Research Journal of Pharmaceutical, Biological and Chemical Sciences

Knowledge, Attitude and Practice of Osteoporosis among Malay Adults in Selangor, Malaysia.

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ABSRACT

Osteoporosis is a condition in which the bones become brittle and fragile, due to hormonal changes as well as vitamin D and calcium deficiency. Osteoporosis commonly occurs in adult and elderly, however, prevention steps can be taken as early in child and young adult. Therefore, the objective of this study is to determine the level of knowledge, attitude and practice of osteoporosis among Malay adults. A total of 402 respondents have participated in this study with the age of 18 years and above. Data was collected and then analyzed using SPSS version 20.0. T-test and one way ANOVA were used for data analysis. About 50.5% of the participants have moderate knowledge score, 50.2% have good attitude score, but 50.2% have poor practice score. Results revealed that knowledge score is influenced by age and marital status (p=< 0.001, p=0.016), while attitude score is influenced by household income and educational level (p=0.01, p=0.004). On the other hand, it showed that practice score is influenced by gender, marital status and employment status (p≤ 0.001, p=0.005, p≤ 0.001 respectively). Knowledge is influenced by age and marital status; attitude is influenced by household income and educational level; practice is influenced by gender, marital status and employment status.

Keywords: knowledge, attitude, practice**,** osteoporosis, adults, Malaysia

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INTRODUCTION

Osteoporosis is a serious public health problem. It is estimated that over 200 million people worldwide suffer from this disease [1]. In the Asian population, the prevalence of osteoporosis is higher than the western countries due to the fact that the Asian population has lower body mass index and shorter height [2]. It has been estimated that by 2050, more than 50 percent of all osteoporotic fractures will occur in Asia [3]. In Malaysia, the prevalence of osteoporosis was reported as 24.1% in 2005, predominantly affecting hip [3]. According to Arthritis Foundation of Malaysia, it has been estimated that more than 1 million Malaysians are at risk of developing osteoporosis [5].

The great concern about osteoporosis was the cost involved in the diagnosis and management of osteoporosis related fractures. European studies documented that hip fracture unit cost was the highest, ranging from Euro 8,346 for Italy to Euro 9,907 in France [6]. Similar findings were reported in Thailand where the cost incurred from the diagnosis and management of hip fracture in one year was high amounting to 116,458.6 Baht [7].In Malaysia, the direct cost for hospitalization due to hip fracture in 1997 was estimated at Ringgit Malaysia 22 million [8]. This is a huge amount, which most patients in the developing country cannot afford. If it continues rising every year, this will have significant impact on the financing of healthcare system in the country.

The literature suggests that more attention must be given to Osteoporosis as it is no more considered a disease that affects the elderlies of late fifties [9]. Lifestyle choices, certain diseases and medications can cause this condition even in children, adults, men and premenopausal women [10]. Since it can occur at any age, it is extremely crucial to maximize peak bone mass during adolescence [11] as the amount of bone mass achieved during that stage determines the quality of bones in later life. Information regarding health beliefs and knowledge of osteoporosis in general population is necessary to increase the awareness and prevention of osteoporosis [12, 13, 14].Most of the previous studies focused on women suffering from osteoporosis [15].Very few studies have been conducted on adolescence female[16, 17-19].Furthermore, studies evaluated knowledge, attitude and practice regarding osteoporosis in both genders at adolescence are lacking [20].Therefore, the aim of this study is to determine the knowledge, attitude, and practice about osteoporosis among adults.

METHODOLOGY

Studyarea and Population

This study was conducted atTaman SetiaWarisan, Kampung Melayu Subang, Shah Alam, Selangor, Malaysia. The estimated population of this area is about 900 people with total houses of about 198.The duration of this study was 4 weeks, which lasted from 4th January until 28th January 2016.

Study Design

A cross-sectional study was conducted. The variables in this study include socio-demographic details of the community such as (gender, age, marital status, household income, employment status and educational status), 20 statements testing the knowledge on osteoporosis, 11 statements on attitude towards osteoporosis and 7 statements on practice towards prevention of osteoporosis.

