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OSTEOPOROSIS AWARENESS AMONG PERIMENOPAUSAL WOMEN-A CROSS-SECTIONAL STUDY

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Introduction: Osteoporosis is a global public health problem currently affecting more than 200 million people worldwide. Osteoporosis is characterized by low bone mass and is associated with deterioration of bone microarchitecture. Osteoporosis causes the bones to be fragile and increases susceptibility to fracture even with trivial trauma. **Objective:** To assess the knowledge of pre-and post-menopausal women on osteoporosis. **Methods:** A cross sectional study was carried out at the Dept. Obstetrics and Gynaecology, Sheikh Sayera Khatun Medical College & Hospital, Gopalganj, Bangladesh from November 2021 to June 2022. One hundred (100) patients included in our study. Fifty premenopausal women and fifty post-menopausal women were selected using purposive sampling. Baseline data was collected and the knowledge was assessed using the knowledge questionnaire respectively developed by the researcher. Fifty pre-menopausal women between the age of 25-45 years and fifty post-menopausal women between the ages of 46-65 years were selected using purposive sampling technique. **Results:** Majority of the pre-menopausal women 38 (76%) had average knowledge, 10 (20%) had poor knowledge and 2(4%) had good knowledge when compared to post-menopausal women 35 (70%) had average knowledge, 14(28%) had poor knowledge and 1(2%) had good knowledge regarding risk factors and prevention of osteoporosis. Both premenopausal 76% and postmenopausal 70% women demonstrated average knowledge of osteoporosis based on their awareness questionnaire score. Comparison of the knowledge level in pre and post-menopausal women showed the mean knowledge score of pre-menopausal women is 11.37±3.26 SD and mean knowledge score of

post-menopausal women is 10.243±.24 SD The 'p' value was >0.05 Hence, there was no difference in the knowledge level between the pre and post-menopausal women. **Conclusions:** Although half of the pre- and postmenopausal women reported having some awareness of OP, their level of knowledge was average, particularly with regard to the concept, risk factors associated, treatment with the condition and its complications. Having information or creating awareness regarding the risks of OP, screening for OP and a better understanding of the diet during the post-menopausal period of those at risk are important, as both may play a major role in influencing an individual's OP-preventing behaviors.

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INTRODUCTION

Osteoporosis is characterized by low bone mass and is associated with deterioration of bone microarchitecture. Osteoporosis causes the bones to be fragile and increases susceptibility to fracture even with trivial trauma [1]. The World Health Organization also reports that osteoporosis is second only to cardiovascular disease as a global health care problem and medical studies show a 50-year-old woman has a similar life time risk of dying from hip fracture as from breast cancer [2]. A study conducted on incidence of osteoporosis states that osteoporosis constitutes a major health problem in the western world and the incidence of fractures due to osteoporosis is increasing. The study concludes that prevention is of great importance and suggested that physical activity, combined with adequate calcium intake and hormone level is necessary for the formation and maintenance of bone tissue [3]. After attainment of menopause in women, the process of osteoporosis is accelerated by estrogen deficiency. Estrogen helps in maintaining a positive calcium balance and in osteogenesis. Menopause accelerates the rate of bone loss by 2%–5% per year, and this may continue for the next 10 years [2, 3]. In a recent study, the prevalence of osteoporosis in ambulatory postmenopausal women was shown to be 50% at any site [4]. The 1-year mortality after osteoporotic hip fractures is estimated to be about 20% [5]. The basic requirement for managing any chronic health disorder starts with evaluation of the awareness about the disease among the target subjects. Although a good understanding of the disease may not be sufficient to bring about changes in health-related behaviour, adequate knowledge is a prerequisite for the success of preventive efforts [6]. Although more commonly seen in women, the burden of osteoporosis in men remains under diagnosed and underreported [4, 6]. A study was conducted on the incidence of osteoporosis over 50 years of age suggested that men account for 1/3 of the 1.7 million hip fractures worldwide with a higher mortality rate than women. Osteoporosis results in longer hospital stays than several common diseases of elderly including myocardial infarction and diabetes mellitus. Osteoporosis is a major public health problem many studies have cited the incidence of vertebral or hip fractures [7]. Osteoporosis is a condition that can be prevented and treated if diagnosed early and accurately. Unfortunately, it is often undiagnosed until a fracture occurs. Unfortunately, many individuals are either unaware of their risk of developing osteoporosis, uninformed of preventive behaviors or have failed to engage in preventive behaviors as they view osteoporosis as a distant threat [5, 7]. Perceiving osteoporosis as a major health problem among the menopausal women with adequate support of reviews the investigator problem among the

menopausal women felt the need to identify the risk for osteoporosis and to determine the knowledge on osteoporosis so that an information booklet can be prepared to create awareness. Very often, screening efforts are hampered by the lack of awareness of this condition among rural postmenopausal subjects. To promote knowledge and better health seeking behavior among postmenopausal women, it is necessary to assess their current state of awareness and work towards reducing the identified gaps in knowledge.

