Assessment of Knowledge Level on Osteoporosis among a Private University Students in Malaysia

Dr Samia Amin[1*] & Dr Nor Ashikeen Mukti [2]
[1] Assistant Professor, Lincoln University College, Malaysia
[2]Deputy Dean (Pre-clinical), Lincoln University College, Malaysia

Abstract: Osteoporosis is one of the major public health problem with a high prevalence and incidence of morbidity and mortality worldwide. Evidence suggesting that osteoporosis knowledge is a contributor to osteoporosis preventive behavior. Low literacy rates, lack of understanding regarding disease risk, effects and consequences leads to increase the incidence of this combatable disease. So, Osteoporosis can be avoided via educational interventions. The objective of this study was to evaluate osteoporosis knowledge among university students in a private university in Malaysia. Information was collected through a cross sectional survey. The data gathered from seventy three university students using convenience sampling method during the period from August to October, 2016. Respondents had been requested to sign a written informed consent, then self-administered, validated questionnaire consisted of 20 items assessing knowledge regarding osteoporosis was administered. Descriptive statistics was used to analyze the data by Microsoft Excel and Statistical Package for Social Sciences. Out of the seventy three participants, 38 % were males and 61% were female. There were 24 students in foundation and 49 students in bachelor course. The mean age of the respondents were 22.91 ± 1.74 years. Among the participants 53% were Malaysian. Total 79.4% students had poor knowledge and only 6.8% of the respondents had good knowledge on risk, cause, signs and symptoms, prevention, diagnosis and treatment of osteoporosis. Female respondents had poor knowledge (1.60+0.52) than male (1.61+0.49). Bachelor students had poor knowledge (1.29+0.46) than foundation college students (1.92+0.26).The study finding revealed an inadequate knowledge of osteoporosis among university students, so intervention program need to be adopt to increase the knowledge regarding osteoporosis for prevention.

Keywords: Osteoporosis; knowledge; private university students, Malaysia.

1. Introduction

Headings Osteoporosis is a progressive metabolic skeletal disease where bone mass reduction occurs characterized by the porous bones which leads to diminished bone strength (1). It has been described as a silent disorder by National Osteoporosis Foundation as people are not aware of consistent loss of their bone mass till they experience a fragility fracture (2, 3) which impede their quality of life (4).

Risk factors causing primary and secondary osteoporosis are classified as modifiable and non-modifiable. Modifiable risk factors are those which can be changed or if they are eliminate the risk of occurrence of the disease can be reduced which includes low calcium and vitamin D consumption, carbonated beverages, low BMI, sedentary working and prolong immobilization; while non-modifiable occur with age, family history, menopause and aging(5).

Osteoporosis is a serious public health problem (6) and both male and female become disable with severe complications (7). Approximately 75 million people are suffering from osteoporosis worldwide7. The prevalence of osteoporosis in Malaysia was suggested as 24.1% in 2005, predominantly affecting the hip fracture among the elderly (8).

Osteoporotic fractures incur massive healthcare and economic burdens. A recent study among South Korean population indicated that the cost of osteoporotic fractures, accelerated from USD $8.8 million in 2007 to $149.3 million in 2011 (9). Another study among the Eastern Saudi Arabian population stated that the treatment cost of osteoporotic fractures of the femur for the primary 12 months became USD $628.95 million, with a projected lifetime cost of $9.34 billion in 2025 (10). According to the survey conducted by International Osteoporosis Foundation hip fractures in Pakistan expenses 1200-2400 USD per hip fracture indicating an extreme burden of disease on poor population of Pakistan (11).

Osteoporosis research in Malaysia is very limited. The most comprehensive survey in hip fracture

incidence was performed in 1996–1997 which was a retrospective study, whereby it was demonstrated that the rate was 218/100,000 for women and 88/100,000 for men12. The direct hospitalization cost for hip fracture in 1997 was estimated conservatively at RM 22 million (12).

