

Association between osteoporosis Knowledge and Food Habits in Female University Students of Lahore

Saeed Taj Din^{1*}, Masooma Fareed Thind²

¹Associate Professor Orthopaedic surgery Azra Naheed Medical College Lahore.

²Physical Therapist, Lahore.

*Corresponding Author: Saeed Taj Din, Associate Professor Orthopaedic surgery Azra Naheed Medical College Lahore.

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Abstract

Background: Osteoporosis is a general metabolic disorder which causes many musculoskeletal issues and reduces the quality of life in the elderly population which usually progresses at the age between 30 to 40 years in both males and females. Recent studies suggested some of the associated factors like age, low bone mineral density, sex family history of fracture, less dietary intake of vitamin D, and abnormal thyroid function, these factors are the leading cause of osteoporosis especially in females. It is also indicated that along with other associated factors poor living style, malnutrition and the bad food habits leads to form osteoporosis which contributes in the loss of bone mass in post-menopausal stage of women

Objective: To determine the association between osteoporosis knowledge and food habits in female university students of Lahore.

Methodology: After the approval from the research committee of University an analytical cross sectional study was conducted using the Osteoporosis knowledge assessment tool (OKAT) & Adolescent food habits checklist tool (AFHC) to collect data from 138 students. The collection of data was carried by online Google forms because the university was closed due to the pandemic situation.

Results: Mean knowledge score was found 9.9 with SD 4.8. Majority of the participants were found having average Knowledge good Knowledge (33.3% and 32.6%). Mean AFHC score was found 12.1 with SD±4.5. Increasing score indicates higher good food habits' value and r value indicates that there is association between osteoporosis knowledge and food habits.

Conclusion: This study concluded that there is a strong positive correlation between osteoporosis knowledge and food habits.

Keywords: osteoporosis; food; habits; skeletal; university students

Introduction:

Osteoporosis is defined as a systemic, skeletal ailment affected by poor bone mineral density and degeneration of bone tissues that results increase in bone fragility and fracture risk. For the most part, the double energy X-ray absorptiometry has been utilized to test bone density in various areas of the body [1]. It usually progresses at the age between 30 to 40 years in both males and females [2]. It is a general metabolic disorder which causes many musculoskeletal issues and reduces the quality of life in the elderly population [3]. Recent studies suggested some of the associated factors like age, low bone mineral density, sex family history of fracture, less dietary intake of vitamin D, and abnormal thyroid functions are the leading cause of osteoporosis especially in females [4].

The most common symptoms of osteoporosis are musculoskeletal pain, wrist and hip fracture Among these symptoms hip fracture increases the mortality of patients and also leads the poor quality of life and reduces daily physical activity in their life [5]. Recent studies mentioned the osteoporosis prevalence in females is 10% in USA, 14% in Japan, 4% in Canada and 10% in France. All the suggested data mentioned that osteoporosis is the most common age related disease in females which compromise the health of the females and also reduces the strength of bones [6].

Bone mineral density (BMD) normally presents in all the individuals but varies person to person the level of BMD decreases and the loss of bone occurs with the age. Almost 24% women suffered from severe

osteoporosis at the age between 50 to 84 years. Bone mineral density is most commonly mentioned as T- score and z-score. T-score of less than 2.5 indicates the case of osteoporosis [7]. It is suggested that the prevalence of post-menopausal osteoporosis is very high and the 31% females is suffering from the post- menopausal osteoporosis. It is revealed that the menopause is the contributing factor that causes sudden loss in the bone mineral density, and generally type 1 post- menopausal osteoporosis occurs at the age of 65 years and badly affects the women health and increases the proportion of hip fractures in advance age [8].

It is also indicated that along with other associated factors poor living style, malnutrition and the bad food habits lead to osteoporosis which contributes in the loss of bone mass in post-menopausal stage of women [9]. Smoking and the high rate of coffee consumption also contribute to osteoporosis and reduces the quality of life in most of the women [10].

In Korean women the rate of post-menopausal osteoporosis is 28.1% in lumber spine and 20.2% in femoral neck. It is suspected that the main cause of osteoporosis in them is the high intake of sodium in their food. Sodium intake causes the excretion of calcium in the body so, high intake of sodium decreases the bone mineral density and also increase the chances of osteoporosis in females [11]. There is a significant association between osteoporosis, femoral neck fracture and osteopenia. Genetic, lifestyle and developmental issues like smoking, age, family history poor diet effects the muscle and bone mass which ultimately leads to osteoporosis [12].

