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Exploration of Osteoporosis Knowledge and Perception among Young Women in Quetta, Pakistan

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Abstract

Introduction: Osteoporosis is a skeletal disease characterized by low bone mass and a major public health problem in Pakistan. Women have been the most susceptible group of this silent disease therefore needs primary preventive steps such as health education of which one of the steps is to assess their knowledge according to which the content of their health education program is made. The study intended to investigate knowledge regarding osteoporosis among female students of university in Quetta, Pakistan.

Methods: A cross-sectional study was undertaken with 162 female students of University of Baluchistan, Quetta. Knowledge was assessed by using a pre-validated self-administered questionnaire containing 20 disease related questions. Convenience sampling technique was used for data collection. Descriptive analysis was used to demonstrate the characteristics of the study population. Inferential statistics (Mann-Whitney U test and Kruskal Wallis tests, p< 0.05) were used to assess the significance among study variables.

Results: Out of 162 female students, 153 (81.5%) were single and science students 123(75.9%) with the majority of age group of less than 24 years. Mean age of the study participants was 21.91 ± 1.74 years. 134(82.7%) have not been previously diagnosed of bone related problem or osteoporosis. Mean score of knowledge was 13.01 ± 2.9. Department and living status were significantly associated with knowledge scores.

Conclusion: The study concluded that females had better understanding of the disease, osteoporosis, but they need to know about the treatment for this disease in Pakistan and it is also necessary for them to know more about some specific risk factors.

Keywords: Osteoporosis; Knowledge; Women's health; Females; Risk factors

Introduction

Osteoporosis is a progressive metabolic skeletal disease characterized by the porous bones due to which bone mass reduction occurs, bone strength is compromised increasing susceptibility to fractures and diminishing the health related quality of life [1-5]. Osteoporosis has been described as a silent disease by National Osteoporosis Foundation as people are not aware of constant loss of their bone mass until they experience a fragility fracture [3,6,7]. WHO defines osteoporosis with its diagnostic point of view, as a bone mineral density BMD that lies 2.5 SD or more below the average value for young healthy women (a T-score of < -2.5 SD) [8].

Risk factors causing primary and secondary osteoporosis are classified as modifiable and non-modifiable. Modifiable risk factors are those which can be changed or if they are eradicated the risk of occurrence of the disease can be reduced such as low calcium and vitamin D intake, drinking carbonated drinks, low BMI, sedentary work and prolonged immobilization; whereas non-modifiable occurs with age or are associated with the normal physiology of an individual and they persist. The non-modifiable are family history, menopause and aging [9-14].

Osteoporosis is a public health problem [15,16] and ranks high among people to become disable with severe complications [17].

According to the survey conducted recently by International Osteoporosis Foundation hip fractures in Pakistan costs 1200-2400 USD per hip fracture indicating a great burden of disease on poor population of Pakistan [18].

About 75 million in United State, Europe, and Japan are affected from osteoporosis [17,19] whereas there is limited data from developing countries since the disease is not life-threatening [3,20]. In Pakistan many epidemiologic studies [21-31] have been conducted for determining the prevalence of osteoporosis but none of the studies that have been conducted until now state the overall or accurate prevalence of osteoporosis in women of Pakistan [22].

Knowledge is referred to as an ability to acquire, to retain and use information; a mixture of comprehension, experience, discernment and skills [32]. When adequate knowledge is given it is retained in mind as a kind of concept for which a model is made in the mind as a perception and on the basis of these perceptions logics are given in order to distinguish between right and wrong [32,33]. It is attained by many sources like newspapers, brochures, seminars, books and many other sources of information. Knowledge of any disease can be assessed in a community to see how much community have correct information about disease by true/false options or by multiple choice questions about an issue [33]. Conventionally a question by which disease knowledge is assessed includes its general description, causes, symptoms, treatment for the disease and preventive measures [34].

Young females are the most vulnerable population but they lack knowledge about osteoporosis as reported by many studies [1,5,35-38]. Moderate knowledge has also been reported in the studies [4,19] but their positive attitude towards osteoporosis has not been reported.

To date no study has been conducted on university students in Pakistan especially on females of the age group at which osteoporosis starts to develop. Therefore the present study aims to assess young women knowledge regarding the disease osteoporosis depending on the demographic characteristics of study population. An assessment of knowledge can be useful in developing information, educational activities to minimize the risk of disease and disease burden.

