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A COMMUNITY BASED CROSS-SECTIONAL STUDY TO ASSESS OSTEOPOROSIS AWARENESS AMONG URBAN HOUSEWIVES OF PRAYAGRAJ CITY

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Abstract

Background: Globally, osteoporosis is becoming an increasingly serious health issue. Since Osteoporotic fractures are increasing in frequency and the general public is less aware of the condition, the burden of the illness on the healthcare system and the populace as a whole is steadily rising.

Method: A descriptive cross-sectional study was conducted among 90 urban housewives of Prayagraj city of Uttar Pradesh to measure their knowledge and awareness about osteoporosis. The study also aimed to determine the correlation between their level of education and osteoporosis awareness and its associated risk factors. Random sampling was employed to select housewives belonging to Middle adulthood (40-65 years) and late adulthood (more than 65 years). Thereafter respondents were screened according to their age by purposive sampling. Socio-demographic characteristics and life style related information of the respondents was evaluated using a self-structured questionnaire. Osteoporosis Knowledge Assessment Tool (OKAT) was utilised to evaluate their level of understanding about osteoporosis.

Result: The results of the study indicated that 61.2% of the respondents had satisfactory knowledge about osteoporosis followed by 25.5% who possessed good knowledge about it. A high correlation (0.725) was noted between Education level of respondents and their osteoporosis awareness level.

Conclusion: Overall knowledge was found to be the highest in women having higher education levels in comparison to women who were less educated. It was recommended to design interventional strategies for women who are less educated to increase their awareness about risk factors and health hazards of osteoporosis.

Keywords: Osteoporosis, Vitamin-D, Bone Mineral Density (BMD), Bone Quality, Osteopenia, Fracture.

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Introduction

Osteoporosis (porous bone) is a gradual, systemic skeletal disease marked by low bone mineral density (BMD). It is a type of test which measures the calcium level present in the bone and deterioration in the microarchitecture of tissue found in bones that makes them more brittle and fracture susceptibility [1].The National Institute of Health (NIH) has defined it as "Osteoporosis is characterized by a decline in the bone mass, bone mineral density [2] and strength of bone tissue that raises the risk of fracture and makes bones more fragile (broken bone)" [3]. It is called a "silent disease" because people who develop it may not see a sign of any change until a bone breaks-usually a bone in the hip, spine or wrist. Bones are made up of living tissue to keep them strong. A healthy human body breaks down old bone and replaces it with new bones but in osteoporosis formation of new bones is decreased [4].

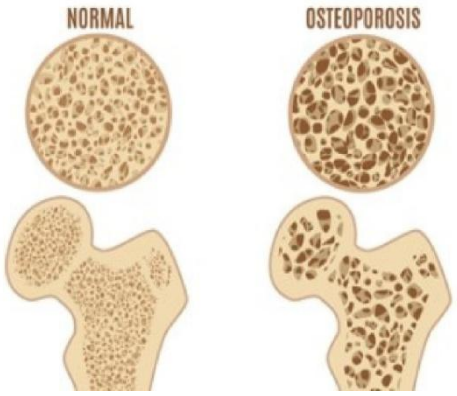

Fig: 01

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Around 200 million women worldwide have osteoporosis based on femoral neck BMD criteria which uses a T-score

of -2.5 SD or lower. The femoral neck is the area of the bone that is measured because it contains more soft bone than the rest of femurs. As a result it is more susceptible to breakage and BMD also decreases with age. More women are developing osteoporosis as they become older. At age 60, around 10% of women are affected, at age 70, nearly 20%, at age 80, roughly 40%, and at age 90, up to two thirds of all women have osteoporosis [5].

Table 01: Osteoporosis diagnosis criteria as per World Health Organisation (WHO)

BMD T Score	Diagnosis
T- Score ≥-1	Normal
T-Score -1 to -2.5	Low bone mass (Osteopenia)
T- Score ≤ -2.5	Osteoporosis

Multiple controlled and uncontrollable risk factors are associated with osteoporosis. Gender, race and ethnicity, ageing, postmenopausal status, family history and body frame size are among the uncontrolled factors. Controllable risk factors include less physical activity, sedentary lifestyle, smoking, alcohol abuse, low calcium intake and low vitamin D intake. Symptoms of osteoporosis include- many physical problems related to osteoporosis like pain in the lower back, joint and neck, weakness and tiredness, bone fracture, brittle bones, loss of height over time, change in posture (stooping or bending forward) faced by women [6].

