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"A STUDY TO EXPLORE THE RISK FACTORS AND KNOWLEDGE REGARDING OSTEOPOROSIS AMONG ELDERLY WOMEN ATTENDING GERIATRIC OPD AT SELECTED HOSPITALS OF MYSURU"

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Abstract

Introduction: Osteoporosis represents a major public health problem worldwide. Osteoporosis is a chronic progressive metabolic bone disease marked by low bone mass and deterioration of bone tissue leading to increased fragility. This can lead to a decrease in bone strength that can increase the risk of fractures. Education is a key tool in the prevention and disease management, contributing to appropriate behavioural modifications. **Aim:** The aim of the study was to explore the risk and knowledge regarding osteoporosis among elderly women attending geriatric OPD. **Methods:** Descriptive exploratory design and Survey approach was used in the study. Non probability Purposive sampling technique was used to select 100 elderly women for the study. Data was collected using structured interview schedule by risk assessment scale and knowledge questionnaire. **Results:** The results of the study revealed that majority (47%) were in moderate risk and majority of elderly women (64%) were having poor knowledge regarding osteoporosis. **Conclusion:** Health professionals in planning and implementing various educational strategies to improve the knowledge and reduce the risk factors of osteoporosis among the general public and women regarding promotion of health.

Keywords: Osteoporosis, Knowledge, Risk factors, Elderly women

Introduction:

Osteoporosis is a chronic progressive metabolic bone disease marked by low bone mass and deterioration of bone tissue leading to increased fragility. Osteoporosis is a bone disease that develops when bone mineral

density and bone mass decreases, or when the quality or structure of bone changes. This can lead to a decrease in bone strength that can increase the risk of fractures (broken bones.)[1]

The risk of getting osteoporosis increases with age as bones naturally become thinner. After age 30, the rate at which your bone tissue dissolves and is absorbed by the body slowly increases, while the rate of bone building decreases. So overall you lose a small amount of bone each year after age 30[2].

In women, bone loss is more rapid and usually begins after monthly menstrual periods stop, when a woman's production of the hormone estrogen slows down (usually between the ages of 45 and 55). A man's bone thinning typically starts to develop gradually when his production of the hormone testosterone slows down, at about 45 to 50 years of age. Women typically have smaller and lighter bones than men. As a result, women develop osteoporosis far more often than men. Osteoporosis usually does not have a noticeable effect on people until they are 60 or older[2].

Whether a person develops osteoporosis depends on the thickness of the bones (bone density) in early life, as well as health, diet, and physical activity later in life. Factors that increase the risk for osteoporosis in both men and women include: Life style factors, Alcohol use, Getting little or no exercise, A diet low in foods containing calcium and vitamin D, Having certain medical conditions, Being inactive or bedridden for long periods of time, Excessive dieting or having an eating disorder, such as anorexia nervosa[2]

Menopause can increase a woman’s risk of developing osteoporosis. The drop in estrogen levels that occurs around the time of menopause results in increased bone loss. It is estimated that the average woman loses up to 10 percent of her bone mass in the first five years after menopause. If a woman’s peak bone mass before menopause is less than ideal, any bone loss that occurs during menopause may result in osteoporosis[3].

There is a large amount of elderly persons suffering osteoporosis. And also elderly peoples are more prone to develop osteoporosis one or more peoples over 50 will sustain an osteoporosis-related fracture during their lifetime. This disease is silent thief because it slowly robs the skeleton of its banked resources. Bones eventually become so fragile that they cannot withstand normal mechanical stress. Incidence rate is high in women, especially post-menopausal women[4].

Women tend to lose BMD more rapidly than men, especially after the menopause[5].Low calcium intakes with extensive prevalence of vitamin D deficiency, increasing longevity, sex inequality, early menopause, genetic predisposition, lack of diagnostic facilities, and poor knowledge of bone health have contributed toward the high prevalence of osteoporosis[6].

Thus, osteoporosis is a major public health problem in Indian women. Low calcium intakes with extensive prevalence of vitamin D deficiency, increasing longevity, sex inequality, early menopause, genetic predisposition, lack of diagnostic facilities, and poor knowledge of bone health have contributed toward the high prevalence of osteoporosis. Bone health may be optimized by creating an environment to achieve peak bone mass during adolescence, maintenance of healthy bone throughout the life cycle, and prevention of bone

loss postmenopausal. In Indian women, calcium, vitamin D, and bisphosphonates are the commonest first-line therapies used[6].

A case-control, multi centre-based study was conducted in selected hospitals and health centres from urban areas in Iran and India with the aim of assessing the risk factors for osteoporosis in women from selected BMD centers of two developing Asian countries. The sample included a total of 363 subjects from Iran and 354 subjects from India. The results revealed that osteoporosis in Iranian and Indian subjects appeared to be associated with several known risk factors such as aging, demographic factors, menstrual and obstetric factors, medical disorders and medications, nutritional factors, physical activity and exercise, anthropometric factors, habits, and fracture history. But there were no significant differences in the association of risk factors and osteoporosis between Indian and Iranian subjects.[5]

Menopause can wreak havoc on the bones. During menopause, estrogen levels in the body drop rapidly. Unfortunately, it seems that estrogen plays an important role in bone health. Estrogen keeps the osteoclasts in check, allowing the osteoblasts to build more bone. Unless the estrogen that one loses is being replaced, bones can become thin and brittle quite rapidly.[6]

Need for the study

Osteoporosis is a skeletal characterized by decreased bone mass and microarchi-tectural deterioration of bone tissue resulting in less bone tension and strength and increased risk of fragility fracture. Osteoporosis is a major threat to elderly people, a fast-growing population of the world, in whom the risk of fracture increases with continued aging of the population[7].