Sample Size

The estimated sample size was calculated using Epi. Info Software was 370. Considering a non-response rate of 20%, the final estimated sample size was 440 respondents. At the end of data collection, non response rate calculated was 8.6%, which drop the final sample size to402 respondents.

Inclusion and Exclusion criteria

Inclusion criteria were adult aged 18 years and above who are able to understand Malay or English language. Individuals who have mental illness, those who are bedridden and unable to understand Malay or English language were excluded from the study.

Instrument

The data collection tool used in this study was designed based on previous studies. The questionnaire was developed in stages which included literature search, discussion and pre-testing the questionnaire to ensure good content validity. The questionnaire consists of four sections with a total of 44 questions. Domain 1: Socio-demographic details [6 questions]: gender, age, marital status, household income, employment status and educational status. Domain 2: Knowledge on Osteoporosis [20 statements]. Choice given to the respondents to answer whether the statements were true, false or don't know about it. Three marks were given to every correct answer, 2 marks if they don't know and 1 mark if they answer it wrongly. Domain 3: Attitude on Osteoporosis [11statements]. Respondents have 4 choices for each statement, they need to decide whether they strongly agree, agree, disagree or totally disagree for that statement. For positive attitude statement, 4 marks were given if they answer strongly agree, 3 marks for agree, 2 marks for disagree and 1 mark for strongly disagree. For negative attitude statement, vice versa marks were given. Domain 4: Practice on Prevention Steps of Osteoporosis [7 statements]. They will be assessed whether they did practice for the past one week. Respondents have 4 choices for each statement, they need to decide whether they practice it every day, more than 3 days a week, 2 to 3 days a week or never. For positive practice such as 'I did physical activity' statement, 4 marks were given if they answer every day, 3 marks for more than 3 days a week, 2 marks for 2 to 3 times a week and 1 mark for never. For negative practice statement such as 'smoking', vice versa marks were given.

Data collection

Data was collected through face to face interview questionnaire which consists of 4 sections on socio-demographic details, knowledge, attitude and practice on osteoporosis.Ethical approval was obtained from research ethics committee of Research Management Institute of Universiti Teknologi MARA (UiTM), Malaysia. Respondents were informed that participation in this study is voluntarily and have been fully informed about the aims and objectives of the study.Simple random sampling technique was used to select the participants randomly.

Data Analysis

The data was entered, cleaned and analysed by using SPSS version 20.0. Appropriate statistical test such as t-test, ANOVA test, Chi-squared test, correlation and regression were used according to the type of variables, and significance level will be taken at 95% or p value 0.05.

RESULTS

Table 1. Socio-demographic details (n=402)

Parameter	Item	Frequency (Percentage), N (%)
Gender	Male	164 (40.8)
	Female	238 (59.2)
Marital status	Single	100 (24.9)
	Married	297 (73.9)
	Divorcee	5 (1.2)
Employment status	Student	25 (6.2)
	Employed	229 (57.0)
	Unemployed	112 (27.8)
	Retired	36 (9.0)
Educational status	Informal	5 (1.2)
	Primary	39 (9.7)
	Secondary	235 (58.5)
	Tertiary	123 (30.6)
Household income (RM)	Low income	205 (51.0)
	Moderate income	124 (30.8)
	High income	73 (18.2)

A total of 402 respondents participated in this study. The response rate was 91.4%. Their age ranged between 18 to 86 years old. The majority of the respondents are female (59.2%), married (73.9%), employed (57%) and received secondary education (58.5%). The mean age of respondents is 39.86 with standard deviation of 14.472. Their household income ranged from RM420 to RM 15,000. More than half of the respondents are those with low income (51.0%).