Methodology

Study design and setting and sampling

A convenience sampling technique was used to complete the questionnaires from the study sample. As per resources 400 questionnaires were distributed among students of University (in total there were 1616 regular female students) of whom 282 returned the questionnaires. 60 of the females had not even heard the name of osteoporosis so remaining complete questionnaires were 162.

Ethical consideration

This study was performed according to National Bioethics Committee Pakistan's guidelines [39]. According to the standards, written consent was taken from students prior to data collection. Students were ensured about the confidentiality of their answers and their right to leave the survey at any time.

Study instrument

The primary version of questionnaire was developed from some previous studies conducted to assess the disease knowledge for the same disease [4,19,35,38,40]. It underwent few alterations according to the population from which data had to be collected under the process of validation in which the questionnaire went through a face and content validation by experts from Department of Pharmacy Practice, Faculty of Pharmacy, University of Baluchistan, Quetta. To have a better assessment of overall knowledge regarding the disease osteoporosis a total of 20 questions were added in the questionnaire and it was divided into six sections i.e. general introduction, risk factors, symptoms, diagnosis, treatment and prevention of disease. The dichotomous type of questionnaire was made with 'Yes' 'No' and 'Don't know' options. Source of Information about the disease was also included in the study instrument and subjects were allowed to choose more than one source of information. The English version was later translated into Urdu by using standard forward-backward-forward translating method (Behling and Law, 2000, Braun and Harkness, 2005). The study instrument in both languages was then tested for its reliability by conducting a pilot study. The reliability of the current study's instrument was assessed by internal consistency which was measured by Cronbach's alpha which was $\alpha = 0.967$ for 20 items that made it highly acceptable [41]. The questionnaire was then made available for the data collection.

Scoring method

Each response was recorded as 'Yes' 'No' and 'Don't know'. Each correct answer carried 1 mark whereas wrong or 'don't know' carried 0 mark. This gave a total score range of 0-20. A cut-off level of < 11 was considered as poor knowledge while ≥11 was regarded as good knowledge.

Data analysis

Code data was entered in SPSS version 20 Descriptive statistics were used to demonstrate the characteristics of the study population. Categorical variables were measured as frequency and percentages whereas continuous variables were expressed as mean ± standard deviation. Kolmogorov-Smirnov test was applied to determine nature of distribution i.e. parametric or non-parametric.

Inferential statistics (Mann–Whitney U test and Kruskal Wallis tests, $p < 0.05$) were used to assess the significance among study variables.

Results

Demographic characteristics

The demographic characteristics of respondents are displayed in Table 1.

Character	Frequency	Percentage
Age (21.91 ± 1.74) years		
<24	132	81.5
≥24	30	18.5
Marital status		
Single	153	94.4
Married	9	5.6
Ethnicity		
Punjabi	36	22.2
Balochi	50	30.9
Pakhtoon	50	30.9
Persian	4	2.5
Urdu speaking	13	8
Others	8	4.9
Not mentioned	1	0.6
Department		
Science	123	75.9
Arts	36	22.2
Not mentioned	3	1.9
Degree		
Bachelors	81	50
Masters	80	49.4
Not mentioned	1	0.6
Living Status		
Hostel Boarders	16	9.9
Day Scholars	140	86.4
Not mentioned	6	3.7

Prior diagnosis with osteoporosis and other bone disease		
Yes	25	15.4
No	134	82.7
Not mentioned	3	1.9

Table 1: Demographic Characteristic of the Respondents

Mean age of the participants was 21.91 ± 1.74 years. Regarding their living status large number of respondents were day scholars (n=140), were single (n=153) and have not ever been diagnosed with osteoporosis or any other bone related disorder (n=134). Majority of the respondents were of science students (n=123) of them bulk of students were from faculty of pharmacy (n=63).

