

Research Article

Osteoporosis Knowledge, Self-Efficacy and Perception of Health Belief Among Collegiate Girls

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Abstract

Background: Osteoporosis is a systematic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue. The adverse effects include morbidity, loss of functional independence and high risk of fractures. The most common risk factors include menopause, low mineral bone density, hereditary, age, poor calcium intake, sedentary lifestyle etc.,. It is a geriatric disease with an adolescent onset. In this regard it is essential to assess Osteoporosis knowledge, health belief, self-efficacy and its risk factors during the productive age group of women as this may have a great impact on changing behaviours.

Objective: To find out the knowledge level, Health belief and self- efficacy of Osteoporosis among collegiate girls.

Methodology: It is an observational study done with convenient sampling in which 200 Female college students from various branches of non-medical were presented with Osteoporosis scales to fill with the informed consent.

Results: The overall knowledge of the participants is found to be Poor in 34.5% average in 56.5% Only 9% of the participants had a good knowledge.

Conclusion: This study shows that the participants level of knowledge was found to be low. The self-efficacy of the subjects was found to be higher in spite of their increased negative health belief.

Keywords: Osteoporosis; Primordial prevention; Cognitive determinant; Health belief; Confidence

Introduction

Osteoporosis is a systematic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue leading to enhanced bone fragility and a consequent increase in fracture risk [1]. This occurs due to an imbalance between the bone resorption and bone remodeling due to the influence of estrogen level especially in perimenopausal women [2-12]. During perimenopausal transition, the bone resorption can get increase up to 90% whereas the bone remodeling increases only up to 45% due to the fall in serum estradiol and serum estrone. After few years of menopause, this imbalance in a woman can result in the loss of 20% of their mineral bone density which can result in Osteoporosis [2].

Women aged 35 years and above with a family history of Osteoporosis are at higher risk of developing Osteoporosis than women without a family history [2]. When compared to men, women have longer life span and smaller bones, which seeks additional attention to have adequate intake of calcium and vitamin-D in their regular diet. Due to increased loss of bone mineral density after

menopause women are more prone to this than men worldwide [3,12]. Osteoporosis is considered as an important public health issue worldwide¹⁵ as it affects both men and women [3,4]. There were no reliable data for the prevalence of Osteoporosis in India due to the increase in life expectancy and poor nutritional status of low-income people. The loss of calcium from the bone can make it more fragile which leads to increased risk for fracture. Among all the skeletal fractures, hip fracture is the most common fracture seen in Osteoporosis with increasingly high economic and social costs. The morbidity and mortality rates are highly associated with hip fracture and disability rates are found to be increased in men [3]. Apart from fractures other complications include increased morbidity and mortality, reduced height, kyphotic changes, back pain and poor quality of life [5-14]. The high-risk factors associated with Osteoporosis are postmenopausal status, gender, family history, older age, low bone mineral density. The modifiable risk factors include sedentary lifestyle, low calcium intake, poor nutritional status, increased consumption of coffee, avoidance of flavoured drinks, more intake of milk and dairy products, giving up of smoking and alcohol [5]. Osteoporosis is not a preventable disease⁴ but its complications can be reduced or prevented by adapting a healthy life style which follows regular exercises, modifying the dietary habits such as regular intake of calcium.⁵ Physical activities such as walking may help in improving bone strength, Joint flexibility, reduce the rate of fracture risk. Studies have also shown that, walking for 30 minutes per day help in reducing the risk for Osteoporosis [6]. Even though Osteoporosis is a senile disease, the onset of disease actually starts during the period of adolescence. There is an abundant growth of skeletal bones during adolescence and young adulthood. The bone mass is attained peak during this period and there is an increased calcium demand due to pregnancy and lactation [5,15]. Studies have also shown that there is increased sedentary behaviours and low intake of calcium in adolescence diet frequently [6]. Osteoporosis is becoming a global