METHODS AND MATERIALS

A cross sectional study was carried out at the Dept. Obstetrics and Gynaecology, Sheikh Sayera Khatun Medical College & Hospital, Gopalganj, Bangladesh from November 2021 to June 2022. One hundred (100) patients included in our study. Fifty pre-menopausal women between the age of 25-45 years and fifty post-menopausal women between the ages of 46-65 years were selected using purposive sampling technique. The sample sizes were not calculated based on power analysis it was based on the availability of the samples for the study for a period of time. The inclusion criteria were Post-menopausal women aged more than 45 years and less than 65 years, Premenopausal women above 25 years and below 45 years, those willing to participate exclusion criteria were Women with existing osteoporosis, Pregnant women, Women with fracture. Among the pre and post-menopausal women and to assess their awareness on its risk factors, prevention and treatment. Written permission was obtained from the participants after proper explanation about the purpose and usefulness of the study. Confidentiality was assured to the participants.

Data Analysis: SPSS version XVI was used to analyses the data. The demographic variables and the knowledge level were compared between the pre and post-menopausal women and were analyzed using the independent t test. To ensure the content validity, the tools along with the problem statements, hypothesis and criteria checklist were submitted to five experts from the flied of nursing and also doctors. The final data were translated by verbatim from English to Kannada by language experts.

RESULTS:

Table-1: Distribution of knowledge scores of Pre and Post-menopausal women.

Level Of Knowledge	**Score**	**Pre-Menopausal**		**Post-Menopausal**	
		Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Poor Knowledge	0-8	10	20	14	28
Average Knowledge	9-17	38	76	35	70
Good Knowledge	18-25	2	4	1	2
Total		50		50	

Assessment of level of knowledge: In order to find out the existing knowledge of Osteoporosis a three-point scale was used and the scoring was done as follows 0-8 poor knowledge, 9-17 average knowledge, 18-25 good knowledge. The table-1 depicts that majority of the pre-menopausal women 38 (76%) had average knowledge, 10 (20%) had poor knowledge and 2(4%) had good knowledge when compared to post-menopausal women 35 (70%) had average knowledge, 14(28%) had poor knowledge and 1(2%) had good knowledge regarding risk factors and prevention of osteoporosis.

Table-2: Distribution of Area Wise Mean, Standard Deviation and Mean Percentage of knowledge.

Sl. No	Knowledge Area	Maximum possible scores	Mean	Standard Deviation	Mean Percentage
1	Concept of osteoporosis	5	1.73	1.09	35%
2	Causes, risk factors and clinical manifestation of osteoporosis	7	2.60	1.36	37%
3	Osteoporosis preventive factors	9	4.54	1.67	50%
4	Diagnosis and treatment	4	1.49	1.06	37%
Total		25	10.36	1.29	

Area wise analysis of Knowledge Score: Out of 25 maximum obtainable scores, the total mean score was 10.36. The highest mean percentage (50%) was obtained in the area of osteoporosis preventive factors with a mean ±SD 4.54±1.67. Area-wise mean percentage in the area diagnosis and treatment and causes, risk factors and clinical manifestation of osteoporosis was 37% with mean ±SD 1.49 ±1.06 and 2.60±1.36 respectively. In the area concepts of osteoporosis, the mean percentage was 35% with mean ± SD 1.73 ±1.07 (Table-2).

Table-3: Distribution of the correct responses of the women regarding concept of osteoporosis.

Sl: No	Items	Pre-menopausal		Post-menopausal	
		N	%	N	%
1.	Osteoporosis means porosity of the bone	6	12	6	12
2.	Osteoporosis of the bone commonly leads to fracture	33	54	21	42
3.	Body part commonly affected in osteoporosis is spine and hip	17	34	24	48
4.	3-9% of bone loss occurs after menopause	17	34	19	38
5.	Osteoporosis is called silent thief because it causes no symptoms	15	30	15	30

Item wise analysis of Knowledge Score: The findings of the study revealed that majority of the premenopausal women 33 (54%) knew that osteoporosis of the bone commonly leads to fracture, whereas the post-menopausal women 24 (48%) responded correctly to body part commonly affected in osteoporosis is spine and hip. Only 6(12%) of the women knew that osteoporosis refers to porosity of the bone (Table-3).

Table-4: Distribution of the correct responses of the women regarding identification of risk factors.

