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Prevalence of Bone Diseases among women (35-60 years) with special reference to osteoporosis: A case study of Patna Town

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Abstract : *The study was undertaken to assess the prevalence of bone diseases with special reference to Osteoporosis in women. The aim of the study was to find out the prevalence and awareness level regarding Osteoporosis. 100 women of age group of 35-60 years were taken from different localities of Patna town by purposive- cum- incidental sampling method. Percentage was drawn of respondent's orientation. 57% women were not aware of Osteoporosis. 49% women did not have a proper diet. It was also found that 46% women fulfill their calcium and vitamin- D requirement*

through diet. It was also found that only 59% women were exposed to sunlight regularly. The study focused on awareness , physical problems and symptoms of the disease. The findings of the study indicate that as far as Osteoporosis is concerned women's perceptions show that it is not merely a physical problem but also a social and cultural problem. Superficial knowledge about Osteoporosis leads to the severe conditions of the disease in women. It is not an individual problem but a universal problem.

Keywords: *Osteoporosis, Calcium, Mineralization, Demineralization, Fracture, Menopause.*

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Introduction :

Health is a vital part of the great experience of living. This is a state of balance, with inputs and outputs of energy and matter in equilibrium (allowing for growth). Health also implies good prospects for continued survival. In sentient creatures such as humans, health is a broader concept. Nutrition is closely related with health. If a person eats the right kind of foods in the required amount, he or she will keep good health provided no other factor intervene (Maimun2006:11-15).

Osteoporosis is defined by the National Osteoporosis Foundation (NOF) as “porous bone”

and “a skeletal disorder”. It has rightly been considered a silent killer. 30% skeletal mass is generally lost before the first sign appears. Bone loss is also determined by menopausal age, and is mainly due to deficiency of ovarian hormone or sex hormone and also by a low calcium intake and unhealthy lifestyle (Raju, 2002:5-7).

According to *World Health Organisation*, Health is a positive state, that means health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. A person may not be suffering from any disease and yet may not enjoy complete well-being. There are many times when we feel tired, we do not enjoy complete well-being even though at other times we do. There are also times when we suffer from an infection or periods of good health. This means no person enjoys full health all the time. So we call a person healthy if he or she enjoys good health most of the time (www.en.wiki.health.org).

As far as health is concerned, we are focusing on “Bone Health with special reference to Osteoporosis in woman.” Strong bones support our body, protect the vital organs of our body from injury and are the framework for muscles that allow us to move. They are also a storehouse for life supporting minerals. Bone diseases refer to the medical conditions which affect the bone. A bone disease is called an “Osteopathy”. It is a condition that damages the skeleton and makes bone weak and prone to fractures. Weak bones are not a natural part of ageing, while strong bones begin in childhood, people of all ages can improve their bone health. Bone health begins at a young age. A woman acquires about 85-90% of her bone mass during childhood and adolescence. By about age 20, bone building is complete but bone mass continues to increase until the early 30s. Bone become stronger and more dense as more calcium becomes part of the bone matrix. If there is not enough calcium deposited in bones during

childhood they may become weak later in life, leading to bone diseases such as Osteoporosis, Osteomalacia, Arthritis, Bone cancer etc. (www.en.org/wiki/bone).

The most common bone disease in woman is Osteoporosis, which is characterized by a reduced amount of bone mass which leads to diminished physical strength and susceptibility to fracture. In India, 35% of post menopausal women are osteoporotic and at present more than 5 crores of general population are suffering from Osteoporosis, of which 3 crores are females.

The incidence of Osteoporosis is expected to multiply five fold in next fifty years:-

1960	–	40 million cases
2000	–	200 million cases
2050	–	1000 million cases

Source : Family Health Survey, 2006

Osteoporosis is a metabolic bone disorder which serves to be a major health concern in the elderly population. It is one of the most common bone disease, characterized by the impairment of bone strength due to low bone mass and defects in bone tissue micro – architecture. This makes the bone fragile thereby increasing the risk of fractures. It is a disease in which the bones become brittle and weak to an extent that they are not even able to bear normal body weight. It occurs due to depletion of bone proteins and minerals like calcium or vitamin- D. Deficiency of either one or all of them in any form, be it dietary (decreased intake or absorption), decreased formation of bone proteins or decreased deposition of minerals and calcium, can lead to severe bone depletion or Osteoporosis (Health Screen 2013:14-18).

