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RESEARCH ARTICLE

AWARENESS OF OSTEOPOROSIS AND ITS RISKS AMONG SCHOOL TEACHERS

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ABSTRACT

Osteoporosis is a global health problem both in developed and developing countries. Community education forms an important part in the management of osteoporosis. The objective of this study was to evaluate knowledge and awareness about osteoporosis and identify their sources of information. Study samples are school teachers and rural women belong to age group 35-55. Knowledge was assessed using osteoporosis questionnaire and analysis was performed using Minitab software. Of the total sample 96% had heard osteoporosis and 35% reported television as the major source of information. Total sample were consisted of 60 and 35 of them were school teachers and 25 of them were rural women. Out of 35 of school teachers only 40% were aware about osteoporosis and 24% of rural women were aware of it.

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1. INTRODUCTION

This chapter consists of study site, background of the study, problem justification, rationale and the literature review.

1.1 Background of the study

Osteoporosis is a condition of bone deterioration characterized by reduction of bone density due to the increased rate of bone resorption than the rate of bone formation. Alteration of bone micro architecture resulting in progressively porous, brittle, and fragile bones. They fracture easily under stresses that would not break normal bone. While the primary osteoporosis is age related and secondary osteoporosis is associated with other disease conditions, nutritional deficiencies, and side effect of some medications. Although the condition more prominent among women, this can be seeing among men as well.

The risk of osteoporosis is increased with, genetics, age, lack of nutritional intake, lack of physical exercise, certain lifestyle choices side effects of certain medication and certain disease conditions.

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1.2.1 Predisposing factors of osteoporosis

1.2.1a Genetics

Family history

From family histories, twin studies and molecular genetics, it is quite evident now that some of redisposition for osteoporosis can be inherited. Genetic control of osteoporosis is polygenic. The specific genes involved are beginning to be enumerated. Both structural and regulatory genes have been implicated in the propensity toward osteoporosis. Variance or mutation in genes that controls bone mass (and its mineral content) and /or bone turnover is obvious candidate genes. Estimation of the genetic component to the variance found in bone mineral density (BMD). For example; ranges from 60%-90%.

Female

Postmenopausal women are at high risk of osteoporosis because there is a direct association between lacks of estrogens after menopause. After menopause bone resorption outpaces the building of new bone. Women especially if slim are more prone to bone loss after menopause because they have less bone to lose than women with large body weight and large stature.

Race

Researchers have shown that Caucasian and Asian women are more likely to develop osteoporosis.

1.2.1. b. Lack of nutritional intake

Low calcium intake

Calcium is an essential mineral for build strong bones. Low calcium intake leads to weaken the bones. Daily requirement for adult is 1200 – 1500 mg. calcium rich sources are green leafy vegetables, beans (soya), milk, fish, etc.

Low vitamin D intake

Vitamin D helps the absorption of calcium from the intestine. Lack of vitamin D causes calcium depleted bone (osteomalacia) which further weakens the bones and increases the risk of fractures. Vitamin D can get from the diet or after series of reaction on the skin when individual are exposed to sunlight. Therefore Vitamin D production by the skin is dependent on exposure to sunlight. Average amount of vitamin D is 400 IU for men and women 51 to 70 years old.

1.2.1. c. Lack of physical exercise

Lack of physical exercise and lack of activity level (sedentary life style) or long term bed rest can cause weak bones. Low body mass index (BMI) also indicates risk for osteoporosis.
BMI

1.2.1. d. Certain lifestyle choices

High consumption of caffeine

Caffeine is a stimulant. But Caffeine is also a diuretic and it is increases the amount of calcium excretes in urine for several hours after drink it. Many researches shown this as a cause for concern of those with osteopenia or osteoporosis. As example over the counter analgesics, ice cream, hot cocoa, and soda pop contain caffeine.

High consumption of carbonated soft drinks

New researches indicate association between consumption of carbonated soft drinks and decreased bone mineral density. It's revealed that women who are used to take cola based sodas has 4% lower bone mineral density in the hip.

Alcohol abuse and smoking

Alcoholcan affect bone health because it interferes with the bone building cells known as osteoblasts. It decrease the number of osteoblast cells and interfere with their ability to form bone. This will lead to a lower peak bone mass and potential bone loss.

Smoking

Tobacco, nicotine, and other chemicals found in cigarettes are directly toxic to bones. They inhibit absorption of calcium and other nutrients needed for bone health. And also directly affect the bone building cells and acts to decrease the bone formations. This can be particularly bad for bones during youth and young adult hood because smoking can result in reaching a lower peak bone mass than expected.

1.2.1. e. Side effects of certain medication

Intake of corticosteroids drugs

Corticosteroids drugs cause osteoporosis and fractures in a high percentage of patients. It has several adverse effects on bone metabolism including direct inhibition of osteoblast function, direct enhancement of bone resorption and inhibition of gastro intestinal calcium.

Long term use of antiepileptic medications

Long term use of antiepileptic drugs can be caused decreasing the bone mineral density resulting in increase the risk of fragility and fracture (ex; phenytoin).

Thyroid hormone

Excessive replacements of thyroid hormones can cause decrease the bone mineral density resulting in osteoporosis.

1.2.1. f. Certaindisease conditions

Hyperthyroidism

Hyperthyroidism is associated with an increased excretion of calcium and phosphorus in the urine and stool which results in a loss of bone mineral density and increase the risk of fracture.