Table 2: Knowledge on Osteoporosis (n=402)

Statement	Frequency (%)		
	True	False	Don't know
Physical activity increases the risk of osteoporosis.	99 (24.6)	**218 (54.2)**	85 (21.1)
High-impact exercise (weight-training) improves bone health.	**244 (60.7)**	92 (22.9)	66 (16.4)
Most people gain bone mass after 30 years of age.	116 (28.9)	**145 (36.1)**	141 (35.1)
Lower weight women have osteoporosis more than heavy women.	**144 (35.8)**	124 (30.8)	134 (33.3)
Alcoholism is not linked to the occurrence of osteoporosis.	**219 (54.5)**	72 (17.9)	111 (27.6)
The most important time to build bone strength is between 9 and 17 years of age.	**357 (88.8)**	12 (3.0)	33 (8.2)
Normally, bone loss speeds up after menopause.	**204 (50.7)**	36 (9.0)	162 (40.3)
High caffeine intake increases the risk of osteoporosis.	**212 (52.7)**	67 (16.7)	123 (30.6)
Low calcium intake increases the risk of osteoporosis.	**341 (84.8)**	27 (6.7)	34 (8.5)
Without preventive measures, 20% of women older than 50 years will have a fracture due to osteoporosis in their lifetime.	**306 (76.1)**	33 (8.2)	63 (15.7)
There are treatments for osteoporosis after it develops.	**265 (65.9)**	43 (10.7)	94 (23.4)
Reduced exposure to early sunlight increase the risk for osteoporosis.	**158 (39.3)**	95 (23.6)	149 (37.1)
Smoking increase the risk of osteoporosis.	**159 (39.6)**	95 (23.6)	148 (36.8)
Walking has a great effect on bone health.	**272 (67.7)**	86 (21.4)	44 (10.9)
After menopause, women not on oestrogen need about 1,500mg of calcium (for example, 5 glasses of milk) daily.	**220 (54.7)**	45 (11.2)	137 (34.1)
Osteoporosis affects men and women.	**356 (88.6)**	20 (5.0)	26 (6.5)
Early menopause is a risk factor for osteoporosis.	158 (39.3)	56 (13.9)	**188 (46.8)**
Replacing hormones after menopause can slow down bone loss.	134 (33.3)	53 (13.2)	**215 (53.5)**
Children 9 to 17 years old of age get enough calcium from one glass of milk each day to prevent osteoporosis.	**225 (56.0)**	114 (28.4)	63 (15.7)
Risk of osteoporosis high in those who have family members with osteoporosis.	**173 (43.0)**	133 (33.1)	96 (23.9)

The majority of the respondents have the correct knowledge that physical activity did not increase the risk of osteoporosis (54.2%), high impact exercise improves the bone health (60.7%). The majority of them know that the most important time to build the bone strength is between 9 to 17 years old (88.8%). More than half of them have correctly answered that walking is good for the bone health (67.7%).

However, only a third of them know the risk factors for osteoporosis are reduced due to exposure to early morning sunlight (39.3%) and smoking (39.6%). Nearly half and more than half of them are not aware that early menopause is a risk factor for osteoporosis (46.8%) and that post-menopausal hormone replacement therapy can slow down the rate of bone loss (53.5%). More than half of them think that a glass of milk a day is sufficient for children between 9 to 17 years old to prevent osteoporosis (56.0%) and nearly half of them know that the risk of getting osteoporosis is higher in those with previous family history (43.0%).

Table 3. Attitude on preventive measure of osteoporosis (n=402)

Statement	Frequency (%)			
	Strongly Agree	Agree	Disagree	Strongly Disagree
I am willing to exercise.	122 (30.3)	269 (66.9)	9 (2.2)	2 (0.5)
I should spend 30 minutes of activity 5 times per week.	88 (21.9)	274 (68.2)	37 (9.2)	3 (0.7)
I enjoy life without healthy lifestyle.	13 (3.2)	87 (21.6)	231 (57.5)	71 (17.7)
I choose to stay outdoor to get sunlight before 10 am.	85 (21.1)	274 (68.2)	39 (9.7)	4 (1.0)
I should maintain normal weight.	148 (36.8)	243 (60.4)	11 (2.7)	0 (0.0)
I should not smoking or being a passive smoker	210 (52.2)	168 (41.8)	28 (4.5)	6 (1.5)
I should take milk or dairy products (i.e; yogurt, milk, cheese).	168 (41.8)	216 (53.7)	18 (4.5)	0 (0.0)
I should take Vitamin D supplement.	80 (19.9)	243 (60.4)	75 (18.7)	4 (1.0)
I should take calcium supplement.	96 (23.9)	242 (60.2)	59 (14.7)	5 (1.2)
I like to drink coffee more than 4 cup per day.	17 (4.2)	45 (11.2)	237 (59.0)	103 (25.6)
I prefer traditional medicine.	23 (5.7)	203 (50.5)	161 (40.0)	15 (3.7)