Ethnicity and race are important factors influencing the prevalence of osteoporosis. Older Asian men are reported to have 50% lesser risk of sustaining a hip fracture over their lifetime than Caucasian men. Similar to men, Asian women also have lower fracture risk than Caucasian women. Moreover, there are differences in drug treatment response for osteoporosis based on ethnicity and race[7].

Osteoporosis is a disease in which the density and quality of bone are reduced, leading to weakness of the skeleton and increased risk of fracture, particularly of the spine, wrist and hip. Osteoporosis and associated fractures are an important cause of mortality and morbidity. Approximately 1.6 million hip fractures occur each year worldwide, the incidence is set to increase to 6.3 million by 2050[8].

Currently, it has been estimated that more than 200 million people are suffering from osteoporosis. According to recent statistics from the International Osteoporosis Foundation, globally 1 in 3 women over the age of 50 years and 1 in 5 men will experience osteoporotic fractures in their lifetime[9].

It was estimated that the number of patients worldwide with osteoporotic hip fractures is more than 200 million. It was reported that in both Europe and the United States, 30% women are osteoporotic, and it was estimated that 40% post-menopausal women and 30% men will experience an osteoporotic fracture in the rest of their lives[9].

According to the World health Organization (WHO) statistics, osteoporosis have become an important public health problem worldwide, one in three women and one in five men over 50 years of age will have an osteoporotic fracture in their lifetime. Osteoporotic fractures cause enormous healthcare costs and reduce quality of life. In addition, osteoporotic are associated with increased mortality, functional decline, loss of quality of life, and a need for institutionalization in older subjects. In developed countries, for example, the prevalence of osteoporosis in elderly was 13%- 18% and the mean prevalence rate of osteoporosis in China is about 15.7% among older adults, and it is considered to be increasing gradually with the increasing age worldwide. Osteoporosis is an increasingly common chronic disease that has a great effect not only in regard to clinical effects, but also in regard to economic burden worldwide[10].

According to the studies conducted among women in India across the country, it is estimated that among the 230 million Indians expected to be over the age of 50 years, 46 million are women with osteoporosis. However, compared to women a low T-score in men indicates higher vulnerability to osteoporosis[6].

Osteoporosis is associated with numerous risk factors such as age, gender, menstrual cycle changes, tobacco smoking, alcohol consumption, physical inactivity, and decrease calcium and vitamin-D intake. Such factors disturb bone mass density shaped early in life, doubled by the age of 20 years, and rapidly shrink by the age of 50 years among women. Thus, preserving bone mass early during the first three decades of life for young females through promoting females' knowledge regarding the disease and adopting a healthy lifestyle is an important strategy in reducing the risk of osteoporosis among women[11].

Osteoporosis affecting mostly women is one of the diseases that reduce the quality of life significantly. It is responsible for millions of fractures annually, mostly involving the vertebrae, hip and wrist. The annual number of osteoporotic fractures in women is greater than the total number of cases of heart attacks, strokes and breast cancer combined. Osteoporosis has been defined by the World Health Organization (WHO) as 'low bone mass and micro architectural deterioration of bone tissue, leading to enhanced bone fragility and a consequent increase in fracture[12].

The gold standard for the diagnosis of osteoporosis is by dual energy X-ray absorptiometry (DXA). Data suggest that there are ~0.26 DXA machines per million of the Indian population. Very few of these machines are found in government hospitals; thus, there is limited access to DXA scanners. Further, studies also suggest that ethnic-specific reference data need to be used for the diagnosis of osteoporosis[6].

Further, studies also suggest that knowledge about bone health among Indian women is poor. In a study designed to assess knowledge of osteoporosis in educated women, authors concluded that there was a general lack of knowledge about osteoporosis and that there was a need for increased involvement of medical professionals in education about bone health[6].

While women experience marked increase in bone loss during pre-menopause and post menopause, in men, a small longitudinal bone loss is observed throughout life. Thus, women in addition to age-related bone loss also experience menopausal bone loss. Although it is said that bone loss in a universal phenomenon that starts from

the time peak bone mass is achieved, most studies have assessed bone health status in postmenopausal women and men above 50 years of age[13].

A study was conducted to evaluate the awareness, perception and knowledge of osteoporosis among 768 Turkish rural women (40-70) years and they were selected by random sampling method. A structured interview schedule was done to assess the knowledge level. The results showed that that mean knowledge score was only 5.52 out of 20. Thus the study concluded that majority of the women were unaware about the risk factors and preventive methods of osteoporosis, so appropriate educational programs should be planned according to community needs[14]

A study on prevalence of osteoporosis and awareness, education, prevention and treatment of osteoporosis was conducted among 200 pre and post-menopausal women in postgraduate institute of Medical education and Research, Chandigarh, India. The results revealed that the prevalence of low BMD (bone mineral density) was found in more than half of the population (53%). The mean age in group 1 (normal BMD) was found to be 50.56±5.74 year as compared to 52.50±5.94 in group II with low BMD (P=0.02). Strategies to identify and manage low BMD in the primary care setting need to be established. So there is need for developing awareness programme to manage low bone mineral density among postmenopausal women[15]