Osteoporosis can be diagnosed by DEXA test (Dual-Energy X-ray Absorptiometry)/ golden standard test - measures bone density thickness and strength of bones by passing a high and low energy x-ray beam through the body, usually in the hip and the spine). It is non-invasive, easy to use, inexpensive, quick and painless and gives an adequate estimate of the BMD (Bone Mineral Density) [7, 8].

Awareness and comprehension about osteoporosis is extremely crucial for its management and prevention [9]. Hence the present study was carried out to evaluate the knowledge and awareness about osteoporosis among urban housewives of Prayagraj city belonging to middle and late adulthood years. This will provide us an insight to chalk out some measures for the timely identification and treatment of osteoporosis as it has now become a significant public health concern [10].

Justification

Bone is a structural and supporting part of body which protects the different organs present inside the body. Bones store calcium and other minerals like magnesium and phosphorus. When the body needs calcium, it breaks down and rebuilds bone. This process called bone remodeling, supplies the body with the needed calcium while keeping the bones strong. Bones normally build-up till age 30 but after 30 years breakdown of bone occurs faster than build-up which causes a gradual loss of bone mass. In osteoporosis, bone mass loss is at a greater rate but it can be deferred to some extent by consumption of calcium and vitamin-D rich foods in our diet like milk and milk products, fish oil, ragi, meat, egg etc. but lack of awareness among individuals on these aspects may increase a person's vulnerability to osteoporosis. This is a matter of great concern as the number of women suffering due to osteoporosis is escalating day by day. Osteoporosis is major public health problem but women are basically the primary victims of this irreversible bone disorder. Due to this they might face major challenges in their lives especially during advance age when they are dependent on others to the maximum. Any preventive measures can be initiated only after an evaluation of the awareness level of the target population about osteoporosis. A comprehensive understanding of the awareness level of women regarding osteoporosis will help in chalking about strategies to enhance their knowledge and awareness level on this issue. Keeping this in mind the research was outlined with the following objectives:

Objectives

1. To assess osteoporosis awareness among urban housewives of Prayagraj belonging to middle and late adulthood years.
1. To find out the correlation between the education level of urban housewives and their awareness about osteoporosis and its risk factors.

Materials & Methods

Study design- A cross-sectional descriptive research design was used.

Area of study- Prayagraj city of Uttar Pradesh

Sample size- This study was conducted among 90 housewives of Prayagraj city.

Age- Housewives belonging to middle adulthood (40-65 years) and late adulthood (more than 65 years) were selected for the study

Sample selection- The respondents were selected randomly and thereafter purposive sampling technique was used to select the respondents for the study according to their age.

Tools used- A self- structured questionnaire was employed to evaluate the socio-demographic characteristics of the respondents, information related to their life style and their knowledge level about osteoporosis. The socio-demographic characteristics included the respondent's age, marital status, educational status, occupation and income of husband while the life style related information dealt with the nature of work, alcohol consumption, smoking, intake of calcium rich foods and exercise by the respondents.

The Osteoporosis Knowledge Assessment Tool (OKAT) [11] was used to collect data about osteoporosis from the housewives. OKAT tool is a validated and reliable tool developed by Winze berg in 2003. The OKAT questionnaire comprises of twenty "true", "false" and "do not know" type questions about common knowledge of osteoporosis. This 20- the questionnaire's four primary domains (1) understanding (symptoms and risk factors of osteoporosis, (2) the knowledge of risk factors for

osteoporosis (3) knowledge of preventive factors as physical activity and diet relating to osteoporosis (4) treatment availability. [12] Participants' knowledge of osteoporosis was graded in the following manner: each correct response was attributed a score of one while each incorrect or do not know response scored zero points. The total score of all the responses was 20. The scores were characterized as follows: less than 10 indicated poor knowledge, 10-15 indicated satisfactory knowledge and more than 15 indicated good knowledge [12].

