# Osteoporosis Knowledge, Attitude and Practice among Doctor Of Physical Therapy Students

Shamsa Abdul Rehman, Kanwal Lalwani*, Rabbiah Mughal

*Department of Physiotherapy, Isra Institute of Rehabilitation Sciences, Isra University, Hyderabad, Pakistan.*

**Abstract: Background:** Osteoporosis is a metabolic disease which is common globally. It is defined as decrease in bone mass and bone tissue destruction that causes decrease in bone strength and increase the chances of fractures. Over 200 million people are suffering from osteoporosis worldly and the number of individuals will increase greatly in coming decades due to aging and sedentary lifestyle. Knowledge combined with strategic planning related to preventive measures decrease its occurrence.

**Objective:** The objective of this study was to evaluate the knowledge, attitude and practice of osteoporosis in students of physical therapy.

**Materials and Methods:** A Questionnaire-Based survey was conducted at Department of Physiotherapy, Isra University Hyderabad in April 2021 to December. 2021. The study approval was given by Ethical Committee of Isra Institute of Rehabilitation Sciences, Isra University Hyderabad. 200 students from 3rd to final year were asked to complete the questionnaire. The knowledge, attitude and practice (KAP) of osteoporosis questionnaire consisted of 20 close ended questions.

**Results:** A total of 200 were selected out of which 182 participants completely filled and returned the questionnaire. The mean age of participants was 22.31±1.86 years. Male participants were 34 (18.7%) and female participants were 148 (81.35%) in this study. High knowledge regarding osteoporosis was found among students with percentage of 99.45%. The participants showed positive attitude related to osteoporosis with percentage of 60.9%. These students also had positive impression towards management practices for osteoporosis with the percentage of 70.33%.

**Conclusion:** This study concluded that the participants have better knowledge regarding osteoporosis. Further proper health education programs must be held in university to encourage them to adopt healthy practices about osteoporosis in daily life.

**Keywords:** Osteoporosis, Knowledge, Practices, Attitude, Predictors, Students.

## INTRODUCTION

Osteoporosis is a systematic disorder, which progresses with age, leading to decrease in bone mass density, and damaging the structural makeup of the bones making it more fragile [1]. In early stages, it remains undiagnostic and asymptomatic until the fracture occurs [2].

Osteoporosis is a silent disease; the person only knows about it when they get fractures [3]. Over 30% of women having age of 50 are more prone to develop porous bones globally [4]. The international osteoporosis foundation estimate that around 200 million women population is suffering from osteoporosis around the world [5]. The ratio of osteoporosis is 1:2 and 1:3 in women and men respectively when they approach at the age of 60 years [6].

Along with genetics, several factors play a role that stimulates a healthy bone mass which includes the hormonal levels, physical functioning, bodily growth and nutrition. The bone remodeling contributes as preventive maintenance program. When more bone loss occurs than bone ossification, it causes

decrease in bone mass density and weakening of bones. Menopause and advancing age can cause this imbalance [7]. At the time of menopause, 85–90% of serum 17β-estradiol levels decreases causing an imbalance between bone resorption and bone formation. This estrogen deficiency can be prevented by estrogen replacement [8].

Osteoporosis is categorized into primary osteoporosis and secondary osteoporosis. Primary osteoporosis comprises of postmenopausal osteoporosis and senile osteoporosis which is due to increase in age and hormonal changes [9]. Secondary osteoporosis occurred due to medical disorders or certain intervention that causes decrease in bone mass density [10]. Osteoporosis due to medication are the most common cause of secondary osteoporosis [11].

Old age, female gender, genetic factors, Race (Caucasian and Asian) are non-modifiable risk factors however thinning of the body, low body mass, estrogen deficiency, early menopause before the age of 45, hyperthyroidism, type 1 diabetes, rheumatic diseases, smoking and other poor habits in menopause females contributes osteoporosis [12].