More than half of the respondents agree that they are willing to exercise (66.9%), spending 30 minutes a day on physical activity (68.2%), choose to stay outdoor for early morning sunlight (68.2%) and agree that they should maintain ideal body weight (60.4%). More than half strongly agree that they should not be smoking or being a passive smoker (52.2%). As for the dietary intake as a preventive measure towards osteoporosis, more than half of them agree that they should be taking milk or dairy products (53.7%), vitamin D (60.4%) and calcium supplements (60.2%), and most disagree that they should not take more than 4 cups a day (59.0%). However, more than half of them prefer traditional medicine (50.5%).

Table 4.Practice on Osteoporosis in a week (n=402)

Statement	Frequency (%)			
	Everyday	> 3 times a week	2-3 times a week	Never
Exposure to sunlight (before 10 a.m.).	**196 (48.8)**	44 (10.9)	124 (30.8)	38 (9.5)
Performing physical exercises.	49 (12.2)	47 (11.7)	**214 (53.2)**	92 (22.9)
Performing physical activities.	132 (32.8)	51 (12.7)	**170 (42.3)**	49 (12.2)
Drinking soft drinks.	10 (2.5)	41 (10.2)	121 (30.1)	**230 (57.2)**
Eating food rich of calcium.	53 (13.2)	63 (15.7)	**223 (55.5)**	63 (15.7)
Smoking.	62 (15.4)	3 (0.7)	14 (3.5)	**323 (80.3)**
Taking vitamin D supplement.	22 (5.5)	9 (2.2)	56 (13.9)	**315 (78.4)**

Nearly half of the respondents are being exposed to the early morning sunlight everyday (48.8%), which means that more than half have either received less or never in a week. More than half and nearly half

of them have been performing physical exercises (53.2%), physical activities (42.3%), eating food rich in calcium about 2 to 3 times a week, while more than half (57.2%) have never taken soft drinks in a week. most of the respondents (78.4%) have never taken vitamin D supplement in a week.

Table 8. Mean score of knowledge, attitude and practice with respect to the demographic

Variable	Knowledge	P-value	Attitude	P-value	Practice	P-value
Age						
Young adult	45.03 (4.380)		34.13 (3.465)		17.98 (2.985)	0.167
Adult	46.73 (4.167)	**<0.001**	34.18 (3.205)	0.102	18.57 (3.118)	
Elderly	44.52 (3.600)		32.57 (2.599)		18.62 (4.189)	
Gender						
Male	45.48 (4.083)	0.166	33.80 (3.707)	0.17	17.56 (3.434)	**<0.001**
Female	46.08 (4.470)		34.26 (3.002)		18.79 (2.801)	
Marital status						
Single	44.82 (4.412)		33.81 (3.410)		17.43 (3.198)	
Married	46.14 (4.237)	**0.016**	34.14 (3.285)	0.462	16.61 (3.068)	**0.005**
Divorcee	48.00 (4.848)		35.40 (2.966)		17.80 (2.049)	
Household income						
Low	45.63 (4.255)		33.50 (3.181)		18.43 (3.433)	
Moderate	46.00 (4.578)		34.44 (3.259)	**0.01**	18.36 (2.883)	0.385
High	46.12 (4.082)	0.624	34.85 (3.447)		17.85 (2.569)	
Employment status						
Student	1.96 (0.735)		33.84 (2.996)		17.96 (2.557)	
Employed	2.03 (0.690)		34.22 (3.501)		17.70 (3.057)	**<0.001**
Unemployed	2.14 (0.715)	0.165	33.63 (3.014)	0.412	19.32 (2.836)	
Retired	1.97 (0.696)		34.03 (2.893)		19.33 (3.726)	
Educational level						
Informal	44.63 (5.236)		31.75 (2.493)		17.38 (3.021)	
Primary	46.12(4.435)	0.682	33.12 (3.756)	**0.004**	18.98 (3.829)	0.507
Secondary	45.78(4.219)		33.83 (3.125)		18.28 (3.213)	
Tertiary	45.82(4.364)		34.83 (3.327)		18.18 (2.647)	