2. Significance of the study

Osteoporosis is a significant global health concern due to its high prevalence and incidence worldwide. Awareness on osteoporosis as a disease is vital for its identity, risk factors, management and prevention. It's not only confined to the growing older population however has implications for all age groups. Public awareness of osteoporosis remain low, especially in developing country. Health education had been shown to be effective in enhancing knowledge inducing behavioral change during adolescence; the period of peak bone density. This study is to discover the awareness among private university students about this critical joint disease which can be a base line evidence to point out the focus of health education program.

3. Material and methods

Information was gathered through a cross-sectional survey. The data was collected from 73 university students using convenient sampling method during the period from August to October, 2016. Respondents were asked to sign a written inform consent then self-administered validated questionnaire consisted of 20 items assessing knowledge regarding osteoporosis was administered. Respondent's confidentiality was maintained and special precaution was taken to reduce mutual communication to minimize bias by invigilating respondents whilst they were completing the questionnaire.

Students were instructed about the objectives of the study, terminology used in questionnaire and instructions for fill up the questionnaire before data collection procedure. Respondents were given 30 minutes to finish the questionnaire. All respondents were given choice to withdraw from the study at any time without any obligation. All eligible respondents were sincerely advised that participation on this study was voluntary and anonymous and confidentiality will be strictly conserved.

Data were collected, complied, and tabulated using Microsoft Excel and analyzed using SPSS 22.0 version. Each questions had two possible answers; 1 point for "TRUE" response and 0 point for "FALSE" response. Total score used to rank the level of knowledge and subsequent quantitative analysis was conducted to rank good, satisfactory and poor knowledge score on osteoporosis. The respondents who obtain knowledge score above 15 were

considered as good knowledge, scores between 15 and 10 considered as satisfactory knowledge. The score below 10 was considered as poor level of knowledge.

4. Finding

Out of the 73 respondents, 38 % were male and 61% were female. There were 24 students in foundation and 49 students in bachelor course. The mean age was 22.91 ± 1.74 years. Among the participants, 53% were Malaysian. Regarding the age distribution of the respondents, 26% was below 20 years, 58% between 20-30 years and 15% above 30 years (Table 1).

Table 1: Demographic characteristics (N=73)			
Variables	Status	N	%
Age	Below 20	19	26.0
	20-30 years	43	58.9
	Above 30 years	11	15.0
Sex	Male	28	38.3
	Female	45	61.64
Education level	Foundation	24	32.8
	Bachelor	49	67.1
Nationality	Malaysian	39	53.42
	Non Malaysian	34	46.5

Regarding the knowledge score among the respondents, 79.4% students had poor knowledge and only 6.8% of the respondent had good knowledge on risk factor, symptoms, signs, cause, prevention, diagnosis and treatment of osteoporosis (Table 2).

Table 2: Knowledge score	
Knowledge score	N (%)
Poor knowledge (>10)	58(79.4)
Satisfactory knowledge(10-15)	10(13.6)
Good knowledge(<15)	5(6.8)

In terms of knowledge score with the demographic characteristics, female had poor knowledge (1.60+0.52) than male (1.61+0.49). Bachelor student had poor knowledge (1.29+0.46) than foundation students (1.92+0.26) (Table 3).

Table 3: Sex and education level variation with knowledge score				
Demographic characteristics		Poor knowledge	Satisfactory/ Good knowledge	Mean score (SD)
Sex	Male	28 (38.3)	0 (0)	1.61 (0.49)
	Female	43 (58.9)	2 (2.7)	1.60 (0.52)
Education	Foundation	20 (27.3)	4 (5.4)	1.92 (0.26)
	Bachelor	48 (65.7)	1 (1.3)	1.29 (0.46)

Table 4 presenting the percentage of "TRUE/FALSE" responses of various questions regarding the distribution of general Knowledge, risk

factors, symptoms, cause, prevention, diagnosis and treatment of osteoporosis obtained by participant's response from the questionnaire.