Osteoporosis can largely be controlled by maintaining a

*Address correspondence to this author at the Department of Physiotherapy, Isra Institute of Rehabilitation Sciences, Isra University, Hyderabad, Pakistan. Email: kanwal.pt@gmail.com

healthy lifestyle. This includes consumption of Ca supplements, proper diet, resistance training or osteogenic loading [13]. A diet for osteoporosis includes adequate amount of Ca and calciferol consumption; which can be obtained by food or medicines [14]. Individuals who have sufficient amount of vitamin D and Ca, reduces the early risk of bone mass loss and fall in older individual by 20% [15].

The objective of physiotherapy treatment is to set a program which help them to provide prevention against fall and thereby from fractures, improve quality of life and overall physical functions [16].

Exercises has significant part in prevention and treatment of osteoporosis [17]. Weight bearing exercises such as aerobic dancing, gymnastic, sports, weight lifting, stair climbing, jumping rope, yoga, tai chi, posture exercises, Pilates are more helpful in prevention of osteoporosis, can improve bone mineral density of the person and help to develop strength and power in the muscles which supports the bones [13].

Most of the studies have concluded that the lack of knowledge and awareness regarding osteoporosis in different age groups leads to malpractice and decrease confidence and self-efficacy in implementation of preventive strategies i.e. physical activity and dietary plans [18]. Hence, it is essential to know the knowledge, attitude and practice of physical therapy students regarding osteoporosis so that the preventive measures could be made to optimize peak bone mass and ultimately improve the bone mass density of themselves as well as of family and community. Therefore, this study may help to evaluate the knowledge, attitude and practice of osteoporosis in students of physical therapy.

## MATERIALS AND METHODS

It was a Questionnaire-Based survey conducted at Department of Physiotherapy Isra Institute of Rehabilitation Sciences, Isra University Hyderabad in April 2021 to December 2021. Convenient sampling technique was used. Participants were selected if they met the inclusion criteria: both male and female students who were willing to participate and gave consent, students studying in any year from third to final year and aged between 18-25 years were included in the study. Those who gave only verbal consent and students from other departments were excluded. The sample size was determined by using Raosoft sample size calculator. By using 50% of response distribution, 95% confidence interval and 2% margin of error, the calculated sample size was 200. Written informed consent form was obtained from participants and questionnaire was distributed after Ethical Committee review.

The questionnaire was extracted from Assessment of knowledge, attitude and practice (KAP) of osteoporosis and its predictors among university students by Sabaa Saleh Al-Hemyari et al. in 2018 by distributing it among students [1]. This questionnaire includes demographic section with 5 questions, whereas knowledge, attitude and practice portion includes 12, 5 and 3 questions respectively. These all questions were closed-ended questions. The yes option was scored 1 whereas no option was scored 0. The total score of knowledge was divided into 3 categories: 1-4 (poor), 5-8 (average) and 9-12 (high). Similarly, attitude score was ranged in 1-2 (poor), 3 (average) and 4-5 (high). Practice score was also categorized in 3 groups as 1 (poor), 2 (average) and 3 (high). The study investigator was present to guide, if students had any query without prompting them with the answers. All information was kept confidential and only used for statistical analysis.

## STATISTICAL ANALYSIS

The data was analyzed by Statistical Package for the Social Sciences (SPSS) Version 21, as descriptive tool in terms of frequency and percentage.

## RESULTS

A total of 200 were selected, out of which 182 participants completely filled and returned the questionnaire. The mean age of participants was 22.31±1.86 years. Male participants were 34 (18.7%) and female participants were 148 (81.35%) in this study. According to study level of the students 85 (46.7%) students were from 3rd year, 55 (30.2%) students from 4th year and 42 (23.1%) students from 5th year.

Knowledge of high, average and poor grade was seen among 181 (99.45%), 1(0.55%) and none respectively (Table **1**). The more positive response was seen when participants were questioned whether they had heard about osteoporosis and can define osteoporosis, in which all participants 182(100%) agreed as shown in Table **2**.

High attitude was seen in 111 (60.99%) study participants whereas 61(33.52%) and 10(5.49%) had average and poor attitude (Table **1**). 167(91.8%) participants knew that fracture of bones is sign and symptom of osteoporosis whereas 80(44%) of participants do not consider osteoporosis a serious disease as shown in Table **3**.

