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Knowledge of Osteoporosis among women of 40 years and above in Nepalgunj Sub-Metropolitan City

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ABSTRACT

Background: Osteoporosis is a global problem with a lifetime risk of osteoporotic fractures among women. It is the condition that reduces bone mass per unit volume of normally mineralized bone resulting in fractures, even minor trauma which increases as an increase in age.

Objectives: The study aimed to assess the osteoporosis knowledge among women of 40 years and above residing in Muktipur-12, Nepalgunj, Banke.

Methods: A quantitative cross-sectional study was carried out in Muktipur-12, Nepalgunj Sub Metropolitan city among 150 women of 40 years and above. Face to face interview was conducted during July-August, 2018. Statistical Package for the Social Sciences (SPSS) version-16 was used for descriptive and inferential statistics.

Results: Study showed 61.3% women of 40 years and above had fair knowledge of osteoporosis. Personal presence of osteoporosis was reported by 26% of respondents. Diet low in calcium (79.3%), lack of exercise (57.3%) and personal history of fracture during adulthood (44.7%) were the major reported causes of osteoporosis. Regarding knowledge on symptoms, lower back pain (78%), stooped position (64.7%) and bone fracture (42.7%) were reported. More than three fourth (84%) answered adequate calcium intake as preventive measures for osteoporosis. Knowledge of osteoporosis was found to be significantly associated with age ($p<0.001$), literacy ($p=0.028$) and occupation ($p=0.019$) of the participants.

Conclusion: This present study concluded fair level of knowledge regarding osteoporosis. Osteoporosis awareness program need to be continued and expanded covering young age women which could minimize the future risk of osteoporosis.

Keywords: Knowledge, Osteoporosis, Women

1. Introduction

Osteoporosis is explained as the reduced bone mass per unit volume of normal mineralized bone supposed to lead fractures, even with minor trauma. Osteoporotic fractures are a common cause of morbidity and mortality in adult men and women [1]. Osteoporosis literally means “porous bones” and is characterized by a decreased mineral density of the bones [2]. The occurrence and progress of osteoporosis are mostly asymptomatic and it might not be diagnosed until the fracture occurrence, it is called a silent disease [3].

Osteoporosis prevalence is comparatively lower in western countries compared to Asian. For the prevention and control of osteoporosis, there is a great need in conducting epidemiologic surveys. Very limited studies have been conducted regarding osteoporosis in Nepal. Worldwide, lifetime risk for osteoporotic fractures in women is 30-50 percent [4].

It is projected that an osteoporotic fracture occurs every three seconds worldwide. Nowadays, osteoporosis and osteoporotic fractures are becoming important public health problems worldwide, resulting in a heavy economic burden [5].

Despite its adverse effects, osteoporosis is often overlooked and undertreated. About 75% of all women aged 45–75 years never discussed about osteoporosis with their physician [6].

In context of Nepal, some of the studies on Osteoporosis were found but no any research related to knowledge or awareness on osteoporosis came in researcher’s attention.

Knowledge regarding osteoporosis among menopausal women attending outdoor in tertiary care center revealed that 70.56% had fair score of KAP (Knowledge, Attitude and Practice) followed by 18.18% who had good score, 10.91% had poor score and only 0.35 percent had scored excellent [7]. Half of the pre and post-menopausal women reported having some awareness of osteoporosis, their level of knowledge was poor [8]. The mean level of knowledge about osteoporosis in Iranian women was 44.3. The relationship of osteoporosis-related life habits and awareness of osteoporosis and its risk factors was significant [9].

These all literature suggests that the knowledge on osteoporosis seems to be low. There might be different factors associated with it. So, the study was done to assess the osteoporosis knowledge among women of 40

years and above residing in Muktipur-12, Nepalgunj, Banke.

2. Methods

2.1 Study method and period

An Analytical cross-sectional study design was conducted to collect the quantitative information on knowledge regarding osteoporosis among women of 40 years and above residing in Muktipur-12, Nepalgunj, Banke between the time period July-August, 2018.