A recent report suggested that the tea is only beverage that helps to reduce to risk of hip fracture because it contains green tea polyphenols which helps to reduce the bone loss and improves the bone mineral density [13]. But another study reported that daily intake of tea has a minimal effect on the bone mass or bone mineral density but there is no significant association between tea and the risk of osteoporosis among elderly females [14]. Mainly osteoporosis is diagnosed by the DEXA scan but the self- perception about the osteoporosis is also considered. At the age post-menopause there is an evidence of the risk of osteoporosis and hip fractures in the women. The self- perception osteoporosis results certain behavior like advance medical consultation, bone mineral density screening, medication which may lead to advance health care and improve the bone health [15].

A recent report conducted for guidelines of the prevention of osteoporosis for female nurse staff because it is very important to know the guidelines for the prevention of risk of the osteoporosis. The main aim of the study is to promote knowledge or the important guidelines to nurses regarding the prevention of osteoporosis, which includes investigation, diagnosis, physical activities, healthy food and calcium intake recommendations. It is mentioned that there were positive results regarding the implementation on the guidelines and also continuous improvement is observed in the behaviors of the nurses related to the prevention of the osteoporosis [16].

There are many researches presented on osteoporosis in women, but mostly researches finds the prevalence, causes, risk factors and the post-menopausal osteoporosis in females. But this research will mainly focus to determine the relationship between osteoporosis knowledge and the food habits among the female university students, because food habits or healthy food intake plays important role in maintaining the vitamin D or calcium levels which will helps to reduce the risk of osteoporosis in the elderly age of females. It will help us in future to make better or effective guidelines related to the food intake or healthy habits. It also determines the health status or quality of life of females for the better measurements in future regarding this issue.

There are many researches presented on musculoskeletal issues in school going children but mostly researches find the prevalence, causes and risk factors of the musculoskeletal issues. But there is no study found in Pakistan which determines the relation between musculoskeletal

disorders and heavy bag packs in school going children. This study determines the association of musculoskeletal disorders and their heavy bag packs load in school going children. It will help us in future to make better or effective guidelines related to heavy school bags or also helps to make the postural awareness. It also determines the health status or quality of life of patients for the better measurements in future regarding this issue.

One of the objectives is to promote health providers' awareness of osteoporosis in order to aid in the implementation of preventative and screening strategies. According to a recent study conducted at an outpatient clinic to establish the screening rates for osteoporosis in males and females according to age-specific recommendations, only 18.4% of men and 60% of women received a DEXA scan. Similar findings from different investigations revealed that the overall screening rate is still not ideal. This could be due to a lack of understanding and practice when it comes to osteoporosis screening. As a result, we should conduct study to analyze interns' knowledge, practice, and attitudes on osteoporosis.

Literature review:

Bilal et al (2017) conducted a research to determine the level of knowledge, views, and actions regarding osteoporosis among Pakistani female medical school applicants. This descriptive cross sectional study included 400 female medical students from DOW University of Health Sciences and Jinnah Sindh Medical University in England. The osteoporosis knowledge assessment tool and food frequency questionnaire was used and it was concluded that participants possessed insufficient amount of knowledge of the disease [17].

Nada Vujasinović Stupar et al (2017) conducted a study on 132 postmenopausal women to assess the level of familiarity with osteoporosis and the dangers it poses. Osteoporosis knowledge assessment tool-shorter version was used to determine a person's degree of knowledge which showed significant differences between their knowledge about osteoporosis and its risk factors [18].

Varisha Tariq et al (2018) did this study to investigate and assess the awareness and understanding of osteoporosis and its risk factors among doctor of physiotherapy undergraduate students in Pakistan. This observational cross-sectional study was conducted on the 252 doctor of physiotherapy students with the help of osteoporosis knowledge assessment tool to assess the knowledge regarding osteoporosis and its risk factors. This study concluded that considerable number of students was having poor knowledge and we need to start awareness at the root level to deal with this increasing problem [19].

Descriptive cross-sectional study conducted by Sarita Pantaall et al (2020) assess the awareness and health beliefs of osteoporosis in 328 middle aged of selected community of Kathmandu. Osteoporosis health beliefs scale and osteoporosis knowledge assessment tool indicate that majority of the women were having poor knowledge of osteoporosis [20].

Naif R. Almalki et al (2016) conducted a cross sectional study to evaluate the knowledge regarding osteoporosis among 140 medical interns. Osteoporosis knowledge assessment tool was used to evaluate these things, which shows the knowledge among medical interns was poor [21].