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) (version 21) was used to analyse the collected data about osteoporosis knowledge and awareness.

Result

Table 01: Socio-Demographic characteristics of the Respondents

Item	Frequency	Percentage (%)
Age		
40-50	48	53.3
50-60	37	41.1
60-70	5	5.6
Marital status		
Single	00.00	00.00
Married	84	93.4
Widowed	5	5.5
Divorced	1	1.1
Education Level		
Illiterate	9	19
Primary Education	18	20
Middle education	14	15.6
Secondary education	9	10
Graduation	22	24
Post-Graduation	18	20
Occupation of the husband		
Businessman	9	10
Teacher	10	11.1
Labourers	8	8.9
Any other	63	70
Income of the husband		
5000	3	3.3
5000-10,000	12	13.3
10,000-15000	12	13.3
15000-20,000	24	26.7
Above 20,000	39	43.3
Diseases		
Kidney disease(Chronic kidney disease (CKD) nephrotic disease)	4	4.4
Liver disease (Cholestatic liver disease, chronic liver disease, *liver cirrhosis)*	3	3.3
Rheumatoid arthritis	4	4.4
Other	45	50
None	34	37
Total	**90**	**100.0**

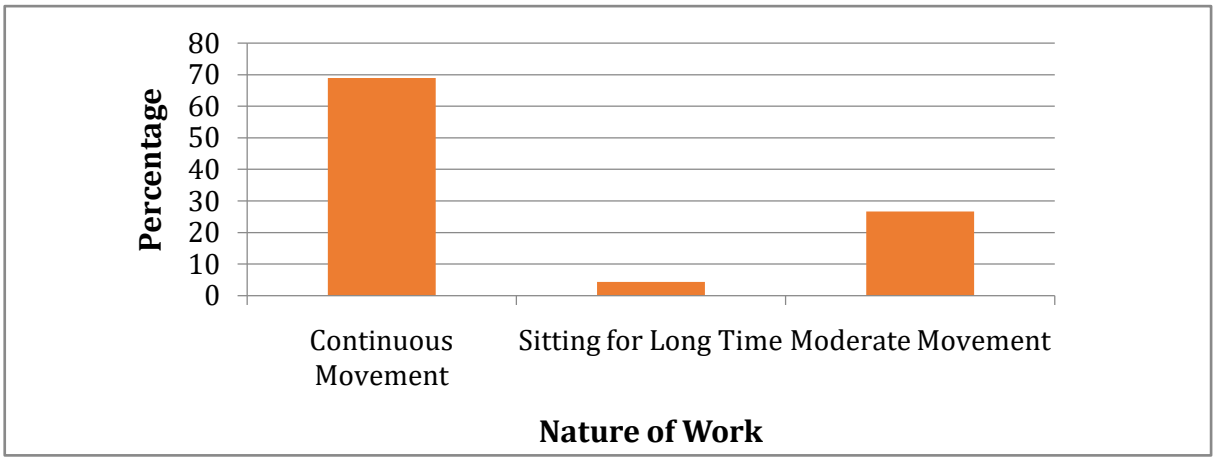

Fig 1. Distribution of the respondents on the basis of their Nature of work

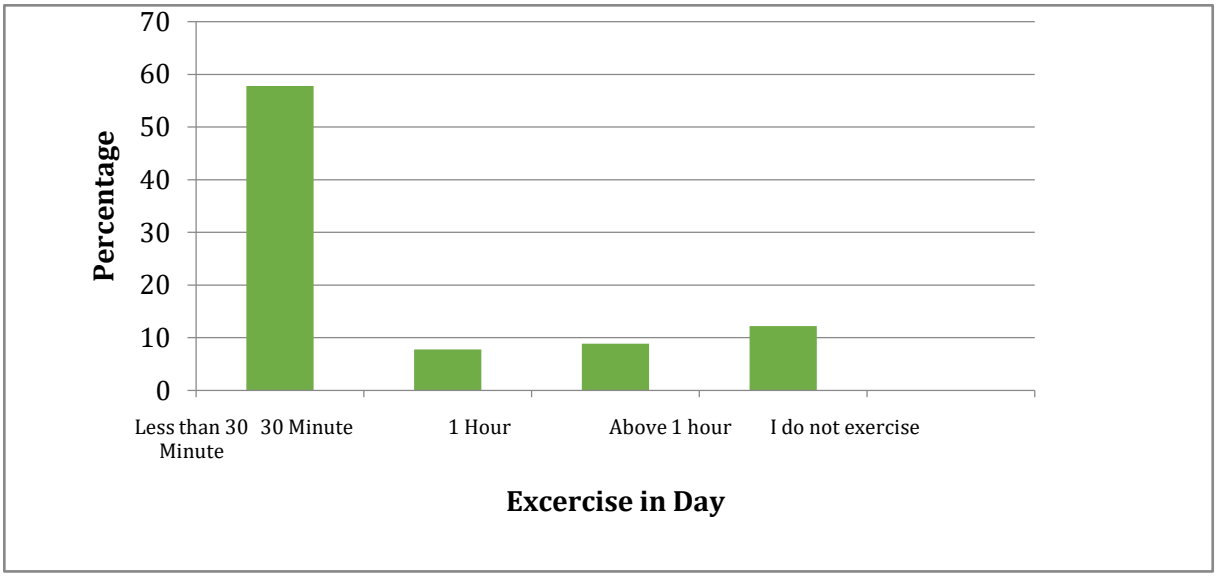

Fig 2. Distribution of the respondents on the basis of their exercise in a day

Table 02: Percentage of correct responses of various questions (OKAT tool) (Tardi *et al.* 2021, Winzenberg*et al.* 2003) regarding knowledge of osteoporosis among the respondents

	Items	Frequency (n)	Percentage (%)
1.	Osteoporosis leads to an increased risk of bone fractures.	86	95.6
2.	Osteoporosis usually causes symptoms (e.g., pain) before fractures occur.	6	6.7
3.	Having a higher peak bone mass at the end of childhood gives no protection against the development of osteoporosis in later life.	6	6.7
4..	Osteoporosis is more common in men.	23	25.6
5.	Cigarette smoking can contribute to osteoporosis.	62	68.9
6.	White women are at highest risk of fracture as compared to other races.	54	60
