



Prevalence Of Osteoporosis In Premenopausal Women In Buldana District

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Abstract. The osteoporosis prevalence in rural and urban women was compared using multivariate logistic regression, and disparities were highlighted using descriptive statistics. In all, there are 1,000 women split evenly between urban and rural settings. Individuals might be labelled as overweight, normal weight, or underweight based on this measurement. From the $Y^2=6.322$ statistic, where PM has a value of 0.001, we may infer values of, and 0.022 for obesity, normal weight, and underweight, respectively. There are 432 patients with osteoporosis and 317 with low BMD in this sample. Rural areas had a higher prevalence of underweight women (754 vs. 246). The prevalence of osteoporosis in American women is between 480 and 520 per 100,000. Women's bone mineral density (BMD) is lowest in rural regions, at 36.6%, and highest in urban areas, at 63.4%.

Keywords: Osteoporosis, health, human nutrition, women, overweight

INTRODUCTION

Women go through premenopausal and the menopausal transition at various points in their lives. It's possible that menopause symptoms like irregular periods first appeared in the 1940s. But many women report alterations starting in their mid-fifties. Menopause symptoms may start as early as a woman's thirties, but for most women, it's not until they're well into their forties. Alterations in menstrual cycle length and intensity are symptoms of this disease. While most women experience premenopausal for four years, its length might range from a few months to 10 years. Premenopausal is considered complete after menstruation has stopped for 12 consecutive months. Some of the earliest indicators of menopause include shifts in menstrual cycles, vasomotor symptoms like hot flashes and sleep disruptions, mood swings, urogenital concerns like bladder and vaginal problems, decreased fertility, altered sexual function, bone loss, and shifts in cholesterol levels. Premenopausal symptoms often include menstrual irregularity; however, this is not always the case. Hormonal changes, for example, may cause a woman to stop menstruating for good. Each woman experiences perimenopause, menopause, and post menopause differently. Menopause's transitional period is characterized by generally constant hormone levels. The menopausal transition begins when oestrogen and progesterone production cease in a woman's ovaries. After a woman has gone a year without menstruating, this condition is common. Symptoms of perimenopause and menopause include night sweats and hot flashes; systemic oestrogen medication is generally accepted as the most effective treatment for these conditions. Capsules, transdermal patches, sprays, gels, moisturizing creams, and more are all a part of this strategy. Decreased oestrogen levels in women might cause significant changes to their menstrual cycles. Hormonal fluctuations may contribute to a variety of physical and mental symptoms, including but not limited to: gaining weight, sweating excessively, having trouble sleeping, experiencing vaginal dryness, feeling down or depressed, and having irregular menstruation cycles. Menstruation stops for a whole year for most women once they reach the postmenopausal stage of life. The premenopausal blood test examines several facets of health care, such as the delicate hormonal balance, that may be impacted by the onset of menopause.

Rates of death and general health are included in this category. Because there may be some overlap in symptoms between gland failure and premenopausal states, this study aims to investigate stress hormone levels. However, anybody experiencing any of the aforementioned signs should probably make an appointment with a doctor. Users have the danger of internal bleeding that may be serious or unexpected. Due to very lengthy menstrual cycles, some women may spend an entire year without experiencing menstruation. In addition, a woman may begin to spot either before or after engaging in sexual activity, depending on her menstrual phase. A healthy, balanced diet that includes a variety of fruits, vegetables, grains, legumes, nuts, seafood, lean sources of protein, and essential fats like olive oil has been shown to help control and perhaps alleviate a number of health conditions. This solution eliminates the need to constantly readjust your sanitary napkins and prevents embarrassing cramps. The risk of developing osteoporosis is similar for premenopausal and postmenopausal women. It's possible that low bone density and the progressive breakdown of bone's microarchitectural features are at the basis of this problem.

Cross-sectional data on premenopausal osteoporosis prevalence in the Buldana area of the Indian state of Maharashtra is the focus of this research. For the research, researchers selected 1,000 women, 500 from urban areas and 500 from rural ones.

METHODS

Women in the Buldana region of Maharashtra, After the original pool of candidates was whittled down, a representative sample of one thousand women was chosen. Body mass index (BMI), height, and other anthropometric parameters were

also recorded. Data was input from sources such the Global Physical Activity Questionnaire (GPAQ), the Health Assessment Questionnaire (HAQ), and the health survey to account for possible hazards, demographics, reproductive characteristics, and other factors [1]. The method of sampling requires segmenting the population into three subsets, depending on age ranges: 35–38, 39–41, and 42–45. Bone density and osteoporosis rates may be assessed because to this separation [2]. The following equation may be used to estimate a sample size based on the prevalence of osteoporosis among people aged 40–45:

$$\text{Sample Size}(40-45) = \text{deff} \frac{u_{\alpha}^2 p(1-p)}{e^2} \quad (1)$$