Types of Bone Disease :

- **OSTEOPOROSIS** - It refers to weak and porous bones that are incapable of maintaining normal bone functions.

Osteoporosis occurs when bone loses density.

- *OSTEOGENESIS IMPERFECTA* - Also known as brittle bone disease, osteogenesis imperfecta figures in the list of bone diseases and disorders that are caused due to mutations in certain genes. The mutations affect the way the body makes collagen. Those who suffer from this disease are highly susceptible to fractures.
- *OSTEOMALACIA* - Osteomalacia is an acquired condition caused by deficiency of vitamin-D. Moderate to severe deficiency of vitamin-D impairs the bone building process, leading to soft and weak bones.
- *FRACTURES* - Fracture refers to a breach or break in the continuity of bones. The most commonly fractured bones are long bones of the body. In some susceptible individuals, the spinal and pelvic bones can also get fractured.
- *OSTEITIS FIBROSA CYSTIC* - Hypersecretion of certain hormones like parathyroid gland leads to excessive resorption leading to osteitis fibrosa cystic bone lesions. The primary role of this hormone is to control the levels of calcium, phosphorous and vitamin- D that eventually control the bone mineralization.
- *OSTEOARTHRITIS* - This is a common form of arthritis that is characterized by the degeneration of joints owing to the breakdown of cartilage. Cartilage refers to the connective tissue that coats the ends of the bones and acts as a protective covering for the bones. When this tissue gets worn out with age, the bones start

rubbing against each other. Friction between the bones gives rise to inflammation, and may cause development of bony outgrowths that are referred to as bone spurs. Joint pain, stiffness and reduced range of motion of the affected joint are some of the symptoms of this bone disorder.

- *RICKETS* - Rickets is defective mineralization of bones due to deficiency or impaired metabolism of vitamin-D, phosphorous or calcium potentially leading to fractures and deformity.
- *BONE TUMOUR* - A bone tumor is a neoplastic growth of tissue in bone. Abnormal growths found in the bone can be either cancerous or non-cancerous.
- *BONE CANCER* - It begins in any bone of the body, but it most commonly affects the long bones of the arms and legs. Cancer refers to abnormal and uncontrolled cell division that leads to the development of malignant growth. Primary bone cancer refers to abnormal division of cells in the tissues that make up the bones(Malhotra, 2008:23-28).

Signs and Symptoms :

Osteoporosis is a relatively silent disease and is identified only by the measurement of bone density or when the fracture occurs. Osteoporosis does not manifest any symptom, however on a later stage, the bones become fragile and begin to break. As age advances there is reduction in bone density, resulting in brittle bones. These brittle bones are easily susceptible to fractures even at low impacts and pressures, as compared to the normal bones. No symptoms are observed in early stages of bone loss, but when the bone gets considerably weakened, following signs and symptoms may be observed (Thomkas, 2000:146-151) :-

- Bone pain and tenderness
- Broken bones (fractures) – Neck, femur, trochanter vertebral, wrist
- Loss of height over time
- Astooped posture
- Moderate to severe back pain due to collapsed or fractured vertebra
- Pain coming down the legs and in multiple pains
- Swelling in knee/ joint

Risk Factors :

- Sex
- Age
- Family history
- Eating disorders
- Sedentary lifestyle
- Known low BMD
- Low physical activity or sedentary lifestyle
- Nutrient deficiency (vitamin-D, calcium)
- Low exposure to sunshine
- Alcoholism
- Smoking
- Low BMI (especially in postmenopausal woman)

Causes :

- The strength of the bones depends on their size and density, bone density depends in part on the amount of calcium, phosphorous and other minerals bones contain.
- When the bones contain fewer minerals than normal, they are less strong and eventually lose their internal supporting structure.

Significance of the Study :

Good health is a vital part of living being. Health provides man an instrument to fight disease. Steady progress in the

fields of education, medicine, surgery as well as public health has proved to be helpful but it has also affected the community adversely. Health is a matter which affects not only each individual but also the community in which we live. An unfit individual cannot make full use of his life nor can an ailing community play its role. Concept of health is vitally important to all of us. Lack of proper food causes deficiency diseases. Medicines are needed to cure and prevent disease and promote health.

Objectives :

1. To know the awareness and knowledge regarding bone problems in women.
2. To know the physical problem in women suffering from osteoporosis.
3. To identify the symptoms of osteoporosis in women.
4. To know the socio-economic condition of women (35 - 60years).
5. To know about their habits and types of dietary intake.