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burden. Hence it has to be addressed and people should be aware of its risk factors and complications as well especially women [6]. Since prevention is considered better than cure, early assessment of the knowledge and awareness about the disease should be evaluated to bring early changes in people's lifestyle. Knowledge acts as a cognitive determinant in changing behaviours which may result in reducing risk factors and in the prevention of various chronic diseases. Self-efficacy shows the confidence level of an individual that perceives herself to have to implement the preventive measures against the disease despite barriers. The perception of health belief determines an individual's self-belief towards their own health which may help in analysing the seriousness, susceptibility, barriers and help promoting the health [7]. This study aimed to evaluate the knowledge, Self-efficacy and Health belief of Osteoporosis among college going girls of age group between 18 and 25. Early assessment of the knowledge of women may help in creating awareness about the disease, early diagnosis, identifying the risk factors, and may also help in preventing the development of the risk factors of the disease with the help of early intervention and changing lifestyle [11-17]. Osteoporosis has become an increasing social health issue and causes a great impact on the health of an individual. Hence it is of great importance to have sufficient knowledge about its risk factors and health belief to prevent the development of the disease. Self-efficacy describes about the confidence level, that an individual possesses to execute the preventive measures despite various perceived barriers. Knowledge acts as a cognitive determinant in changing behaviors, reducing risks and preventing chronic illnesses. Since this study is based on the concept of primordial prevention, that is prevention before the emergence of risk factors [18] it is essential to find out the self-efficacy, knowledge level and health belief of Osteoporosis among Collegiate Girls.

Materials and Methods

An observational study with convenient sampling method was conducted among collegiate girls at SRM Institute of Science and Technology and other Institutions in and around Chennai. Prior to the study, Departmental Ethical committee approval was obtained. Participants: This study surveyed collegiate girls of (N=200) age group between 18 and 25 of various department who were volunteering to participate and being open to communicate excluding health science group students. The survey instrument used in this study was similar to the Instrument used in other published studies [3] enquires about Osteoporosis Health belief, Osteoporosis Self-efficacy, Osteoporosis knowledge test.

Procedure

The subjects were selected based on the inclusion and exclusion criteria. The purpose and complete procedure of the study has been clearly explained and 'Informed consent' is obtained from the subjects.

A set of Questionnaire regarding Osteoporosis has been given to the subjects consisting of 3 Scales which includes,

- Osteoporosis Health belief
- Osteoporosis Self-efficacy
- Osteoporosis knowledge test [3]

and completed under supervision. The demographic data were also collected from the subjects enquiring about age, study course, marital status, socioeconomic status, History of alcohol/smoking and family history of Osteoporosis. The Osteoporosis Health belief scale consists of 42 questions which are subdivided into 7 domains

namely, Susceptibility, Seriousness, Exercise-benefits, Calcium-benefits, Exercise-barriers, Calcium-barriers and Health motivation. Each domain consists of 6 questions and are scored on the basis of 5point Likert scale ranging from 1-strongly disagree to 5-strongly agree. The Osteoporosis Self-efficacy scale consists of 12 questions which is divided into 2 components namely Self-efficacy exercise and Self-efficacy calcium. The subjects were asked to provide score of what they feel best between 0-10, where 0 represents not at all confident and 10 represents very confident. The higher the score indicates the higher level of confidence of each subject.

The Osteoporosis knowledge test consists of 24 questions. The first 9 questions represent a list of options which may or may not affect a person's chance of getting Osteoporosis. The next questions from 10-16 are assigned to know about an individual's knowledge regarding exercise and questions 17-21 are for determining knowledge about the food sources of calcium. The last 3 questions from 22-24 enquires about the calcium intake recommendation. The scores are assigned by providing 1 for correct answer and 0 for wrong answer.

The overall knowledge is estimated by classifying the scores into 3 categories

- Poor knowledge (0-8)
- Better knowledge (9-16)
- Good knowledge (17-24)

The overall rate of Osteoporosis health belief, Self-efficacy and knowledge of college students are determined. The content validation has been done for each questionnaire in previous studies and has a reliability score of 0.83, 0.80 and 0.94 respectively. After the completion of the procedure the participants were presented with health advice regarding life style modifications. It is an effort to promote awareness about bone health and Osteoporosis, as a gratitude of participation.

Results

The mean and Standard deviation for Osteoporosis Health belief, Self-efficacy and Knowledge test were calculated and represented in the following table using the SPSS version 20.

