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OSTEOPOROSIS PREVALENCE AND ASSOCIATED RISK FACTORS IN PATIENTS RECEIVING ROUTINE OUTPATIENT CARE AT GHURKI TRUST HOSPITAL

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Abstract

Background: Osteoporosis is a disease of the skeleton. Osteoporosis is a chronic pathological condition characterized by three main aspects: low bone mass or bone mineral density, deterioration of bone and increased risk of fracture. Osteoporosis affects approximately 6.3% of men over the age of 50 and 21.2% of women of the same age range globally. Objectives: To assess prevalence and risk factors among osteoporosis patients. Method: Analytical cross-sectional study was conducted at Ghurki trust hospital Lahore. A total of 146 patients were selected through convenience sampling. A self-structure questionnaire was used to collected data from the study participants. Data was analyzed by using graphs, table and statistical test chi square to assess the risk factor of the osteoporosis. Result Most of the participants were female (69.2%) and 51.4% from rural areas, (45.9%) experienced menopause between 40 and 45 years of age. Among all the participants (67.1%) used to perform physical activity, (56.2%) having past medical fracture history 99.3%) were not taking any bone lose medication, while (63.7%) of the participants were educated. Conclusion: The study identified significant associations between certain demographic variables such as married women, unemployed individual and those living in rural areas with the risk factor of osteoporosis. Specifically demographic groups were found to be correlated with risk factor of osteoporosis. Common risk factors for osteoporosis was low milk intake, lack of physical activity, smoking habits, family history of osteoporosis and past medical fracture history; while the least common factors was bone loss medication, alcohol consumption and educational status.

INTRODUCTION

Osteoporosis is a skeletal disease that cause microstructural deterioration of bone tissue and bone mass. Osteoporosis (meaning 'porous bone') make bones fragile and make it more prone to fracture (1). It is often referred to as a "silent disease" due to its asymptomatic nature until a fracture occurs. Globally, osteoporosis represents a significant public health concern, especially among aging populations, with

millions affected each year by osteoporotic fractures that can lead to disability, loss of independence, and even mortality (2). In Pakistan, the growing elderly population, coupled with lifestyle factors such as poor nutrition, limited physical activity, and early menopause, has contributed to an increasing prevalence of osteoporosis (3). Despite its widespread impact, osteoporosis remains underdiagnosed and undertreated, particularly in outpatient settings where routine screenings are not consistently performed (4). Osteoporosis is classified as primary (age-related) or secondary (disease or treatment-related), with risk factors divided into modifiable (e.g., lifestyle, diet) and non-modifiable (e.g., age, gender, genetics). Women face added risks such as premature menopause and hormonal loss (5). Osteoporosis is a silent metabolic bone disease that often leads to fractures, disability, and reduced quality of life, especially in the elderly. Early prevention through diet, lifestyle, supplements, and education is key to managing its progression (6).

Osteoporosis affects both genders but is more common and severe in women, especially postmenopausal, who face higher fracture risks in the spine, arms, and hips. Research shows 20% of women die within a year of a major fracture, highlighting the disease's serious impact (5). Pakistan's aging population faces rising osteoporosis risks due to factors like poor diet, inactivity, and early menopause. Globally, Asians and Whites are more affected, with osteoporosis causing 1.5 million fractures annually—often leading to disability or death—while treatment costs and hospital stays remain high (7). Bone Mineral Density (BMD) testing, commonly done via ultrasound, assesses bone strength using T-scores. A T-score 1 to 2.5 SD below normal indicates osteopenia, while more than 2.5 SD indicates osteoporosis; it's mainly used for postmenopausal women and men over 50 (8). This study aims to assess the prevalence of osteoporosis and identify its associated risk factors among patients receiving routine outpatient care at Ghurki Trust Hospital in Lahore. By analyzing demographic characteristics, lifestyle habits, medical history, and awareness levels, the study seeks to provide valuable insights into the burden of osteoporosis in this population. The findings are intended to support the development of targeted interventions, early screening practices, and preventive strategies to reduce osteoporosis-related complications and improve patient outcomes.

Material and Method: This analytical cross-sectional study was conducted over four months at Ghurki Trust Hospital, Lahore, to determine the prevalence and risk factors of osteoporosis. A sample of 146 diagnosed patients aged 40 and above was selected using convenient sampling. Inclusion required OPD attendance and willingness to participate, while exclusions included poor prognosis, psychiatric issues, or medications affecting bone density. Data were collected via a self-structured questionnaire covering demographics and 15 items on lifestyle, diet, medical history, and osteoporosis awareness. After informed consent, responses were collected, digitized, cleaned, and analyzed using SPSS. Descriptive and chi-square inferential statistics identified significant trends and risk factors.