2.2 Study population and sampling procedure

Sample size of 150 was obtained by using Cochrane's formula ($n=Z^2pq/d^2$) where the proportion (10.91%) of poor knowledge was used. Finite population of middle aged and elderly women (40 years and above) of Muktipur ward was not available while finite household detail was available. Total of 1652 household were reported in 'Municipality and rural municipality profile of Banke district [10]. Systematic random sampling was done to reach individual house with sample interval of 11 (k=1652/150=11). After, reaching household, one woman was randomly selected, in case if single house contains more than one woman of age 40 years and above. If any of the house didn't have woman of age 40 years and above adjacent house was selected.

2.3 Study variables

Risk population, age of osteoporosis risk, disease type, risk factors, symptoms, common fracture sites, preventive measures, treatment, food rich in calcium, food rich in Vitamin-D and best exercise for bones were considered for calculating knowledge. Relevant response was scored with 1 and irrelevant answer was scored with 0. Total knowledge score was converted to percentage and Bloom's cut off point was used to categorize knowledge. Scores below 60% was considered as poor knowledge while between 60-80% was considered as fair knowledge and above 80% as good knowledge being based on similar study but on different area [11]. Other variable includes age, marital status, religion, educational status, occupation, personal and family history of osteoporosis.

2.4 Data collection, data processing and analysis procedure

Structured questionnaire designed in English and Nepali was used for data collection. Face to face interview was conducted. Tool was self-developed with extensive literature review and consultation with experts, orthopedic surgeon and nurse. No any

clinical examination was done for osteoporosis verification. Only the reported response was considered.

Collected data was checked, coded, reviewed and organized for its completeness & accuracy. Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 16. Analyzed data was interpreted by using descriptive and inferential statistics. Chi-square test was used to determine significance between independent and dependent variables. The odds ratio and 95% CI was reported while showing association between dependent and independent variables and the result was considered significant at p value less than 0.05.

2.5 Ethical approval

Prior to data collection, ethical approval from research committee, Nepalgunj Nursing Campus was obtained. An official written request letter was submitted to concerned local level. After getting written permission from ward office of Muktipur-12 Nepalgunj, data collection had been carried out. Pretesting of the instrument was done in 10 percent of respondents of Siddhartha tole, ward no 10, of Banke district. The respondents involved in pre-testing were excluded from the main study. Only women willing to participate in the study and available during data collection period were considered for study. Written informed consent was taken and confidentiality was maintained during data collection.

3. Results

All the participates were included in the study. Quantitative analyses of findings are reflected in different tables and descriptions.

Table 1 shows socio demographic characteristics of respondent. The mean age of the respondents was 51.55 years. Majorities (45.3%) were between the age range 40-49 years and 78% were married. Hindu population includes 89.3% while only 10.7% were Muslim. Similarly, regarding educational level, 22% were illiterate, while only 6.7 percent were found to be of higher secondary level. More than half of the respondents (56.7%) were homemakers.

Table 1: Socio- demographic characteristics of the respondents (n= 150)

Variables	Number (n)	Percentage (%)
Age (in years)		
40-49	68	45.3
50-59	58	38.7
60-69	22	14.7
70-79	2	1.3
Mean ± SD 51.55±7.42, Min:40, Max:71		

Variables	Number (n)	Percentage (%)
Marital Status		
Married	117	78.0
Widow	27	18.0
Separated	6	4.0
Religion		
Hindu	134	89.3
Muslim	16	10.7
Educational level		
Illiterate	33	22.0
Informal education	42	28.0
Primary level	32	21.3
Secondary level	33	22.0
Higher secondary level	10	6.7
Occupation		
Agriculture	15	10.0
Service	10	6.7
Business	40	26.7
Home-maker	85	56.7

Respondent's information related to presence of osteoporosis is illustrated in table 2 which shows only 26% of the respondent had experienced in their lifetime while 27.3% had family history of osteoporosis.

