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## Awareness and preventive practice regarding osteoporosis among women in a community, Lalitpur

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### Abstract

**Introduction:** Osteoporosis is a major public health problem globally that can break a bone from a minor fall, or even from simple actions like sneezing. This study sim to assess the awareness and preventive practice of osteoporosis among community women.

**Method:** An analytical cross-sectional study was conducted. The multistage sampling technique was used to select the sample from women 18-65 years from ward no. 16 of Lalitpur, Kathmandu, Nepal. Data were collected by using a semi-structured questionnaire to obtain socio-demographic variables. The Osteoporosis knowledge assessment tool (OKAT) and Osteoporosis Knowledge tool (OKT) were modified to assess the level of awareness and the Likert scale was used to assess the level of preventive practice. The SPSS 16 was used for analysis. The association and correlation between variables were measured by chi-square and Pearson correlation coefficient respectively.

**Result:** The majority 167(74.2%) of the respondents had an adequate level of awareness. The awareness had a statistically significant association with educational status ( $p=0.042$ ). More than half 119(52.9%) of respondents had a poor level of preventive practice. There is a low but significant positive correlation between the level of awareness and level of total preventive practice ( $r=0.251$ ).

**Conclusion:** There was an adequate level of awareness among respondents, but had a poor level of preventive practice. There was a low but positive correlation between awareness and preventive practice.

**Keywords:** Awareness, awareness of osteoporosis, the preventive practice of osteoporosis, women

## Introduction

Osteoporosis is a metabolic bone disorder resulting in fragile bones that are prone to fracture.<sup>1</sup> The spine, wrist, and hip are the most common areas.<sup>2</sup> In worldwide, 1 in 2 women and 1 in 5 men over 50 years will experience an osteoporotic fracture.<sup>3</sup>

The risk factors of osteoporosis are aging, gender, family history, post-menopausal, consumption of alcohol, smoking, intake of caffeine, inadequate consumption of calcium and Vitamin D, and physical inactivity.<sup>4,6</sup>

The morbidity and mortality only are not concerning factors regarding osteoporosis but are also important in terms of the quality of life, lifestyle adjustment, and its effect on the economic burden.<sup>4,7</sup> Prevention should start from a younger age because bone formation and the achievement of optimal peak bone mass take place at a younger age.<sup>8</sup>

The highest prevalence was found in Europe, followed by the Western Pacific, and countries of South East Asia like Nepal, India, and Bhutan.<sup>9</sup> The prevalence study conducted in Nepal shows that 65.5% had low bone density.<sup>10</sup> In Nepal, there is a high prevalence of osteopenia, and osteoporosis among people of age 50 and above, and there is a positive association with the lifestyle, dietary habits, and increasing age of people. A study shows that there is only 14.5% had good knowledge and 42.7% had a poor preventive practice of osteoporosis.<sup>11,13</sup>

The findings may help strategic planning for the awareness and preventive practice of osteoporosis, especially in the local context.

## Method

An analytical cross-sectional study was conducted. The multistage sampling technique was used to select the 225 samples of women 18-65 years in a selected community of Lalitpur district of Kathmandu valley, Nepal. The sample size was calculated

by a formula based on the prevalence of awareness of osteoporosis at 46%, the study was conducted in India, and Uttar Pradesh with a 95% confidence interval with an 8% allowable error by using Cochran's formula.<sup>13</sup>

A semi-structured questionnaire was used to obtain socio-demographic variables. The standard tools Osteoporosis knowledge assessment tool (OKAT) and Osteoporosis Knowledge tool (OKT) were modified to assess the level of awareness.<sup>14,15</sup> The Likert scale was developed to assess the level of preventive practice. The instrument was developed based on reviewing the literature, consulting with subject experts, and the objectives of the study. The instrument consists of the following three parts: Part I, Questions related to socio-demographic factors of respondents. Part II, Questions related to awareness of osteoporosis. Part III, Questions related to the preventive practice of osteoporosis. A score of more than the median score (>50%) was considered an adequate level of awareness and less than that is an inadequate level. A mean score of more than (>3.5) in the preventive practice related to the questionnaire was considered a good practice and less than that was a poor practice.

