Assessment of knowledge and self-efficacy in achieving osteoporosis prevention behaviors among high school female students

Khorsandi M a, Hasanzadeh L* b, Ghobadzadeh M c

a Faculty member of Arak university of Medical sciences, Arak, Iran, b Student of Master degree of biotechnology Arak university of Medical sciences, Arak, Iran; c University of Minnesota, Twin Cities, USA.

Abstract

The focus of this study was on assessing current level of knowledge and self-efficacy of osteoporosis among adolescents. Multi-stage sampling method was used to reach the participants (209 high school female students). The questionnaire, Osteoporosis Health Prevention belief Scale, was prepared based on the Health belief. The mean age was 15.67 years. Knowledge of osteoporosis and self-efficacy were low. The mean knowledge scores and self-efficacy were 33.1615 (SD=12.74046) and 26.1393 (SD=4.69580) respectively. Majority of participants (75.4%) received their information from friends and family and the school role in providing information was negligible. These results may be useful in planning educational intervention programs based on health education models. Osteoporosis prevention education should be included in high school curriculum.

Key words: Osteoporosis, Knowledge, High school female students, self-efficacy

Introduction

Osteoporosis is the most common metabolic bone disease. It is a condition characterized by low bone density and vulnerability to fractures. Osteoporosis is called a silent disease because bone loss occurs without symptoms. People may not know that they have osteoporosis until a sudden fall or strain causes a bone to fracture. Osteoporosis affects 1 in 4 women and more than 1 in 8 men in their lifetime. The clinical expression of osteoporosis is a skeletal fracture. Vertebral fracture is the most common. A woman has a 2.8% risk of death related to hip fracture during her remaining lifetime, equivalent to her risk of death from breast cancer and 4 times higher than that from endometrial cancer. Women are more likely to develop osteoporosis than men. More than 80 percent of those affected are women. Approximately 14 percent of Iranian citizens are teenage girls who are more vulnerable to physical, social and emotional problems than boys. Peak bone mass typically is obtained by age 18 and tends to be minimal change in total bone mass between age 30 and menopause. Therefore, It is important for
young girls to reach their peak bone mass in order to maintain bone health throughout life\textsuperscript{11}. Based on previous studies, ten percent improvement in bone mass between young people can account for a 50-percent decrease in the risk for bone fracture in later life\textsuperscript{12}. Calcium intake and weight-bearing exercise can have a significant impact on preventing bone loss\textsuperscript{13}. During the teen years, 1300 mg of calcium is needed each day. But boys and mostly girls don't get enough calcium each day\textsuperscript{14}. Measures including education of people toward consequences and prevention of osteoporosis can reduce osteoporosis-related complications\textsuperscript{10, 15, 17, 18, 19, 20}. Based on health belief model, People are more likely to be motivated to take a course of action that will promote their health if they believe they are at risk of a disease (susceptibility), the disease has a negative impact on their health (severity), and a particular behavior will improve their quality of life (benefits)\textsuperscript{21, 22, 23, 24}. For example, a woman is more likely to consume adequate calcium intake and engage in weight-bearing exercise if she believes she is susceptible to osteoporosis. Her self-efficacy also contributes to her taking action. Self-efficacy is the confidence that an individual perceives himself or herself to have to implement the prevention measures despite various perceived barriers. They must feel themselves competent to implement that change.

While osteoporosis is treatable, it's not curable, so early detection really is key\textsuperscript{20}. According to Census statistics, 30547 young female people aged 15-19 live in Arak, a city in central Iran\textsuperscript{25}. A need exists to further the knowledge base related to the prevention of osteoporosis in teenage girls because there is no cure for this debilitating chronic condition. The purpose of this study was to assessment of knowledge and self-efficacy in achieving osteoporosis prevention behaviors among a sample of teenage female students.

**Methods:**

This is a descriptive study used multi-stage sampling design. At the first stage, four centers were randomly selected from a list of all high schools. Then in the next stage 209 students were randomly assigned. Demographic information regarding age, gender, education, socioeconomic situation, general health, and health problems was collected through a questionnaire.