Table 2: Presence of Osteoporosis (n=150)

Variables	Number (n)	Percentage (%)
Personal presence of osteoporosis		
No	111	74.0
Yes	39	26.0
Family History of Osteoporosis		
No	109	72.7
Yes	41	27.3

Knowledge related responses are explained in table 3 where most (70.7%) of the respondent's response was correct i.e., osteoporosis is disease that thins and weakens the bones. Similarly, more than half (63.3%) of the respondents said that females are commonly affected by osteoporosis. Almost three fourth (73.3%) respondent's replied osteoporosis to be common in old age.

Table 3: Knowledge on risk population and meaning of osteoporosis (n=150)

Variable	Number (n)	Percentage (%)
Meaning of osteoporosis		
Disease that thins and weakens the bones**	106	70.7
Disease that increases blood sugar level	14	9.3
Disease in which blood pressure is increased	16	10.7
Disease transmitted by mosquito	14	9.3
Commonly affected by osteoporosis		
Male	13	8.7
Female**	95	63.3

Variable	Number (n)	Percentage (%)
Both	42	28
Common in which age group		
Reproductive age	25	16.7
Old age	110	73.3
All age	15	10.0

*Note: ** Correct response*

Table 4 reflects that most of respondents (79.3%) had knowledge that diet low in calcium causes osteoporosis while only 27.3% said thin/ small body as cause for osteoporosis. Similarly, knowledge on symptoms of osteoporosis was found to be as lower back pain (78%) followed by stooped position (64.7%), bone fracture (42.7%) and curving of spine (44%). Regarding knowledge on preventive measure of osteoporosis, more than three fourth (84%) replied that adequate calcium intake can prevent osteoporosis. Respondents with the view of adequate protein supply and sunlight exposure as preventive measure for osteoporosis was found to be 39.3% and 36.7% respectively.

Table 4: Knowledge related to Osteoporosis (n=150)

Variables	Number (n)	Percentage (%)
Causes of osteoporosis*		
Thin/Small body	41	27.3
Family history of Osteoporosis	62	41.3
Personal history of fracture as an adult	67	44.7
Cigarette smoking	38	25.3
Excessive Alcohol consumption	46	30.7
Lack of exercise	86	57.3
Diet low in calcium	119	79.3
Low estrogen level in women	49	32.7
Others (obesity, workload, old age)	47	31.3
Symptoms of osteoporosis*		
Bone fracture	64	42.7
Lower back pain	117	78.0
Stooped position	97	64.7
Curving of spine (loss of height)	66	44.0
Others (tingling, improper circulation)	29	19.3
Preventive measures for osteoporosis*		
Adequate protein supply	59	39.3
Appropriate body weight (BMI)	66	44.0
Adequate calcium intake	126	84.0
Adequate intake (vitamin D)	81	54.0
Sunlight exposure	55	36.7
Exercise	112	74.7
Others(yoga, fruit intake, avoiding heavy lifting)	33	22.0

*Note: * multiple responses*

Table 5 reveals that, majority (90.5%) had knowledge that milk is rich in calcium. More than half (62%) had knowledge that sunlight is rich in Vitamin D while only 23.3% of respondent's response was mushroom regarding food rich in vitamin D. Majority (84.7%) were found to believe that, weight should be according to age to prevent osteoporosis. Likewise, most (64%) of respondent's response was walking as a best exercise for bone. Similarly, 83.9% had knowledge that drug therapy is the treatment for osteoporosis. Regarding treatment availability for osteoporosis, 94% were found to have knowledge that treatment is available in orthopedic hospital.

Table 5: Knowledge related to food intake, exercise and treatment relating Osteoporosis (n=150)

Variables	Number (n)	Percentage (%)
Calcium rich food*		
Milk	133	90.5
Cheese	64	43.5
Yoghurt	63	42.9
Others(cauliflower, fruits, beans)	33	22.4
Vitamin D rich food*		
Fish	67	44.7
Mushroom	35	23.3
Milk	81	54.0
Sunlight	93	62.0
Others(ghee, salt, fruits)	20	13.3
Weight a healthy person should have*		
According to height	108	72.0
According to age	127	84.7
Best exercise for bone		
Swimming	21	14.0
Walking**	96	64.0
Cycling	33	22.0
Treatment for osteoporosis*		
Drug therapy	125	83.9
Nutrient supplement	96	64.4
Physiotherapy	109	73.2
Treatment available for osteoporosis*		
District Hospital	78	52.0
Zonal Hospital	144	96.0
Orthopedic hospital	141	94.0