Mal absorption syndrome

The condition is characterized by interfere the digestion of food orabsorption of the nutrients mainly from the small intestine to blood stream. This can be due to disease of the small intestine, lack of digestive enzymes or bile salts or certain surgical procedures.

Osteoporosis among men

Although men are not experience in rapid hormonal changes as women, other causes can affect them to develop osteoporosis.

Alcohol interferes with the bone building cells known as osteoblasts. In fact, it may decrease the number of osteoblast cells and interfere with their ability to form bone. This will lead to a lower peak bone mass and potential bone loss.

1.3. Clinical features

Usually the condition is asymptomatic in the early stages of bone loss. But once bones have been weakened following signs and symptoms are presented. Pain is often relieved by rest and aggravated by movements. Back pain is common feature and which can be severe, as a result of afractured or collapsed vertebra.

Loss of height over the time due to collapsed vertebra
A stooped posture

Fracture of the vertebra, wrist, hip or other bone.

1.4. Investigations.

Non-Laboratory Tests

DEXA scan

The bone mineral density (BMD) test is the primary test used to identify osteoporosis and low bone mass. One of the preferred and most accurate ways to measure BMD is Dexa-Scan (dual-energy X-ray absorptiometry or DXA). It uses a low energy X-ray to evaluate density of the bones. BMD is often reported in terms of peak bone mass in young adults. A BMD value that is less than 1 standard deviation below the young adult mean is considered normal. BMD in osteopenia has a value between -1 and -2.5 standard deviations below the young adult mean while osteoporosis BMD values are even lower and are at least -2.5 standard deviations below the mean.

Laboratory Tests

Blood tests may include:

Blood calcium levels: this test is usually normal in osteoporosis but may be elevated with other bone diseases.
Vitamin D: deficiencies can lead to decreased calcium absorption.
Thyroid tests: such as T4 and TSH to screen thyroid disease.
Parathyroid hormone PTH: to check hyperparathyroidism.
Follicular stimulating hormone FSH: to check for menopause.
Testosterone: to check for deficiency in men.
Protein electrophoresis: to identify abnormal proteins produced by a certain type of cancer (called multiple myeloma) that can break down the bone.
Alkaline phosphatase (ALP): to test for increase levels that may point to problem with bones.

Bone markers are blood and urine tests that may sometimes be ordered to help evaluate and monitor the rate of bone resorption and formation.

Tests measuring bone loss.

Bone resorption tests are done to diagnose the rate of bone loss. They can be check before and after treatments. They include:

C –telopeptide (C-terminal telopeptide of type one collagen. (CTx))
Deoxypyridinoline (DPD)
Pyridinium cross links
Tart rate –resistant acid phosphatase (TRAP)5b

Investigations to test bone formation

Bone formation tests performed to identify the rate of bone production. As with bone turn over tests, they may be checked before the start of treatment and periodically after treatment to see if bone information has increased. They include;

Bone specific alkaline phosphatase (ALP)
Osteocalcin.
PINP (Procollagen type 1 N –Terminal propeptide)
1.4) Management of osteoporosis

Prevention

Management is based on taking preventive measures by modifying and maintaining healthy lifestyles of the individuals.

Maintaining a healthy lifestyle means greater protection against fractures in later life.
Maintain a balanced diet to achieve adequate calcium and vitamin D intake.
Avoid smoking and high intakes of alcohol.
Participating in regular, weight-bearing exercise and bone building exercises include running, skipping, aerobics,

It's also important to attain the peak bone mass during adolescence. This level is attaining during the process of Ossification.

Ossification

Ossification is the formation of bone by the activity of osteoblasts and osteoclasts and the addition of minerals and salts. Calcium compounds must be present for ossification to take place. Osteoblasts do not make these minerals, but must take them from the blood and deposit them in the bone. At the birth many of the bones have been at least partly ossified. In long bones, the growth and elongation (lengthening) continue from birth through adolescence. Elongation is achieved by the activity of two cartilage plates, called epiphyseal plates, located between the shaft (the diaphysis) and the heads (epiphyses) of the bones. These plates expand, forming new cells, and increasing the length of the shaft. In this manner, the length of the shaft increases at both ends, and each head of the bone moves progressively apart. As growth proceeds, the thickness of the epiphyseal plates gradually decreases and this bone lengthening process ends. In humans, different bones stop lengthening at different ages, but ossification is fully complete by about age 25. During this lengthening period, the stresses of physical activity result in the strengthening of bone tissue

Peak bone mass

Peak bone mass the maximum bone density and individual can attain, is reached between the ages of 16 -25. It's important to reach peak bone mass because individual become older lower bone mass may increase the risk of stress fractures and increase the risk of osteoporosis. It also important to reach peak bone mass to maintain calcium homeostasis in later life.

Other most common treatments includes

Calcium and vitamin D supplements –this can be benefit for elderly people to reduce the risk of hip fracture.

Bisphosphonates-Hormonal drugs, which maintain bone density and reduce, fracture rates.
Selective Estrogen Receptor Modulators (SERMs)- are drugs which act in a similar way to estrogen on the bone, helping to maintain bone density and reduce fracture rates specifically at the spine.
Parathyroid hormone- stimulates new bone formation and significantly increases bone mineral density and reduce fracture rates
Hormone replacement therapy (HRT) is estrogen replacement for women at the menopause, which help maintain bone density and reduce fracture rates for the duration of therapy.