By following the previous research work, the prevalence of osteoporosis p is evaluated as 0.132 and $\alpha = 0.05$, $u_{\alpha} = 1.96$, $e = 0.0198$ with the design effect of 3. For the age group of women around 35 to 39, the sampling rate can be estimated as,

$$\text{Sample Size}(35-40) = \left(\frac{u_{\alpha} \rho}{\eta} \right)^2 \quad (2)$$

Standard deviation, represented by the symbol, is calculated to be 0.196. Indicated by, an acceptable margin of error is 25% of the standard deviation. In accordance with multistage sampling principles, we use Stratified Cluster Random Sampling (CRS) in this investigation. Based on the PPS, we used the CRS (Community Resource System) to choose streets at random among the Buldana districts [3]. The major purpose of the study is to collect data on how common osteoporosis is. Data is collected via in-person interviews and medical checks [4]. Expert investigators have gathered both types of data. Standardized questionnaires may help researchers gain a more full picture of the risk factors at play by measuring things like nutrition, physical activity, genetic predisposition to fragility, socioeconomic status, and stress levels [5]. In addition to the area, systolic blood pressure (SBP), body mass index (BMI), and heart rate, bone mineral density (BMD) measurements have been done at specific locations including the greater trochanter, lumbar spine (L1, L2, L3, and L4), and entire hip. Bone density and bone mineral content are assessed at the left femur-neck (FN), the anteroposterior lumbar spine (LS), and at all three locations simultaneously. Full-body pencil beam Densitometer Lunar DPX-PRO with medium-mode scan is utilized for therapy. For this purpose, we use Encore 2005, build 9.30.044 [6]. When determining a sample's T-score, DXA machine software consults reference databases. The cross-sectional data collection contains measurements of bone mineral density (BMD) for 3,000 Indian women. When determining hip bone density, the lowest T-score value among femoral neck (FN) measurements is used. The International Society for Clinical Densitometry has standardized T-scores for adults at LS and the mean of L1-L4 [7].

In order to statistically compare the features of the various demographic groups, T-tests were used. Continuous variables have their means and standard deviations determined. Chi-square analysis is performed to contrast the groups, and aggregate variables are shown as numerical values and percentages [8]. Those weighted percentages you saw in the presentation were derived using a mix of multistage sampling and stratified cluster random sampling [9]. We analyzed osteoporosis risk variables in both rural and urban areas using Multivariate Logistic Regression. The variables employed in the multivariate logistic regression were determined by the binary analysis to have a significance level of $p < 0.05$. In the course of the fitting procedure, p values that are too large (greater than 0.05) are disregarded. The statistical analysis in this study was conducted using SPSS, a programme developed by SPSS Inc. of Chicago, Illinois. This programme will only run on Windows. Due to the significance of the linked analyses, a 96% confidence interval was used to determine the adjusted odds ratio (AOR) in this study [10].

RESULTS AND DISCUSSION

Table 1 provides a detailed breakdown of the demographic information for the population that was studied. For the purpose of this research, a total of one thousand female volunteers were recruited, with the first 500 coming from metropolitan regions and the remaining 500 coming from rural areas. The Body Mass Index (BMI) or weight (measured in kilograms per square meter) is used to classify individuals into one of three categories: overweight, normal weight, or underweight. Using the formula $Y^2 = 6.322$, we are able to determine that the proportion of premenopausal women who are either overweight, have a normal body mass index, or are underweight is 0.022. Women who are not yet menopausal often have readings that are lower than 0.001.

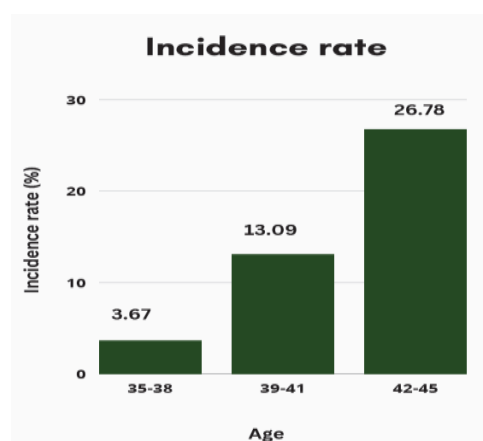
TABLE 1. Study populations characteristics

Variables		Total	Rural	Urban	PM	Statistics
Females		1000	500	500	0.563	Y ² =0.2001
Age	35 to 38	220	100	120	0.211	Y ² =6.672
	39 to 41	325	150	175		
	41 to 45	455	169	286		
BMI or Weight (Kg/m ²)	Over weight	663	402	261	0.022	Y ² =6.322
	Normal	287	109	178		
	Under weight	50	30	20		
Lower BDM	Yes	317	127	190	0.019	Y ² =5.210
	No	683	307	376		
Osteoporosis	Yes	432	149	283	0.021	Y ² =5.213
	No	568	216	352		
Lumbar Spine (LS)	LS1	0.99	0.96	1.02	<0.001	T=4.96
	LS2	0.91	0.87	0.95	<0.001	T=6.78
	LS3	1.05	1.03	1.08	<0.001	T=2.21
	LS4	1.05	1.02	1.09	<0.001	T=3.66