Sl:No	Items	Pre-menopausal		Post-menopausal	
		N	%	N	%
6	Vitamin D deficiency leads to osteoporosis	22	44	19	38
7	Deficiency of hormone estrogen leads to osteoporosis	19	38	8	16
8	Common site of facture include all except fracture of skull	35	70	28	36
9	Osteoporosis is common among individual	5	10	4	8

	with thin frame				
10	Common cause of osteoporosis in women is menopause	23	46	25	50
11	Controllable risk factor of osteoporosis is exercise	32	64	34	68
12	Menopause increases osteoporosis because production of estrogen by body is decreased	24	47	23	46

Risk factors: The highest percentage 35 (70%) of the pre-menopausal were aware that the Common site of facture include all except fracture of skull & 24(47%) of them knew that menopause increases osteoporosis because production of estrogen by body is decreased, whereas the post-menopausal women 34(68%) were aware that controllable risk factor of osteoporosis is exercise. The least percentage 5(10%) & 4(8%) of the pre and post-menopausal women respectively responded correctly to the item that is osteoporosis is common among individual with thin frame (Table-4).

Table-5: Distribution of the correct responses of the women regarding Prevention of osteoporosis.

Sl: No	Items	Pre-menopausal		Post-menopausal	
		N	%	N	%
22.	Hormone used for the alleviation of symptoms following menopause is estrogen	15	30	11	22
23.	Diagnostic measure to rule out osteoporosis is bone mineral density	13	26	12	24
24.	Function of vitamin D in relation to the bones is it helps in absorption of calcium	23	46	21	42
25.	Treatment for osteoporosis are calcium supplements , vitamin D and exercise	23	46	31	62

Prevention of Osteoporosis: Majority of the premenopausal and post-menopausal women 44(88%) and 39(78%) respectively were aware that essential mineral needed to maintain healthy bone structure is calcium. More or less 38 (76%) & 34(68%) of the pre-menopausal women and 26(52%) & 33(66%) of the post-menopausal women knew food item rich in calcium is milk & Best exercise in maintaining strong bone is walking respectively. Only 11(22%) & 9(18%) of the premenopausal and post-menopausal women respectively responded correctly to the item "Recommended daily dietary calcium intake for adult is 300-400mg/day (Table-5).

Table-6: Distribution of the correct responses of the women regarding diagnosis and treatment of osteoporosis.

Sl:No	**Items**	**Pre-menopausal**		**Post-menopausal**	
		N	**%**	**N**	**%**
13.	Dietary source of vitamin D include egg yolk	19	38	20	40
14.	Essential mineral needed to maintain healthy bone structure is calcium	44	88	39	78
15.	Recommended daily dietary calcium intake for adult is 300- 400mg/day	11	22	9	18
16.	Free source of vitamin D sun exposure	31	62	25	50
17.	Food item rich in calcium is milk	38	76	26	52

18.	Lifestyle change to prevent osteoporosis are exercise and balanced diet	26	52	20	40
19.	Best exercise in maintaining strong bone is walking	34	68	33	66
20.	Cheapest and richest source of Calcium ragi	20	40	11	22
21.	Recommended daily dietary requirement of vitamin D 400-600 IU	23	46	25	50

Diagnosis and Treatment of Osteoporosis: The highest percentage 23 (46%) of the pre-menopausal and 21(42%) and 31(62%) of the post-menopausal women were aware that function of vitamin D in relation to the bones is it helps in absorption of calcium and Treatment for osteoporosis are calcium supplements vitamin D and exercise. The least percentage 13 (26%) of the pre-menopausal women responded correctly to the item that is Diagnostic measure to rule out osteoporosis is bone mineral density and 11 (22%) of the post-menopausal women responded correctly to the item that hormone used for the alleviation of symptoms following menopause is estrogen (Table-6).

Table-7: Comparison of the knowledge level in pre and post-menopausal women.

Group	Mean	S.D	Mean difference	df	t Value	P value
Pre-menopausal	10.24	3.24	1.120	98	1.723	0.08
Post-menopausal	11.37	3.26				

The mean knowledge score of pre-menopausal women is 10.24 and mean knowledge score of post-menopausal women is 11.37 and the mean difference is 1.120. The standard deviation of knowledge score of pre-menopausal women is 3.24 and for the post-menopausal are 3.26. The 'p' value was >0.05 which indicated no significance The calculated 't' value using independent t-test, t value was 1.723, which was less than the table value df (98) = 1.984 at 0.05 level of significance. Hence, there is a no difference in the knowledge level between the pre and post-menopausal women (Table-7).