Problem justification

The prevalence of osteoporosis is increasing in the western societies as well as in the eastern societies. More than 1.5 million osteoporotic fractures are reported annually in United States. Its reaches 15.8% of women who have osteoporosis in both lumbar spine and femoral neck in Canada. Prevalence of the osteoporosis in the hip in Chinese women 10.1-19.8%, in Japanese women is 11.6- 16.8%and in Caucasian woman is 13-20%and 16% of Egyptians menopausal female had lumbar osteoporosis. Prevalence of osteoporosis among postmenopausal women in Sri Lanka is 44.9%. Most dominant risk factors in all countries include age (post menopause), diet in lack of calcium and vitamins, and lack of exercise. Osteoporosis receives low attention and most women are largely unaware of the serious complications associated with it. Risk of acquiring the disease can be reduced by modification of individuals life styles .for example taking high quality and balanced nutrition with adequate calcium and vitamin D intake(dietary supplements), engaging with regular exercise, daily skin exposure to sun light for more than 15minutes and avoid alcohol consumption and cigars smoking.

1.4. Rationale

The objectives of the study are to find out whether the selected population has an adequate knowledge and awareness about osteoporosis and to assess whether they have taken any measures to prevent it. Similar studies carried out in other countries involving women in both rural and urban areas, teenage students, graduates and health care professionals. Sri Lanka is a developing country educational state, facilities, concerns can differ. Thus knowledge and awareness also can differ towards the osteoporosis when comparing with other countries. Therefore the results may also change. So proceed the similar study on a selected population in Sri Lanka will be important.

1.5. Review of literature

An experimental study has done to assess knowledge regarding osteoporosis in school of nursing, Ohio, USA by Doheny *et al*. The study has designed with two groups of 31 young college women and one group received osteoporosis prevention program. They assessed the knowledge based on health belief and self-efficacy model (cited in, bandura, 1977). Eventually they concluded that the subjects in the experimental group had significantly higher knowledge and health belief scores compared to other group.

Another study conducted by Gemalmaz *et al*. To evaluate the awareness, perception, sources of information and knowledge of osteoporosis in a sample of rural Turkish women. Total were 768 women mean age 53.6(age range 40-70). In this study only 44.9% of women have defined the condition accurately.42.6% of women expected to have osteoporosis in future.55% reported television as the main source.

A cross sectional study was conducted over a period of one year from April 2006 to march 2007 in national research center (NRC). Female employees were subjected to evaluate the health education intervention program towards the osteoporosis. In the pretest 52% of women have answered accurately, 13% wrong and 35% were unknown. In the posttest 86%were correct, 8% were wrong and 6% were unknown.

A descriptive study collected the data over two month of period in 2003 revealed following results related to osteoporosis risk factors and practices among Jordanian women. By 192, 12% had family history, 68% of sedentary, 27% were post-menopausal and 5% on corticosteroid therapy.

Another study conducted regarding adolescent's knowledge, attitudes, and practices towards the osteoporosis prevention. A total 329 students who randomly selected from 6 schools, 199 of age 15-18 and 130 of age 19-25 undergraduates in Taichung city Taiwan. They concluded that the osteoporosis prevention programs should start before young adult hood.

A cross sectional study done including 569 postmenopausal women aged more than 49 Palestinian and bone mineral density was measured. The results indicated that 12% area ware regarding the disease and 61% reasonably aware and 27% were unaware.

A study conducted to assess the knowledge regarding osteoporosis among exercise physiologists working in a cardiopulmonary rehabilitation setting in USA. 96 were selected and average age of 42.2 year. The major areas of knowledge deficit found in this study were disease prevalence, nutritional relationship, and prevention.

Another study done to determine the depth and sources of knowledge about osteoporosis among public in Malaysia. Total of 87% of the attendees had heard osteoporosis, 89.5% were concerned about getting osteoporosis. 97.1% identified low calcium intake, 87.8% lack of exercises. 80% have family history and 75.8% in post-menopausal status.

A study conducted to assess the knowledge in teenage girls about risk factors and life style affecting osteoporosis in Jordan. Total 320 of girl's age range 13-17 have participated. 84.3% girls heard of osteoporosis and 15.65 reported that they had not known about that.

Many of above studies have been done to assess the awareness and knowledge about osteoporosis among women teenage students and health care professionals. The studies also report the risk factors among those groups. Objective of this study is to assess the knowledge and awareness of osteoporosis among

school teachers. It will important to assess the knowledge and awareness among educated group in Sri Lanka.

2 Objectives

Primary objectives

The primary objective to assess the awareness of the prevalence of osteoporosis features and risk of osteoporosis among selected population.

Secondary objectives

The secondary objectives are to assess the need for the raising awareness in the community and to assess the need for effective educational programs to modify the lifestyle to prevent risk.

Hypothesis and null-hypothesis

Hypothesis

There is a dependency between educational level and knowledge of osteoporosis.

Null-hypothesis

There is not a dependency between educational level and knowledge of osteoporosis.

03 Methods and materials/methodology

This chapter presents the study area and study population, sampling and sample size, selection criteria (inclusion and exclusion criteria), data collection methods and data collection tools, data entry and analysis.