Assessment of knowledge of osteoporosis

Table 2 describes the present level of knowledge about osteoporosis of female students.

c	Questions	Number of correct responses n (%)	Number of incorrect responses n (%)
1	Osteoporosis is a disease of bones	162 (100)	0(0)
2	Osteoporosis makes bones weak and fragile (easy to break) and less dense.	156 (96.3)	06(3.8)
3	The ideal time to make bones strong and increase bone mass is before the age of 25 years.	109(67.3)	53(32.7)
4	Osteoporosis affects both men and women equally	97(59.9)	65(40.1)
5	Lack of calcium alone causes osteoporosis	95(58.6)	67(41.4)
6	You can get osteoporosis, if you do not drink milk and take other dairy products	133(82.1)	29(17.9)
7	You can get osteoporosis, if someone in your family already suffers from osteoporosis	44(27.2)	118(72.8)
8	You can get osteoporosis, if you avoid sunlight (lacking Vitamin D)	141(87.0)	21(13.0)
9	You can get osteoporosis, if you suffer from menopause at early age(before the age of 50 years)	81(50.0)	81(50.0)
10	You can get osteoporosis, if you do not do enough physical activities / exercise everyday	114(70.4)	48(29.6)
11	You can get osteoporosis, if you are short and thin	72(44.4)	90(55.5)
12	You can get osteoporosis, if you drink carbonated drinks (Coca Cola, Pepsi etc.), regularly	116(71.6)	46(28.4)
13	There is no apparent symptom of osteoporosis	53(32.7)	109(67.3)
14	If you suffer from osteoporosis , you are more likely to have back pain	124(76.5)	38(23.4)
15	If you suffer from osteoporosis, you are more likely to have fragility fractures (vertebral column, ribs, wrist etc.)	127(78.4)	35(21.6)
16	If you suffer from osteoporosis, you become shorter due to bent spine	97(59.9)	65(40.1)
17	Bone Mass Density(BMD) is used to measure strength and quality of bones	111(68.5)	51(31.5)
18	Osteoporosis is treatable disease	121(74.7)	41(25.3)
19	There are no effective treatments for osteoporosis available in Pakistan	55(34.0)	107(66.0)
20	Calcium supplements and Vitamin D can prevent osteoporosis	146(90.1)	16(9.9)

Table 2: Responses related to knowledge of Osteoporosis

Each response was recorded as 'Yes' 'No' and 'Don't know'. Each correct answer carried 1 mark whereas wrong or 'don't know' carried 0 mark. This gave a total score range of 0-20. A cut-off level of <11 was considered as poor knowledge while ≥11 was regarded as good knowledge. Mean of total score of knowledge was 13.01 ± 2.9. Out of 162 respondents, 29 (17.9%) had poor knowledge and 133(82.1%) had good knowledge about osteoporosis.

Source of information

Fourteen (8.7%) of the studied respondents did not mention any source of information from which they attain knowledge regarding osteoporosis disease whereas the remaining respondents achieved knowledge from one or more than one sources of information.

Internet was the most common source of knowledge (n=58, 20%) followed by neighbors or relatives or family (n=42, 14.7%), health care professionals and others which included books and seminars mentioned by the participants (n=32, 11%). Posters and brochures were considered as the least informative source as shown in the Table 3.

Source	Frequency N=261	Percentage
Television	25	8.7
Internet	58	20.3
Magazines	28	9.8
Health care professionals	32	11.2
Family/ relatives/neighbours	42	14.7
Friends	31	10.8
Posters	13	4.5
Others	32	11.2

Table 3: Source of information of knowledge

Association of demographics and knowledge score

Inferential statistics, i.e. Mann-Whitney test and Kruskal Wallis test were applied to compare scores of knowledge with various demographic variables. Association of demographic characteristics and mean knowledge score is presented in Table 4.

Description	Frequency	Knowledge score (13.01 ± 2.9)	p-value
Age (21.91 ± 1.74) years a			
<24	132	13.07 ± 2.6	0.905
≥24	30	12.73 ± 3.8	
Marital status a			
Single	153	13.09 ± 2.8	0.221
Married	9	11.56 ± 3.4	
Ethnicity b			
Punjabi	36	13.39 ± 2.4	
Balochi	50	12.34 ± 3.1	
Pakhtoon	50	13.20 ± 3.0	0.228
Persian	4	12.00 ± 3.6	
Urdu speaking	13	14.62 ± 2.7	
Others	8	12.13 ± 2.9	
Not mentioned	1	13	
Department b			
Science	123	13.51 ± 2.5	
Arts	36	11.36 ± 3.6	0.008
Not mentioned	3	12.00 ± 3.5	
Degree b			
Bachelors	81	13.57 ± 2.6	
Masters	80	12.41 ± 3.1	0.032
Not mentioned	1	15	
Living Status b			
Hostel Boarders	16	10.87 ± 3.0	
Day Scholars	140	13.20 ± 2.8	0.011
Not mentioned	6	14.17 ± 2.0	
Prior diagnosis with osteoporosis and other bone disease b			
Yes			
No	25	13.36 ± 3.6	
Not mentioned	134	12.98 ± 2.7	0.616
3	11.33 ± 5.5		

Table 4: Mean knowledge scores' association with demographics, aMann-Whitney test (p < 0.05);b Kruskal Wallis test (p < 0.05)

By taking $p < 0.05$ as statistically significant there was a difference between mean knowledge scores of departments, degree and living status of the respondents. No statistically significant difference in scores was observed among other demographic variables.