*Note: * multiple responses, **correct response*

Most of respondents (92%) had knowledge that osteoporosis is non communicable and most (87.3%) replied it as curable disease which is illustrated in table 6. Nearly half (45.3%) respondents had correct knowledge regarding starting time of bone thinning as mid-30s. Knowledge of respondents on common fracture site for osteoporosis reflected that 67.3% respondent's response was back bone while only 6.7 percent replied hip bone as common fracture site.

Table 6: Knowledge related to disease, fracture site and timing of Osteoporosis (n=150)

Variables	Number (n)	Percentage (%)
Type of disease*		
Non-Communicable	138	92.0
Preventable	112	74.7
Curable	131	87.3
Others (Communicable, non-preventable)	19	12.7
Bone starts to thin		
Mid 30s**	68	45.3
Mid 40s	52	34.7
Mid 50s	17	11.3
Mid 60s	13	8.7
Common fracture site for osteoporosis		
Hip Bone	10	6.7
Wrist Bone	39	26.0
Back Bone**	101	67.3

*Note: *Multiple response, ** Correct response*

The level of knowledge regarding osteoporosis is depicted in table 7 where the majorities (61.3%) of the respondent had fair knowledge and only 30% had poor knowledge. In this study, less number of participants were above 80% of total score which caused difficulties in analysis. So, after getting the three levels of knowledge regarding osteoporosis, fair and good knowledge were combined to form a "good knowledge" [11] during analysis of association between independent and dependent variables.

Table 7: Level of knowledge on Osteoporosis (n=150)

Knowledge level	Bloom's Cut off point for knowledge level	Number (n)	Percentage (%)
Poor	Score below 60%	45	30.0
Fair	Scores between 60%-80%	92	61.3
Good	Score above 80%	13	8.7

Table 8 reflects the association between independent variables and knowledge of osteoporosis. Knowledge on osteoporosis was categorized into good and poor due to low cell frequency where fair and good knowledge was merged. Variables which showed statistically association with knowledge were age ($p<0.001$), literacy ($p=0.028$) and occupation ($p=0.019$). Osteoporosis knowledge had no significant association with marital status ($p=0.182$) and literacy ($p=0.384$).

Table 8: Bivariate analysis between independent variables and knowledge on osteoporosis

Variables		Knowledge on Osteoporosis		p-value	Odds Ratio	95% CI
		Good	Poor			
Age	Less than 60 years	59(86.8%)	9(13.2%)	**<0.001***	1	
	60 and above years	46(56.1%)	36(43.9%)		0.20	0.08-0.44
Marital Status	Married	85(72.6%)	32(27.4%)	0.182	1	
	Others	20(60.6%)	13(39.4%)		0.58	0.26-1.29
Literacy	Literate	87(74.4%)	30(25.6%)	**0.028***	2.42	1.08-5.38
	Illiterate	18(54.5%)	15(45.5%)		1	
Occupation	Home-maker	66(77.6%)	19(22.4%)	**0.019***	1	
	Others	39(60.0%)	26(40.0%)		0.43	0.21-0.88

**Level of significance p-value <0.05*

4. Discussion

This study reflected that the level of knowledge among the majority of study population was found to be fair. Similarly, majority reported fair knowledge (61.4%) in the study conducted by Al-Muraikhi H and et al in Qatar [12]. Another study conducted in Bhopal, India showed 10.91% had poor knowledge whereas present study showed 30% had poor knowledge [7].

In contrast to this study, study on risk perception and knowledge about osteoporosis carried out in Mexico shows that almost all (97.9 %) had received some sort of information about osteoporosis [13]

While this research study reflects the fair knowledge on osteoporosis. Current study revealed that 27.3% had family history of osteoporosis. Finding was supported by the study conducted in Rawalpindi, Pakistan (20%) and Mexico (13.4%) [12, 13].