3.1 Study area, population

Study was carried out in two groups comparing female school teachers aged 35-55 in Pilimathalawa and women relevant same age group in Alpitikanda GN division in Kandy district.

3.2 Sampling and Sample Size

I have chosen random and unbiased sampling considering inclusion and exclusion criteria that are list below. Sample sizes are 35 female school teachers and 25 women from rural area gathering 60 of total sample.

3.3 Selection Criteria

Inclusion criteria

Selected population of female teachers aged 35-55 in Pilimathalawa.

Exclusion criteria

None (among the sample)

3.4. Data collection and data collection tools

Data obtained through personal interviews using prepared questionnaire. The questionnaire consist of six parts and age, educational status are obtained as demographic factors. The first part collected information on awareness of osteoporosis and the sources of its knowledge. From the second part, knowledge about osteoporosis were assessed using several types of questions, related to clinical features, pathophysiology, complications, risk group and risk factors. This part consisted of 18 questions. Each item had true, false, and "do not know" options. The latter option was included to avoid guessing. The analysis was performed by scoring 1 for acorrect response and 0 for an incorrect and "do not know" response. The total score could range from 0 to 18.In this study calculated the percentages of women who could be able to provide 50% or more than 50% of total true answers [score 9 or more than 9 out of 18 marks. (marks >= 9)] And they were considered as having knowledge about the osteoporosis. And also the statistical analysis was done to find association between educational level and knowledge of osteoporosis. Knowledge about food was obtained by the third part of the questionnaire. This consisted four (4) questions. Fourth part of the questionnaire consisted with five (5) questions to assess disease history, prediagnostic tests, and knowledge about side effects of other drugs which they are already taking. Fifth part of the questionnaire used to collect the data about aware awareness of preventive measures. From the sixth part data gathered about their suggestions.

3.5. Data analysis

The collected data were entered to the spread sheet of Microsoft Excel, and Minitab software, Wilcox on Signed Rank Testand Pearson's Chi square test.

4. RESULTS

Awareness of the disease and sources of knowledge

The total 60 women completed the questionnaire. The average age of teachers was 44.17. And 45.52years of rural women's, and age range was 35-55 years old. Of the total sample 96% had heard osteoporosis and sources of awareness as follows.

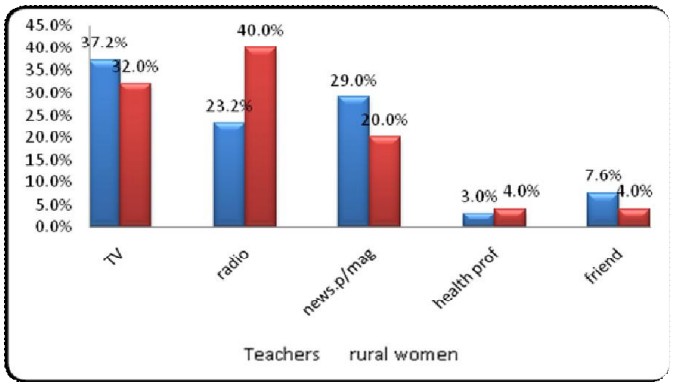


Figure 4.1 Sources of awareness

Knowledge about clinical features

There was not a significant difference of mentioned clinical features between two groups they have given the priority for back pain.