There are well-established known clinical risk factors for osteoporosis that can be modifiable or non-modifiable. The non-modifiable risk factors include like age, female gender, family history of fracture, previous fracture, ethnicity, and menopause/hysterectomy. The modifiable risk factors include alcohol intake, smoking, low body mass index (BMI), poor nutrition, vitamin D deficiency, eating disorders, insufficient exercise, low dietary calcium intake and frequent falls[7]

National osteoporosis awareness and prevention month is celebrated each May, and becomes a chance for our Nation to become more familiar with the effects of this disease, and about the preventable steps that we can to deal with it. Osteoporosis is defined by the World Health Organization (WHO) as a bone mineral density that is 2.5 standard deviations or more below the mean peak bone mass as measured by DXA; the term "established osteoporosis" includes the presence of a fragility fracture[9]

In the near future, developing countries like India, may expect the occurrence of fractures in epidemic proportions at a time when it is still coping with the problems of malnutrition and infectious diseases. It has been projected that over half of the fractures in the world in the year 2050 will occur in Asia[16]

In view of the abovementioned statistical data and studies, it is essential to identify the risk factors of osteoporosis. one of the main complication faced by the clients is osteoporotic fracture and helps the elderly women to improve the quality of life with osteoporosis. Hence the researcher is interested to conduct a study to explore the risk factors and knowledge regarding osteoporosis among elderly women.

Review of literature

1. A prospective cross-sectional study was conducted to assess the prevalence of independent risk factors for the development of osteoporosis and osteoporotic fractures among women. The study concluded that the risk for vitamin D insufficiency and deficiency is high and should be treated appropriately. Strategies to reduce fall risk in this population will be just as important as pharmacological therapy. Further studies are needed in older seniors, especially men, to better understand the risks and benefits of pharmacologic therapy for the management of osteoporosis[19]

2. A cross-sectional study of prevalence and predictors of osteoporosis and osteopenia remain to be examined in the postmenopausal women of Punjab, India. The present cross-sectional study screened 1628 postmenopausal women during September 2019 to March 2020. Osteoporosis and osteopenia were confirmed on the basis of T-scores using dual energy X-ray absorptiometry (DXA) at the hip (femoral neck) and lumbar spine regions (L1–L4 vertebrae). The higher prevalence rates of osteoporosis and osteopenia in postmenopausal women of Punjab are alarming, which solicits awareness and earlier testing of those women who are approaching menopause[20]

3. A cross-sectional study osteoporosis prevalence and risk factors in a community-based cohort in Korea. The study population consisted of 1,547 men and 1991 women aged 40 years and older with BMD measurements using central dual energy X-ray absorptiometry from a prospective community-based cohort. The data were compared with other ethnic groups. Risk factors related to osteoporosis were analyzed. The mean BMD of studied female subjects after age of 50 was not significantly different from that of Chinese but significantly lower than that of Japanese, non-Hispanic whites, non-Hispanic blacks and Mexican Americans. Risk of osteoporosis was significantly associated with the presence of past fracture history[21]

4. A epidemiological study carried out in a representative sample of Brazilian men and women aged 40 years or older. The prevalence of fragility fractures is about 15.1% in the women and 12.8% in the men A total of 2,420 individuals (women, 70%) from 150 different cities in the five geographic regions in Brazil, and all different socio-economical classes were selected to participate in the present survey. In the women, the main CRF associated with fractures were advanced age, family history of hip fracture, early menopause, sedentary lifestyle, poor quality of life, higher intake of phosphorus, diabetes mellitus, use of benzodiazepine drugs and recurrent falls. In the men, the main CRF were poor quality of life, current smoking, diabetes mellitus and sedentary lifestyle. Findings suggest that CRF may contribute as an important tool to identify men and women.[22]

Objectives

1. To explore the risk factors regarding osteoporosis among elderly women.
2. To assess the knowledge regarding osteoporosis among elderly women
3. To determine the association between the level of knowledge regarding osteoporosis among elderly women and their selected personal variables.

Hypotheses

H_1: There will be significant association between the risk factors of osteoporosis and their selected personal variables of elderly women.

H_2: There will be significant association between the level of knowledge and their selected personal variables of elderly women.

Materials and Methodology

Research approach: Survey approach was adopted for this study.

Research design: Descriptive exploratory design

Variables of the study: Research variables: Risk factors and knowledge regarding osteoporosis

Sources of data

Setting: Geriatric outpatient departments (OPD) of selected hospitals, Mysuru.

Population: The entire set of individuals or objects having some common characteristics in the present study population consists of elderly women attending in geriatric OPD.

SAMPLE AND SAMPLING

Sample: Elderly women attending geriatric outpatient department (OPD) at selected Hospitals of Mysuru.

Sampling technique: Non-probability purposive sampling technique

CRITERIA FOR SAMPLING

Inclusion Criteria for Sampling

The elderly women who

- Are willing to participate the study.
- Are attending the geriatric OPD

Exclusion Criteria for Sampling

The elderly women who

- Are not willing to participate in the study

Data collection technique or Data accessibility

- Personal Proforma to assess the personal variables of elderly women attending the geriatric OPD.
- Risk assessment scale to explore the risk factors of elderly women attending the geriatric OPD regarding osteoporosis.