7.	A fall is just as important as low bone strength in causing fractures	81	90
8.	By age 80, the majority of women have osteoporosis.	86	95.6
9.	From age 50, most women can expect at least one fracture before they die.	86	95.6
10.	Any type of physical activity is beneficial for osteoporosis.	4	4.4
11.	It is easy to tell whether I am at risk of osteoporosis by my clinical risk factors.	84	93.3

12.	Family history of osteoporosis strongly predisposes a person to osteoporosis.	83	92.2
13.	An adequate calcium intake can be achieved from two glasses of milk a day.	86	95.6
14.	Sardines and broccoli are good sources of calcium for people who cannot take dairy products.	85	94.4
15.	Calcium supplements alone can prevent bone loss.	25	27.8
16.	Alcohol in moderation has little effect on osteoporosis.	76	84.4
17.	A high salt intake is a risk factor for osteoporosis.	63	70
18.	There is a small amount of bone loss in the 10 years following the onset of menopause.	27	30
19.	Hormone therapy prevents further bone loss at any age after menopause.	51	56.7
20.	There are no effective treatments for osteoporosis.	33	36.7

It was inferred from Table 02 that a major percentage of the respondents (53.3%) belonged to the 40-50 age group. 93.4% respondents were married, 24% had received graduation degree followed by postgraduate (24%) and primary education (20%). 70% of the respondent's husbands were engaged in jobs other than teaching, business or labouring. 37% of the respondents stated that they were not suffering from any type of disease while 50% of them stated that they suffered from illnesses other than that of liver, kidney and arthritis. Arthritis was reported by only 4.4% of the respondents. Liver and kidney diseases were also found in 3.3% and 4.4% respondents respectively. Majority of the respondent's husband (43.3%) earned more than 20,000 rupees per month.