The content validity of the instrument was established by consulting subject experts, research experts, and research advisors. Pretesting of the instrument was carried out on 10 % i.e. 23 of the total sample of women in a homogeneous community to check its clarity, sequencing, and feasibility. Based on the face validation few changes were done in the language of the item for clarity and feasibility of time and finalized for data collection. Data was collected after getting the proposal approved by the research committee of Maharajgunj Nursing Campus. Ethical clearance was obtained from the Institutional Review Committee (IRC), TU IOM. The researcher has met the authority of the Ward Office with a request letter. After obtaining formal permission from the ward office, a door-to-door visit was done to collect the data from selected toles. The objectives

were explained individually before starting the interview and informed written consent was obtained from each respondent. A face-to-face interview was taken by the researcher herself and necessary help was taken from Female community health volunteers (FCHV) to identify the houses. The interview was taken with 10-12 respondents daily for 4 weeks at their convenient time. It took about 20-30 minutes to complete the interview session. Privacy of their information was maintained by interviewing them in a separate place and convincing them that research findings will be used only for study purposes. Confidentiality was maintained by encoding the number of interviewed women. During the study, every precaution was taken to safeguard the rights and welfare of every respondent, and thanks were given to all participants of the study. Data were collected within a period of 4 weeks.

Data were analyzed by SPSS 16. Descriptive statistical methods in terms of frequency, percentage, mean and standard deviation were used and inferential statistics chi-square and Pearson correlation were used.

## Result

In this study, the majority of respondents 167(74.2%) had an adequate level of awareness regarding osteoporosis, and 58(25.8%) had an inadequate level of awareness regarding osteoporosis, Table 1. And there was a poor level of preventive practice of osteoporosis in 119(52.9%) of total respondents whereas 106(47.1%) had a good level of preventive practice of osteoporosis among them, Table 2.

And there was low but a significant positive correlation between the level of awareness and level of preventive practice of osteoporosis with a 95% level of significance ( $r=0.251$ ;  $p<0.01$ ), Table 3. There was a statistically significant between the level of awareness of the respondents and their educational level ( $p=0.042$ ) whereas there was no statistically significant association with other socio-demographical variables, Table 4. And there was no statistically significant association between osteoporosis preventive practice found with the selected variables, Table 5.

**Table 1. Level of awareness for osteoporosis among women in a community, Lalitpur, Nepal, N=225**

Level of Awareness	N	%
Adequate (<50%)	167	74.2
Inadequate (≥50%)	58	25.8

**Table 2. Level of preventive practices for osteoporosis among women in a community, Lalitpur, Nepal, N=225**

Level of Practice	N	%
Good Practice (<3.5)	106	47.1
Poor Practice (≥3.5)	119	52.9

Mean ± SD (3.52 ± 0.435)

**Table 3. Relationship between level of awareness and level of preventive practice for osteoporosis among women in a community, Lalitpur, Nepal, N=225**

		Preventive Practice
Level of awareness	Pearson correlation	0.251**
	p-value	<0.001

\*\*Correlation is significant at the 0.05 level

**Table 4. Association between the level of awareness of osteoporosis and socio-demographic characteristics of the respondents, n=225**

Variables	Level of Awareness, N(%)		$\chi^2$	p-value
	Adequate	Inadequate		
<b>Age (in completed years)</b>				
≤ 45	102(76.1)	32(23.9)	0.623	0.430
>46	65(71.4)	26(28.6)		
<b>Marital Status</b>				
Married	131(72.8)	49(27.2)	0.981	0.322
Single	36(80.0)	9(20.0)		
<b>Educational Level</b>				
Up To Basic	39(68.4)	18(31.6)	6.317	*0.042
Secondary	65(69.2)	29(30.8)		
University	57(85.1)	10(14.9)		
<b>Occupation</b>				
House maker/Self employed	119(74.4)	41(25.6)	0.369	0.831
Service	30(71.4)	12(28.6)		
Student	18(78.3)	5(21.7)		
<b>Economic Status</b>				
Sufficient for six months or less	40(78.4)	11(21.6)	2.347	0.309
Sufficient for 1year	103(71.0)	42(28.9)		
Sufficient for 1year and surplus	24(82.8)	5(17.2)		
<b>Fracture History</b>				
Yes	14(66.7)	7(33.3)	0.691	0.406
No	153(75.0)	51(25.0)		
<b>Menstruation History</b>				
Yes	119(76.3)	37(23.7)	1.128	0.288
No	48(69.6)	21 (30.4)		
<b>Menopausal History</b>				
≤10	25(73.5)	9(26.5)	0.283	0.595
>10	23(67.7)	11(32.3)		
<b>Family History of Fracture</b>				
Yes	26(78.8)	7(21.2)	0.421	0.516
No	141(73.4)	51(26.6)		