Table 4: Percentage of TRUE/FALSE responses of various questions regarding knowledge of osteoporosis among the respondents		True (%)	False (%)
General knowledge on osteoporosis			
	Osteoporosis is a disease condition	91.7	8.2
	Osteoporosis causes bones to become weak and brittle	19.1	80.8
	Osteoporosis literary means porous bone	9.5	90.4
	Osteoporosis is called the "silent disease"	2.7	97.2
Knowledge on risk factor of osteoporosis			
	Both man and woman can have osteoporosis	21.9	78.0
	Menopausal women are more prone to osteoporosis.	4.1	95.8
	Family history increases the risk	28.7	71.2
Knowledge on symptoms of osteoporosis			
	No symptoms in the early stages of osteoporosis	16.4	83.5
	Bone pain and fracture is the late symptom of osteoporosis	12.3	87.6
	With osteoporosis, hip fractures occur most commonly	15.0	84.9
Knowledge on causes of osteoporosis			
	Prolong bed rest causes osteoporosis	20.5	79.4
	Using steroid drug can cause osteoporosis	23.2	76.7
	Carbonated drinks and coffee can cause osteoporosis	42.4	57.5
	Smoking and excessive alcohol cause osteoporosis	36.9	63.0
Knowledge on prevention of osteoporosis			
	Exposure to sun light can prevent osteoporosis	10.9	89.0
	Calcium rich diet & vitamin D can prevent osteoporosis	17.8	82.1
	Regular exercise can prevent osteoporosis	31.5	68.4
	Avoid falls reduce the risk of fractures in osteoporosis	23.2	76.7
Knowledge on diagnosis and treatment of osteoporosis			
	A bone mineral density test use to check osteoporosis	6.8	93.1
	Medical treatments are available	50.6	49.3

5. Discussion

The purpose of this study is to assess the knowledge of osteoporosis among university students. Because this important population of the community when targeted by the correct knowledge, they will give a great value in improving bone health among the various extensive community.

The mean age of participants for this current study was 22.91 ± 1.74 years which is similar to the age from Sri Lanka study among university students which reported an age of 20±2.1 years (13).

In present study, the knowledge on osteoporosis; female had poor knowledge than male. This result is contrary of another study in Malaysia in which women had higher knowledge on osteoporosis than men (14).

One more significant finding of the study was that bachelor students had more poor knowledge than foundation course students however in another study there was no significant difference between knowledge of osteoporosis among the undergraduates and postgraduates students (14). Another study conducted on highly educated population (15); study among general female population (16) or teenagers (17) had not known about the clinical condition osteoporosis.

Regarding knowledge score among 73 respondents, 79.4% students had poor knowledge and only 6.8% of the respondent had good knowledge on risk factor, symptoms, cause, prevention, diagnosis and treatment of osteoporosis. This result was just reverse of another study which was performed in Pakistan among young female and it was observed that, out of 162 respondents, 29 (17.9%) had poor knowledge and 133(82.1%) had good knowledge about osteoporosis (18).

Knowledge of the disease and its risk factors are important measures to prevent the disease. In current study, 91.7% of the respondents know osteoporosis is a disease but "False" statement was stated by 80.8% regarding osteoporosis causes bone week and brittle; 90.4% regarding osteoporosis literary means porous bone and 97.2 % about osteoporosis is called the "silent disease". Another study among medical students from a medical college in Turkey revealed that knowledge on disease resulting in osteoporosis were poor (19).

Respondents of the present study had poor knowledge regarding the risk factors (family history, menopause, male and female osteoporosis). However one study shown the good knowledge results about the risk factor of osteoporosis (20). Menopause was less identified in this current study and this might be due to the reason that the respondents were not much aware of the term "menopause".