➢ Structured interview schedule to assess the knowledge of elderly women attending the geriatric OPD regarding osteoporosis.

Results

Section A: Description of selected personnel variables of study subjects.

Frequency and percentage distribution of elderly women.

Section B: Risk assessment scale to explore the risk factors regarding osteoporosis.

Section C: Structured interview schedule to assess the knowledge regarding osteoporosis.

Section D: Association between risk assessment score and their selected personal variables.

Section E: Association between knowledge score and their selected personal variable.

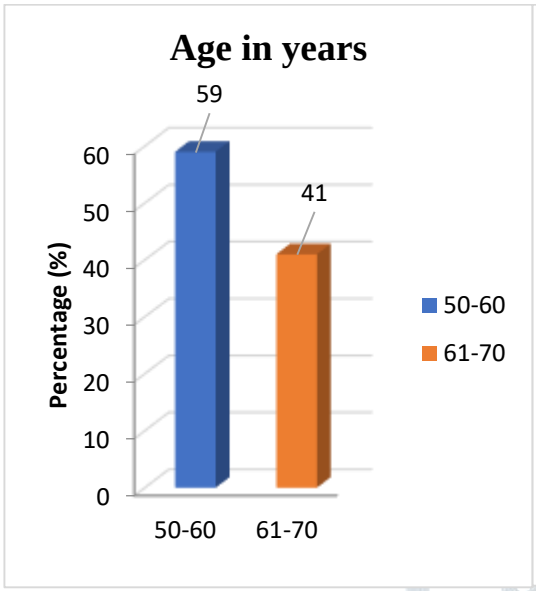
TABLE 1

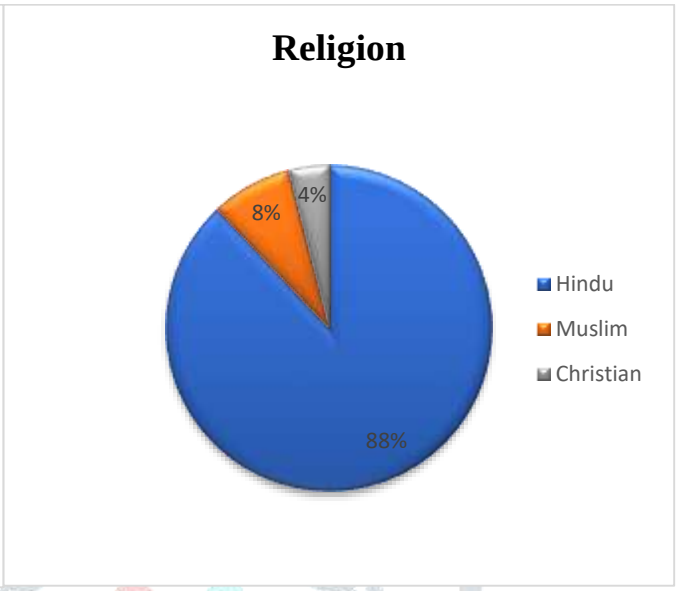
Frequency and percentage distribution of Elderly women according to their selected personal variables

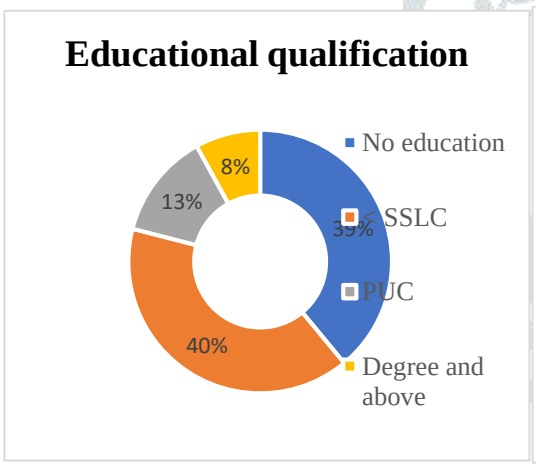
n=100

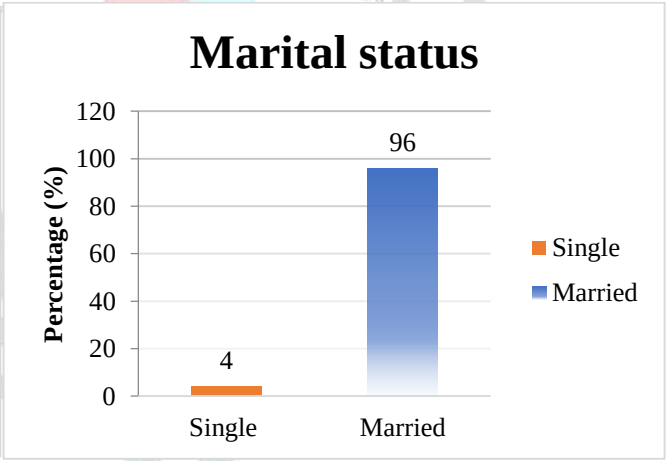
Sl No.	Personal Variables	Frequency (f)	Percentage (%)
1.	**Age in years**		
	1.1 50-60	59	59%
	1.2 61-above	41	41%
2.	**Religion**		
	2.1 Hindu	88	88%
	2.2 Muslim	08	08%
	2.3 Christian	04	04%
3.	**Educational Qualification**		
	3.1 No education	39	39%
	3.2 < SSLC	40	40%
	3.3 PUC	13	13%
	3.4Degree and above	08	08%
4.	**Marital Status**		
	4.1 Single	04	04%
	4.2 Married	96	96%
5.	**Family monthly income**		
	5.1<10000	43	43%
	5.2 11000-20000	**26**	**26%**
	5.3 Above 21000	31	31%
6.	**Previous exposure to any health education on osteoporosis**		
	6.1 Yes	13	13%
	6.2 No	87	87%
7.	**Dietary Pattern**		
	7.1 Vegetarian	52	52%
	7.2 Mixed	48	48%
8.	**No of children delivered**		