Table 03. Distribution of the Respondents on the basis of their Life style

Items	Frequency	Percentage (%)
Nature Of Work		
Continuous Movement	62	68.9
Sitting For Long Time	4	4.4
Moderate Movement	24	26.7
Alcohol consumption		
Yes	00.00	00.00
No	100	100
Smoking		
Yes	00.00	00.00
No	100	100
Intake Of Calcium Rich Food (Milk, Green Vegetable)		
Yes	100	100
No	00.00	00.00
Exercise in a day		
Less than 30 Minute	52	57.8
30 Minute	7	7.8
1 Hour	8	8.9
Above 1 hour	11	12.2
I do not exercise	12	13.3

Table 03 elucidates that 62 (68.9%) respondents were engaged in jobs requiring continuous movement while only 4 (4.4%) were doing jobs that required sitting for long time. As far as alcohol consumption was concerned it was seen that all the respondents did not smoke or consumed alcohol and all of them also stressed on the intake of calcium rich foods (milk, green vegetable). The respondents had less awareness about the importance of exercise as it was seen that though 57.8% respondents did exercise on a daily basis but did not devote more than 30 minutes every day to it. However, 12.2% respondents stated that they were health conscious and took out more than one hour daily for their exercise related activities.

Table 04 Knowledge Score of Osteoporosis among the Respondents

Knowledge score	NO	(%)
Poor knowledge (<10)	12	13.3
Satisfactory knowledge (10-15)	55	61.2
Good knowledge (>15)	23	25.5

Table 04 shows that 61.2% respondents had satisfactory knowledge about osteoporosis, 25.5% had good knowledge of it, compared to just 13.3% that had bad knowledge.

Table 05. Correlation between level of education and osteoporosis awareness among urban women

			Education Level	**Awareness**
Spearman's rho	Education Level	Correlation Coefficient	1.000	.725**
		Sig. (2-tailed)	.	.000
		NO	90	90
	Awareness	Correlation Coefficient	.725**	1.000
		Sig. (2-tailed)	.000	.
		NO	90	90
**. Correlation is significant at the 0.01 level (2-tailed).				

Table 05 shows that the spearman coefficient (r_s) = 0.725 for 90 samples. This infers that there is a positive correlation between educational level and osteoporosis awareness among the respondents.

Discussion

Osteoporosis is a worldwide public health problem. It is a slowly progressing, silent illness that affects the skeletal system, causing fractures and decreased bone density. Prevention and control of osteoporosis depends on the level of knowledge of women. The aim of the present study was to assess the osteoporosis awareness among urban housewives of Prayagraj city belonging to middle and late adulthood years. It also aimed to assess the relationship between the education level of urban housewives and the knowledge of the risk factors and symptoms of osteoporosis [13].

According to research, almost half of the respondents (53.3%) belonged to 40-49 years age and most of the respondents consumed calcium rich food (milk and green vegetable) daily. These might ensue due to the cheap availability of milk and green vegetables in Uttar Pradesh (U.P.) since U.P. is a farming state where the production of milk and green vegetables is relatively high [14]. All the respondents in the study did not smoke or drink alcohol because they viewed it as a bad habit for women as they had been trained to follow this since their childhood.

Majority (95.6%) of the respondents agreed that bone fractures mainly resulted due to osteoporosis. Similar findings were reported in another study done in Baranya County, South-western part of Hungary [12]. where a large percentage of the respondents (95%) admitted to the possibility of higher bone damage in people having osteoporosis. This happens because in osteoporosis bone mass and bone mineral density decreases and the quality and structure of bone undergoes transformation therefore the risk of fracture is increased [12].