Results

Table No 1: Demographic variables such as gender, marital status, employment and area

		n	%
Gender	Male	45	30.8
	Female	101	69.2
Marital status	Married	135	92.5
	Unmarried	11	7.5
Employment	Employed	47	32.2
	Unemployed	99	67.8
Area	Rural	75	51.4
	Urban	71	48.6
	Total	146	100.0

Analyzed by frequency (n) and percentage (%)

This table number 1 represented demographic variables of patients with osteoporosis. According to gender most of the participants were female 101(69.2%) followed by males 45(30.8%). Regarding marital status most of the participants were married 135(92.5%) and 11(7.5%) unmarried. On the base employment most were unemployed 99(67.8%) and 47(32.2%) employed. Regarding area most were from rural 75(51.4%) followed by urban 71(48.6%). It is concluded that regarding gender most of the participants were female (69.2%), married (92.5%), on the base of employment most were unemployed (67.8%) and regarding area most were from rural (51.4%) as shown by table no 1.

Table No 2: Demographic of female regarding Age of menarche and menopause

		n	%
Age of menarche in years	None	2	1.99
	Above 15	72	71.28
	Below 15	27	26.73
Age of menopause in years	Above 45	55	54.45
	Between 40 and 45	46	45.55
	Total	101	100.0

Analyzed by frequency (n) and percentage (%)

This table 2 represented the demographic data of patients with osteoporosis. It represents demographic variables like age of menarche and menopause. According to the table, 105(72%) of the female experienced menarche above the age of 15 while 40(27.3%) of female experienced menarche below 15. While 1(0.7%) didn't experienced menarche. Regarding Menopause, 79(54.1%) of female experienced menopause above the age of 45 while 67(45.9%) experienced menopause between 40 and 45 years of age.

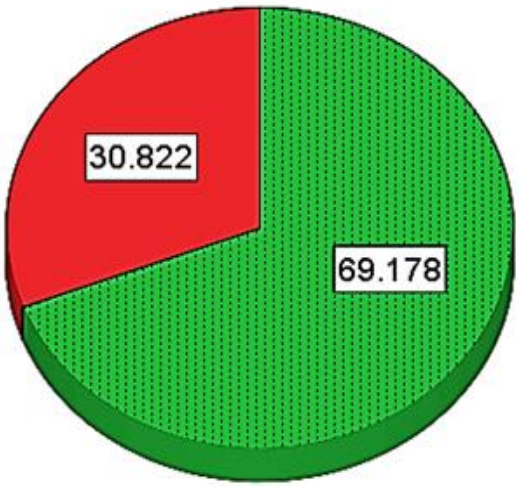


Figure1: Prevalence of Osteoporosis

This graph 1 represent the prevalence of osteoporosis on the base of question did your doctor informed you that you have low bone density .30.822% said yes to the question that they have low bone density. Its mean prevalence of osteoporosis according to our study is 30.822%. While 69.178% said no to the question which means they don't have low bone density and no osteoporosis.

Table 3 Risk factors of Osteoporosis such as milk intake, alcohol intake, calcium supplements intake and physical activity			
		n	%
Daily milk intake	Yes	98	67.1
	No	48	32.9
Alcohol intake	Yes	11	7.5
	No	135	92.5
calcium supplements intake	Yes	58	39.7
	No	88	60.3
Daily physical activity	Yes	98	67.1
	No	48	32.9
	Total	146	100.0
Analyzed by frequency(n) and percentage (%)			

This table 3 represented the risk factors of patients with osteoporosis. The 98(67.1%) of the participants mentioned that they take milk on daily basis and 48(32.9%) said that they don't take milk regularly. As for alcohol intake, 11(7.5%) of the participants used to take alcohol while 135(92.5%) mentioned that they don't take alcohol. Upon asking about calcium supplements intake,58(39.7%) said that they take supplements while 88(60.3%) were not agree with the statement. Among all the participants 98(67.1%) used to perform physical activity and 48(32.9%) were those who don't perform any daily physical activity.