Hypotheses :

1. Women (35-60 years) are less aware of the facts related to Osteoporosis.
2. Women (35-60 years) are generally seen suffering from bone related physical problems.
3. Women of lower socio-economic background are more prone to bone related problems.
4. Lack of proper food intake causes deficiency diseases.

Methodology :

The study was conducted in Patna town. 100 women were selected by purposive cum co-incident sampling method by the researcher who visited different localities of Patna town. Those who were available and fulfilled the purpose of the

present study were selected as the sample of the present study. The data was collected amongst the women on the awareness and knowledge of Osteoporosis with respect to the general health problems. The results were analyzed in three broad dimensions that included the following areas:-

- I. General information
- II. Awareness level about Osteoporosis
- III. Impact of economic and living environment on health.

Result and Discussion :

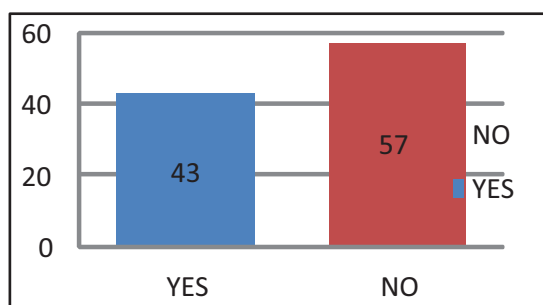


Fig. 1. Awareness regarding Osteoporosis (N=100)

Fig. No.1 depicts that 43% women are aware and 57% are unaware about osteoporosis because 20% respondents were illiterate. Among literate women the level of awareness is low because there is no proper campaign in the community by the government or NGOs. Counselling sessions and workshops are not properly conducted amongst women because of which health and economic assessments are very scarce caused by absence of information. Hence, *Hypothesis 1*-“Women are less aware of the facts related to osteoporosis” is proved.

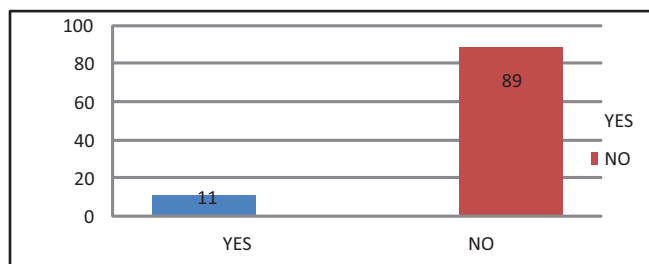


Fig. 2. Respondents undergone BMD Test

Fig. No. 2 shows that 89% women have not gone for *Bone Mineral Density Test* while 11% of women have attempted the test. The results shows that a higher percentage of the respondents were not aware or interested. According to them it is time taking, costly and not convenient.

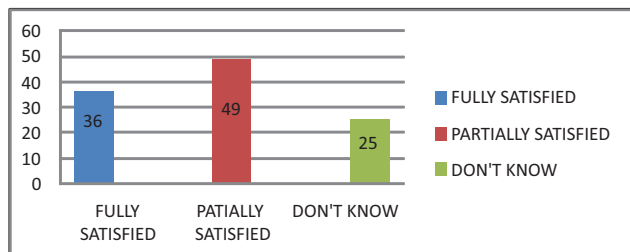


Fig. 3. Satisfaction about Nutritional Intake

Appropriate nutritional intake is necessary for healthy and disease free life. It provides all the nutrients which regulates metabolic activities and maintains all the functions of the body and strengthen the bones. Fig. No. 3 shows that 36% women are fully satisfied with their nutritional intake, 25% women don't know and 49% are partially satisfied because they are in habit of skipping their meals and also taking junk food. The figure above reveals that a very low percentage of women are fully satisfied with their nutritional intake and most of them are partially satisfied with their nutritional intake which may be a cause for deficiency disease like osteoporosis. Unawareness of proper nutritional intake may lead to deficiency disease. Therefore, *Hypothesis 4*-“Lack of proper food intake causes deficiency diseases” is proved.