Basim Khalid AlHarthiet al (2017) conducted this study with the purpose to examine the osteoporosis knowledge among 200 Saudi females in Riyadh. The osteoporosis knowledge assessment tool was used for evaluation. The conclusion was, very good percentage of females were aware of the osteoporosis [22].

Manickavasagam Senthilrajat al (2021) conducted a cross sectional study to evaluate the knowledge regarding osteoporosis and beliefs among 302 postmenopausal women in India. Osteoporosis knowledge assessment tool was used to evaluate these things, which shows a deficit

of knowledge regarding osteoporosis among postmenopausal women in India [23].

Sayaf H. Alshareef et al (2018) conducted a cross sectional study on 1012 young college women to assess the level of knowledge and awareness regarding osteoporosis and its risk factors. Osteoporosis knowledge assessment tool was used for data collection to assess the understanding of symptoms, fracture risks and level of knowledge. This study concludes that young Saudi females do not have considerable amount of knowledge [24].

Tagreed O. Shawashiet al (2017) conducted this descriptive cross sectional study with the purpose to examine the female university student's beliefs, knowledge and self-efficacy regarding osteoporosis in 260 female students. The osteoporosis knowledge assessment tool, osteoporosis health beliefs scale and osteoporosis self-efficacy scale was used for evaluation. The conclusion was, very poor percentage of females has any knowledge about osteoporosis [25].

REE De Silva et al (2014) conducted a descriptive cross sectional study to evaluate the knowledge, practices and beliefs among 186 medical school entrants in Sri Lanka. Self-administered questionnaire was used for evaluation, which shows a modest level of knowledge regarding osteoporosis among medical students in Sri Lanka. It is also stated that along with other associated factors poor living style, malnutrition and the bad food habits leads to form osteoporosis which contributes in the loss of bone mass in post-menopausal stage of women [26].

Objective: (Analytical cross-sectional survey)

To determine the association between osteoporosis knowledge and food habits in female university students of Lahore.

Hypothesis:

Null hypothesis:

There was no significant association found between osteoporosis knowledge and food habits in female university students of Lahore.

Alternate hypothesis:

There was a significant association found between osteoporosis knowledge and food habits in female university students of Lahore.

Rationale:

Many researches present on osteoporosis in women, but mostly researches finds the prevalence, causes, risk factors and the post-menopausal osteoporosis in females which are done in other countries. But there is no study found in Pakistan which determines the association between osteoporosis and food habits in female university students of Lahore. This research was mainly focused to determine the guidelines about osteoporosis and its relationship with food patterns or habits. Because food habits or healthy food intake plays important role in maintaining the vitamin D or calcium levels which helps to reduce the risk of osteoporosis in the elderly age of females. It will help us in future to make better or effective guidelines related to the prevention of osteoporosis.

Operational Definition:

1st Measurement Tool:

Name:

Osteoporosis Knowledge Assessment Tool (OKAT) [27].

Purpose of the Questionnaire:

This questionnaire was used to assess attitude, knowledge, practice and perception to prevent from osteoporosis.

Total Questions:

The OKAT questionnaire has 20 items to assess understanding of osteoporosis, with the first 12 questions assessing knowledge and

questions regarding the disease. The remaining four questions assessed practice and thought to prevent osteoporosis, while 13-16 were used to assess mind-set to osteoporosis [28].

Measurement:

It was measured as a numerical tool.

Interpretation:

It was a 20-item survey with true, false, and don't know alternatives for each question. The analysis was conducted by assigning a score of 1 to a correct response and a score of 0 to an incorrect or unknown response. The overall score ranged from 0 to 20. The overall score out of 20 was multiplied by 5 to reach a score of 100. The criteria were set as follows: (<20: very poor), (20-40: poor), (41-60: average), (61-85: good), (86 or more: very good).(17)

Reliability:

This instrument was a reliable tool to assess attitude, knowledge, practice and perception to prevent from osteoporosis [29].

2nd Measurement Tool:

Name:

Adolescent Food Habits Checklist Tool (AFHC)

Purpose of the Questionnaire:

This questionnaire was geared toward measuring healthful eating conduct of teenagers.

Total Questions:

The AFHC questionnaire consisted of 23 objects using means of dietary fat and fiber intake, fruit and vegetable consumption, dietary restraint, nutrition knowledge and a measure of family income [30].

Measurement:

It was measured as a numerical tool.

Interpretation:

1 point for each 'healthy' response. (False for questions 3, 8, 14, 18, 21. True for all others.) Final score was adjusted for 'not applicable' responses (questions 1, 6, 7, 11, 16, 17, 18, 19, 20, 21), and missing responses using the formula: AFHC score = no of 'healthy' responses x (23/no of items completed).