Concerning knowledge, adults showed better knowledge compared to young adults and elderly (p≤ 0.001) and divorcee showed better result as compared to married and single (p=0.016). On the other hand, the results for gender, household income, employment status and educational level did not reveal significant findings.

With regards to attitude, high household income showed better attitude towards preventive measure of osteoporosis compared to moderate and low income (p=0.01). The respondents with tertiary level of education showed better attitude than secondary, primary and informal level of education (p=0.004). Other socio-demographic factors do not affect the attitude towards preventive measure of osteoporosis.

Finally, practice was affected by three elements: firstly, gender where female has better practice compared to male (p≤ 0.001), secondly, divorcee practiced better compared to single and married (p=0.005) and lastly retiree showed better practice compared to unemployed, student and employed (p≤ 0.001).

DISCUSSION

Osteoporosis is a growing chronic health problem that could result in mortalities and poor quality of life. To prevent osteoporosis among the adults population, it is necessary to have an initial understanding about their knowledge, attitude and practice towards preventive measures of osteoporosis. Consequently, health education and promotion activities can be planned and implemented accordingly [21]. This study differs from all previous studies as it specifically focuses on Malay Muslim adults.

With regards to the knowledge scores, the highest score is 56 and the lowest score is 32, this brings the mean knowledge scores to a moderate level which contributes about 50.5%. Our study is consistent with a study done in Saudi Arabia, which showed that 50% of participants have moderate knowledge on osteoporosis [22]. It is a good indicator that more than half of the respondents has answered correctly that physical activity

does not increase the risk of osteoporosis, high impact exercise improves bone health, alcoholism is not linked to osteoporosis and most important times to build bone strength is between 9 to 17 years old. However it is alarming that majority of them agreed that there are treatments for osteoporosis when there is actually none; they also did not have the knowledge on menopausal effect of osteoporosis as well as early menopause being a risk factor for osteoporosis. Additionally, respondents lacked the knowledge that post-menopausal hormone replacement can help in slowing down osteoporosis. Apart from that, the majority believed that that a glass of milk per day is sufficient for children with 9-17 years old, while the facts is instead of 1 glass a day the sufficient amount should be 5 glasses of milk per day.

With regard to attitudes score, nearly half of the population had poor attitude (49.8%) towards prevention of osteoporosis. However it is a good indicator that half of them had good attitudes (50.2%) towards prevention of osteoporosis. This study is consistent to the research done in Thailand which showed that most respondent have good attitude on osteoporosis (53.3%) [23]. Similarly a study conducted in Saudi Arabia showed that half of the respondents involved in the study had good attitude towards osteoporosis (55%) [24]. The most alarming finding is that more than half of respondents prefer traditional medicine, which often may contain steroid that can induced osteoporosis [25]. Nevertheless, it is a good indicator that more than half are willing to exercise, spending 30 minutes a day for physical activity, stay outdoor early in the morning for sunlight exposure and know that they need to maintain ideal body weight in order to prevent osteoporosis.

With regards to preventive activity, result indicates that half of the population have poor practices towards preventions of osteoporosis. This study is inconsistence with a study done in Saudi Arabia, which showed a good practice towards osteoporosis (60%) [24]. It is alarming that majority of them have poor practice on intake of vitamin D supplement as only minority of them took it daily and majority had never at all. Nonetheless, nearly half of them are exposed to early morning sunlight daily, have been performing exercises 2-3 times per week and never had soft drinks in a week. There is a need to educate people about the important of sunlight, and its relation to vitamin D, in addition to create awareness about most appropriate time of exposure to sunlight during the day to protect the skin and have the benefit at the same time.