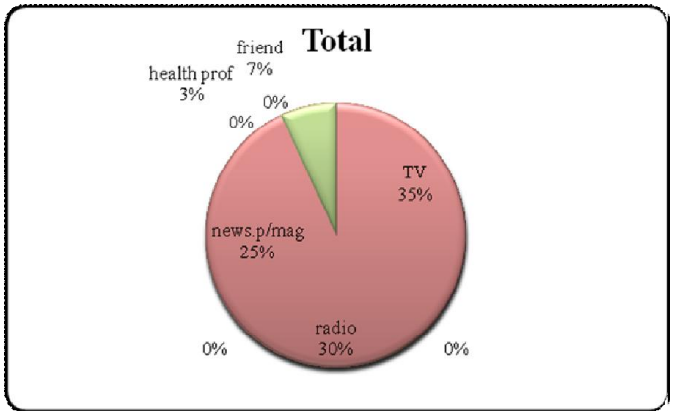


Figure 4.2. Sources of awareness among total sample

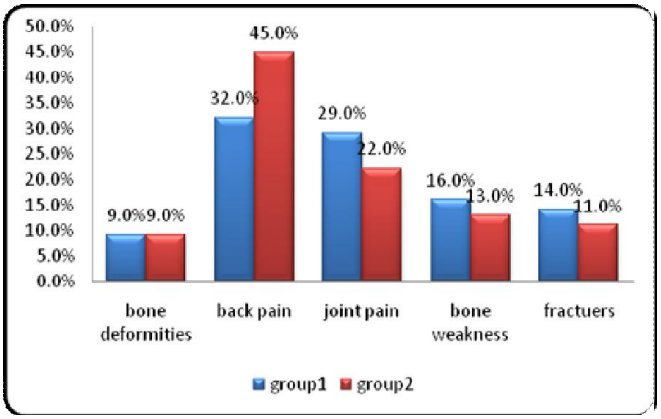


Figure 4.3. Awareness of the clinical features of two groups

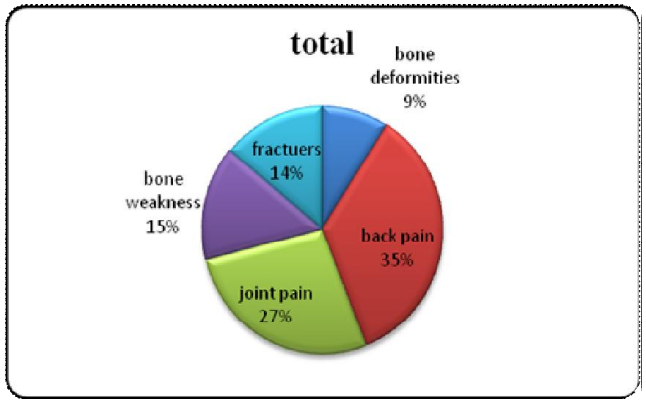


Figure 4.4. Awareness of the clinical features among both groups

Following table content some of the questions they have answered

Table 4.1. Question 01 –osteoporosis can cause bone weakening and fracture as its serious complication

	Yes	No	Don't know
Teachers	35	0	0
	100%	-	-
	10	5	10
Rural women	40%	20%	40%
Total	45	5	10
	75%	8%	17%

Table 4.2. Question-02-osteoporosis is a preventable condition

	Yes	No	Don't know
Teachers	10	5	20
	28.5%	14.2%	57.3%
Rural women	728%	8	10
		32%	40%
Total	17	13	30
	28.3%	21.6%	50.1%

Following two charts shows the awareness of the population about the condition is preventable or not.

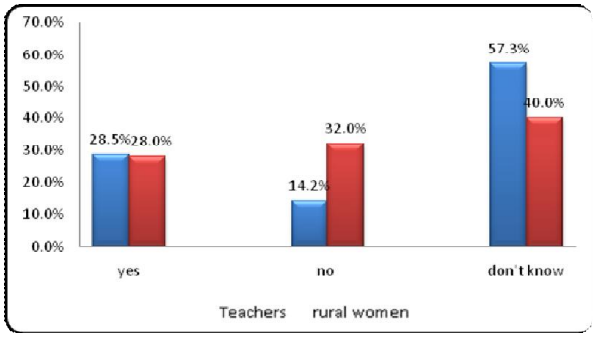


Figure 4.5. Question-02-osteoporosis is a preventable condition

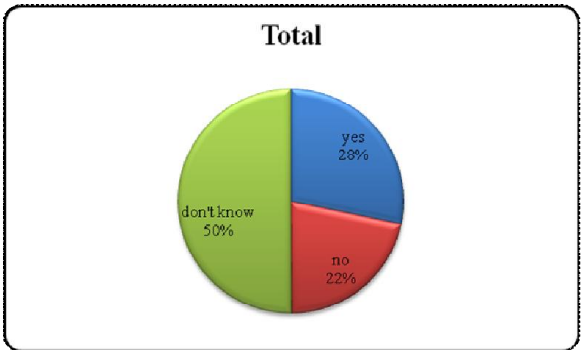


Figure 4.6. Question-02-osteoporosis is a preventable condition

Table 4.3. Question 3-osteoporosis is a condition can be affect both male and female

	Yes	No	Don't know
Teachers	5	6	24
	14.2%	17.3%	68.5 %
Rural women	3	12	10
	12%	48%	40%
Total	8	18	34
	13.3%	30%	56.7%

Above data were put into a pie chart for further clarification

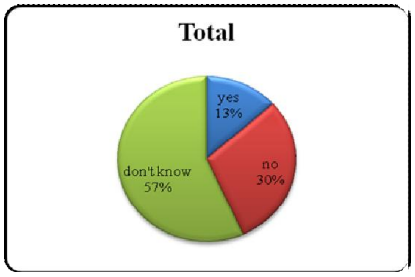


Figure 4.7. Osteoporosis is a condition can be affect both male and female

Table 4.4. Question 4-sedentary life style can cause osteoporosis

	Yes	No	Don't know
Teachers	9	4	22
	25.7%	11.4%	62.9%
Rural women	2	5	18
	8%	20%	72%
Total	11	9	30
	18.3%	15%	66.7%

Following pie chart shows the above information

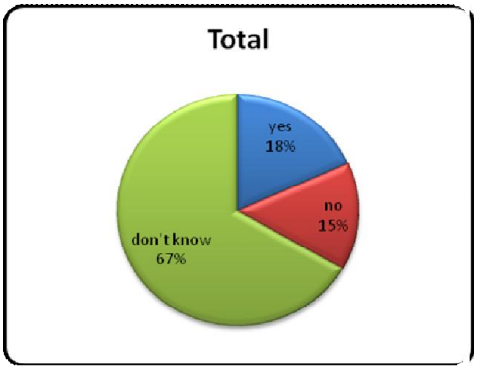


Figure 4.8. Sedentary life style can cause osteoporosis

Knowledge about vitamins and minerals

Majority of the total sample (97%) mentioned that calcium as the necessary element for healthy bones. But there was a significant difference when selecting the vitamin as a necessary factor for bone growth. When comparing both groups 85.7% of school teachers had selected vitamin as a necessary element, but only 8% of rural women had given the response correctly.

Table 4.5. Question – vitamin is necessary element for bone growth

	Yes	No	Don't know
Teachers	30	2	3
	85.7%	5%	9.3%
	2	6	15
Rural women	8%	24%	60%
Total	32	8	18
	53%	13%	34%

Above data were put into a pie chart for further clarification.