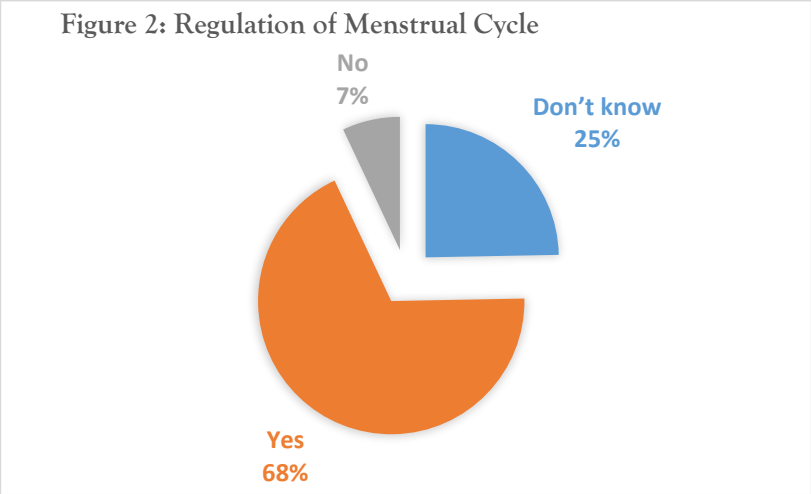
Table 4: Risk factor of Osteoporosis such as smoking, family history of osteoporosis, past medical fracture history			
		n	%
Smoking	Yes	15	10.28
	No	131	89.72
Family history of Osteoporosis	Yes	43	29.5
	No	103	70.5
Past medical fracture history	Yes	82	56.2
	No	64	43.8
	Total	**146**	**100.0**
Analyzed by frequency (n) and percentage (%)			

This table no. 4 represented the risk factors of osteoporosis. Regarding Smoking most of the participants were non-smoker with this percentage of 131(89.72%) and 15(10.28%) were smoker. 103(70.5%) of the participants were not having any family history followed by 43 (29.5%) having a family history of osteoporosis. The risk factor for osteoporosis was past medical fracture history. Among all participants, 82(56.2%) mentioned about having a past medical fracture history while other 64(43.8%) claimed of not having any fracture history.

Table No. 5: Risk factors of osteoporosis such as regulation of menstrual cycle, any bone loss medication, educated			
		Frequency	Percent
Any bone loss medication	Yes	1	0.7
	No	145	99.3

	Total	**146**	**100.0**
Educated	Yes	93	63.7
	No	53	36.3
	Total	**146**	**100.0**
Analyzed by n (frequency) and % (Percentage)			

This table no. 5 represented the risk factors of osteoporosis. Regarding regulation of menstrual cycle most of the participants with 100 (68.5%) were having a regular menstrual cycle and 10 (6.8%) were with irregular cycle. Most



of the participants 145 (99.3%) were not taking any bone lose medication followed by 1 (7%) who were taking the medication. 93 (63.7%) of the participants were educated and 53(36.3%) were uneducated.

Figure 2 shows menstrual cycle regulation among 101 female participants: 68.3% reported regular cycles, 24.7% were unsure, and 7% reported irregular cycles.

Table no 6: Association between information provided by doctor about your low bone density and gender

Gender	**Did your doctor inform you that you have low bone density?**		**Total**	**df**	**p-value**
	No	**Yes**			
Male	45	0	45	01	0.000
Female	56	45	101		
Total	101	45	146		
Analyzed by chi-square with p less than 0.05					

This table no 6 presents gender-wise responses on doctor-informed low bone density diagnosis. All 45 males reported not being informed, while 45 out of 56 females were informed. A significant association was found between gender and being informed, with a p-value of .000. Overall, 45 out of 146 participants were informed about their low bone density status.

Table No 7: Association between information provided by doctor about your low bone density and marital status.					
Marital status	Did your doctor inform you that you have low bone density?		Total	df	P-value
	No	Yes			
Married	90	45	135		
Unmarried	11	0	11	01	0.021
Total	101	45	146		
Analyzed by chi-square with P value less than 0.05					

This table 07 shows responses on doctor-informed low bone density status by marital status. Of the 135 married participants, 45 were informed, while all 11 unmarried participants were not. A significant association was found between marital status and being informed, with a p-value of .021. Overall, 45 out of 146 individuals were informed by their doctor.

Table No 8: Association between information provided by doctor about your low bone density and employment					
Employment status	Did your doctor inform you that you have low bone density?		Total	df	p-value
	No	Yes			
Employed	45	2	47	01	0.000
Unemployed	56	43	99		
Total	101	45	146		
Analyzed by chi-square with the p value less 0.05					

This table no 8 shows doctor-informed low bone density status by employment. Only 2 of 47 employed individuals were informed, compared to 43 of 56 unemployed individuals. A significant association was found between employment status and being informed, with a p-value of .000. Overall, 45 out of 146 participants were informed.