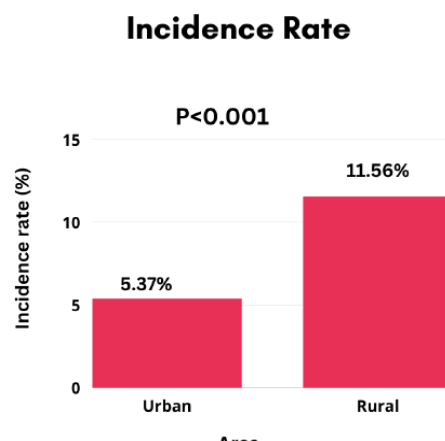
TABLE 2. Rural and urban characteristics of bone mineral density (BMD)

Parameters	Rural	Urban	PM
Mean Body Mass Index (Kg/m ²)	23.22	25.38	<0.001
Over weight (≥ 24.0)	525	475	
Normal (18.5 to 23.9)	632	368	
BMI(Kg/μ ²)			<0.001
Υνδερ ωειγητ (18.5 το 23.9)	754	246	
Yes	366	634	
Lower BDM	No	732	<0.001
Yes	480	520	
Osteoporosis	No	534	<0.001
LS1	0.92	0.81	<0.001
LS2	1.02	0.86	<0.001
Lumbar Spine (LS)	LS3	1.09	<0.001
LS4	1.09	0.95	<0.001

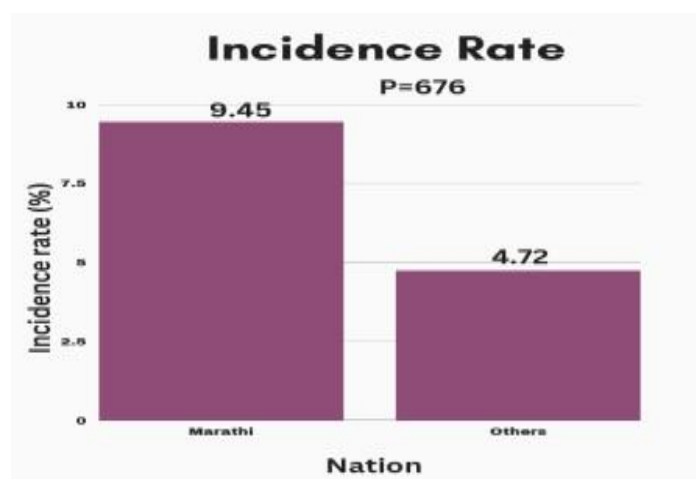
Bone mineral density (BMD) statistics from both rural and urban areas are compiled and shown in Table 2 below. The average body mass index (BMI) is 25.38 kg/m² in cities, but just 23.22 kg/m² in rural regions. Body mass index (BMI), calculated by dividing one's weight in kilograms by the square of one's height in meters (Kg/m²), is often used to categories people as either overweight, normal weight, or underweight. According to the data provided, there are 525 more obese persons in rural areas compared to urban areas. The 632 and 368 participants are healthy-sized women from rural and urban settings, respectively.



(a)



(b)



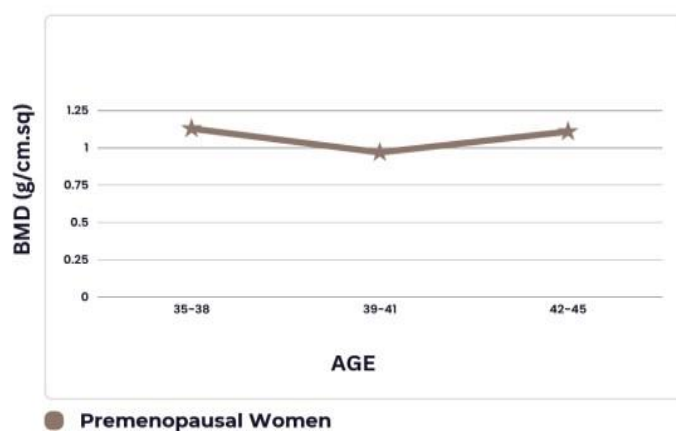
(c)

FIGURE 1. Prevalence of osteoporosis (a) based on the region, (b) age of the women we have considered, (c) nation (ethnicity)