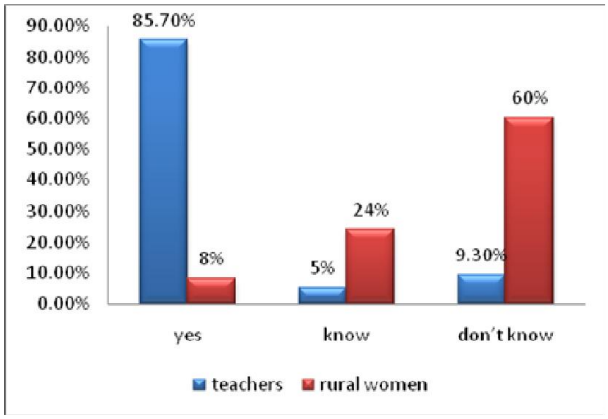


Figure 4.9. Knowledge about vitamin as a necessary element for bone growth

Following chart shows knowledge about vitamin among total sample

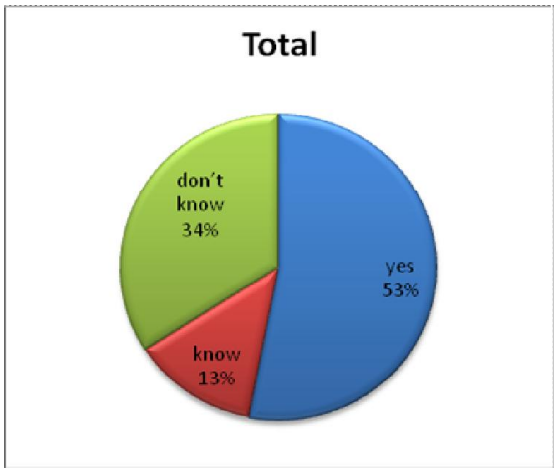


Figure 4.10. Knowledge about vitamin among total sample

Table 4.6.

	Yes	No	Don't know
Teachers	5	6	24
	14.2%	17.3%	68.5 %
Rural women	3	12	10
	12%	48%	40%
Total	8	18	34
	13.3%	30%	56.7%

Table 4.7. Following table contain total answers and total number of individuals

Group	True answers (true answers, score>=9)	false answers (score less than 9)
Number of teachers	14	21
	40%	60%
Number of Rural women	6	19
	24%	76%

According to the above analysis 40% of school teachers answered correctly for all yes, no, don't know type questions. Only 24% rural women answered correctly. Although teachers are aware of osteoporosis than rural women total sample unaware of the condition.

Following statistical analysis was done to find whether there's a correlation between educational level and awareness of the diseases.

Table 4.8. Chi-square test 1: Table of Pearson's Chi square test for the association between the educational level and the knowledge of osteoporosis

	True answers (true answers, score >=9)	False answers (score less than 9)	Total
Teachers	14	21	35
	11.67	23.33	
	0.467	0.233	
	6	19	25
Rural	8.33	16.67	
	0.653	0.372	
Total	20	40	60

Chi-Sq = 1.680, DF = 1, P-Value = 0.195

Table 4.9.

Factor	Teachers			Rural women			Total		
	Yes	No	Don't know	Yes	No	Don't know	Yes	No	Don't know
Genetic (Percentages %)	5 14	10 28	20 57	5 20	5 20	15 60	10 17	15 25	35 58
Age	20 57.1	7 20	8 22.9	13 52	3 12	9 36	33 55	10 16.6	17 28.4
Nutritional deficiencies	25 71.4	7 20	3 8.6	4 16	7 28	14 56	29 48.3	14 23	17 28.7
Lack of exercise	6 17.2	20 57.1	9 25.7	2 8	8 32	15 60	8 13.3	28 46.6	24 40.1
Hormonal changes	18 51.4	8 22.8	9 25.8	3 12	9 36	13 52	21 35	17 28	22 37
medication	6 17.1	7 20	22 62.9	2 8	3 12	20 80	8 13.3	10 16.6	42 70.1
Smoking/alcohol	5 14	20 57	10 29	0 0	5 5	20 80	5 8	25 41.6	30 50.4
Caffeine	5 14	10 29	20 57	0 0	3 12	21 84	5 8.3	13 21.6	41 70.1
Soft drinks	2 3.3	13 37.1	20 59.6	1 4	2 8	21 84	3 8.3	15 25	41 66.7
Other disease	5 14	10 28	20 57	3 12	2 8	15 60	8 13.3	12 20	35 66.7

Above results indicates two variables are independent which mean there is no correlation between educational level and awareness of osteoporosis.

Table 4.10.

Chi-square test 2: Table of Pearson's Chi square test for the association between the educational level and the knowledge of risk factors of osteoporosis

	True answers for factors	False answers for factors	Total
Teachers	7	28	35
	5.25	29.75	
	0.5.83	0.103	
	2	23	25
Rural	3.75	21.25	
	0.817	0.144	
Total	9	51	60

Chi-sq=1.647, DF=1, P-Value=0.199

Above results indicates two variables are independent which mean there is no correlation between educational level and awareness of the risk factors of osteoporosis.

Family history of osteoporosis

Out of the 60 individuals five had a positive family history.

