



FACING BITTER TRUTH OF BONES. ASSESSMENT OF OSTEOPOROSIS KNOWLEDGE AND BELIEFS IN COMMUNITY SETTINGS

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ABSTRACT

Osteoporosis is a metabolic disease that has emerged as a major public health concern due to its delayed diagnosis, lifelong treatment and complicated outcomes. Until now, osteoporosis is still being neglected either considering it as a fated part of aging or disease of the elderly. This neglecting behavior is due to low awareness and low knowledge of disease among the general population. The aim of the study was to evaluate existing knowledge, attitude and practices of multi-ethnic Malaysian population towards osteoporosis and to study the relationship between significant demographic factors and knowledge of the disease. Based on results of study, ethnicity, education and prior diagnosis of any bone disease were the most significant demographic factors that influence knowledge, attitude and practices. Awareness campaigns based on health belief model should be designed and implemented for multi-ethnic Malaysian population.

KEY WORDS: Attitude, Bones, Knowledge, Osteoporosis, Practices.



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INTRODUCTION

Due to devastating consequences of osteoporosis, it is no longer considered as only a public health concern, rather it has emerged as a socio-economic issue, as it demands a huge expense for diagnosis, treatment as well as management of its complications¹. National Institute of Health defines osteoporosis as a skeletal disorder that manifests itself by effecting both strength and quality of bones leading to decrease in bone mineral density and increase vulnerability to fractures². Major determinant symptoms of osteoporosis includes fragility fractures, among which most common one are hip fractures followed by vertebral and wrist fractures, severe acute back pain, limitation of mobility, stooped posture (kyphosis) and loss of height (dowager's hump) in chronic severe cases^{3,4}. Though osteoporosis quietly develops over years, most considerable risk factors includes genetics, being female especially postmenopausal women³, advance age, petite body structure, low consumption of calcium and vitamin D, lack of exposure to sunlight, sedentary life style, chronic ingestion of alcohol and prolong cigarette smoking^{5, 6, 7}.

Research shows that in 2005, the estimated direct cost for management of osteoporosis in U.S alone was \$19 billion. Experts believed that this cost would continue to rise and by 2025, the cost would approximately reach to \$25.3 billion⁸. The prevalence of osteoporosis has reached to an epidemic proportion in European countries with almost 77 million victims⁹. According to National Osteoporosis Foundation (NOF) 55% of U.S population aged 50 or above is already suffering from osteoporosis while approximately 34 million of the population has been predicted to suffer from osteopenia making them vulnerable to brittle bones and fragility fractures, ultimately osteoporosis⁹. Currently, osteoporosis is a major health concern for Caucasians but due to increase in life expectancies and limited availability of resources, it has been predicted that in near future osteoporosis would be more prevalent among Asians¹⁰.

Recognition of osteoporosis as a fated part of aging, low literacy rates, lack of awareness regarding disease consequences and risk factors ultimately results in increased incidence of this combatable disease^{11, 12}. A deep and thorough awareness about risks and preventive strategies would help to combat battle against the encroaching disease known as Osteoporosis¹³. In the past, a number of studies have been carried out among different ethnic populations dwelling in diverse geographical settings¹⁴. The purpose of these studies was to evaluate the varying level of knowledge, attitude and practices among study populations. Yet literature review suggests a paucity of data in terms of Asian countries especially in studies with adequate sample size, studies involving both genders and studies being carried out by individuals with different educational and socioeconomic status. As all these factors might significantly affect individual's knowledge, attitudes as well as practices, therefore it is important to know about the relationship between significant demographic factors and knowledge regarding a disease. This would ultimately help to increase awareness of the disease as well as assist in designing population needs based strategies and interventions to fight against the increasing prevalence of the disease. Furthermore, such studies might help to overcome the misconception of osteoporosis being only an elderly disease and would result in implementing positive practices among the community population.

METHODOLOGY

The current study was conducted among both academic and non-academic staff members of University Sains Malaysia. The academic staff includes teaching staff while non-academic staff includes clerical staff and other staff involved in cleaning, maintaining transportation within university and workers working in cafes within

the university. The purpose of including both academic and non-academic staff was to ensure that the sample belongs to different socio-economic status with different level of education. In order to seek permission to conduct this study, a letter explaining purpose of this study was sent to the respective deans of different schools in USM. Upon approval by respective deans, researcher distributed pre-validated questionnaires to academic and non-academic staff. Each questionnaire was accompanied by a letter that introduces researcher as well as purpose of study and a formal request to participate in the study. For clerical staff, questionnaires were given to one representative of clerical staff from each school. For academic staff, questionnaires were placed in their locker by the researcher while for the rest of non-academic staff questionnaires were distributed by researcher by personnel meeting. After interval of one week, questionnaires were collected back from each school by the

researcher. Ethical approval to conduct this research was also taken from National Institute of Health (NIH), Malaysia.