Nearly three-fourth of the participants has high practices (n=128, 70.33%) where as some about quarter of them has average level of practice (n=53, 29.12%) and only 1 (0.55%) was found to have poor practice as shown in Table **1**. 179 (98.4%) and 177 (97.3%) of respondents knew that calcium rich foods and physical activity respectively can reduce the risk of osteoporosis, which leads to high practices (Table **4**).

**Table 1.** Scoring of Knowledge, Attitude and Practice about Osteoporosis.

| Scoring of KAP (n=182) | | | |
|---|---|---|---|
| **Knowledge** | | | |
| Score | Grade | Frequency | Percentage |
| 1-4 | **poor** | **0** | **0.00** |
| 5-8 | **average** | **1** | **0.55** |
| 9-12 | **high** | **181** | **99.45** |
| Attitude | | | |
| Score | Grade | Frequency | Percentage |
| 1-2 | **poor** | **10** | **5.49** |
| 3 | **average** | **61** | **33.52** |
| 4-5 | **high** | **111** | **60.99** |
| Practice | | | |
| Score | Grade | Frequency | Percentage |
| 1 | **Poor** | **1** | **0.55** |
| 2 | **average** | **53** | **29.12** |
| 3 | **High** | **128** | **70.33** |

**Table 2.** Response distribution on Knowledge Items (n=182).

| S. No | Knowledge Questions | Yes | No |
|---|---|---|---|
| 1. | Have you heard about osteoporosis? | 182 (100%) | 0  (0%) |
| 2. | Can you define osteoporosis? | 182 (100%) | 0  (0%) |
| 3. | Do you know future osteoporosis risk? | 180 (98.9%) | 2 (1.1%) |
| 4. | Being a female is osteoporosis risk factor | 181 (99.5%) | 1 (0.5%) |
| 5. | Old age is osteoporosis risk factor | 181 (99.5%) | 1 (0.5%) |
| 6. | Cigarette smoking is osteoporosis risk factor | 129 (70.9%) | 53 (29.1%) |
| 7. | Family history is osteoporosis risk factor | 180  (98.9%) | 2 (1.1%) |
| 8. | Lack of activity is osteoporosis risk factor | 177 (97.3%) | 5 (2.7%) |
| 9. | Low calcium intake is osteoporosis risk factor | 179 (98.4%) | 3 (1.6%) |
| 10. | Early menopause is osteoporosis risk factor | 178 (97.8%) | 4 (2.2%) |
| 11. | High salt diet is osteoporosis risk factor | 122 (67%) | 60 (33%) |
| 12. | Previous fracture is osteoporosis risk factor | 147 (80.8%) | 35 (19.2%) |

**Table 3.** Response Distribution on Attitude Items (n=182).

| S. No | Attitude Questions | Yes | No |
|---|---|---|---|
| 1. | Is osteoporosis a serious disease as heart disease & breast cancer? | 102 (56%) | 80 (44%) |
| 2. | Fracture of bone is osteoporosis signs & symptoms | 167 (91.8%) | 15 (8.2%) |
| 3. | Humped spine is osteoporosis signs & symptoms | 130 (71.4%) | 52 (28.6%) |
| 4. | Loss of height is osteoporosis signs & symptoms | 117 (64.3%) | 65 (35.7%) |
| 5. | Back pain is osteoporosis signs & symptoms | 160 (87.9%) | 22 (12.1%) |

**Table 4.** Response Distribution on Practice Items (n=182).

| S. No | Attitude Questions | Yes | No |
|---|---|---|---|
| 1. | Regular exercise can protect against osteoporosis? | 177 (97.3%) | 5 (2.7%) |
| 2. | Eating calcium rich foods protect against osteoporosis? | 179  (98.4%) | 3 (1.6%) |
| 3. | Smoking cessation protect against osteoporosis? | 136 (74.7%) | 46 (25.3%) |

## DISCUSSION

The study aims to determine the knowledge, attitude and practices of physiotherapy students related to osteoporosis. Such study promotes the national and international efforts to fight against osteoporosis by increasing knowledge and awareness among one of the best planners of preventive and interventional measures i.e. physical therapy students.182 students were included in this study which shows the satisfactory level of knowledge, attitude and practice of osteoporosis.