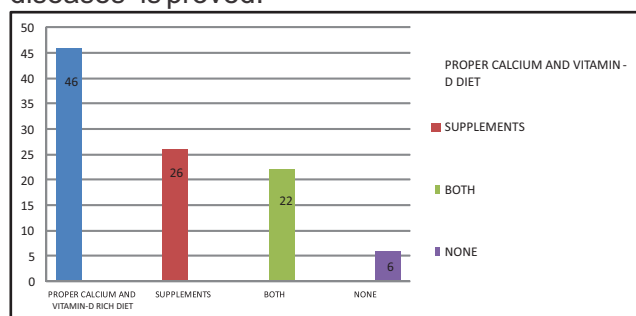


Fig. 4. Fulfillment of Calcium and Vitamin-D (N=100)

Fig. No.4 shows that 46% women fulfill their calcium and vitamin-D requirement through diet because they think that fulfilling the mineral needs through diet is important as it helps in mineralization. A diet low in mineral contributes to diminished bone density, early bone loss and increased risk of fractures.

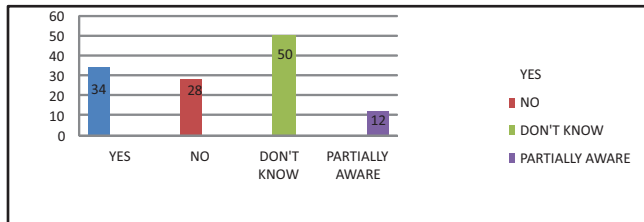


Fig. 5. Intake of sufficient calcium in early Age (N=100)

Fig. No. 5 shows that 34% women have taken sufficient calcium in their early age, 28% have not taken while 12% are partially aware. 50% women do not know that they had taken calcium in their early age or not. Sufficient calcium intake in early ages helps in bone mineralization and keeps the bone healthy after demineralization starts. Inadequate calcium intake during childhood and adolescence can impair bone development and may prevent the attainment of optimal peak bone mass during early adulthood. In older adults inadequate calcium intake accelerates bone loss and most likely contributes to the development of osteoporosis.

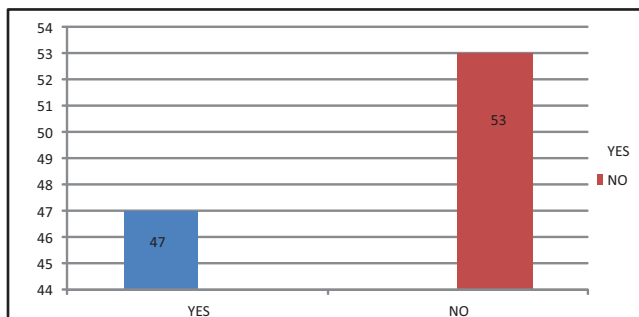


Fig. 6. Habit of regular Exercise (N = 100)

Fig. No. 6 shows that 47% women are in a regular habit of exercise while 53%

women are not in a regular habit of exercise. Physically inactive women are more prone to osteoporosis. Exercise is very important for slowing the progression of osteoporosis. Walking 100 or 50 steps in room may be starting exercises. When the normal body reflexes returns a small ration of competitive sporting activities needing thumping running and jumping is of immense utility. Dancing, running, cycling, swimming is a good exercise.

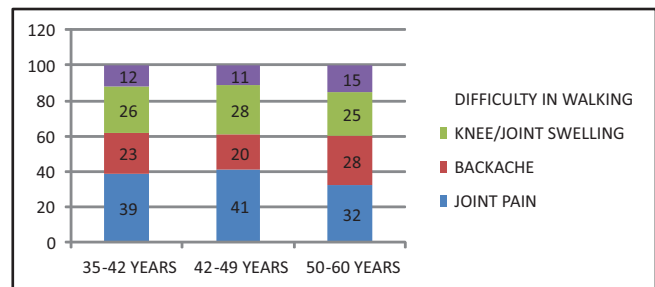


Fig. 7. Physical Problems (N=100)

Fig. No. 7 reveals that women after 35 years of age suffer from many physical problems. The percentage of women having difficulty in walking is 12%, 11% and 15% in women of 35-40 years, 42-49 years and 50-60 years respectively. Women having knee/joint swelling are 26%, 28% and 25% in women of age 35-42 years, 42-49 years and 50-60 years respectively. 23%, 20% and 28% women were suffering from backache of age 35-42 years, 42-49 years and 50-60 years respectively. Joint pain prevails in most of the women, 39%, 41% and 32% women were seen suffering from this aged 35-42 years, 42-49 years and 50-60 years respectively. Most of the women face these physical problems because after the age of 30, demineralization of bones start and these problems occur due to weakening of bones. Other than this lack of physical activity also contribute to various physical problems. Hence, *Hypothesis 2- "Women (35-60 years) are generally seen suffering from bone related physical problems"* is proved.