DISCUSSION

Our study evaluated to have an overall average knowledge of osteoporosis among pre and post-menopausal women, as well as their knowledge on Concept of osteoporosis, Causes, risk factors and clinical manifestation, Osteoporosis preventive factors, diagnosis and treatment of osteoporosis. The results of our study, which are consistent with those of other reports, indicate that several aspects of patients' knowledge and lifestyle could be improved. The results of the current study among the pre-menopausal women 38 (76%) had average knowledge, 10 (20%) had poor knowledge and 2(4%) had good knowledge when compared to post-menopausal women 35 (70%) had average knowledge, 14(28%) had poor knowledge and 1(2%) had good knowledge regarding risk factors and prevention of osteoporosis. Out of 25 maximum obtainable scores, the total means score was 10.36. The highest mean percentage (50%) was obtained in the area of osteoporosis preventive factors with a mean ±SD 4.54±1.67. In the area diagnosis and treatment and causes, risk factors and clinical manifestation of osteoporosis was 37% with mean ±SD 1.49 ±1.06 and 2.60±1.36 respectively. In the area concepts of osteoporosis, the mean percentage was 35% with mean ± SD 1.73 ±1.07. In agreement to this a study conducted on an assessment of patients' knowledge of osteoporosis found irrespective of gender, 31.2% of participants had very good knowledge of osteoporosis, providing correct answers to more than 85% of the questions.

most participants were able to identify several osteoporosis risk factors (smoking 63.4%, low dairy products consumption 96.7%, low calcium intake 96.7%). on the other hand, fewer participants were able to identify other factors, such as the fact that thin women are at greater risk than overweight women (17.4%) [6]. In another study, with regard to knowledge, an exploratory cross-sectional study, was conducted to assess osteoporosis knowledge showed similar findings. A convenience sample (n =320) comprising of three groups aged 25-35 years, 36-45 years, and over 45 years was taken. The knowledge on osteoporosis in younger women was very poor compared to relatively older females. However, women belonging to higher socioeconomic status and better education had slightly more knowledge about osteoporosis compared to those with a low education level, regardless of age. The majority of women had modest knowledge on osteoporosis. Younger women were at increased risk for low bone mass and premature osteoporosis [7]. Majority of the pre-menopausal women 16 (32%) were in the age group of 45-50 years, 14 (28%) were in the age group of 56-60, 11(22%) were in the age group of 61-65 years and 9(18%) in the age group of 51- 55 years. A similar study conducted to evaluate the osteoporosis knowledge and self-efficacy of female orthopedic patients showed the mean age of the patients was 59·6 ± 12·9 years [8]. Majority of the post-menopausal 24 (48%) were illiterate, 16(32%) with primary education 2(4%) with higher primary 5(10%) graduates and 3(6%) in other category. More or less similar findings were seen in the other studies conducted to assess educational level and osteoporosis risk in postmenopausal Moroccan women. Out of 356 women selected the mean age was 58.9±7.7 years. Patients were separated into four groups according to school educational level; group 1, no education (n=98 patients); group 2, elementary level (n=57 patients); group 3, secondary level (n=138 patients) and group 4, university level (n=66 patients) [9]. The current study showed that premenopausal women 27(54%) and postmenopausal women 31(62%) had information on osteoporosis through mass media, this is in agreement with the study by Al Attia et al., which identified magazines, newspapers, and television as the major source of information among patients. A study conducted at Malaysia also showed similar finding with the above study, 55.7% obtained information about Osteoporosis from newspapers and 46.4% from magazines. In this self-selected population, women, the better educated, and those earning higher incomes were more aware of Osteoporosis [10]. Thus, we recommend that media outlets should be used to deliver disease specific information such as healthy lifestyle advertisements on television talks on radio, distribution of pamphlets, have shown such to be effective. One limitation of the study is that it did not investigate whether patients applied their knowledge to implement changes in lifestyle or dietary habits. Another limitation is the fact that study participants were not diagnosed with osteoporosis but were the post-menopausal women who were at risk of developing osteoporosis. A third limitation is related to gender: even though osteoporosis is seen in men only females were enrolled in the study (osteoporosis being more common among women). In a large study (n = 1514) of the Norwegian population, Magursky V et al., found that women knew significantly more about osteoporosis than did men ($p < 0.001$) [11]. Finally, a larger sample size with adequate statistical power that is representative of the overall population is needed to generalize the findings described above. Our study is limited by its cross-sectional design. Ideally, conducting a teaching session on osteoporosis, its risk factors, and treatment and assessing the questionnaire responses before and after the same will help in determining the effect of education on their existing state of awareness. Since the study was conducted

among consecutive postmenopausal women referred for DXA scan from the outpatient department, the knowledge of osteoporosis among our study population is not representative of the community. However, as most postmenopausal women in our country reside in rural areas, and belong to the lower socioeconomic strata, it is reasonable to presume that the state of awareness among them might be worse than what was noted in this study.

CONCLUSION

The results of this study showed post-menopausal women were in the age group of 45-50 years. Television and radio should be targeted in efforts to raise awareness and provide health education. Future research should examine perceptions in a larger sample of patients, as well as in the general population. This should aid in building and directing future modalities for the prevention and treatment of osteoporosis. The physicians and healthcare providers should make more effort to teach and inform patients about preventing, treating, and living with osteoporosis.

CONFLICT OF INTEREST: None.

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