History of pre diagnostic test

Out of 60 of all individuals six had done pre investigations of bones for diagnostic purpose.

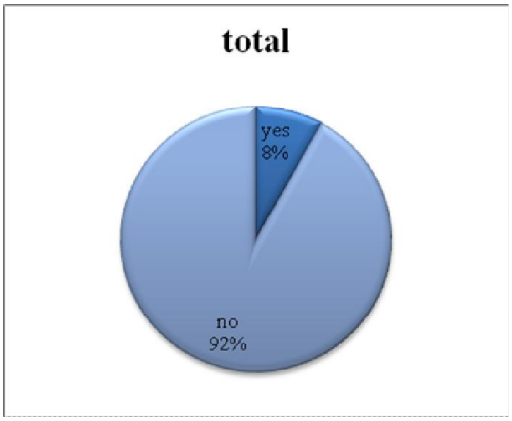


Figure 4.11. Family history of osteoporosis

Figure 4.12

Prevalence of osteoporosis among total sample

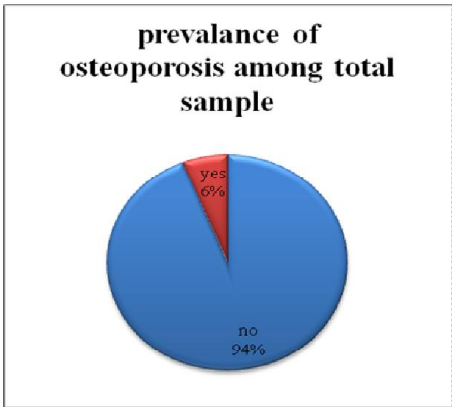
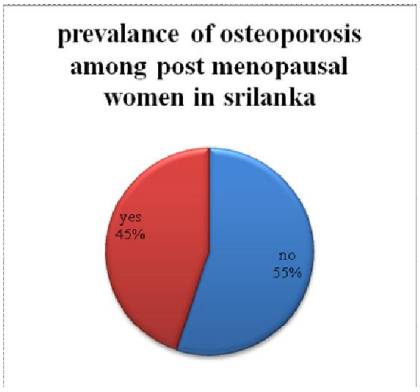


Figure 4.13

Following chart shows that prevalence of osteoporosis among post-menopausal women selected from seven provinces in Sri Lanka except north and east.



Preventive measures

Preparing a balanced diet

When compare the two samples 77.1% teachers are considerable about a balanced diet. From the rest of the teachers, 22.9% were not considerable about a balanced diet

Majority among 22.9% had mentioned that being busy as the main reason.80% of rural women had mentioned that they were not considerable about their diet due to the lack of attention towards this.

Above data has summarized as follows

Table 4.11:
Question –do you very concern about to prepare a balanced meal.

	Group A	Group B
Yes	23	5
	66%	20%
No	12	20
	34%	80%
Being busy	5 (14%)	3 (12%)
Lack of attention	4 (11%)	12 (48%)
Other	3 (9%)	5 (20%)

Figure 4.14
Following chart shows the reasons to not concern about balanced meal

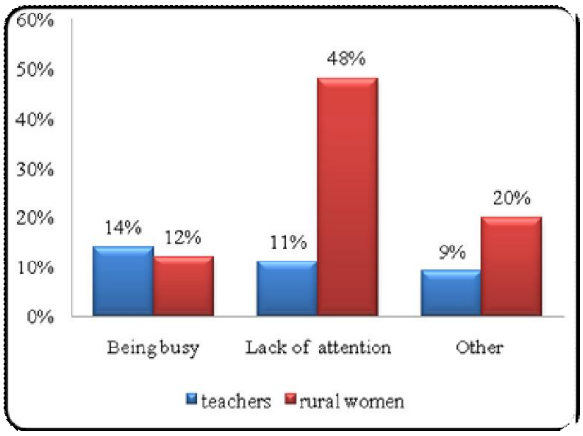


Figure 5. Participating in regular exercises

Table 4.12:

Questions-Do you manage your time to participating in regular exercises?

	Group A	Group B
Yes	5	3
	14.2%	12%
No	30	22
	85.8%	88%
Being busy	2 (5%)	3 (12%)
Lack of attention	20 (57%)	14 (56%)
Other	8(38%)	5(20%)

According to above data both teachers and rural women are largely unconcern about regular exercise due to lack of attention. Above data gathered in to following chart.

Maintaining Healthy Body Mass Index (BMI)

All the teachers (100%) had heard about BMI, but only 14.2% of teachers could be able to clearly explain about measurements of BMI. Out of the 25 of rural women only 55% had heard about BMI and 8% could be able to clearly explain about that.