The Osteoporosis health belief questionnaire, based on the HBM, was used to obtain information regarding participants' health beliefs pertaining to osteoporosis. The reliability and validity were examined ($\alpha=0.8$). The osteoporosis questionnaire is divided into two subscales that evaluate the knowledge and self-efficacy toward osteoporosis prevention behaviors. This questionnaire comprises 15 questions about knowledge and 10 questions about belief in one's ability to perform preventive behavior (self-efficacy) and also some questions to measure Cues to Action. A total score was calculated by summing the number of correct responses; this score was then converted to a percentage correct out of 100. SPSS was used to analyze the data.

This is a cross-sectional descriptive study. Student surveys were returned by 685 individuals, from a total of 854 sent. This survey was created and administered using the online survey software. One site was created for the participants to deliver the evaluation online. They were able to conveniently access to the online forms by applying a numerical code of access recorded on the paper-based evaluation form. Students were given instructions regarding the procedures for completing the surveys. The identical evaluation instrument was used for both traditional and online formats. Traditional evaluations were given to students during the last class session. The online evaluations were available within 48 hours after completing the paper-based one. All students who had taken at least one semester in the college during the year and experienced the two evaluation methods were provided a link to the electronic survey. The results were then analyzed by SPSS to determine differences between online and traditional evaluations.

**Results:**

The mean age of the sample was 15.67 Years (SD=0.951). The highest frequency of age was found in age group of 16 years (42.1%). Most of participants live in private home (81.8%) and most of them came from average income families (45.9%). With respect to self-efficacy, the scores ranged between 12 to 38 and the average was 26.1393(SD=4.69580). The range of scores for knowledge changed from 0 to 60 with an average score of just 33.1615 (SD=12.74046). About Cues to Action majority of participants (75.4%) received relevant information from out-of-school sources. Of these, 29.7% stated friend and family as the source breakdown. Fear of osteoporosis
complications was the most predictor of prevention behaviors (41.1%). In general, participants rated osteoporosis as a severe disease, although they did not perceive themselves to be susceptible to it. Participants believed that they were not faced risk of developing osteoporosis and considered the disease as a disease of old age. However, although respondents were aware that the main source of calcium is from dairy products they were not fully aware of other sources. However, the majority appeared to be largely unaware of the potential threat. The result indicated the mean of Perceived benefits, Perceived barriers, perceived susceptibility and Perceived severity were 81.5137(SD=14.67614), 21.3230 (SD=19.86871), 48.0363 (SD=15.28592), 51.7647(SD=13.25286) respectively.

Discussion

Knowledge of osteoporosis was very low, with the average score on the osteoporosis test under 50%. This was not surprising, as knowledge of osteoporosis across adolescents is typically low, as it is in young adults and older adults. In fact, age is positively correlated with osteoporosis knowledge. This may in part be due to the fact that osteoporosis is perceived as a disease of old age, and so younger individuals believe it is not important to educate themselves about osteoporosis until they are older. These results show strengths and weaknesses in the knowledge base which could be used as a focus when implementing health promotion work. The participants lack specific knowledge of risk factors, calcium-rich foods, dietary calcium requirements, and the type of exercise needed to reduce the risk of osteoporosis. The existing evidence that adolescents lack knowledge about osteoporosis risk factors related to bone health makes it important to provide educational opportunities to increase adolescents' knowledge base. Harel et al. found that adolescents' who have greater knowledge related to menopause prevention are more likely to increase their calcium intake than those who do not have this knowledge. Few participants knew about the full range of preventative strategies that can be instigated as a prophylactic from an early age. One possible explanation is that many young people did not perceive it to be a serious threat to their own health at the present time. Thus, there appears to be a need for wider dissemination of information about osteoporosis, particularly targeting younger people.

However, given that childhood and adolescence are the most critical periods for prevention of osteoporosis, more should be done to emphasize that prevention occurs in youth. The most majority of participants were not aware of the age at which women start losing bone mass and the effect of physical activities and calcium intake on bone mineral density.

Most of participants received their information from out-of-school sources. Consequently, alternative or complementary methods of distributing information, for example through school health nurses, should be encouraged. In conclusion, although osteoporosis is recognized as a major public health problem, the focus of attention has remained on medical intervention rather than on promotion of early preventive measures. The results of this study can be used to develop effective implementation guidelines for preventing osteoporosis especially among adolescents.

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