Awareness and knowledge about osteoporosis among under-graduate medical students in a medical college in south India

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Abstract
Background: Osteoporosis affects millions of people world-wide. Awareness about osteoporosis is one of the contributing factors for osteoporosis prevention. Lack of awareness among health care providers will ultimately results in increased incidence of this disease. The objective of this study is to assess awareness and knowledge about osteoporosis among under-graduate medical students in a private medical college located in south India. **Methods:** It is a cross-sectional study, conducted from 1st semester to 9th semester using self-designed, semi-structured, pre-validated questionnaire consisting of 20 elements in a private medical college located in South India. **Results:** All 734 students have heard about osteoporosis but their understanding about disease and knowledge about risk factors were deficient. 85.58% students knew regular exercises can help in preventing osteoporosis but only 26.97% knew about the availability of treatment options once osteoporosis develops. **Conclusion:** Although 100% students were aware of osteoporosis but the knowledge regarding pathogenesis, risk factors and treatment principles were deficient. There is a need to update these lacunae about osteoporosis to become better medical professionals, to prevent and to avoid delay in diagnosis and management of this disease.
Key Word: Osteoporosis, Awareness, knowledge, risk factors and Under-graduate medical students

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INTRODUCTION

Osteoporosis is one of the major health problems of the world. Throughout the world, Osteoporosis causes more than 8.9 million fractures annually, resulting in an osteoporotic fracture every[3] sec.[2] it can affect both sexes, but females are having more risk for developing it.[1] Osteoporosis affects about 45% women after 50yrs. of age or more. As per World Health organization (WHO), Osteoporosis is defined as low bone mass with micro architectural deterioration in bone tissue leading to increased fragility and fracture risk.[3] It is a silent disease as bone mass loss occurs without symptoms and it is known only after fracture occurs.[4] It is estimated that nearly 20 % of patients having osteoporotic hip fractures die within one year due to complications.[5] 40% of patients suffer sustained disability and loss of independence requiring long term nursing care.[6] Osteoporotic hip fractures form a major challenge in Asian countries.[7] This problem is increased in last few decades due to affluent lifestyle which increases vulnerability to osteoporosis. It is estimated that by 2050, 50% of all worldwide osteoporotic hip fractures will occur in Asia[8] which leads to tremendous increase in health care burden along with its socioeconomic effect.[9]

Osteoporosis is classified into Type 1 and Type 2. Type I is post-menopausal osteoporosis which affects corticaland cancellous bone both result due to increased osteoclastic activity. It occurs between 10-15 yrs. after menopause. Type 2 is senile osteoporosis, which occurs in both women and men, after 75 yrs. of age, mainly affects cancellous bone.[10] As per the WHO diagnostic definition, osteoporosis is defined as bone mineral density (BMD) at hip or lumbar spine, less than or equal to-2.5 standard deviation from mean peak bone mass (average of young healthy adults) as measured by dual energy X-ray absorptiometry.[11] There are many non-modifiable risk factors of osteoporosis including gender, aging and family history. Modifiable risk factors which are under our control are excessive alcohol intake, smoking, medications and immobilisation.[12] According to University of Maryland Medical Centre (UMMC), few best ways of preventing osteoporosis includes plenty of Calcium and optimal Vitamin D, engaging in weight bearing exercises and exercises against resistance, stopping cigarette use and limiting caffeine intake up to 3-4 cups of coffee per day. Exposure to sunlight can improve the BMD in cases of Vitamin D deficiency which can prevent non-vertebral fractures.[13] Awareness in public regarding osteoporosis remains low in under developed countries[14] which can be improved by future health care professionals. Osteoporosis, being disease of old age, originated in early stage of life by failure to achieve optimal peak bone mass. Higher the peak bone mass, lesser the chances of osteoporotic fractures later in life.[15] As maintenance of bone strength and bone mass during young age reduces the chances of Osteoporosis, it is prudent to assess knowledge and practises to prevent osteoporosis among young generation.[16] Medical students as future doctors are at forefront among health care providers, present study aimed at assessing their awareness and knowledge regarding osteoporosis prevention.

MATERIAL AND METHODS

This is a cross-sectional study, using self-designed semi-structured, prevalidated questionnaire of 20 elements developed after wide literature review. Data was collected from I[st] to IXth semester studentsin a private medical college located in South India. Out 754 students 734 students were interviewed after taking their consent for participation. Prior to execution of questionnaire, purpose of study has been explained to participants. The language of questionnaire was English and consisted of multiple choice questions. Questionnaire focusses on awareness and knowledge about prevalence, risk factors, prevention and treatment principles regarding osteoporosis. Most questions were having answers yes, No and I don't know options. The latter option was to avoid guessing by participants. Questionnaire was pre-validated by pre-test among three faculties (excluded from study) two weeks prior to study to know about ambiguity or misunderstanding of questions and then modified in present form.

RESULTS

Demographic characteristics: Out of 754 students, 734 students gave consent for participation. The age of students was between 17-25 yrs. 504(68.66%) students were female and 230 (31.33%) were male with female to male ratio of nearly 2:1.In this study, all 734 students (100%) heard about osteoporosis. Responses about knowledge of osteoporosis is tabulated in table1.