\*p-value Statistically Significance at 0.05 level

**Table 5. Association between Level of the preventive practice of osteoporosis and socio-demographic characteristics of the respondents'**

Variables	Level of Preventive Practice		$\chi^2$	p-value
	Good, N(%)	Poor, No(%)		
<b>Age (in completed years)</b>				
≤45	56(41.8)	78(58.2)	3.764	0.520
>46	50(54.9)	41(45.1)		
<b>Marital Status</b>				
Married	87(48.3)	93(51.7)	0.540	0.463
Single	19(35.2)	26(48.2)		
<b>Educational Level</b>				
Up To Basic	32(56.1)	25(43.9)	3.289	0.193
Secondary	42(44.7)	52(55.3)		
University	27(40.3)	40(59.7)		
<b>Occupation</b>				
House maker/Self -employed	81(50.6)	79(49.4)	3.997	0.136
Service	14(33.3)	28(66.7)		
Student	11(47.9)	12(52.2)		
<b>Economic Status</b>				
Sufficient for six months or less	28(54.9)	23(45.1)	3.101	0.212
Sufficient for 1year	68(46.9)	77(53.1)		
Sufficient for 1year and surplus	10(34.5)	19(65.5)		
<b>Fracture History</b>				
Yes	13(61.9)	8(38.1)	2.034	0.154
No	93(45.6)	111(54.4)		
<b>Menstruation History</b>				
Yes	67(42.9)	89(57.1)	3.537	0.060
No	39(56.5)	30(43.5)		
<b>Menopausal History</b>				
≤10	14(41.2)	20(58.8)	3.778	0.052
>10	22(64.7)	12(35.3)		
<b>Family History</b>				
Yes	16(48.5)	17(51.5)	0.029	0.864
No	90(46.9)	102(53.1)		

\* p-value Statistically Significance at a level of 0.05

## Discussion

In a present study among 225 respondents, regarding socio-demographic characteristics, nearly one-third of the respondents 69(30.7%) were from the age group 36 - 45 years and only 31(13.8%) were from the age group 18 – 25 years. The mean±SD age was 42.6±13.4. The majority of the 180(80%) were married, 94(41.8%) had completed a secondary level of education, and 160(71.1%) were house-maker and self-employed. With respect to ethnicity, almost 219(97.3%) belonged to Janajati, and 145(64.4%) of them had sufficient income for a year. Regarding menstruation history, 68(30.2%) were menopausal women, only 21(9.3%) had a history of fracture, and 33(14.7%) had a family history of fracture.

In the present study, the majority 167(74.2%) had an adequate level of awareness and 58(25.8%) had inadequate awareness regarding osteoporosis. And this study was in contrast with the study conducted in Southern India that showed that 60% of middle-aged women were unaware of osteoporosis.<sup>16</sup> The present study was supported by the study conducted in China which showed that 67.8% had adequate awareness of osteoporosis.<sup>17</sup> Similarly the study result of Pakistan showed majority 71.48% of the participated women were aware of that.<sup>18</sup> Likewise, the study was done in the United Kingdom of Saudi Arabia also showed that 69% were aware of osteoporosis.<sup>19</sup> This could be because the

present study was conducted in a city where health information and services were easily available.

In the present study, nearly half of 93(41.3%) of the respondent's primary sources of information about osteoporosis were their relatives. This finding was in contrast to the study findings conducted in India and China where the main source of information regarding osteoporosis was mass media.<sup>13,20</sup> This could be because of the study conducted in the Newar community where people like to stay in their community, engage in social gatherings, and function with their relatives and friends rather than engaged in mass media.