RESULTS

A total of 335 participants participated in this research. Based on literature review, the demographic factors that were considered crucial for this study were age, gender, ethnicity, marital status, social status, education level and diagnosis of any bone related disease. The purpose of including these demographic factors was to find out the most significant factor that influences knowledge, attitude and practices towards osteoporosis. The demographic profile of study participants is shown in Table 1.1. Age of participants ranged from 27 years to 64 years with mean age of 42.44 ± 7.7 years.

Table 1.1
Demographic Profile of study participants

Variables	N (%)
Age(mean + SD)	42.44+7.7
Gender	
Male	160(47.8%)
Female	175(52.5%)
Ethnicity	
Malay	145(43.3%)
Chinese	109(32.5%)
Indian	81(24.2%)
Marital status	
Single	85(25.4%)
Married	250(74.6%)
Social status	
Academic	141(42.1)
Non-academic	194(57.9)
Education	
Primary	31(9.3%)
Secondary	53(15.8%)
Undergraduate	106(31.6%)
Postgraduate	145(43.3%)
Diagnosis	
Without diagnosis	(90.1%)
Diagnosed with bone problem	33(9.9%)

The self-designed pre-validated questionnaire used in this study consisted of 37 questions i.e. 17 questions in knowledge section, 10 questions in attitude section, 10 questions in practice section. Descriptive statistics for each question in questionnaire was calculated. The purpose of calculating descriptive statistics was to have a general picture of overall existing knowledge, attitude and practice level in community population. For knowledge section of questionnaire, the first four questions were general questions regarding osteoporosis and bone mass. Although, maximum participants (89%) identified osteoporosis as a disease that makes bones fragile and weak but only 69 % were able to identify that osteoporosis does not affect both genders equally as major victim for this disease are women especially postmenopausal women. In knowledge section, approximately half of the study population was unable to identify that bone

mass measurement measures strength and quality of bones and the ideal time till which peak bone mass can be achieved. In question number 5, potential risk factors associated with osteoporosis were mentioned. Majority (99.1%) identified lack of milk and dairy products followed by avoidance of sunlight (77.7%) as significant risk factors that leads to development of osteoporosis. On the other hand, lack of exercise and early menopause were identified by minimum participants i.e. 37.3% and 42.7 % respectively. The last section in knowledge section comprises of most general and severe complications of osteoporosis. Fractures (88.1 %) followed by slouched posture (77.6%) were identified by majority of study population while loss of height was the least identified complication of osteoporosis. The descriptive statistics for knowledge section of questionnaire are given in table 2.2.

Table 2.2
Frequency of Responses to Knowledge Section

Item No	Yes	No	Don't know
1	298(89%)	7(2.1%)	6(1.8%)
2	172(51.3%)	77(23%)	86(25.7)
3	175(52.2%)	56(16.7%)	104(31.0%)
4	257(76.7%)	69(20.6%)	9(2.7%)
Risk factors			
5a	332(99.1%)	1(0.3%)	2(0.6%)
5b	151(45.1%)	59(17.6%)	125(37.3%)
5c	168(50.1%)	102(30.4%)	65(19.4%)
5d	255(76.1%)	24(7.2%)	54(16.1%)
5e	257(76.7%)	32(9.6%)	48(14.3%)
5f	143(42.7%)	89(26.6%)	103(30.7%)
5g	125(37.3%)	140(41.8%)	70(20.9%)
5h	238(71%)	47(14.0)	50(14.9%)
5i	158(47.2%)	83(24.8%)	94(28.1)
5j	157(46.9%)	89(26.6%)	89(26.6%)
6a	295(88.1%)	20(6%)	20(6%)
6b	199(59.4%)	63(18.8%)	73(21.8%)
6c	260(77.6%)	33(9.9%)	42(12.5%)