Reliability:

This instrument was a reliable tool toward measuring healthful eating conduct of teenagers [30].

Materials and Methods:

Study Design:

It was an analytical cross sectional study.

Setting:

Data was collected from;
Azra Naheed Medical College

Study population:

Female students

Duration of the Study:

Six months

Sample Size:

Sample of 138 female students was taken from Azra Naheed Medical College Lahore.

Sampling Technique:

Convenient sampling technique was used for the collection of data.

Eligibility Criteria:

Inclusion Criteria:

- Female Students
- age 19-24 years
- 2nd to final semester (because they have much knowledge about osteoporosis)

Exclusion Criteria:

- Females with eating disorder
- Psychological disorders
- 1st to final semester

Data Collection Procedure:

After the ethical approval from the affiliated university, 138 female students who meet the inclusion criteria and were explained about the objectives of this study. Only those who gave consent were included in the study. They were provided with online Google questionnaire link via Social media or WhatsApp. All the participants were requested to complete both questionnaires. These questionnaires were a reliable measure to evaluate knowledge, attitude, practice and perception to prevent from osteoporosis and toward measuring healthful eating conduct

of teenagers. OKAT was a 20-item survey with true, false, and don't know alternatives for each question. The analysis was conducted by assigning a score of 1 to a correct response and a score of 0 to an incorrect or unknown response. The overall score ranged from 0 to 20. The overall score out of 20 was multiplied by 5 to reach at a score of 100. The criteria were set as follows: (<20: very poor), (20-40: poor), (41-60: average), (61-85: good), (86 or more: very good). Similarly, The AFHC questionnaire has 23 items that measured dietary fat and fiber intake, fruit and vegetable consumption, dietary constraint, nutrition awareness, and family income. Moreover, the names of participants were not disclosed however descriptors of the participant such as age, gender, height and weight were recorded.

Ethical Consideration:

- Full consent of the participants was taken.
- Protection of the privacy of participants was ensured.
- Confidentiality of the data was maintained.

Results:

	Frequency	Percent
2	9	6.3
3	5	3.5
4	20	13.9
5	17	11.8
6	20	13.9
7	18	12.5
8	14	9.7
10	41	28.5
Total	144	100

Table 1: Semester of the participants

	Minimum	Maximum	Mean	Std. Deviation
Semester	2	10	6.66	2.557

Table 2: Semester of the participants

Table 1 & 2 showing Semester of the participants

	N	Minimum	Maximum	Mean	Std. Deviation
Age	143	17.0	26.0	22.476	1.9817
Height	142	5.0	6.0	5.453	.2697
Weight	141	38.0	78.0	58.617	7.6258

Table 3: Mean age, height and weight of the participants

Table 3 is showing Mean age, height and weight of the participants. Mean age was found 22.4 years with SD ±1.9, mean height was found 5.4 feet with ±SD .26 and mean weight was fund 58.6kg with SD ±7.6.

	Frequency	Percent
<20: very poor Knowledge	21	14.6
20-40: poor Knowledge	25	17.4
41-60: average Knowledge	48	33.3
61-85: good Knowledge	47	32.6
86 or more: very good Knowledge	3	2.1
Total	144	100.0

Table 4: knowledge level of the participants

	N	Minimum	Maximum	Mean	Std. Deviation
Score	144	.00	19.00	9.9236	4.82140

Table 5: Mean Knowledge Score of the Participants

Table 4 & 5 is showing Knowledge level of the participants. Mean knowledge score was found 9.9 with SD 4.8. Majority of the participants were found having average Knowledge good Knowledge (33.3% and 32.6%)

	N	Minimum	Maximum	Mean	Std. Deviation
AFHC score	144	.00	21.00	12.1181	4.50252

Table 6: Mean AFHC score of the participants

Table 6 is showing Mean AFHC score of the participants. Mean AFHC score was found 12.1 with SD±4.5. Increasing score indicates higher good food habits.

		AFHC score	Score
AFHC score	Pearson Correlation	1	.278**
	Sig. (2-tailed)		.001
	N	144	144
Score	Pearson Correlation	.278**	1
	Sig. (2-tailed)	.001	
	N	144	144

** . Correlation is significant at the 0.01 level (2-tailed).

Table 7: Pearson's Correlations between osteoporosis knowledge and food habit

P value =0.01

R value= 0.28**

P value and r value indicates that there is association between osteoporosis knowledge and food habits

Mean age was found 22.4 years with SD ±1.9, mean height was found 5.4 feet with ±SD .26 and mean weight was found 58.6kg with SD ±7.6. Mean knowledge score was found 9.9 with SD 4.8. Majority of the participants were found having average Knowledge good Knowledge (33.3% and 32.6%). Mean AFHC score was found 12.1 with SD±4.5. Increasing score indicates higher good food habits.