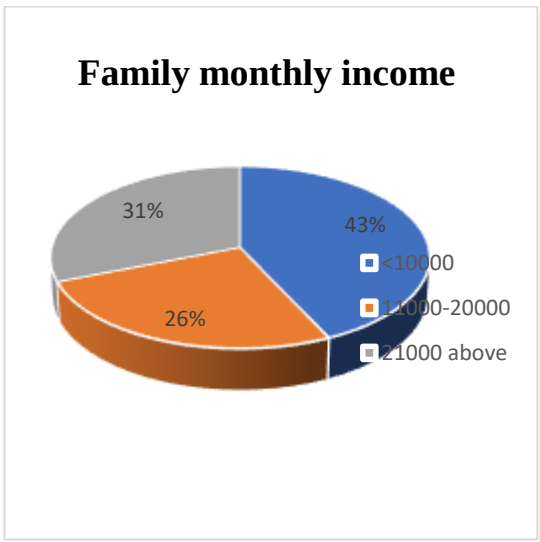
	8.1 1-2	66	66%
	8.2 3-4	34	34%
9.	**Have you had surgically induced menopause**		
	9.1 Yes	33	33%
	9.2 N0	66	66%

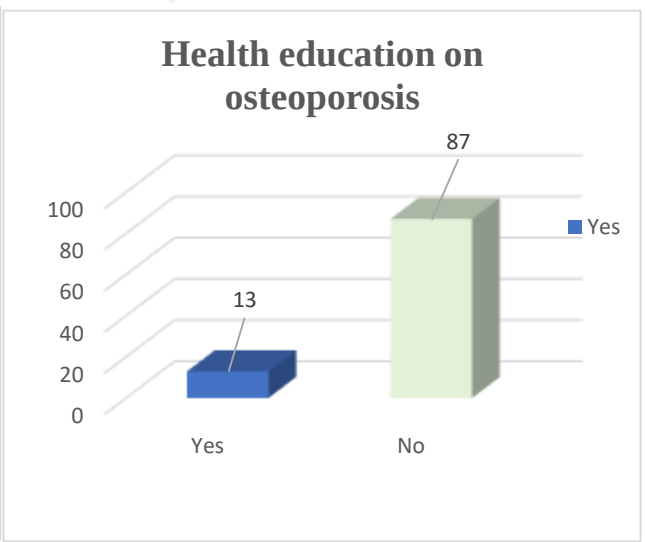


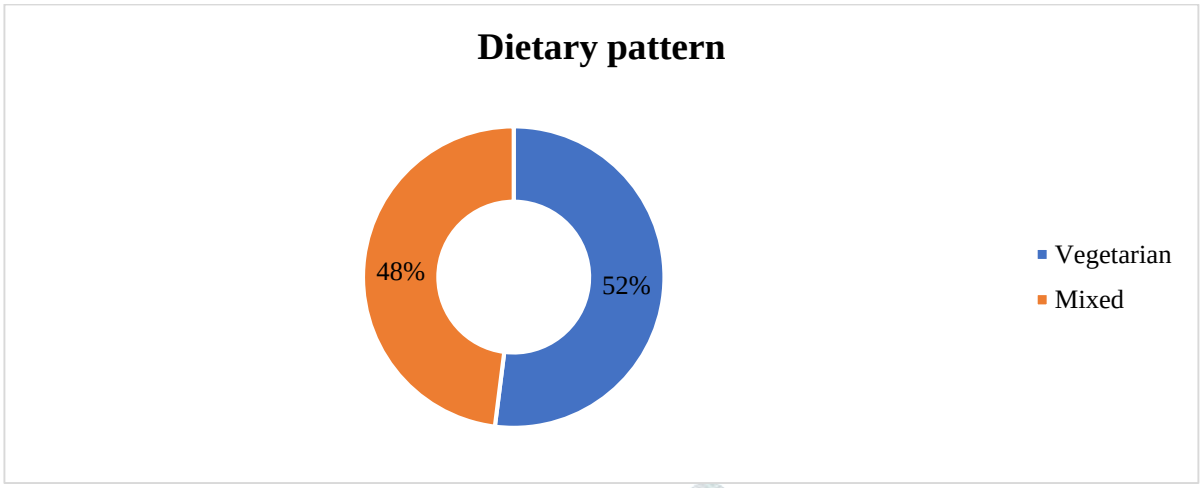


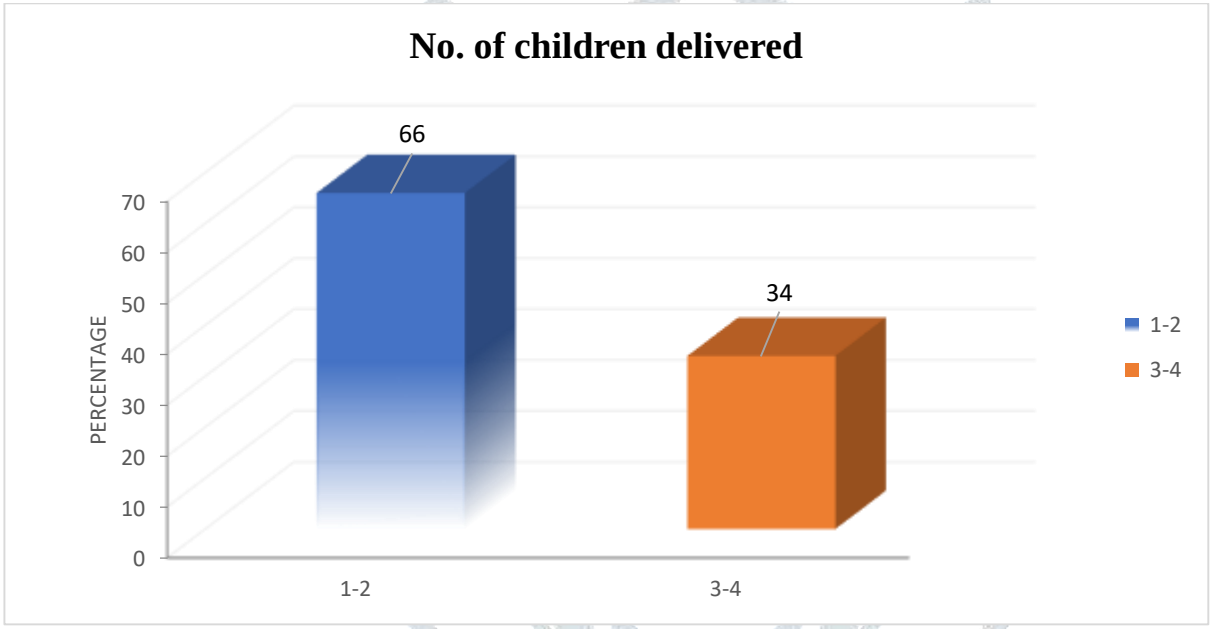









Dietary pattern
48%
52%
Vegetarian
Mixed


No. of children delivered
66
34