In attitude section of questionnaire, individual's attitude towards osteoporosis were assessed by using a likert scale against questions seeking information about individual's perception regarding severity of osteoporosis,

personnel susceptibility of osteoporosis, bone mass measurement and diagnosis of osteoporosis. Frequency of responses to questions in attitude section is shown in table 2.3. The majority of participants did not

consider malnutrition or very strict dieting as risk for osteoporosis. As far as severity of disease is concerned, majority of participants disagree with the fact that osteoporosis is as dangerous as cancer. This explains the reason that only 3.2 % of study participants rated personnel susceptibility to suffer from

osteoporosis. Majority of study participants considered bone mass measurement painful and time consuming only 20.9% and 7.2 % participants correctly identified that neither bone mass measurement is painful nor it is time consuming.

Table 2.3
Frequency of responses to attitude section

	Definitely agree	Moderately agree	Neutral	Moderately disagree	Definitely disagree
1	-----	55(16.4%)	223(66.6%)	53(15.8%)	4(1.2%)
2	58(17.3%)	138(41.2%)	107(31.9%)	32(9.6%)	-----
3	5(1.5%)	77(23.0%)	121(36.1%)	90(26.9%)	41(12.2%)
4	13(3.9%)	74(22.1%)	80(23.9%)	162(48.4%)	6(1.8%)
5	51(15.2%)	42(12.5%)	187(55.8%)	44(13.1%)	11(3.3%)
6	2(0.6%)	68(20.3%)	151(45.1%)	68(20.3%)	2(0.6%)
7	151(45.1%)	78(23.3%)	82(24.5%)	21(6.3%)	3(0.9%)
8	122(36.4%)	178(53.1%)	178(53.15)	15(4.5%)	20(6%)
9	89(26.6%)	135(40.3%)	85(25.4%)	24(7.2%)	2(0.6%)
10	4(1.2%)	10(3.0%)	89(26.6%)	131(39.1%)	101(30.1%)

Questions in the practice section of the questionnaire were designed to identify daily practices that can serve as risk for future development of osteoporosis. Descriptive statistics for questions in practice section is shown in table 2.4. Results from a descriptive analysis showed that the majority of the

participants rarely or never discuss osteoporosis with their friends, family or any health care professional. Secondly, the majority (34.9%) of participants reported to rarely consume milk and dairy products that constitute a serious factor that affects bones adversely.

Table 2.4
Frequency of responses to Practice section

	Always	Frequently	Sometimes	Rarely	Never
1	24(7.2%)	121(36.1%)	102(30.4%)	74(22.1%)	14(4.2%)
2	11(3.3%)	94(28.1%)	112(33.4%)	117(34.9%)	1(0.3%)
3	10(3.0%)	57(17%)	137(40.9%)	93(27.8%)	38(11.3%)
4	3(0.9%)	115(34.3%)	110(32.8%)	87(26.0%)	20(6.0%)
5	-----	26(7.8%)	129(38.5%)	140(41.8%)	40(11.9%)
6	17(5.1%)	62(18.5%)	38(11.3%)	137(40.9%)	81(24.2%)
7	1(0.3%)	23(6.9%)	95(28.4%)	52(15.5%)	164(49%)
8	1(0.3%)	9(2.7%)	70(20.9%)	75(22.4%)	180(53.7%)
9	69(20.6%)	84(25.1%)	87(26.0%)	72(21.5%)	23(6.9%)
10	10(3.0%)	71(21.2%)	107(31.9%)	90(26.9%)	57(17.0%)

In order to evaluate the relationship between demographic factors and knowledge, attitude and practice a scoring system was used. According to scoring the system, each right answer in the knowledge section carries 1 mark

while wrong answer gains zero mark. For attitude section, likert scale was scored as follow; 2 for strongly agree, 1 for moderately agree, 0 for neutral, -1 for moderately disagree and -2 for strongly disagree. In practice section,

following scores were used; 4=always, 3=frequently, 2 = sometimes, 1=rarely, 0=never. For all negatively quoted questions, reverse scoring was used. The mean score of study participant w.r.t. demographics is shown in table 2.5. Inferential statistics i.e. Mann-Whitney U test and Kruskal Wallis H test were

used to study relationship between demographics and knowledge, attitude and practice score. As a result of the above mentioned tests, ethnicity and diagnosis of any bone related disease were most significant demographic factors that affect knowledge, attitude and practice.

