 372-76.
25. Baheiraei A, Pocock NA, Eisman JA, Nguyen ND, Nguyen TV (2005). Bone mineral density, body mass index and cigarette smoking among Iranian women: implications for prevention. *BMC Musculoskelet Disord*, 24(6): 34.
26. Magnus JH, Joakimsen RM, Berntsen GK, Tollan A, Soogaard AJ (1996). What do Norwegian women and men know about osteoporosis? *Osteoporos Int*, 6(1): 32-6.