70
60
50
40
30
20
10
0
PERCENTAGE
1-2
3-4
1-2
3-4

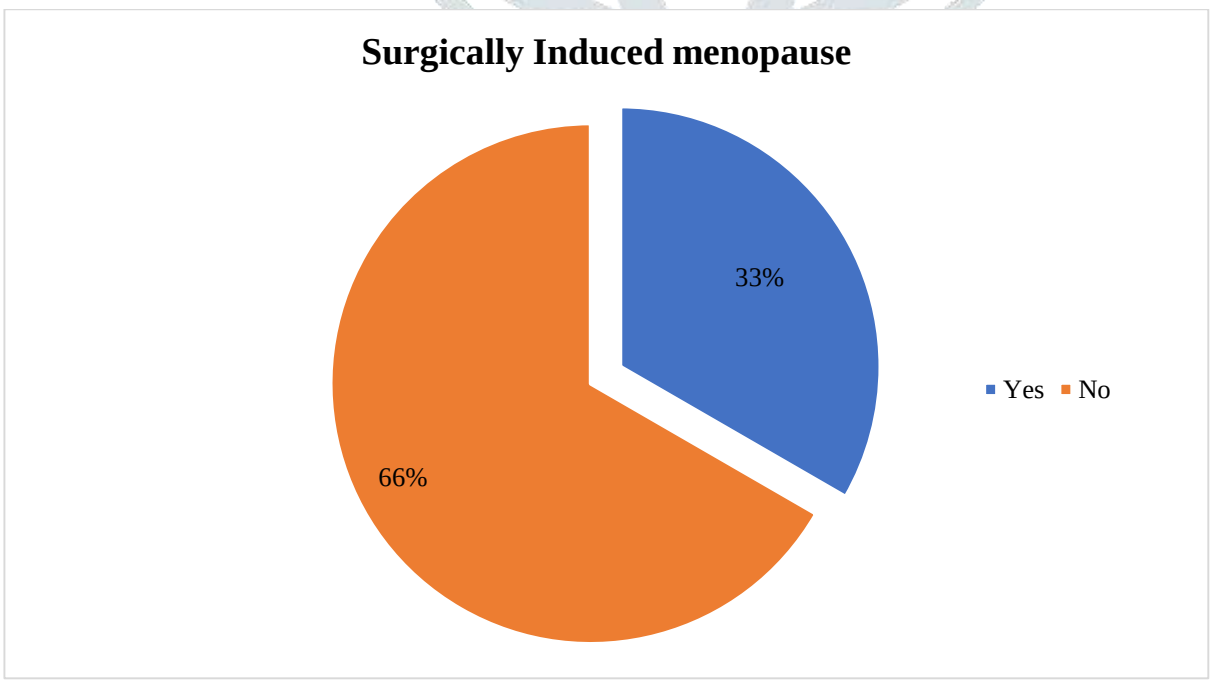

Surgically Induced menopause
33%
66%
Yes
No

TABLE 2

Frequency and percentage distribution of explore the risk factors of women for osteoporosis.

n = 100

RISK FACTORS	FREQUENCY (F)	PERCENTAGE (%)
Low risk (0-4)	42	42%
Moderate risk (5-8)	47	47%
High risk (9-12)	01	01