Table: 2.5
Mean score w.r.t. demographics

Variables	K.score 10.94 3.1 Mean Rank	P-value	A.score 4.79 4.42 Mean Rank	P-value	P.score 21.01 4.04 Mean Rank	P -value
Gender						
Male	164.13	0.47	181.56	0.01	174.49	0.23
Female	171.54		155.60		162.06	
Ethnicity*						
Malay	174.06		176.63		184.05	
Chinese	190.86	0.00	209.56	0.00	190.05	0.00
Indian	126.40		96.63		109.59	
Marital status						
Single	169.24	0.89	125.94	0.21	129.69	0.59
Married	167.58		141.20		140.02	
Education*						
Primary	91.24		124.58		116.89	
Secondary	168.40	0.00	165.85	0.054	185.94	0.00
Undergraduate	201.69		178.37		191.08	
Postgraduate	159.63		170.49		155.50	
Diagnosis						
With diagnosis	245.98	0.00	276.95	0.00	269.27	0.00
Without diagnosis	159.48		156.09		156.93	

*P-value < 0.05= statistically significant *Kruskal Wallis H test*

DISCUSSION

The results of the current study showed conflicting and alarming results. Although, female participants in our study scored higher than males as far as knowledge of osteoporosis is concerned, but even then there was no statistically significant score difference between attitude and practices of males and females. Only domain in which females scored statistically significant then men was personnel susceptibility to suffer from osteoporosis in attitude section. The same attitude has been observed in various KAP studies, where men would not consider themselves as victim of osteoporosis as they consider osteoporosis as

only a disease that attacks female gender^{15, 16, 17}. As shown by the results of our study, the most significant demographic factors that affect individual's knowledge, attitude and practices regarding osteoporosis were ethnicity and diagnosis of any bone related disease e.g. arthritis, osteopenia, low level of calcium or vitamin D. Our study shows that Chinese scored maximum in all three domains of questionnaire i.e. knowledge, attitude and practice, followed by Malay and Indians. Various studies that have been conducted previously on osteoporosis have shown that Chinese are more prone to suffer from osteoporosis due to shorter height

and low bone mass index^{18, 19}. As far as diagnosis is concerned, those who were already suffering from osteoporosis or any bone related diseases; they showed statistically significant higher mean score in all three domains of the questionnaire. Level of education also effects knowledge and practices significantly. These results can be explained on the basis of health belief model²⁰. According to the health belief model; there are four important components that would compel an individual to implement positive changes in lifestyles. Although knowledge is a pre-requisite for positive changes in attitudes and practices but still knowledge alone would not guarantee practical implementation of positive changes in lifestyles^{21, 22}. The health belief model describes four simple components that would strengthen the individual will to practically implement knowledge into positive attitudes and practices. These four components are:

Perceived seriousness of disease i.e. An individual should recognize the consequences and severity of disease
Perceived susceptibility of a disease i.e. An individual should be aware of chances that he or she might be a victim of such disease
Perceived benefits of positive attitudes and practices i.e. An individual should realize the outcomes of preventive behaviors or precautions, how it would benefit them in long run
Perceived barriers i.e. An individual should be aware of all those factors that might pose hindrance in implementing positive changes As

seen in our study, although females showed higher score than men but still there was no difference in attitudes or practices towards osteoporosis. Also a large number of participants recognize lack of milk and dairy products as risk for development of osteoporosis but still majority of the population reported to take milk and dairy products rarely. This leads to the fact that still we need well designed strategies to increase awareness regarding osteoporosis. The first step should be creating awareness regarding the seriousness of osteoporosis so that common misconception of osteoporosis being only female or elderly person's disease can be overcome. Secondly, it is important to aware general population that regardless of age, anyone can be a victim of this disease and chances can be even more if there is a genetic predisposition. Thirdly, an important component of such awareness campaigns should be aware of targeted audience about possible benefits and outcomes in the long run. Lastly, full attention should be paid to figure out those factors that might pose hindrance in the implementation of positive practices e.g. religious beliefs, social pressure from peers, financial constraints. This would ultimately help in designing and implementing a strategy that would not only increase awareness of osteoporosis in general population but also it would help the public to practically implement their knowledge in daily life by adopting positive attitudes and practices.

CONCLUSION

The current study shows need of public awareness and educational programs for the multi ethnic Malaysian community. Such programs should be based upon four components of health belief model and target of such programs should be massive community population regardless of age and gender.

ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to both academic and non-academic staff of University Sains Malaysia.

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