Even having an overall adequate awareness level of osteoporosis among respondents, in the present study the researcher had found inadequate awareness regarding the risk factors of osteoporosis. In the present study, the researcher found that only 70(31.1%) had aware that genetic factor was a risk factor and a similar finding was found in the study that only 36% were only aware of that.<sup>21</sup> In the present study, few of the respondents 78(34.7%) gave the right answer that smoking leads to osteoporosis similar kind of the result found in the study of Pakistan that only 15% were aware of that risk factor and the present study contrasted with the study conducted in Malaysia showed that 89.9% aware of that risk factor.<sup>6, 21</sup> Regarding another risk factor of osteoporosis about the alcohol intake, most of the respondents revealed that alcohol can cause liver damage or failure, not osteoporosis. In the present study, only 49(21.8%) respondents were aware that alcohol was also one of the risk factors which was similar to the study conducted in Saudi Arabia that reported that only 47% were aware of alcohol as the risk factor.<sup>22</sup> Likewise, the risk factor of low body weight and small body frame, in the present study only 56(24.9%) respondents were aware and that was supported by the study conducted in Turkish women that 29.3% only aware of that risk factor.<sup>23</sup> Regarding considered serious diseases, there were only 47.5% of

respondents considered it a serious disease whereas in a study in Pakistan 69.5% considered it to be a serious disease.<sup>18</sup> This could be because of the lack of awareness programs on osteoporosis and there was less priority and advertisement given to bone health in Nepal than other diseases like Cardiovascular, Renal, Cancer, and Communicable Diseases.

Primary prevention of the disease through the awareness of risk factors and preventive practices is crucial. In the present study, more than half of 119(52.9%) of the respondents had a poor level of preventive practices. This study was quite similar to the study conducted in Iraq with Kurdish women that which almost half of the study sample had a poor preventive practices for osteoporosis.<sup>12</sup> Regarding the preventive practice of osteoporosis, only 23(10.22%) of respondents used exposure to sunlight daily. And about the importance of the dietary intake of calcium-containing food in their daily life, 82(36.4%) used to include it in their diet daily. Similar findings were observed in a study conducted in Saudi Arabia where exposure to sunlight daily was (18.2%) and consuming a calcium-containing diet daily was (20.8%).<sup>5</sup> In the present study showed that only 37(16.4%) respondents used to perform weight-bearing exercises daily whereas the study done in Pakistan showed that only (12%) were performing such exercises.<sup>16</sup> This could be because the women of that community most of their occupations were house- makers and self-employers. And more women engage in indoor work and household activities because of that they may not have adequate time to expose to sunlight and perform exercises. Likewise, regarding the importance of consuming dairy products, it may be because of the increasing cost of dairy products day by day in Nepal people are unable to afford their daily diet even having awareness.

The present study had shown a statistically significant association between the level of awareness and the educational level whereas other studies showed the level of awareness was a statistically significant association with

educational level and also with the age.<sup>16,24,25</sup> Likewise, a study in India had shown a statistically significant association between educational level as well as family history.<sup>20</sup> The present study showed no statistically significant association with the level of preventive practice of osteoporosis with selected variables. This study finding is in contrast with the study conducted on Kurdish women there was a statistically significant association between the education level and level of practice.<sup>12</sup> This study showed a low but significant positive correlation between the level of awareness and level of total preventive practice ( $r=0.251$ ,  $p<0.05$ ) as it was contrasted with the study conducted in Malaysia where there was no significant correlation between knowledge and practice but fair positive correlation between the attitude and preventive practice of osteoporosis.<sup>6</sup>

The limitation of this study was that it was conducted in women aged 18-65y and conducted in only one Ward of Lalitpur, Nepal and it may not be generalized to other settings.

### Conclusion

Three fourth of the respondents had adequate awareness of osteoporosis, but they were inadequately aware of the seriousness of the disease and the risk factors. Half of the respondents had poor preventive practices. The level of awareness was statistically significant with the educational level of the respondents. There was a low but significant positive correlation between the level of awareness and the level of preventive practice of osteoporosis.