In this study, knowledge scores were higher (99.45%) as all participants (100%) could define what osteoporosis is and also have heard about it whereas 98.9% of participants knew the future risks associated with osteoporosis. A moderate/fair level of knowledge with the mean of 35.62 (SD=2.87) was reported in a study conducted on Allied Health Sciences students in 2017 by Nabilah Ramli *et al.* [19]. A study conducted by Tagreed O. Shawashi *et al.* in 2020 showed low levels of knowledge regarding osteoporosis with mean score of 40.5% [18]. Similar results were found (49.0%) in study conducted by Bilal M in 2017 on medical students [20]. The high knowledge level in this current study could be due to the topic covered in the physiotherapy syllabus of 3rd to final year students.

The high grade of attitude was demonstrated by 60.99% of participants in this study with 56.0% of respondents reported osteoporosis as a serious disease. Similarly, a study conducted by Tagreed O. Shawashi *et al.* in 2020 represented 70% of female university students had fairly positive attitude and mean=2.9/5, SD=0.8 of participants reported the seriousness of osteoporosis [18].

Striving to attain optimal peak bone mass through healthy diet and lifestyle is critical for osteoporosis prevention. This current study showed nearly three-fourth of the participants had high practices (70.33%) with 98.4% agreeing on calcium rich foods as best practice for osteoporosis prevention. A study conducted by Nabilah Ramli *et al* . on Allied Health Sciences students in 2017 showed poor practice with the mean score of 20.34 (SD=2.86). Varisha Tariq study on physiotherapy students have also favored the exercise as it is beneficial for health and fitness as around 64.3 % of the participant in this study favored that physical activity can be beneficial for osteoporosis [21]. Whereas in the current study, 97.3% of students promotes exercises as beneficial practice.

The results of this study were limited to one university and only one department with small sample size. Despite of its ease, convenient sampling may have led to the biasness in the results of the study. Further studies should include more population from various universities and programs. The study should also explore and emphasize the practice and regulation to prevent and limit the risks of this health related factor. Moreover, focus should be towards the precautionary measures, prevention and medical or physiotherapy treatment.

## CONCLUSION

This study shows adequate level of knowledge attitude and practice regarding osteoporosis. These results suggest that there is still need for implementation of proper health education programs to encourage the students to adopt healthy practices about osteoporosis.

## AUTHORS' CONTRIBUTION

**Shamsa Abdul Rehman:** Conception and design of the study, Data analysis, Manuscript writing.

**Kanwal Lalwani:** Data analysis, Drafting of manuscript, Critical revision.

**Rabbiah Mughal:** Design of the study, Data collection, Data entry and interpretation.

## CONFLICT OF INTEREST

Declared none.

## ACKNOWLEDGEMENTS

## REFERENCES

[1]   Al-Hemyari SS, Jaizoun MA. Assessment of knowledge attitude and practice of osteoporosis and its predictors among university students. J Pharm Educ Res 2018; 8(3): 43-8.

[2]   Page A, Etherton-Beer C. Undiagnosing to prevent overprescribing. Maturitas 2019; 123: 67-72.

[3]   Salminen H, Piispanen P, Toth-Pal E. Primary care physicians' views on osteoporosis management: A qualitative study. Arch Osteoporos 2019; 14(1):4.

[4]   Hemmati E, Mirghafourvand M, Mobasseri M, Shakouri SK, Mikaeli P, Farshbaf-Khalili A. Prevalence of primary osteoporosis and low bone mass in postmenopausal women and related risk factors. J Educ Health Promot 2021; 10: 204.

[5]   Sözen T, Özışık L, Başaran NÇ. An overview and management of osteoporosis. Eur J Rheumatol 2017; 4(1): 46.