68.9% or more than half, of the respondents in the study were of the opinion that cigarette smoking can contribute to osteoporosis. They delivered this statement though they were unaware of the reason behind it. They only related it to bad health. An investigation carried out in Saudi Arabia [15], to evaluate the osteoporosis Knowledge among medical students it was seen that majority of them (90.3 %) were supportive of the bad effect of smoking in contrast to the present study. There is a considerable possibility that they might be having more awareness about the causes and risk factors of osteoporosis due to their medical background. This might be the reason for their high level of support for the statement that smoking may be a probable cause of osteoporosis [15]. According to a new research, smoking tobacco reduces bone mass and increases the risk of osteoporosis and fractures by creating an imbalance in bone turnover. Building and keeping strong bones depend on hormones like oestrogen. Smoking breaks down oestrogen more quickly which weakens bones. Extended periods of smoking may be associated with elevated levels of several hormones, including cortisol, androstenedione, and dehydroepiandrosterone, which may change bone metabolism and lead to a reduction in bone mass. Smokers may experience a lengthier healing time for fractures due to nicotine's detrimental impact on the development of bone-forming cells [16, 17].

During the study a very large percentage of the respondents (93.5%) did not agree with the statement that having a higher crowning bone mass at the end of childhood gives defense against occurrence of osteoporosis later in life. Only 6.5% respondents agreed to this statement while in study undertaken with nursing students it was seen that majority of them agreed to this statement [18].These findings point to the fact that still there is low awareness about osteoporosis among women and their awareness generation on this matter is a priority issue which cannot be ignored. Large scale implementation of campaigns propagating and promoting osteoporosis prevention and treatment should be encouraged.

More than half (56 %) of the respondents in the present study were of the view that hormone therapy after menopause may help in preventing additional bone loss at any age. They rationalized their statement by stating that treatment or medication can offer some relief as

opposed to not taking any treatment. Similar result (58.5%) was discovered in a study conducted on female medical students at King Faisal University, Saudi Arabia to gauge their understanding of osteoporosis [15].

Majority (95.6%) of the respondents considered that consuming two glasses of milk in a day is sufficient for generating calcium in the body since milk is a complete food and a store house of all the essential nutrients like calcium, phosphorus, magnesium, vitamins-B1, vitamin-A and vitamin-D. They cited that milk is a reliable source for healthy bones and good health. A study conducted among Syrian women to assess the reliability of the Arabic version of osteoporosis knowledge assessment tool (OKAT) [12] revealed that more than half of the respondents (75%) supported this statement [18].

The current study reported that out of the 90 respondents only 23 (25.5%) portrayed good knowledge about osteoporosis and the remaining had either satisfactory or poor knowledge. The reason behind this may be that the house wives were less educated, had less interaction with society and may participated less in health programmes. They spent most of their time at home, doing household chores, watching TV or using their mobiles but showed little interest in watching health related shows or programmes.

A study was conducted at Benha City to assess the vulnerability of working women towards osteoporosis and to develop health educational guidelines to prevent or reduce it. It was found that working women scored well on osteoporosis knowledge (63.3%) [19]. As discussed above the discrepancy in knowledge score of working and non-working women or housewives may be due to the fact that women who get an opportunity to step out of their homes are socially more interactive, register their presence in meetings and do not hesitate to communicate with their neighbours and society. They also have greater access to healthcare services resulting in their relatively good knowledge scores on health and related diseases.

High correlation was reported between the educational level of the respondents and their osteoporosis awareness level in the current study. This might be because education offers more opportunities to acquire information and knowledge about health and diseases. It acts a potent tool to enhance the knowledge and awareness of people about health, disease and their risk factors. Health education campaigns and programmes offer opportunity to the people to participate and disseminate information to the wider masses. Same results were obtained in a study conducted among 144 young women in Calmette hospital Cambodia to assess their knowledge and osteoporosis awareness [20]. Furthermore, other papers also mentioned in their study that there existed a high correlation between educational status of women and their knowledge levels [21, 22].

Conclusion

There is a satisfactory knowledge among respondents about osteoporosis and overall knowledge was found to be highest in women who had high education level as compared to low educated women. There exists a necessity for further interventional approaches for women who are less educated to raise their level of understanding regarding risk factors and health hazards of osteoporosis.

Ethical Approval

Not Applicable.

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None

Conflict of Interest

The authors declare no conflict of interest.

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