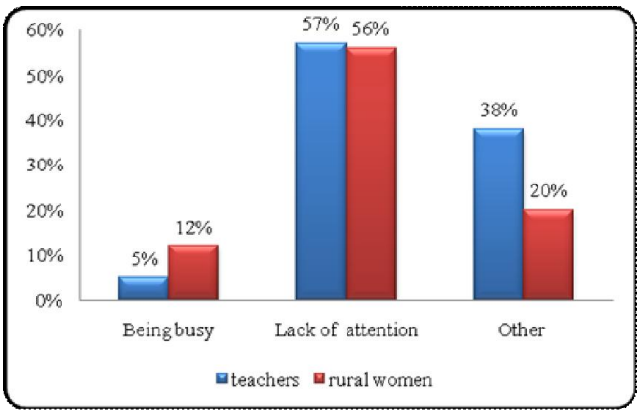


Figure 4.15. Reasons for not engaging in regular exercises

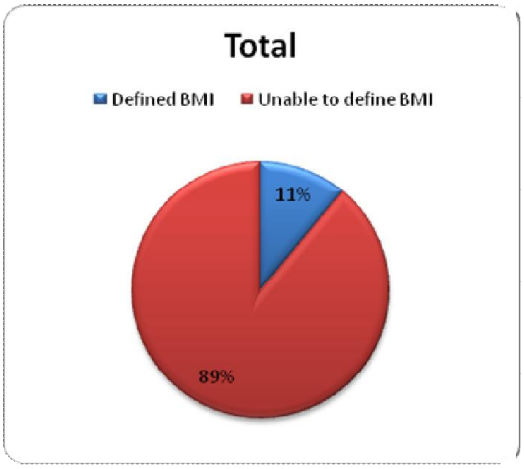


Figure 4.16

Maintaining normal body mass index is very important to healthy life. Although majority of the women have heard about BMI they didn't know how to manage it. Therefore improvement of knowledge regarding BMI is very important.

Table 4.13:

Teachers	Rural women
01)Orientation	01)Orientation
02)Leaflets	02)Leaflets
03)Clinics	03)Clinics
04)Including for the school syllabus	04) TV.
More about,	
Osteoporosis	
Diabetes mellitus	
Hyper tension	
05) Conduct researches to find prevalence and risk.	

Suggestions

Following chart includes the suggestions of the total sample. Most of the teachers suggested that they prefer to know about the disease by means of orientation programmes which are

conducted by the health care professionals. And they emphasized the importance of including the information about osteoporosis and other non-communicable disorders in to the school syllabus. And they also emphasize the Importance of conducting researches

5. DISCUSSION

This study assessed the awareness and knowledge of osteoporosis among sample of school teachers and sample of rural women between ages 35-55 years. Of the total sample 96% had heard osteoporosis and main sources of knowledge were reported as television and radio. But majority reported that they were not affecting for them to being reasonably aware. Therefore the medical professional such as physician and nurses/midwives need to play amore active role as an accurate source of knowledge on osteoporosis for the whole population. In this study, the level of osteoporosis knowledge measured by using a self-administered questionnaire and analytical part done using a scoring system for answers they had given. According to that 40% of school teachers answered correctly for all yes no, don't know type questions while 24% of rural women answered correctly. Although the teachers are aware of the condition as whole fairly low population of women were aware about osteoporosis. In this study majority of them mentioned that back pain as a major clinical feature and fracture as the major complication. But large proportion of them was didn't know that osteoporosis as a preventable condition. They have successfully answered when they choosing the risk category but they couldn't be able to mention the cause accurately. Their knowledge about predisposing factors was very poor. Out of the total sample 55% of women had a myth that osteoporosis is a condition of ageing. Large proportion of women didn't know that genetic, lack of exercise, hormonal changes, and side effects of medications, smoking alcohol, caffeine, soft drinks, and other diseases as pre disposing factors for osteoporosis. They reported 8% of family history of osteoporosis. Prevalence of osteoporosis total sample was 6%. while 66% of teachers out of 35 were very concern about a balanced diet,80% of rural women out of 25,were not concern to prepare a balanced meal due to lack of attention. And also 85.8% of teachers and 88% of rural women did not concern about regular exercise. Out of total only 11% of women could be able to explain about BMI accurately. Therefore it's essential to improve their knowledge by effective educational programmes to modify their life styles.

06 Recommendations and Conclusion

In conclusion, knowledge about osteoporosis among majority of women is low irrespectively their educational status. Therefore it is necessary to promote knowledge in this field. The majority of women surveyed in this study are unaware of the predisposing factors of osteoporosis. Although they had known the complication of the condition majority of them were did not known that osteoporosis is preventable. As an example of a developing country, our population is need of effective education programmes. Future education programmes need to emphasize more strongly on proven risk factors for osteoporosis and measurement of bone density. An understanding of the characteristics of women with poor knowledge may help us to design more appropriate public health educational programmes according to community needs. The results of the study indicated that low awareness among both groups. Therefore educational programmes should address for the community regardless of their educational status.

According to the study the results are provided significant data about women's awareness of preventive aspects of the disease. Majority of women are unaware about the preventive health. Therefore the education programmes should focus on preventive aspects. In the case of osteoporosis the prevention should focused on two aspects.

Adolescence Groups

Teenagers are in growing age and they should maintain their life styles to attain maximum bone density called peak bone mass. Itis reached between the ages of 16 -25. For optimal bone building they need enough calcium and vitamin D, physical activity, hormonal balance, and healthy lifestyle choices like the avoidance of smoking and all other preventive measures. By that they can prevent future risk of osteoporosis

Post-menopausal women

Postmenopausal women are at high risk of osteoporosis because there is a direct connection between lacks of estrogens after menopause. After menopause bone resorption outpaces the building of new bone. Therefore they should also consider about healthy bones and follow the preventive actions. Therefore educational strategies on preventive aspects should address to women and also for adolescence groups. Teachers can play a major role on educating the children and also the community. Health care providers in rural areas should assess the women and address basic prevention strategies before menopause.

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