Discussion

The present study revealed more than half of the population had adequate knowledge about Osteoporosis; the similar results were obtained from another study in which females had adequate knowledge than men [19]. Large number of studied population knew that Osteoporosis is a disease of bones and its meaning as shown by other studies conducted on highly educated population [19,42] while other studies in which general female population [5,37] or teenagers [2] had not known about the medical condition Osteoporosis for they may not have higher level of education.

This fact has been attributed primarily to internet secondly to the family, relatives and neighbors and third to health care professionals. The use of internet has been rapidly increased in recent years and therefore by advancement it provides the information about every disease through many different medical websites and they are especially designed for the youngsters [2]. So this may be the reason that internet was majorly indicated as a source of information by the current study and also by other studies [42,43]. Friends and relatives were the second most important source of information identified by many other studies' population as well as it is believed that they have a strong impact on people knowledge [2,19,37,43].

The studies in which knowledge of osteoporosis was reported as poor or moderate have not identified health care professionals. Health care professionals are not playing a very major role in providing the information about the disease though they should give the information to their patients or to the general public. This may be due to insufficient counseling time between the health care professional and patient or inadequate knowledge about this disease among health care professionals as shown in the studies conducted on nurses and other health care professionals [42,44]. People even themselves are not interested in acquiring the information about that disease which is not much life threatening as other diseases. They would not be serious of getting the disease themselves therefore they don't tend to listen the health care professionals carefully. These may be the reasons by which health care professionals were less identified as a source of information in the studies in which poor or moderate knowledge was reported [19,37].

Respondents of the present study had good knowledge regarding the modifiable risk factors (intake of calcium containing products, lack of physical activity, (< BMI) as compared to non-modifiable risk factors (family history, early menopause). Previous studies have also shown the same results [1,19,37,43]. However there were some previous studies [2,35,38] which indicated poor knowledge about the risk factors of osteoporosis. Family history and of being thin and short have been the least identified risk factors in the present study as well as in other previously conducted diseases [1,19,37]. Menopause was less identified in all studies including the current study and this may be

due to the reason that the respondents were not much aware of the term 'menopause'.

Regarding to the knowledge of symptoms associated with the osteoporosis the present study's respondents did not know much about the apparent symptoms of osteoporosis. But majority of them correctly identified the fragility fractures and back pain as symptoms of osteoporosis. Short height or kyphosis was less recognized as a symptom associated with the disease. Similar results were presented by the other studies too [5,19]. Whereas moderate knowledge about symptoms was observed among Israeli nurses [42]. There is no study conducted which assessed the knowledge about the disease's diagnosis even these studies have not included diagnosis related question in their questionnaires. As far as treatment is concerned two studies did asked their respondents about the treatment one that was conducted in Pakistan [4] and one conducted on Israeli nurses [42]. Pakistani women did not know about the treatment of osteoporosis though they had an adequate knowledge regarding other dimensions of the disease osteoporosis.

The current study revealed that no demographic variable except degree, living status and departments of university significantly affect knowledge score. Female students of science department had greater knowledge than those of arts department. The results are in accordance with the results obtained from the study conducted on university students [19].

The study concluded that females of science department and who are day scholars had better understanding of the disease, osteoporosis, but they need to know about its treatment and some specific risk factors but this adequate knowledge cannot not conclude their positive behaviour towards this disease.

Conclusion

The study concluded that females had better understanding of the disease, osteoporosis, but they need to know the availability of treatment for this disease in Pakistan and it is also necessary for them to know more about some specific risk factors. As knowledge alone may not lead to improvement in life style, Health Policy makers can use the results that this study provided in conducting large educational programs to affect behaviours and attitude towards the disease. However several limitations of this study should also be noted. First, the use of a convenience sampling technique does not allow us to generalize our findings to all young females. Second the non-respondents were not followed up.

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