This study depicted, 32.7% of respondents had knowledge that low level of estrogen in women can cause osteoporosis which comes to the fifth rank as per response rate. This is in contrast to the finding of study carried out by Hirani et al. that showed the chief cause of osteoporosis is the lower levels of FSH and estrogen [14].

Present study showed that highest rate of knowledge regarding prevention of osteoporosis was observed in adequate calcium intake followed by exercise where as one third of respondent replied sunlight exposure can also prevent osteoporosis. Similar finding was also noticed in the study of Iran where the highest rate of awareness was related to the effect of sunlight, and exercise [3]. Likewise, another similar study in Egypt revealed the similar findings where the beneficial effect of physical exercise was identified true to prevent osteoporosis by 88.3 % [15].

This study reflected that nearly half of respondents replied curving of spine (loss of height), whereas 42.7% said bone fracture and more than three fourth believed lower back pain as the symptoms of osteoporosis. Similar, study carried out in Kerman, Iran found that less than half of the participants knew shortening of height in old ages as a symptom of osteoporosis [3]. Likewise, another similar study of Odisha, India revealed, 28% knew that deformity or fracture occurs in osteoporosis and 44% knew that back pain as a major symptom of the disease [16].

Current study showed that majority responded that osteoporosis is common in old age which coincides with another study conducted in urban slum area of Odisha, India [17].

Present study showed significant association for knowledge with age ($p<0.001$) and occupation ($p=0.019$) which is in line to the study carried out in Israel, where knowledge on osteoporosis was found to have significant association with age ($p=0.05$) and occupation ($p<0.0001$). Education ($p=0.028$) had significant relationship with osteoporosis knowledge in this study which coincides with study conducted in Israel, where education ($p<0.001$) had significant relationship. Similarly, marital status ($p=0.182$) had insignificant relationship with osteoporosis knowledge in this study which coincide with the study of Israel ($p=0.230$) [18].

The study area of this research study is Muktipur-12, Nepalgunj which is quite attached to the city. All the people of this area have access to information. Information access in the sense, participants have exposure to radio, television, promotional program, seminars, educational settings and many more. Majority of the respondents i.e. 45.3% were of age range 40-49 years which means that they still have learning attitude and have access to information source. Moreover, these age group people have good ability to do recall. All these factors support for moderate and good knowledge on osteoporosis.

Similarly, only 22% of total respondents were illiterate which means majorities were literate. Literacy ultimately could have improved good exposure on informational source related to osteoporosis. Also, about 34% of the respondents (Service: 6.7 percent; Business: 26.7%) were involved in occupation which is away from their home which provides the platform to get informed.

4. Conclusion

Study showed fair level of knowledge on osteoporosis while more than one fourth had

presence of osteoporosis. Participant's age, literacy and occupation were significantly associated with knowledge of osteoporosis. Majority of the respondent's response regarding causes, symptoms and preventive practice were appropriate. Diet low in calcium was highly reported cause of calcium followed by lack of exercise. Study showed young age women had good knowledge on osteoporosis. So, osteoporosis awareness program need to be continued and expanded covering young age women which could minimize the future risk of osteoporosis. Similarly, women with occupation other than home maker might not get enough time to get notified on osteoporosis due to their busy schedule. Organization holding the employees should manage opportunity to provide knowledge on osteoporosis for such occupation holders.