TABLE 3

Structured knowledge questionnaire to assess the knowledge of elderly women.

n = 100

KNOWLEDGE SCORES	FREQUENCY	PERCENTAGE
Poor knowledge (23-30)	64	64%
Average knowledge (16-22)	24	24%
Good knowledge (0-15)	12	12%

TABLE 4

Mean, median, range and standard deviation of structured interview schedule scores of elderly women

n = 100

VARIABLES	MEAN	MEDIAN	RANGE	SD
Structured knowledge questionnaire	13.84	14	5-27	±5.23

TABLE. 5

Chi square values between risk assessment among elderly women with their selected personal variable

n=100

Sl No.	PERSONAL VARIABLE	LOW RISK	MODERATE RISK AND ABOVE	CHI SQUARE VALUE
1.	**Age in years**			
	1.1 50-60	27	32	**0.84**
	1.2 61 Above	15	26	
2.	**Religion**			
	2.1 Hindu	40	48	**3.5**
	2.2 Muslim and others	2	10	
3.	**Educational status**			
	3.1 No education	14	25	**3.04**
	3.2 < SSLC	21	19	
	3.3 PUC and above	7	14	
4.	**Family monthly income**			
	4.1<10000	20	23	**0.49**
	4.2 10001-20000	10	16	
	4.3 20001 above	12	19	
5.	**Previous exposure to any health education on osteoporosis**			
	5.1 Yes	5	8	**0.00**
	5.2 No	37	50	
6.	**Dietary Pattern**			
	6.1 Vegetarian	25	27	**1.64**
	6.2 Mixed	17	31	
7.	**No of children delivered**			
	7.1 1-2	32	34	**3.35**
	7.2 3-4	10	24	
8.	**Have you had surgically induced menopause**			
	8.1 Yes	12	21	**0.64**
	8.2 N0	30	37	

$\chi 2$ (1)=3.84, **$\chi 2$** (2)=5.99, p>0.05 # yates correction , NS –Not significant

Table 6

Chi square values between the knowledge of Elderly women regarding the osteoporosis and their selected personal variables.

n=100

SL NO.	PERSONAL VARIABLE	POOR KNOWLEDGE	AVERAGE KNOWLEDGE	GOOD KNOWLEDGE	CHI SQUARE VALUE
1.	**Age in years**				
	1.1 50-60	39	12	8	**1.31***
	1.2 61- Above	25	12	4	
2.	**Religion**				
	2.1 Hindu	38	19	11	**2.41***
	2.2 Muslim and others	6	5	1	
3.	**Educational status**				
	3.1 No education	34	3	2	**#16.43***
	3.2 < SSLC and above	30	21	10	
4.	**Marital Status**				
	4.1 Single	01	01	02	**4.41***
	4.2 Married	63	23	10	
5.	**Family monthly income**				
	5.1<10000	34	07	02	**#11.48**
	5.2 10001-20000	17	06	03	
	5.3 20001- above	13	11	07	
6.	**Previous exposure to any health education on osteoporosis**				
	6.1 Yes	05	02	06	**#15.03**
	6.2 No	59	22	06	
7.	**Dietary Pattern**				
	7.1 Vegetarian	32	12	08	**1.37***
	7.2 Mixed	32	12	04	
8.	**No of children delivered**				
	8.1 1-2	38	18	10	**4.13***
	8.2 3-4	26	06	02	
9.	**Have you had surgically induced menopause**				
	9.1 Yes	18	11	04	**0.03***
	9.2 N0	46	13	08	

$\chi 2$ (1)=3.84, **$\chi 2$** (2)=5.99,p<0.05* p>0.05 yate correction, *significant

Discussion

1.Finding related to the selected Personal variables of Elderly women

Data related to the age of Elderly women revealed that majority of Elderly women (59%) were in the age group of 50-60 years. Majority of the Elderly women (88%) were Hindu Religion. majority of below the SSLC, (40%) educational status. Majority (96%) were married. Having (43%) of the Elderly women were having family monthly income of below 10000, 52% were vegetarians, 87% were not exposure to any health education on osteoporosis.66% were having 1-2 children.66%were not undergone surgical induced menopause.

2.Risk factors of elderly women regarding osteoporosis

Data related to the risk factors of elderly women regarding osteoporosis revealed that majority (47%) were in moderate risk,42%were in low risk where as 1% were in high risk for osteoporosis.

A community-based cross-sectional and prospective follow-up study has explored the prevalence and risk factors of osteoporosis among 1500 patients at Beijing. The study findings showed that patients are usually asymptomatic until osteoporotic fractures occur, which makes early diagnosis and prevention difficult, and the associated fractures secondary to OP could be preventable with appropriate management[14]

Study findings are supported by another study among the prevalence of risk factors for osteoporosis and fractures in a large sample of postmenopausal among 4960 women aged 50 to 65 years in Spain. Which reported that low calcium intake, 43%; benzodiazepine use, 35.1%, and height loss, 30.1%. The main risk factors for osteoporosis in women 50-65 years[15]

A prospective cross-sectional study was conducted to assess the prevalence of independent risk factors for the development of osteoporosis and osteoporotic fractures among women. The study concluded that the risk for vitamin D insufficiency and deficiency is high and should be treated appropriately[16].