[6]   Jahan F. Osteoporosis: A silent killer. J Women's Health Care 2015; 4: 260. DOI: 10.4172/2167-0420.1000260

[7]   Al Anouti F, Taha Z, Shamim S, Khalaf K, Al Kaabi L, Alsafar H. An insight into the paradigms of osteoporosis: From genetics to biomechanics. Bone Rep 2019; 11: 100216.

DOI: 10.1016/j.bonr.2019.100216

[8]  Salamanna F, Borsari V, Contartese D, Aldini NN, Fini M. Link between estrogen deficiency osteoporosis and suscepti-bility to bone metastases: A way towards precision medicine in cancer patients. Breast 2018; 41: 42-50. DOI: 10.1016/j.-bonr.2019.100216

[9]  Zhao J, Zeng L, Wu M, *et al*. Efficacy of Chinese patent medicine for primary osteoporosis: A network meta-analysis. Complement Ther Clin Pract 2021; 44: 101419. DOI: 10.1016/j.ctcp.2021.101419

[10] Pandit AP, Omase SB, Mute VM. A chitosan film containing quercetin-loaded transfersomes for treatment of secondary osteoporosis. Drug Deliv Transl Res 2020; 10: 1495-506. DOI: 10.1007/s13346-020-00708-5

[11] Colangelo L, Biamonte F, Pepe J, Cipriani C, Minisola S. Understanding and managing secondary osteoporosis. Expert Rev Endocrinol Metabol 2019; 14(2): 111-22.

[12] Nawrat-Szołtysik A, Miodońska Z, Zarzeczny R *et al*. Osteo-porosis in Polish older women: Risk factors and osteoporotic fractures: A cross–sectional study. Int J Environ Res Public Health 2020; 17(10): 3725. DOI: 10.3390/ijerph17103725

[13] Daly RM. Exercise and nutritional approaches to prevent frail bones, falls and fractures: An update. Climacteric 2017; 20(2): 119-24.

[14] Polzonetti V, Pucciarelli S, Vincenzetti S, Polidori P. Dietary intake of vitamin D from dairy products reduces the risk of osteoporosis. Nutrients. 2020; 12(6): 1743. DOI:10.3390/nu12061743

[15] Oleson CV. Primary osteoporosis in conditions of pediatric onset. Osteoporosis Rehab 2017; 391-411. DOI:10.1007/978-3-319-45084-1_17

[16] Nava T. Physiotherapy rehabilitation in patients with osteopo-rosis. J Adv Health Care 2020; 2(II). Available at: https://-jahc.eu/jahc2003-007/# DOI: 10.36017/jahc2003-007

[17] Tong X, Chen X, Zhang S, Huang M, Shen X, Xu J, Zou J. The effect of exercise on the prevention of osteoporosis and bone angiogenesis. BioMed Res Int 2019; Article ID 8171897. DOI: 10.1155/2019/8171897

[18] Shawashi TO, Darawad M. Osteoporosis knowledge, beliefs and self-efficacy among female university students: A descrip-tive study. Open Nurs J 2020; 14(1): 211-9. DOI: 10.2174/1874434602014010211

[19] Ramli N, Rahman NA, Haque M. Knowledge, attitude, and practice regarding osteoporosis among allied health sciences students in a public university in Malaysia. Erciyes Med J 2018; 40(4): 210-7. DOI: 10.5152/etd.2018.18103

[20] Bilal M, Haseeb A, Merchant AZ, *et al*. Knowledge, beliefs and practices regarding osteoporosis among female medical school entrants in Pakistan. Asia Pac Fam Med 2017; 16(1): 6. DOI 10.1186/s12930-017-0036-4

[21] Tariq V, Khan ZK, Paracha H. Knowledge and awareness of osteoporosis and its related risk factors among the undergradu-ate students of doctor of physical therapy in Karachi, Pakistan. Int J Endors Health Sci Res 2018; 6(4): 1-8. DOI: https://-doi.org/10.29052/IJEHSR.v6.i4.2018.01-08