Regarding the knowledge on symptoms of osteoporosis 80% above respondents stated "False" statement in term of no symptoms in the early stages

of osteoporosis, bone ache and fracture is the late symptom of osteoporosis and with osteoporosis, hip fractures occur most commonly which should be considered as a very alarming point because in another study 97.3% of respondents were aware that osteoporosis causes fracture (21).

However, surprisingly nearly half of the respondents (42.4%) stated "True" about carbonated drinks and coffee can cause osteoporosis and 57.5% stated "False"; the cause behind is unexplainable; but may be respondents were concern about the impact of carbonated drinks and coffee with different common diseases like diabetes and hypertension. Knowledge on causes of osteoporosis in term of smoking was also stated "False" through 63% respondents which is higher than Saudi Arabia study (43%) 21, Egypt study (60.4%) (22), and Iran study (28.5%) (23).

The current data showed that 89%, 82.1%, 68.4% and 76.7% of respondents stated "False" about exposure to sun light, calcium rich diet & vitamin D can prevent osteoporosis, regular exercise and avoid falls reduce the risk of fractures in osteoporosis respectively. But in another study most of the participants identified regular exercise and exposure to sunlight as preventive measures for osteoporosis (94.6% & 90.2% respectively), meanwhile only 7.1% could identify calcium rich food and vitamin D as a preventive measure (24).

Only 6.8% respondents stated accurately about bone mineral density test to use to check osteoporosis and 50.6 % about medical treatment for osteoporosis. So, the present study reveals lack of awareness about osteoporosis among university students, so this study could serve as a stimulant for further researcher to assess knowledge among other community population.

6. Conclusion

The current finding revealed an inadequate knowledge of osteoporosis among university students, therefore, raising the awareness in the community about this serious disease incredibly needed. Intervention program should be adopted to increase the knowledge among young as well as adults to prevent osteoporosis. Thus, health education will be very useful to enhance the information of students.

References

1. Rafraf M, Bazyun B, Afsharnia F (2009) Osteoporosis-related life habits and knowledge about osteoporosis among women in Tabriz, Iran. *International Medical Journal,* 8: 17-20.
2. Cosman F, de Beur SJ, LeBoff MS, Lewiecki EM, Tanner B, Randall S, et al., (2014), Clinician's Guide to Prevention and Treatment of Osteoporosis. *Osteoporosis International,* 2: 2359-2381.
3. Khorsandi M, Hasanzadeh L, Ghobadzadeh M (2012) Assessment of knowledge and self-efficacy in achieving osteoporosis prevention behaviors among high school female students. *Social and Behavioral Sciences,* 46: 4385-4388.
4. Riaz M, Abid N, Patel J, Tariq M, Khan MS, et al. (2008) Knowledge about osteoporosis among healthy women attending a tertiary care hospital, *Journal of Pakistan Medical association,* 58: 190.
5. Ahmad Mohd Sharkawi , Isa Naina Mohamed, Sabarul Afian Mokhtar, Ahmad Nazrun Shuid, (2015) Review of the Risk Factor of Osteoporosis in the Malaysian Population, *Research Updates in Medical Sciences (RUMeS)*, 3(1): 77-82
6. Danish SH, Ahmed F, Hassan F, Khan SA, Hashmi AA, et al., (2014), Osteoporosis and its Associated Factors Revisited: Case Control Study, Pakistan Journal of Medicine and Dentistry 3: 13.
7. World health organization, (2007) Assessment of osteoporosis at the primary health care level. Summary Report of a WHO Scientific Group. WHO, Geneva.
8. Lim PS, Ong FB, Adeeb N, Seri SS, Noor Aini et al.(2005), Bone health in urban midlife Malaysian women: risk factors and prevention, *Osteoporosis International*, 16: 2069-79.
9. Kim J, Lee E, Kim S, Lee TJ,(2015), Economic burden of osteoporotic fracture of the elderly in South Korea:A national survey. Value in Health Regional Issues, 9C, 36 – 41
10. Sadat-Ali M, Al-Dakheel, DA, Azam MQ, Al-Bluwi MT, Al-Farhan MF,AlAmer HA, Al-Meer Z,Al-Mohimeed A,Tabash IK, Karry MO et al.(2015), Reassessment of osteoporosis-related femoral fractures and economic burden in Saudi Arabia. Achieve Osteoporosis. 10, 37.
11. Asia pacific audit report, Pakistan, (2013), Available from: www.iofbonehealth.org.Retrieved on 2nd December, 2016.
12. Lee JK, Khir ASM, (2007), The incidence of hip fracture in Malaysians above 50 years of age: Variation in different ethnic groups, Asia Pacific League of Associations for Rheumatology (APLAR), *International Journal of Rheumatic Diseases,* 10, 300–305.
13. Ediriweera de Silva, R. E., Haniffa, M. R., Gunathillaka, K. D. K., Atukorala, I., Fernando, E. D. P. S., & Perera, W. L. S. P., (2014), A descriptive study of knowledge, beliefs and practices regarding osteoporosis among female medical school entrants in Sri Lanka. Asia Pacific Family Medicine, 13(1), 15.