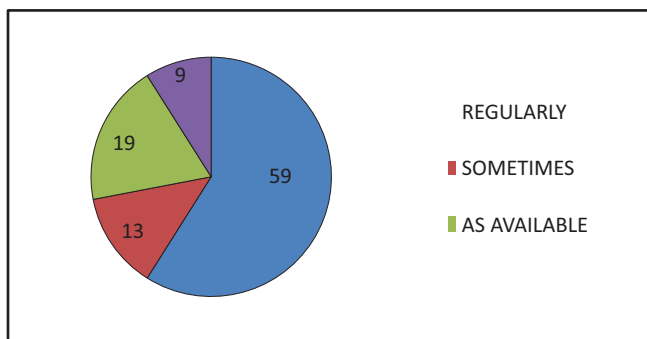


Fig. 8. Exposure to Sunlight (N = 100)

Fig. No. 8 shows that 59% women are exposed to sunlight regularly, 13% sometimes, 19% as available and 9% do not take it as a part of health. Regular exposure to sunlight is a good source of vitamin-D. It is recognized as the sunshine vitamin. Vitamin-D helps in the absorption of calcium. Women in the past had a habit of worshipping the sun by which unknowingly they were exposed to sunlight and also kept good health. But, nowadays all women do not follow this. Houses before were open which allowed the entry of sunlight into the house but, Urbanization has almost put an end to this system. Vitamin D is synthesized in the skin when exposed to ultraviolet-B (UVB) radiation from sunlight.

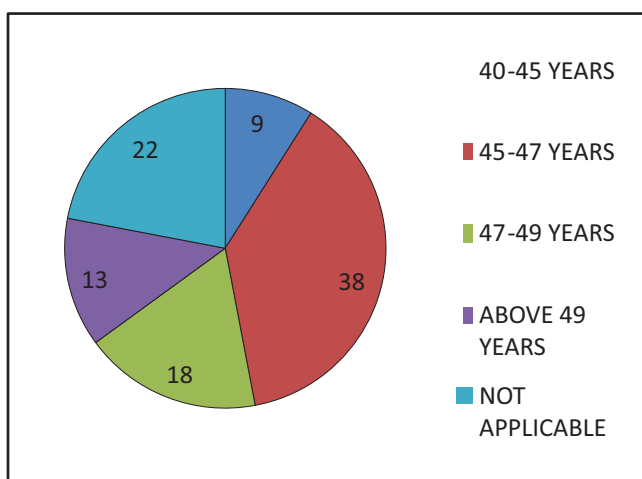


Fig. 9. Age of Menopause (N = 100)

Fig. No. 9 shows that 9% women had their menopause between 40-45 years, 38% women between 45-47 years, 18% women between 47-49 years and 13% women above the age of 49 years.

However, 22% women were not applicable as they were not in their menopausal period. There is a direct relationship between the lack of estrogen during premenopause and postmenopausal period that increases the risk of osteoporosis. After menopause, bone resorption (breakdown) outpaces the building of new bone. The female sex hormone estrogen plays an important role in maintaining bone strength. Estrogen levels drop during menopause, at around the age of 50 years, resulting in increased bone loss. If a woman's peak bone mass before menopause is less than ideal, any bone loss that occurs during menopause may result in osteoporosis.

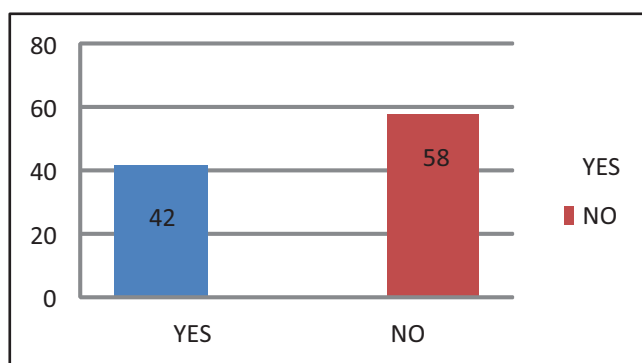


Fig. 10. Awareness about the Preventive and Precautionary steps while entering / already in menopausal Period (N=100)

Fig. No. 10 reveals that 42% women are aware about the preventive and precautionary steps to be taken while entering/ already in menopausal period while 58% women are not. Precautionary steps helps reducing the risk of osteoporosis. If the precautions are taken from early ages it is more beneficial. Physical activities, appropriate intake of calcium, vitamin-D and other minerals help in reducing the risk of osteoporosis.