TABLE 3. Rural and urban populations of osteoporosis-oriented factors

Parameters		Rural	Urban	PM
Females		Ref	Ref	
Education		0.94	0.95	
Hypertension	Yes	1.05	1.37	<0.001
	No	Ref	Ref	
Age		1.69	2.33	
Unmarried		-	4.04	<0.001
Cohabitation		-	-	-
Marital status	Widowed	-	1.40	<0.001
	Divorced	Ref	Ref	-
	Married		2.19	<0.001
	Yes	1.15	1.66	<0.001
	No	Ref	Ref	-
Pasta/Rice		-	0.99	-
Osteoporosis family history	Unknown	1.49	1.37	
Dyslipidemia		1.15	0.99	<0.001
Aquatic product		0.99	0.99	
	Pork	0.99	-	

Mean BMD vs. AGE



(a)

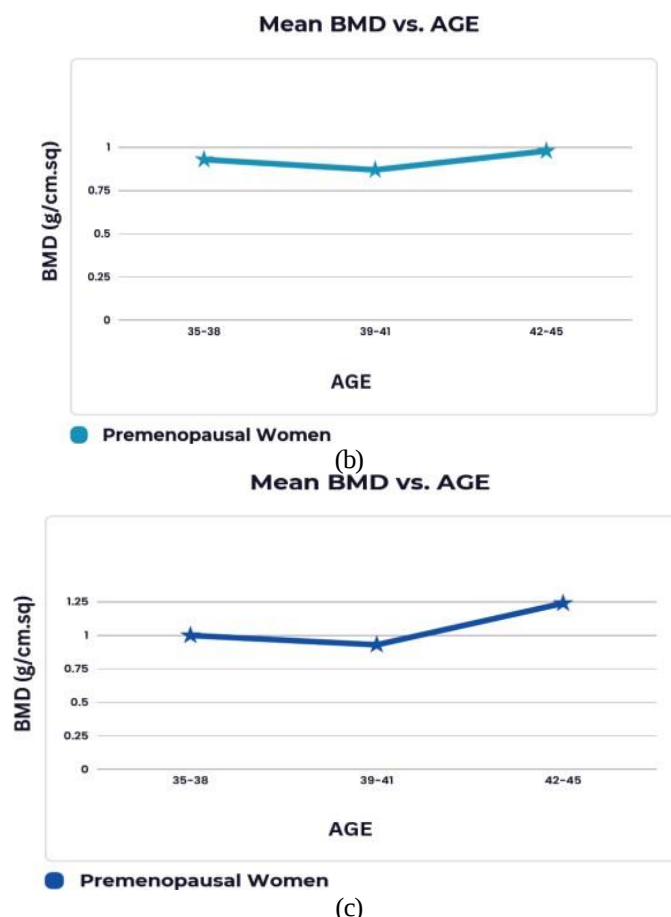


FIGURE 2. (a) Mean BMD vs. age at the lumbar spine (b) Mean BMD vs. age at left femur neck, and (c) Mean BMD vs. age in left hip

Figure 2(b) shows the average bone mineral density (BMD) at the left femur neck as a function of age. The average bone mineral density (BMD) of the first group is 0.87 g/cm², the average BMD of the second group is 0.79 g/cm², and the average BMD of the third group is not given. Figure 2(c) shows the correlation between mean BMD in the left hip region and age. Bone mineral density (BMD) is measured at 1 g/cm² for people aged 35–38. The average BMD for people aged 39–41 is 0.954 g/cm². Finally, the BMD value of 1.25 g/cm² is seen in people aged 42–45. Girls with a low body mass index are found 754% more often in rural areas than in urban ones. Table 3 displays the results of a multivariate logistic regression analysis of osteoporosis-related factors among rural and urban residents. The percentage of women with college degrees is 0.94 percent in rural areas and 0.95 percent in metropolitan areas. Figure 1 displays several facets of the osteoporosis epidemic. To further analyses the prevalence, we have generated visual representations of the rates for different regions, ages of women, and countries (Figures 1(a)–(c)). The incidence rate of osteoporosis may be affected by factors such as location, age, and race. This difference is statistically significant, with a p-value lower than 0.001. As a result, there are now distinct demographics for those 35–38, 39–41, and 42–45 years old.

Osteoporosis is more common in the second group (13.1%) than in the first (3.67%). The highest rate of osteoporosis was seen in the third group, at 26.78 percent. The prevalence of osteoporosis is higher among the Marathi people (9.45%) than it is among persons of other ethnicities (4.72%).

CONCLUSION

In conclusion, menopause is a major physiological transition for women that may affect bone density and play a role in the onset of osteoporosis. This study provides a cross-sectional analysis of osteoporosis rates in women in the Buldana region between the ages of 35 and 45, during the premenopausal years. Women in rural regions had lower bone mineral density (BMD) than women in urban areas, according to our research, which analyzed both urban and rural areas. Moreover, there is overlap between the risk factors in both regions.

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