14. Yusra Habib Khan, Azmi Sarriff, Amer Hayat Khan and Tauqeer Hussain Mallhi, (2014), Knowledge, Attitude and Practice (KAP) Survey of Osteoporosis among Students of a Tertiary Institution in Malaysia; *Tropical Journal of Pharmaceutical Research*, 13(1): 155

15. Yagmur Y, (2009), The Knowledge Of Primary Health Care Providers About Osteoporosis And Changeable Osteoporosis Risk Factors; Maltepe University Journal of Nursing Science and Art, 2(1)

16. Ungan M, Tümer M, (2001), Turkish women's knowledge of osteoporosis, *Family Practice.* 18(2): 199-203.

17. Gurney S, Simmonds J, (2007), Osteoporosis: a teenage perspective. Physiotherapy. 93(4): 267-272.

18. Maria Tahir, Noman-ul-Haq, Aqeel Naseem, Ghulam Razzaque,(2016), Effect of Educational Intervention on Osteoporosis Knowledge among University Female Students in Quetta, Pakistan, Journal of Pharmacy Practice and Community Medicine, 2(2): 40-45

19. Eyigör S, Karapolat H, Durmaz B,(2008), Medical Students' knowledge of osteoporosis in Ege University Faculty of Medicine, *The Archives of Rheumatology Rheumatism,* 23: 77–81.

20. Alexandraki KI, Syriou V, Ziakas PD, Apostolopoulos NV, Alexandrakis AI, et al., (2008), The knowledge of osteoporosis risk factors in a Greek female population. *European menopause journal*, 59: 38-45.

21. Nawal Khalaf AlAnazi, Marahib Saud AlShahrani, Sarah Mohammed AlGosi, Hyder Osman Mirghani,(2016), Osteoporosis knowledge and attitude assessment among females University students in Tabuk, Saudi Arabia, Indian Journal of Basic and Applied Medical Research; Vol.-5(4), 310-315

22. El-Tawab SS, Aziz Saba EK, Taha Elweshahi HM, Ashry MH.,(2015), Knowledge of osteoporosis among women in Alexandria (Egypt): A community-based survey, *The Egyptian Rheumatologist*, 38, 225–231

23. Z. Jalili, N. Nakhaee, R. Askari, V. Sharifi, (2007), Knowledge, attitude and preventive practice of women concerning osteoporosis, *Iran Journal of Public Health*, 36 (2) 19–24

24. Yosria El-Said Hossien, Hanan M. M. Tork, Amirat Ali El-Sabeely (2014), Osteoporosis Knowledge among Female Adolescents in Egypt. *American Journal of Nursing Science*, 3(2), 13-17