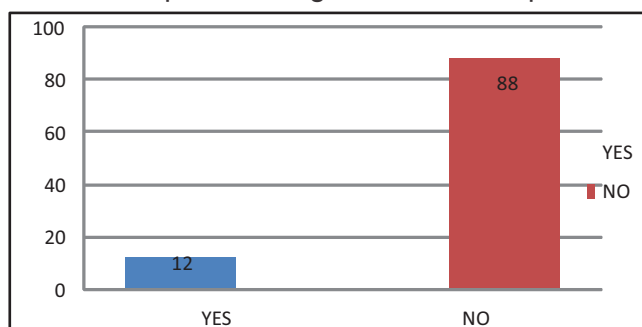


Fig. 11. Awareness regarding the Government Campaigns to prevent bone related Diseases (N = 100)

Fig. No.11 shows that 12% women are aware of the government campaigns to prevent bone disease while 88% women are not. The government runs programs such as distribution of calcium tablets or holds workshops in order to make the women aware about the bone diseases and prevent them from osteoporosis. But, these programs are not implemented properly due to which there is still an absence of information on bone diseases especially osteoporosis.

Conclusion and Suggestion :

It is concluded that there is little awareness about osteoporosis amongst women. 57% women are not aware about osteoporosis which is one of the major diseases. 89% women have not attempted BMD test which is important to know the density of bones. 49% women are partially satisfied with their nutritional intake whereas 25% do not know about their nutritional intake. 46% women fulfill their calcium and vitamin-D requirement through diet while 26% take help of supplements. 44% women are not aware about the nutritional needs of their body according to their age while 45% do not know about the nutritional needs of the body. 53% women are not in a regular habit of exercise which also makes their bone weak. Women of different age groups suffer from different physical problems such as joint pain, backache, joint/ knee swelling etc. 73% women do not take alcohol or tobacco which interferes with the body's ability to absorb calcium. Women these days are least exposed to sunlight which is an excellent source of vitamin-D. 59% women don't take it as a part of health. 38% women were found to have menopause at the age of 45-49 years and also had the symptoms of osteoporosis. 58% women were not aware about the precautionary and preventive steps while entering/ already in menopausal period and lack of this awareness may be a cause of osteoporosis. 52% were found not leading a healthy lifestyle. 47% women

preferred homemade food, 14% junk food while 32% opted for both. 88% women are not aware about the government campaigns. Lastly it is said that, superficial knowledge about osteoporosis lead to the severe conditions of the disease in women. It is not an individual problem but a universal problem.

Following suggestions could be made :

- Counsel all women on risk factors for osteoporosis.
- Perform BMD tests for all postmenopausal women with fractures.
- Keep the body active and exercise regularly.
- Take balanced diet with special emphasis on minerals and vitamins.
- Take vitamin and mineral supplements if the body's need is not fulfilled by diet.
- Avoid smoking and drinking.
- Check for underlying factors for bone loss such as :-
 - Vitamin – D deficiency
 - Over dieting
 - Thyroid problems and excessive thyroid medication.
 - Chronic kidney, liver or lungs disease.
 - Bone robbing drugs such as corticosteroids, anti- seizure medications, chemotherapy.

Prevention :

- Do exercise such as walking, running, skipping or jogging regularly.
- Avoid smoking, it can reduce the levels of estrogen and increase bone loss.
- Avoid excessive alcohol.
- Regular exposure to sunlight.
- Intake of proper nutritional food.

National Osteoporosis Foundation Guidelines:

- Calcium intake 1200mg/ day.
- Vitamin D 400-800 IU/day for high- risk patients.
- Regular weight-bearing, muscle-strengthening exercise.

Lifestyle and Home Remedies :

- Maintain good posture- good posture which involves keeping the head held high, chin in, shoulders back, upper back flat and lower spine arched- helps to avoid stress on the spine. When sitting or driving place a rolled towel in the small of the back. Do not lean over while reading or doing handwork. When lifting, bend at the knees, not the waist, and lift with the legs, keeping the upper back straight.
- Prevent falls.
- Manage pain. Do not ignore chronic pain.

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