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### Conflict of Interest

None

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### Supplements

**Date of Interview:**

**Name of Tole:**

**Code No:**

**Part I: Questions related to Socio-demographic Information**

S. No.	Questions	Response	Code
1.	What is your age?	.....	D1
2.	What is your marital status?	a. Married b. Unmarried	D2



		c. Living with husband	
		d. Husband Aboard	
		e. Divorced	
		f. Widow	
		g. Others if any.....	
3.	Can you read or write?	a. Yes	D3
		b. No	
4.	If yes, what is your education level?	a. Informal education	D4
		b. Basic (up to 8)	
		c. Secondary (9-12)	
		d. University	
5.	What do you do currently (occupation)?	a. House maker	D5
		b. Business/ self-employed	
		c. Service (governmental/ non- governmental)	
		d. Agriculture	
		e. Others if any.....	
6.	Which ethnicity do you belongs?	a. Dalit	D6
		b. Janajati	
		a. Madhesi	
		b. Muslim	
		c. Brahmin/Chhetri	
		d. Others (Thakuri / Sanyasi / Dasnami)	
7.	What is the economic status of your family?	a. Sufficient for six month	D7
		b. Sufficient for less than six month	
		c. Sufficient for one year	
		d. Sufficient for one year & surplus	
8.	Are you still menstruating?	a. Yes	D8
		b. No	
9.	If not, when did your menstruation stop?	.....	D9
10.	Have you ever had a fracture of any body part?	a. Yes	D10
		b. No	
11.	Is there any history of fractures in your family? (Father, mother)	a. Yes	D11
		b. No	
12.	What is your source of information?	a. Mass media	D12
		b. (TV/Mobile/newspaper etc.)	
		c. Health personnel	
		d. Family	
		e. Peers	
		f. Relatives	
		g. Others if any.....	

## Part II

### The Osteoporosis Awareness Assessment Tool

S. No.	Items	True	False	Don't know	Code
1.	Weakening or thinning of the bone (osteoporosis) is a serious disease like heart disease or cancer.				A1
2.	Osteoporosis is more common in men than women.				A2
3.	By age 50, the majority of women have a risk to develop osteoporosis.				A3
4.	Bone loss speeds up after menopause.				A4

5.	You are more likely to suffer from osteoporosis if your father or mother has had osteoporosis.	A5
6.	The risk factor for osteoporosis is cigarette smoking and caffeine.	A6
7.	An excessive amount of alcohol intake has no relationship with osteoporosis	A7
8.	Less intake of calcium-containing diet in childhood and adolescence affects osteoporosis in later life.	A8
9.	You are likely to have osteoporosis if you have low body weight and small structure.	A9
10.	Knee pain, and back are the early symptoms of osteoporosis.	A10
11.	Losses of height, and humped spine are not symptom of osteoporosis.	A11
12.	Bone X-ray helps to diagnose osteoporosis.	A12
13.	There are effective treatments available for osteoporosis in Nepal.	A13
14.	Any type of physical activity is beneficial for osteoporosis. (Household chores, climbing stairs, etc.)	A14
15.	Brisk walking, yoga, Jumba dance like weight-bearing exercises are beneficial for the prevention of osteoporosis	A15
16.	Milk and milk products are the best sources of calcium.	A16
17.	Soya bean, tofu, and green vegetables are also sources of calcium.	A17
18.	Calcium and Vitamin D supplements help to prevent bone loss.	A18
19.	Osteoporosis leads to easily breakdown of bones.	A19
20.	Avoiding cold drinks helps to prevent osteoporosis.	A20

### Part III

#### Respondents' Preventive Practice About osteoporosis

S. No.	Items	Daily	Often	Sometimes	Rarely	Never	Code
1.	Exposure to sunlight for at least 15 minutes. (exposing to neck, arms, and face without lotion, oil, and cloth)						P1
2.	Performing physical activities (e.g. Climbing stairs, Household chores, etc.)						P2
3.	Performing weight-bearing exercise for at least 30 minutes.						P3
4.	Drinking milk at least 2 cups (300ml)						P4
5.	Consuming calcium-containing diet green vegetables/beans/ tofu/ soya bean/ milk / milk product.						P5
6.	Consuming coffee of more than 3 cups/day (900ml)						P6
7.	Consuming a caffeine-containing diet (e.g. dark chocolate, chocolate-containing food, etc.)						P7
8.	Consuming carbonated beverages e.g., cold drinks						P8