



## Knowledge and Attitudes of Maintaining Bone Health among Post-Menopausal Women in Malaysia

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**Abstract**


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**Introduction:** Public awareness of osteoporosis is low among women in the developing countries. Health education was shown to be effective in improving knowledge and awareness on maintaining bone health. This study aims to identify the level of knowledge and attitudes among post-menopausal women in Malaysia on achieving bone health throughout the menopausal transition period.

**Methods:** A total of 116 post-menopausal female patients of orthopedic menopause clinic were recruited using a purposive sampling approach. Data on osteoporosis awareness and knowledge were collected using validated structured questionnaires Osteoporosis Prevention and Awareness Tool and Osteoporosis Attitude Knowledge Test. The chi-square test was used to determine the association between post-menopausal women's socio-demographic characteristics and their knowledge and attitude towards maintaining bone health.

**Results:** Participants' age ranged between 49 and 82 years (61.84, SD=7.87). The knowledge of osteoporosis varied significantly by age ( $p=0.014$ ) and education ( $p=0.001$ ) among the studied population. No significant differences were found for participants' attitude towards bone health.

**Conclusion:** This study showed that the age and education levels have significantly different knowledge of bone health.

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**Keywords:** *Post-Menopausal Women; Knowledge; Attitude; Bone Health; Malasia*

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## Research

### Introduction

The dramatic decline in estrogen levels during the menopause usually leads to a decrease in bone density in women. The prevalence of osteoporosis among post-menopausal women (PMW) is increasing across the globe. One study showed that 28.4% of Malaysian women are osteoporotic.<sup>1</sup> Another study found that 42.1% of postmenopausal and 11.1% of premenopausal women in Malaysia were osteoporotic ( $p < 0.005$ ).<sup>2</sup> Decline in Bone Mineral Density (BMD) among women accelerates after menopause.<sup>3</sup> Suppression of estrogen production results in significant increases in bone resorption markers and suppression of bone formation markers.<sup>4</sup> Post-menopausal women are at high risk of osteoporosis and constitute a majority of fragility fracture hospital admissions. In addition to decreased hormones after menopause, nutritional factors play a significant role in the development of osteoporosis among women<sup>5</sup>. Women tend to have insufficient calcium intake on daily basis, as average calcium intake (426 mg/day) is

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insufficient for postmenopausal women and is associated with low bone density.<sup>6</sup>

It has been shown that lifestyle intervention prevents the loss of spinal bone density in premenopausal women.<sup>7</sup> Osteoporosis, osteoporotic fractures, and other sequela may be avoided by raising knowledge on osteoporosis. Therefore, the aim of this study was to assess the knowledge and attitudes to maintaining bone health among post-menopausal Malaysian women.

## Methods

### *Study Population*

Data collection was performed after obtaining the approval from the Research Ethic Committee (IREC) of International Islamic University and National Medical Research Registry (NMRR). This study was a cross-sectional survey of 116 respondents from orthopedic menopause clinic, and specialist clinics of Hospital Tengku Ampuan Afzan Kuantan, Pahang, Malaysia. A purposive sample of post-menopausal women aged 50 and older was recruited between April and October of 2016. The inclusion criteria were BMD of osteopenic range (T-score of less than -1 and greater than -2.5 SD) and agreeing to participate in the study.

### *Data Collection*

Respondents were assessed via self-administered questionnaires. The information about their knowledge and attitudes towards maintaining bone health was obtained using Osteoporosis Prevention and Awareness Tool (OPAAT) and Osteoporosis Attitude knowledge Test (OAKT) questionnaires.

OAKT questionnaire consist of 20 items with responses forming a 3-point Likert scale (True, False, and Do not know). Questions 1-12 are about knowledge of osteoporosis; questions 13-16 are concerned with the attitude towards osteoporosis, and the remaining four questions test the perception and practice in the prevention of the disease.<sup>8</sup> The evaluation was done by

assigning each correct answer the score of 1, and for the wrong or didn't know answer the score of 0. The questionnaire was thoroughly reviewed by a panel of health care professionals. The questionnaire was validated to ensure that the questions were not ambiguous, and content was appropriate.

OPAAT questionnaire was adopted from Toh et al.<sup>9</sup> This questionnaire consists of 30 items and focuses on 3 sub-topics (knowledge on osteoporosis, osteoporosis treatment, and osteoporosis prevention). The responses consisted of a 3-point Likert scale answer options (True, False and Don't know). The evaluation of responses was done by assigning each correct answer score of 1, and for the wrong or don't know answer the score of 0. The questionnaire was translated to Malay version because a Malay version of OPAAT was not yet available. Hence, the OPAAT questionnaire was piloted after it was translated and retranslated.