Demographic characteristics

The total number of Students participated in the study were 200 among which 89 students are from Arts group 69 students are from science group and 42 students are from Engineering group. 45% of the participants are from the age group of 18-20 and 21-23 and only 10% of the participants are from the age group of 24-25. The participants' mean age was 20. Majority of the participants are from the middle-income group (87.5%). Only 4% of the subjects had a history of alcohol or smoking and 5.5% of the subjects had a Family history of Osteoporosis.

Health belief

The mean values of components of Health belief scale are, Susceptibility- 45.56, Seriousness- 58.36, Exercise-benefits- 67.26, Calcium-benefits- 62.31, Exercise-barriers- 50.89, Calcium-barriers- 52.78 and Health motivation-62.06 in which the beliefs for exercise benefits (67.267) and calcium benefits (62.316) were found to be higher. The overall mean value of Health belief scale is 57.03.

Self-efficacy

The mean values of exercise self-efficacy and calcium self-efficacy are 62.82 and 65.9. The overall mean value of Self-efficacy is 62.8.

Knowledge test

The mean values for Participants General knowledge and Exercise knowledge were found to be 2.30 and 2.92. About the food sources of calcium and regular calcium intake recommendation are 1.81 and 1.01.

The overall knowledge of the participants is found to be

- Poor in 34.5%
- average in 56.5%
- Only 9% of the participants had a good knowledge.

Discussion

The prevalence of Osteoporosis is seen both in men and women whereas it is more in females than in males [3,12-16]. The risk factors and the occurrence of fractures related to this disease are increasing in number which has resulted in increased investment in the treatment of Osteoporosis [3,4]. This is due to the changes in lifestyle which includes lack of physical activity, increased alcohol or tobacco intake and poor dietary habits and hereditary is also a predisposing factor [2]. As prevention is better than cure, early assessment and awareness about the disease should be evaluated among the individuals and the lifestyle modifications should be encouraged. Michiko Franzen (2011) concluded that it was not so easy to change a woman's behaviour. To change an individual's behaviour, good knowledge should be provided which acts as a cognitive determinant in changing behaviour which may result in reducing risk factors and in the prevention of various chronic diseases [2]. Self-efficacy determines the confidence level of an individual that how well a person can deal the problem and to implement the preventive measures despite any form of barrier [2,7]. The perception of health belief of an individual is used to determine that how much belief an individual possess on his own health. Providing proper knowledge and repeated encouragement may result in adequate interest towards Osteoporosis among individuals. Since this study is based on the concept of Primordial prevention, that is prevention before the emergence of risk factors this study aimed to find out the Knowledge, Health belief and self-efficacy of the individuals regarding Osteoporosis as there is a key relationship between these factors pertaining to physical activity [13], so that appropriate needs of the individual population can be evaluated [11]. This study included 200 female college students of which majority of the participants are from the Arts group followed by science and Engineering with a mean age of 20. Most of the students participated in this study are from the middle-income group. Very few subjects had

Table 1: Mean and Standard Deviation of Components of Health Belief Scale.

HEALTH BELIEF	MEAN	STANDARD DEVIATION
SUSCEPTIBILITY	45.562	14.24
SERIOUSNESS	58.366	15.5185
EXERCISE-BENEFITS	67.267	16.6919
CALCIUM-BENEFITS	62.316	18.2615
EXERCISE-BARRIERS	50.899	15.2266
CALCIUM-BARRIERS	52.728	13.9981
HEALTH MOTIVATION	62.066	14.4759
OVERALL	57.0315	9.00382

Table 2: The Mean Values of Components of Self-Efficacy Scale.

SELF-EFFICACY	MEAN	STANDARD DEVIATION
EXERCISE	62.826	18.8643
CALCIUM	65.9	18.8421
OVERALL	62.8	18.8

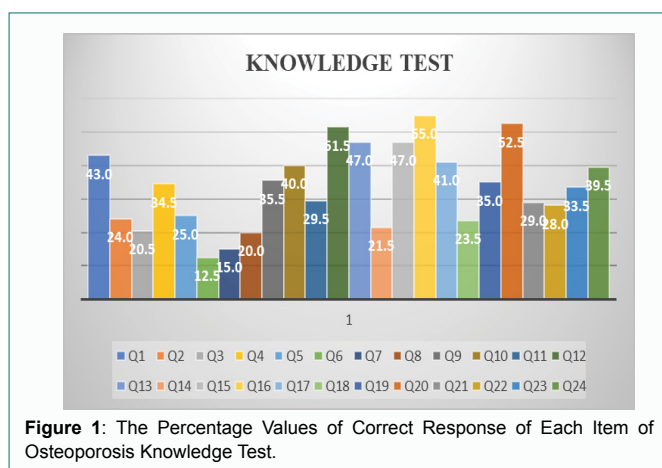
Table 3: The Mean Values of Components of Osteoporosis Knowledge Test.