Table No 9: Association between information provided by doctor about your low bone density and area					
Area	Did your doctor inform you that you have low bone density?		Total	df	P-value
	No	Yes			
Rural	59	16	75	01	0.011
Urban	42	29	71		
Total	101	45	146		
Analyzed by chi-square with the p value less 0.05					

This table 09 presents doctor-informed low bone density status by area of residence. Among rural residents, 16 of 75 were informed, while 29 of 42 urban residents were informed. A significant association was found between residence and being informed, with a p-value of 0.011. Overall, 45 out of 146 participants were informed.

Discussion:

This study found that most participants were female (69.2%), married (92.5%), unemployed (67.8%), and from rural areas (51.4%), with 45.9% experiencing menopause between ages 40–45. In contrast, a study by Cerulli et al. in Italy reported a higher mean menopausal age of 60 among postmenopausal women (9). Studies show a positive link between physical activity and reduced osteoporosis risk. However, our study found that 32.9% of participants did not engage in any daily physical activity. This aligns with Zitzmann et al., who recommend regular aerobic,

balance, and mobility exercises for managing osteoporosis (10). Because according to the findings of Monteleone and colleagues the postmenopausal years seem to be one of the most challenging periods for women. It is observed during this period an increased risk of chronic diseases, such as type 2 diabetes mellitus, coronary heart disease, and osteoporotic fractures, particularly in sedentary women (11)

The present study stated that 56.2% mentioned about having a past medical fracture history, most of the participants 99.3% were not taking any bone lose medication, 36.3% were uneducated and 30% were informed about their low bone density status by their doctor. However the study of Crandall and his colleague stated that most were with age more than 50 years, fracture was associated with a greater risk of subsequent fracture regardless of whether the fracture was traumatic or nontraumatic (12).

The risk factor for osteoporosis was past medical fracture history. Among all participants, 82(56.2%) mentioned about having a past medical fracture history while other 64(43.8%) claimed of not having any fracture history. However, according to van staa and colleagues stated that most of the cases were aged above 65 years. Elderly patients with these risk factors and a history of fracture had especially high fracture risk (13). So, its means that with time interval the factor for the osteoporosis changes with change of time, environment and generation.

In 2022, Bhatngar and Ketatpure identified several recognized risk factors for osteoporosis and related fractures. These include advancing age, being female, being of white ethnicity, undergoing early ovary removal, extended periods of immobility, and prolonged corticosteroid use. Conversely, factors like obesity and estrogen replacement therapy offer protective effects (14). Osteoporosis represents a major public health concern and its prevention is crucial to the maintenance of health the present showed that there was a significant association between gender and being informed about low bone density by the doctor, as evidenced by the p-value of 0.000. Means that most were female diagnosed with osteoporosis compare to male. However the study of wang and colleagues conducted in mainland China, the prevalence of osteoporosis and vertebral fracture were high and the prevalence of vertebral fracture and clinical fracture was similarly high in men and women (15).

Moreover, the current research highlighted an important relation between marital status and receiving information about low bone density from a doctor, as indicated by the p-value of .021. Conversely, Xiao and colleagues' study indicated a significant relationship between educational attainment and bone mass density (16). Also the study investigated that there is statistical a significant association between employment status and being informed about low bone density by the doctor, as indicated by the p-value of 0.000 and the area of residence and being informed about low bone density by the doctor, with a p-value of 0.011. These findings prompt several considerations. Firstly, they highlight potential differences in healthcare access or provider-patient communication related to employment status and area of residence. Individuals who are employed may have greater access to healthcare services or may be more proactive in seeking medical advice, leading to increased awareness about low bone density (17). Conversely, those who are unemployed or underemployed may face barriers to accessing healthcare, resulting in lower rates of being informed about health conditions such as low bone density.

Regarding the association with area of residence, it's reasonable that there are differences in healthcare infrastructure or resources between urban and rural areas. According to cyr and colleagues Urban residents may have easier access to healthcare facilities and specialists, increasing the likelihood of being informed about low bone density by a doctor compared to those living in rural areas where healthcare services may be more limited or distant (18). Additionally, these findings underscore the importance of healthcare providers actively discussing bone health with patients, regardless of their employment status or area of residence. Identifying individuals at risk for osteoporosis and providing early education and intervention can significantly impact their long-term bone health outcomes. Further research is warranted to explore the underlying reasons for these associations and to develop targeted interventions to address any disparities in healthcare access and patient education.

Conclusion:

The study found most participants were female, married, unemployed, and from rural areas. Many women experienced menarche after 15 and menopause after 45. Significant links were observed between osteoporosis risk and marital status, employment, and rural residence. Key risk factors included low calcium and milk intake, physical inactivity, smoking, family history, and prior fractures. Less common factors were alcohol use, bone-loss medications, and low education. The findings highlight the need for targeted health interventions and education to reduce osteoporosis risk, with further research recommended in broader populations.

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