### *Statistical Analysis*

Data entry and analysis were done using the statistical software program SPSS version 21. The data were presented in the form of percentages and mean  $\pm$  standard deviation. Chi-square value was calculated for the variables where the P value less than 0.05 was considered to be significant.

## Results

The average baseline OAKT score was 8.8 out of 20. Cronbach's  $\alpha$  for each domain was ranged from 0.286 to 0.748. All items were highly correlated (Spearman's rho: 0.761-0.990,  $p < 0.05$ ), with no significant change in the overall test-retest scores, indicating that OPAAT has achieved stable reliability. The respondents were 116 post-menopausal women, ranging from 49 to 82 years (61.84,  $SD = 7.87$ ). Most of the respondents (84.5%) were married, had attended secondary school (56.9%) and belong to middle-income group defined by the range of \$246-985 per month

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Variables	Knowledge in assessing			Attitude in assessing		
	Adequate (%)	Inadequate (%)	P-value*	Positive (%)	Negative (%)	P-value*
<b>Age</b>						
50-59 years	9.5	37.1	0.014	21.6	25.0	0.721
60- 69 years	11.2	24.1		17.2	18.1	
70 and above	0	18.1		6.9	11.2	
<b>Ethnicity</b>						0.552
Malay	4.3	26.7	0.520	14.7	16.4	
Chinese	14.7	46.6		27.6	33.6	
Indian	1.7	4.3		3.4	2.6	
Others	-	1.7		-	1.7	
<b>Education level</b>						0.187
Primary	1.7	25.0	0.001*	9.5	17.2	
Secondary	11.2	45.7		30.2	26.7	
Certificate	4.3	7.8		3.4	8.6	
Degree	3.4	0.9		2.6	1.7	
<b>Marital status</b>						0.191
Single	3.4	2.6		3.4	2.6	
Married	14.7	69.8		38.8	45.7	
Widowed	1.7	6.0	0.060	1.7	-	
Divorced	0.9	0.9		1.7	6.0	
<b>Income</b>						0.402
< US \$246	5.2	31.0	0.076	16.4	19.8	
US \$246-985	11.2	43.1		26.7	27.6	
>US \$1,232	4.3	5.2		2.6	6.9	

\*Chi-square

**Table 1:** Association between knowledge attitude and sociodemographic characteristics (Based on N=116)

(54.3%). The result showed that 20.7% had adequate knowledge range for osteoporosis, while 79.3% had inadequate knowledge range.

Table 1 presents the distribution of patients' knowledge and attitude by their sociodemographic characteristics. Majority of the participants possessed inadequate knowledge, and knowledge of maintenance of bone health was significantly different between age groups ( $p=0.014$ ). Similar results were found for ethnic groups, though results were not significant ( $p=0.520$ ).

Inadequate knowledge was also significantly different between various education levels ( $p=0.001$ ). Participants' marital status significantly impacted their knowledge in assessing osteoporosis ( $p=0.060$ ). The knowledge also significantly varied based on the income group ( $p=0.076$ ).

Thirty (30) items from OPAAT questionnaires were selected for assessing the importance of maintaining bone health. Among the participants, 80.2% ( $n=93$ ) incorrectly answered that everybody would get

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osteoporosis as it is part of aging. 75.9% (n=88) showed that they are confused about the differentiate between osteoporosis and osteoarthritis disease. Additionally, nearly half of the respondents 42.2% (n=49) indicated that osteoporosis has no symptoms, while 38.8% (n=45) indicated that PMW are not at risk for getting osteoporosis, and osteoporosis is untreatable disease 42.2% (n=49). Whereas, 82.8% (n=96) and 75.9% (n=88) of the participants provided incorrect answers for symptoms of untreated osteoporosis, which were tooth loss and joint pain or swelling of fingers respectively. In osteoporosis prevention, 55.2% of the PMWs provided incorrect answers about calcium daily intake requirements. Another 66.4% wrongly assumed that it is too late to increase calcium intake after the age of 50. Nevertheless, 87.1% (n=101) participants knew that calcium supplements could help prevent osteoporosis, and 90.5% (n=105) recognized that food; such as milk, anchovies, yellow dhal, and spinach are rich in calcium. 74.1% (n=86) of the participants also found that weight-bearing exercise can prevent bone loss. In this study, 45.7% of the participants perceived themselves as having a positive attitude regarding maintaining bone health; while 54.3% had a negative attitude.

There were 20 items of OAKT questionnaires that assessed attitudes for bone health maintenance, with 94% of PMW believing that osteoporosis leads to an increased risk of bone fractures. 87.1% (n=101) incorrectly answered the item 'osteoporosis usually causes certain symptoms (e.g., pain) before fractures. Moreover, 61.2% (n=71) of participants indicated that Chinese women are at highest risk of fracture as compared to other races. About 83.6% (n=97) assumed that physical activity is beneficial for osteoporosis. Similarly, 87.9% (n=102) indicated that adequate calcium intake could be achieved from two glasses of milk per day. Moreover, 65.5% (n=76) and 67.2% (n=78) of the participants mentioned sardines and broccoli are good sources of calcium for those who cannot consume dairy products.