KNOWLEDGE TEST	MEAN	STANDARD DEVIATION
GENERAL KNOWLEDGE	2.30	1.616
EXERCISE KNOWLEDGE	2.92	1.575
FOOD SOURCES OF CALCIUM	1.81	1.205
CALCIUM INTAKE RECOMMENDATION	1.01	0.665

Table 4: Estimation of Overall Knowledge of Osteoporosis.

	FREQUENCY (n)	PERCENT (%)
POOR KNOWLEDGE	69	34.5
AVERAGE KNOWLEDGE	113	56.5
GOOD KNOWLEDGE	18	9

a family history of Osteoporosis. Among all the participants 4% of the students had a history of smoking or alcohol. These components can also be a predisposing factor for Osteoporosis. The health belief of the individuals is necessary to assess as the negative beliefs could result a negative impact on the quality of life. An individuals' health belief is assessed under 7 sub-scale where each component consists of 6 items and denotes the belief of health in various aspects. The mean value for Susceptibility and seriousness are 45.562 and 58.366 which indicates that higher number of individuals suspect that they have higher chances of getting Osteoporosis and their beliefs about the disease are found to be more serious. The thing to be considered with the perception of seriousness is the perception of threat status containing harmful results concerning the quality of life of an individual [9]. Higher the score indicates that individuals will show interest towards preventive measures for Osteoporosis. Such that the beliefs of exercise benefits and calcium benefits was found to be higher which denotes a positive belief among the participants. This result shows that even when their rate of susceptibility is higher, the individuals possess positive attitude towards the exercise benefit. This shows that implementation of exercises will be beneficial favouring the results of health motivation (62.066) which was found to be higher. When the health belief scale was examined the mean score of the exercise benefit, calcium benefit and health motivation were found to be higher and the mean score of exercise barrier and calcium barrier were found to be lower. This result was found to be similar to another study conducted by Renee D. Endicott (2013) [17]. The overall mean value of self-efficacy scale was found to be 62.8 among which 62.82 was found for exercise self-efficacy and 65.9 was found for calcium self-efficacy. This shows that the participants' can able to concentrate on regular calcium intake than on regular exercise activities. The result shows that participants barrier to exercise was found to be higher than the calcium intake. This can be due to poor knowledge of the participants that calcium rich foods cost too much. The knowledge scale consists of 4 domains



which denotes General knowledge, exercise knowledge, knowledge about food sources of calcium and calcium intake recommendation. The mean values of overall knowledge test are found to be lower with a moderate score in general knowledge and exercise knowledge. The knowledge level is classified under 3 categories. Overall, 34.5% of the participants have poor knowledge and only 9% have good knowledge. This study participants had reported that calcium plays a major role in the prevention of osteoporosis and this is due to the lack of knowledge of exercise and its effects on quality of life. However, the participants were unable to determine the amount of calcium intake required for regular diet. This result was also found to be similar to another study conducted by Ellen Townsend Edmonds (2009) [10,13]. Hence this study emphasizes on the importance of role of Physiotherapy in the prevention and management of Osteoporosis among early adult population by adapting proper exercise, diet and nutrition [19,20].

Conclusion

This study concluded that the participants level of knowledge was found to be low. The self-efficacy of the subjects was found to be higher in spite of their increased negative health belief.

Limitations and recommendations

The main limitation of this study was that boys were not included in the study even when other studies had reported that the prevalence of Osteoporosis was higher also in men. The number of participants from each branch was not selected in equal proportion. The height, weight and Body Mass Index of the participants were not included in the study.

Future studies can be focused on comparing the knowledge levels between

- Medical and non-medical students
- Men and women of college age group
- Students of Rural and urban areas.

Correlating the Body Mass Index with their self-efficacy, health belief and its influence on knowledge levels of individuals can also be focused.

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