Alternative hypothesis was accepted.

Discussion:

Osteoporosis is rapidly becoming a major public health concern impacting tens of millions throughout the world; it is not simply a Age-related illness, but it also affects people of all ages. Despite the fact that OP cases have increased quickly in recent years, little is known about it, and understanding and awareness of it are uncommon. According to a survey performed in Malaysia, just 6.8% of students between the ages of 20 and 30 have a strong understanding of OP. In contrast to our findings, a Saudi Arabian study found that 77 percent of students were aware of osteoporosis. Similar surveys to estimate the risk of osteoporosis have been done in China and the United States of America (USA). According to the findings, both American and Chinese students had insufficient knowledge of osteoporosis.

Among comparison to men, osteoporosis is more common in women and females around the world. The majority of the subjects had a good understanding of osteoporosis, which contrasted with other studies that showed a lack of understanding of osteoporosis risk factors and prevention measures, leading to a poor knowledge and behavior, which would significantly raise the incidence of osteoporosis in our society.

The study's goal was to find out what knowledge, beliefs, and food habits female students in Superior University Lahore, Pakistan had about osteoporosis. The reason for picking Female students was that they had not been educated enough about osteoporosis at the college or university level, and their only understanding of the disease comes from their family physicians. The participants in the study had a strong understanding of osteoporosis. The vast majority of the participants were determined to have average to good knowledge. Knowledge of risk variables is essential since it can be used to inform disease prevention initiatives [31].

Nonetheless, when comparing to girls in college in the United States in a same study, the participants' understanding of risk factors was low [32]. Previous research in Pakistan have found that females in Pakistan do not have a enough understanding of the dangers of osteoporosis, and that understanding does not always transfer into avoidance [31]. However, when compared to a same study done among university students in Quetta, where the average level of expertise was 13.01 2.9, the study

showed a higher mean score on osteoporosis knowledge. This is evidence of regional disparities in health knowledge.

Participants will only take preventative steps if they believe they are susceptible to the disease and that the severity of the sickness will have a significant impact on their life, according to the Health Belief Model [33]. In our study, participants' reported vulnerability to osteoporosis was good, with more than half believing they could develop osteoporosis. And it was discovered that this sickness is linked to one's eating habits. In Pakistani studies, inadequate levels of activity and a physical inactivity are on the upswing, possibly as a result of longer hours spent indoors [34]. Low bone mass and muscle weakness, which both increase the risk of osteoporosis, are two factors to consider, can be exacerbated by a lack of needed amounts of activity and diet [35].

Complications of osteoporosis are the primary cause of morbidity and mortality. Every year, an estimated 9 million people worldwide suffer from osteoporosis fractures. In Europe, osteoporosis-related impairment outnumbered cancer-related disability. This is on par with, if not higher than, non-communicable illness. A method that works (OKAT) to evaluate your understanding of osteoporosis is one of our study's strengths. We also gathered data on the elements that may influence awareness, which we hope to use to promote knowledge in general. This issue is primarily linked to osteoporosis. The study's certain restrictions include limited sample size and the use of an online poll, which could lead to selection bias. As a result, we were unable to apply our findings to both genders.

Conclusion:

According to the findings, there is a considerable positive link between osteoporosis knowledge and food habits. Females who have poor eating habits are at high risk of developing osteoporosis, and for those who have good eating habits and a period of physical activity are at lower risks of developing osteoporosis.

Limitations and Recommendations:

First limitation regarding this study was the population, which was selected from only one university due to pandemic lock down and it does

not represent the whole country. The second limitation was we were not able to use the random sampling technique for data collection because the university was closed due to the pandemic.

With a climbing rate of osteoporosis due to poor food habits and lack of knowledge, this is a demand to investigate current policies, lifestyles and food habits of the students. In the future, further studies should be multicenter and studies on larger scales are also required in the future. Because the prevalence of osteoporosis is calculated higher and this is a good opportunity to review student's present habits, to plan seminars on osteoporosis, women health and food habits in university's curriculum, as well as to create a clear guidelines among university students. Therefore, further evaluation is needed for both groups' especially female students as they are the more prone to multiple musculoskeletal diseases than the other gender.

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