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Conflict of interest

The authors declare no possible conflicts of interest

References

[1] Lekhi A, Lekhi M, Sathian B, Mittal A. The role of biochemical markers in the early detection of osteoporosis in women: A comparative study from the Western Region of Nepal. J Clin Diagnosis Res. 2012; 6(2):274-277.
[2] Gopinathan NR, Sen RK, Behera P, Aggarwal S, Khandelwal N, Sen M. Awareness of osteoporosis in postmenopausal Indian women: An evaluation of Osteoporosis Health Belief Scale. Journal of mid-life health. 2016; 7(4): 180
[3] Mansoureh S., Elahe A., & Hossein S. Awareness of osteoporosis among female employees in Kerman, Iran. Russian Open Medical Journal. 2015; 4(1).
[4] Aryal B. Prevalence of Osteoporosis among Middle Aged Women in Chitwan District of Nepal. International Journal of Pharmaceutical & Biological Archive. 2012; 3(4).
[5] Xu J, Sun M, Wang Z, Fu Q, Cao M, Zhu Z, et al. Awareness of osteoporosis and its relationship with calcaneus quantitative ultrasound in a large Chinese community population. Clinical interventions in aging. 2013; 8: 789.
[6] Puttapitakpong P,Chaikittisilpa S,Panyakhamlerd K,Nimnuan C,Jaisamrarn U,Taechakraichana N. Inter-correlation of knowledge, attitude and osteoporosis preventive behaviors in women around the age of peak bone mass. BMC women's Health.2014;14(1): 35.
[7] Pathak V, Ahirwar N, Ghate S. Study to assess knowledge, attitude and practice regarding menopause among menopausal women attending outdoor in tertiary care centre. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2017 May; 6(5):1848-1853
[8] Okumus M, Ceceli E, Tasbas O, Kocaoglu S, Akdogan S, Borman P. Educational status and knowledge level of pre-and postmenopausal women about osteoporosis and risk factors: A cross-sectional study in a group of Turkish female subjects. Journal of back and musculoskeletal rehabilitation. 2013; 26(3): 337-343.
[9] Etemadifar MR, Nourian SM, Fereidan-Esfahani M, Shemshaki H, Nourbakhsh M, Zarezadeh A. Relationship of knowledge about osteoporosis with education level and life habits. World Journal of Orthopedics. 2013; 4(3): 139.

[10] Statistics office. Municipality and rural municipality profile of Banke district. Nepalgunj Banke: Prisma Design and print solution Pvt. Ltd; 2074.126 p.
[11] Kyaw MKK, O WM, Mya KM. Knowledge, Attitude and Practice on safety measures of occupational hazards among constructional workers at Bayint Naung Bridge Construction Site in Yangon Region. Myanmar Medical Journal, 2015;57(2):28-32
[12] Akhtar A, Shahid A, Jamal AR, Naveed MA, Aziz Z, Barkat N, Ali F. Knowledge about osteoporosis in women of child bearing age (15-49 years) attending Fauji Foundation Hospital Rawalpindi. Pakistan Armed Forces Medical Journal, 2016; (4): 558.
[13] Clark P, Lavielle P. Risk perception and knowledge about osteoporosis: Well informed but not aware? A cross-sectional study. Journal of Community Health. 2015; 40(2): 245-250.
[14] Hirani A, Fehmi A, Momin M, Rupani S, Haidri U, Khowaja Z, et al. Osteoporosis in post-menopausal women. i-Manager's Journal on Nursing. 2014; 4(2): 7.
[15] El-Tawab SS, Saba E, Elweshahi HMT, Ashry MH. Knowledge of osteoporosis among women in Alexandria (Egypt): A community based survey. The Egyptian Rheumatologist. 2016; 38(3): 225-231.
[16] Al-Muraikhi H, Said H, Selim N, Chehab M. The knowledge of osteoporosis risk factors and preventive practices among women of reproductive age in the state of Qatar: a cross-sectional survey. International Journal of Community Medicine and Public Health. 2017; 4(2): 522-527.
[17] Mohapatra G, Jena D, Tripathy RM, Panda A, Mohapatra J, Swain PK. Effectiveness of video-assisted teaching module on knowledge of osteoporosis among perimenopausal women in urban slum area of Berhampur, Odisha, India. International Journal. 2016; 5(4): 1479.
[18] Blumstein T, benyamini Y, Farhi A, Boyko V, Lerner-Geva L. Knowledge of risk factors and prevention of osteoporosis: the Israeli women's health at midlife study. Archives of Osteoporosis. 2018; 13:70