Another study finding among risk factors for osteoporosis related to their outcome: fracture cross sectional study was carried out on 4725 postmenopausal women, 50-80 years of age. The absolute risks of sustaining one or more fractures ranged from 3% to 40%. In this category women with normal BMI had a statistically lower risk of fracture.

3.Knowledge of Elderly women regarding Osteoporosis

Data related to the knowledge of elderly women regarding osteoporosis revealed that majority of elderly women are (64%) had Poor knowledge, 24% had average knowledge and 12% had good knowledge regarding osteoporosis.

Study findings consist with the findings of another study which analyzed the knowledge and risk status of elderly women above 40 years regarding osteoporosis at Selected organization of Sharda University. women 41(41%) of them had below average knowledge, 51(51%) of them had average knowledge, and 8(8%) of them had good knowledge regarding osteoporosis[27].

Similar findings are observed in a study conducted among women in Hospital USM. The findings indicate 40.5% had a good level of knowledge towards osteoporosis, while 53.5% had a poor practice level. Knowledge of osteoporosis and practices is still at a fair level, affecting osteoporosis prevention practices[30].

Similar study finding conducted in Klang Valley, Malaysia. The current study found moderate levels of knowledge and beliefs regarding osteoporosis but poor osteoprotective practices[31].

4.Association between the risk assessment scores and their selected personal variables.

Data shows that there was no statistically significant association between the personal variables of Elderly women viz. age in year, religion, marital status, educational status, family monthly income and Previous exposure to any health education on osteoporosis Dietary pattern, No of children delivered and Have you had surgically induced menopause with their risk assessment regarding osteoporosis.

Study findings consist with the findings of another study which analyzed the knowledge and risk status of elderly women in Sharda University. There is significant association between dietary pattern and family income with knowledge level. This narrative review result has appeared that the majority of the women have knowledge deficit regarding osteoporosis. Most of the women are unaware of their condition and means to prevent it[27]

Similar study which related to assessment of osteoporosis risk factors in Iranian women compared with Indian women. The statistical significant ($p<0.05$) association of risk factors in present study population with their odds ratios.(2bibliographysoori)[18]

5.Findings related to the association between the level of knowledge of Elderly women regarding the osteoporosis and their selected personal variables.

Study findings revealed that there was statistically significant association between the personal variables of Elderly women viz. educational status, family monthly income and Previous exposure to any health education on osteoporosis with their level of knowledge regarding osteoporosis.

Similar findings are observed in a study conducted among 120 pre-menopausal women in rural areas of Waghodia. Which reported that statistically significant association between the education (15.64) occupation, family income (19.743) where found significance at 0.05 level and variable such as Age (2.401), type of family, type of diet (4.219), and history of osteoporosis (0.059) where not significant at 0.05 level of significant[26].

Findings of another study conducted in primary health care centres at Qatar. A statistically significant relation was noted between the overall knowledge score and age, the level of education, marital status, and positive family history of osteoporosis.[28]

Similar study finding conducted in Klang Valley, Malaysia. Osteoporosis knowledge, beliefs, and practices were significantly different based on subjects' demographic characteristics ($p < 0.05$). Osteoporosis knowledge and beliefs were correlated significantly with osteoprotective practices ($p < 0.05$)[18].

Conclusion

The study findings Menopause can increase a woman's risk of developing osteoporosis. The drop in estrogen levels that occurs around the time of menopause results in increased bone loss. Health professionals in planning and implementing various educational strategies to improve the knowledge and reduce the risk factors of osteoporosis among the general public and women regarding promotion of health. Adequate information in time can help the people to prevent the development of this chronic problem later in their life with necessary life style modifications.

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Ethical issues: No

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Research highlights:

- **Focus of the Study**

- Investigates **osteoporosis**, a major public health concern among elderly women.
- Aims to **identify risk factors** and **assess the level of knowledge** regarding the disease.

- **Target Population**

- Elderly women (usually aged 60 years and above) attending **geriatric outpatient departments (OPDs)** at selected hospitals in **Mysuru**.

- **Problem Significance**

- Osteoporosis leads to **bone fragility and fractures**, which cause disability and poor quality of life.
- Lack of awareness and preventive behaviors worsen disease outcomes among older women.

Objectives

- To **determine the prevalence of risk factors** (e.g., menopause, calcium deficiency, sedentary lifestyle, low BMI, lack of sun exposure).
- To **assess knowledge levels** regarding causes, prevention, and management of osteoporosis.
- To explore the **association between demographic variables** and knowledge or risk factors.

Methodology Overview

- **Descriptive cross-sectional design**.
- **Structured questionnaire** or interview schedule used for data collection.
- **Sample:** Elderly women attending geriatric OPD.
- **Data analysis:** Descriptive and inferential statistics to find relationships.

Expected Findings

- Majority of participants may have **moderate to poor knowledge** about osteoporosis.
- Several **modifiable risk factors** likely to be identified (e.g., poor diet, limited exercise, low calcium intake).
- Possible correlation between **education level and knowledge** about osteoporosis.

Practical Implications

- Findings can help in **developing health education programs** to improve awareness.
- Can guide **preventive nursing interventions** for elderly women.
- Useful for **policy-making** and **geriatric health promotion** at community and hospital levels.

Contribution to Nursing and Public Health

- Enhances nurses' role in **screening, educating, and counseling** elderly women.
- Promotes **preventive and promotive health care** in geriatric populations.
- Supports the goal of **healthy aging** by reducing fracture-related morbidity.

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