## Discussion

This study assessed the knowledge and attitudes for maintaining bone health among post-menopausal Malaysian women. Results revealed inadequate knowledge and lack of awareness among PMW in maintaining the bone health. This study demonstrated that knowledge on bone health significantly varied based on the age group. The respondents believed that they had adequate knowledge on bone health, while in actuality they did not.

These results are corroborated by the previous findings of Samia et al.<sup>10</sup>, which asserted that public awareness of osteoporosis remains low, especially in less developed countries. Health education is needed to improve awareness and to motivate healthy behaviors.<sup>6</sup> This study identified that there is a low level ( $p=0.001$ ) of knowledge among PMW in maintaining their bone health. Potentially, adequate knowledge would facilitate PMW in maintaining their good health and achieving a higher level of bone health in Malayan women. Inadequate knowledge was associated with the level of education and the age of the population in this study. These findings are conflicting with previous reports, which found that most of the women in their study had adequate knowledge about osteoporosis (85.2%)<sup>11,12</sup>. The adequate knowledge is probably due to the overall improvement of education level and better health information about osteoporosis.<sup>11</sup> Furthermore, the results of the present study are corroborated by the previous findings illustrating that Riyadh participants possessed a knowledge score of 57%. which is lower than their attitude scores 72.5% towards osteoporosis disease.<sup>13</sup>

Thirty items from OPAAT questionnaire have been constructed to identify the level of knowledge in maintaining bone health, where general misconceptions were revealed such as 'everybody will get osteoporosis as it is part of aging'. The assumption of this statement is incorrect because if the preventive measures are taken, the incidence of osteoporosis will be reduced.<sup>14</sup> Although

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it is agreed that osteoporosis is considered a disease associated with aging; a growing body of evidence indicates that osteoporosis may have its origins at earlier ages.<sup>15</sup> This misunderstanding regarding osteoporosis should be corrected, so that that early disease prevention can be practiced appropriately.

The recommended calcium intake for women above the age of 50 is 1000 mg.<sup>16</sup> The awareness scores in our study were reflective of need for further education on the relationship between calcium and bone health<sup>11</sup>. There was a higher level of agreement about the seriousness of osteoporosis, but less than a quarter of the participants regarded osteoporosis as a disabling disease. These attitudes suggest that there is an opportunity to develop and improve the effectiveness of the future osteoporosis prevention programs. Initiatives which increase perceived personal susceptibility could be beneficial. Previously published research reported a few barriers to exercise and calcium intake that need to be taken into account for the future research.<sup>17</sup>

Additionally, most of PMW believed that any type of physical activity is beneficial to prevent osteoporosis. This finding was contradicted with other results which found that older women with a positive attitude to physical activity can manage to be physically active on their own if they feel secure about how much stress their bones can endure and which exercises are safe.<sup>18</sup> The knowledge and beliefs regarding the appropriate activity level and the benefits of certain exercises can be potentially considered to enhance awareness and belief on the beneficial of strengthening exercise. An interesting finding of this study is the reported belief that calcium supplement alone can prevent bone loss. This misconception on calcium intake was also found in another study, in which although there was a strong agreement with most of the 'Benefits of Calcium' items, only 7% of subjects agreed with the statement 'I feel good about myself when I take enough calcium'. A significant negative correlation was found between this statement and the item 'Calcium-rich foods

have too much cholesterol'<sup>17</sup>. The misconception on calcium intake should be taken consideration in order to educate the PMW regarding this particular knowledge.

Hence, the findings suggest the need for educational interventions to promote PMW to increase their knowledge about osteoporosis and have positive attitudes and beliefs in osteoporosis prevention towards maintaining bone health. It would be potentially useful to develop nutritional fact sheets for Malaysian food and make them accessible especially for the old-aged females, who are at the age when preventive measures act against osteoporosis. The preventive steps can be done by promoting early assessment and prevention programs at an early age to avoid behavioral risk factors. Health education was shown to be effective in improving knowledge and awareness among the public in maintaining bone health with the use of the teaching-learning process, especially in therapeutic intervention of chronic diseases.<sup>19</sup> Proper educational strategies would increase knowledge of osteoporosis and inducing lasting behavioral change during the menopausal transition.

The use of purposive sampling for participant recruitment, as well as lack of information on non-respondents were study limitations. The restriction of the study to a certain region also impacts the applicability of findings to other geographic and socioeconomic areas. Therefore, we recommend that future studies need to focus on larger sample sizes and wider reach.

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