Through our study we found out that the factors contribute to knowledge are age and marital status. Young adults (18-35 years old) showed lower knowledge on osteoporosis compared to other age groups. This is inconsistent with the study done in Saudi Arabia, which showed that younger age (18-25) have better knowledge [24]. Nevertheless, the result is consistent with the study of Hurst et al. [25] who found that knowledge about osteoporosis increase with age.

For marital status, married people have higher knowledge compared to single. This is a new finding as a previous Malaysian study showed that no significant mean difference of knowledge between married and single (p= 0.498) [26]. Otherwise, gender, employment status, household income and educational level do not influence the knowledge in this population. For gender, our study is inconsistent with a study done in Malaysia, which showed that women (89.6%) had significantly higher knowledge compared to men (81.0%) [27]. For household income, this study is incongruent with a study conducted at Majmaah City, which showed significant association between monthly income and knowledge score [24]concluding that those with higher income have better knowledge. For employment status, our study is inconsistent with a study done in Pakistan, which showed that those who are employed have better knowledge compared to unemployed [22]. On the effect of educational level, our study is parallel with a study done in Pakistan in which there was no significant difference in the scores of highly educated and low educated respondent regarding osteoporosis [28]. Nevertheless, in a study done in El Salvador, women with secondary or higher education obtained significantly higher total knowledge score [29].

Our study revealed that there are two things that influence the attitude score of osteoporosis in this community, which is household income and educational level. We have found that those who have higher household income have a higher attitude score. In the Malaysian setting based on Institute for Democracy and Economic Affairs chief executive officer Wan Saiful Wan in an article in Malay Mail Online January 31, 2016, noted that those who earn less than RM1500 are considered poor, those who earned a household between RM 1501 to RM 3000 are moderate income, while those who earned more than RM 3000 are rich. In this study, the poor has the lowest attitude score followed by the moderate and the rich group. His findings are consistent with a study done in Saudi Arabia [30] which showed a similar pattern. On the other hand, there are

two studies that did not found any significant difference between household income and attitude score on osteoporosis [31, 22].

In the present study, there is a significant difference between level of education and attitude score (p=0.004). It is found that those with tertiary level of education has higher attitude score compared to those who had primary and secondary level of education. Our study is consistent with studies at Riyadh in 2014 (p=0.001) and 2013 (p=0.0147) which also found that those with tertiary level of education has higher attitude score [30, 22]. However, other studies [26, 31] revealed that there is no significant difference between level of education and attitude score.

Age, gender, marital status and employment status does not influence the attitude score in this population. As for age, our finding is consistent with the finding in the studies conducted in Riyadh and in India [22, 31]. Again for gender, our study also consistent with study in Riyadh 2013 which also found that there is no significant mean difference between male and female in attitude score [22]. Other studies are consistent with our study, which showed that marital and employment status are not a significant factor towards the attitude score [26, 22].

With regards to the scores related to practice, the results of this study revealed three factors that can influence it; these are gender, marital and employment status. As for gender the results of our study show that female and married had better practice compared to male and single. This is also a new finding as previous studies stated that gender and marital status are not a significant factor to practice score against osteoporosis [26]. In the present study, practise against osteoporosis differs between employed compared to unemployed and retired. Those who are employed have the lowest practise score against osteoporosis. A study done in 2013 is inconsistent with our study, in which they found that employment status does not influence the practice score [22].

For age, household income and educational level, our study is consistent with previous studies confirming no significant difference was observed between age, income, and educational level of respondent with practice score towards prevention of osteoporosis [22, 27]. The limitation of this study that the respondent only include resident of Kg. Melayu Subang, thus it does not represent Selangor population.

CONCLUSION

From this study it can be concluded that 50.5% of the population have moderate knowledge score, 50.2% have good attitude score but 50.2% have poor practice score. In this study we found that age and marital status have influence on the knowledge score. While attitude score was found to be influenced by household income and educational level. Additionally, the study showed that practice score is significantly influenced by gender, marital status and employment status.

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