Table1: participants knowledge about osteoporosis

Questions	Yes	No	I don't know
Have you heard about osteoporosis?	734 (100%)	--	--
Whether Osteoporosis is a silent disease?	382 (52.04%)	224 (30.51%)	128 (17.43%)
Whether osteoporosis increases the risk of having fractures?	454 (61.85%)	143 (19.48%)	137(18.66%)
Whether peak bone mass is being achieved between 25-30 yrs. of age?	624 (85.01%)	34 (4.63%)	76 (10.35%)
Whether men and women both can affect by osteoporosis?	238 (32.42%)	Only men 63(8.58%)	Only women 433 (58.99%)
Whether women are more prone to have osteoporosis?	647 (88.14%)	4 (00.54%)	83(11.30%)
Whether bone loss accelerates after menopause?	442 (60.21%)	69 (9.40%)	223 (30.38%)
Whether 60 % of all women older than 50 yrs. will have fractures due to osteoporosis?	464 (63.21%)	132 (17.98%)	138 (18.80%)

Only 26.97% (198 students) were aware about availability of treatment of osteoporosis whereas 86.10% (632 students) responded positively about reduction in depletion of bone mass after menopause by hormone replacement.
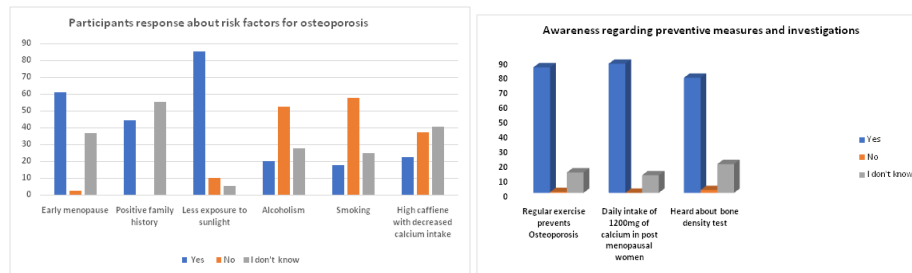
Figure 1: describes about awareness of risk factors for osteoporosis; **Figure 2:** describes about awareness regarding prevention and investigations
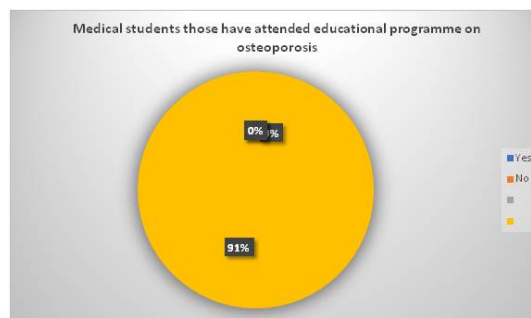

Figure 3: depicts the percentage of students those have attended educational programme regarding osteoporosis.

DISCUSSION

Most of the studies on awareness on Osteoporosis has been done on general population and only few studies have been done on health care professional[17,18] especially undergraduate medical college students. Medical students as future doctors will be on forefront of health care delivery system can become effective tool for prevention, early diagnosis and management of osteoporosis, a major health problem. In our study all participants were aware about osteoporosis which is consistent with other studies.[12,19] Only 32.42% (238 students) knew that both men and women can get osteoporosis, in contrast to 100% respondents reported by Korean study by Chan-Ho Park etal. on health care professionals.[20] In present study, only 44.14% (324 students) considered positive family history as risk factor which is comparable to 36% students stated by Bilal *et al*.[17] In our study, only 20.02% (142 students) were aware of alcoholism as risk factorwhereas it was 92.5% in the study of Chan-Ho Park, *et al*.[20] In our study smoking as a risk factorwas reported by 17.43% (142 students) though it can lead to osteoporos is which is comparable to 15 % in study of Bilal *et al*.[17] In present study 22.34% (164 students) knew high caffeine associated with low calcium is a risk factor for osteoporosis whereas it was 97% in the study of Chan-Ho Park, *et al*.[20] In our study, 85.58% (628 students) reported weight bearing exercises will prevent osteoporosis which is comparable to 80.6% reported by Chan-Ho Park, *et al*.[20] and more than 45% reported by similar study done by Bilal *et al*.[17] As per the 2000 NIH osteoporosis

consensus conference, exercises only against resistance and high impact activities contributes to high peak bone mass and walking alone is not enough for improving bone mass[21] Health care practitioner usually underestimates the effect of exercises on bone health and only advice medications.[20] In our study, 646 students (88.01%) reported positively about the need of 1200mg of daily calcium intake after menopause whereas only 61.2% respondents knew this fact in a similar study done by Chan-Ho Park, *et al*.[20] In present study, 198 students (26.97%) knew about the availability of treatment once osteoporosis develops whereas 76.1% reported by Chan-Ho Park, *et al*.[20] In our study, 86.10% (632 students) knewthat hormone replacement after menopause will reduce the depletion of bonemass whereas 25.5% knew about this in a similar study by Bilal *et al*[17] and 64.2% knew in study by Chan-Ho Park, *et al*.[20] There are few limitations to this study. Only one medical college was included so the population study was limited. The awareness and knowledge were assessed by identifying risk factors of osteoporosis and majority of questions were having yes or no answers. This format might encourage guessing and may not be a true reflection of participant's knowledge on osteoporosis.

CONCLUSION

Osteoporosis no longer confined to elderly age group, but it effects all age groups.[22] Increasing knowledge about Osteoporosis should be a priority to promote specific behaviour strategies to prevent osteoporosis.[23] In this

study, participants, had limited knowledge regarding risk factors, prevention and treatment principles. There is a need to update their knowledge so that they can improve the overall bone health and to prevent and manage osteoporosis. The effect of physical exercise on bone health should be emphasised in educational curriculum. We recommend having further similar researches from multiple centres with larger sample size to increase the accuracy of findings.

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