

# **Role of Dietary Pattern in Prevention of Osteoporosis in Post Menopausal Females**

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## **ABSTRACT**

**Background:** Exponentially increasing osteoporosis in postmenopausal women has become an emerging issue globally. Being a disease of older age, osteoporosis can bring about a lot of adverse effects for the postmenopausal women.

**Aim:** To assess the role of diet in causing / preventing osteoporosis in postmenopausal women.

**Method:** It was descriptive cross-sectional survey carried out at OPD of two major department of Services Hospital, over a period of two months. All patients presenting in OPD were included in this study. They were asked to fill a proforma. All data was analyzed using SPSS version 20.

**Results:** A total of 50 post menopausal women were included in this study. Age of onset of menopause ranges from 30 to 50 years, 84% of the female were found to be having fruits weekly whereas 66% were having vegetables on daily bases. Also 82% of the women were having meat and 44% of the women were having milk weekly. Seventy percent of the women had never taken calcium or vitamin D supplements. A total of 36(62%) of the women developed osteoporosis 2-5 years after the onset of menopause where as 9(18%) of the women developed osteoporosis 1 year later.

**Conclusion:** Osteoporosis in postmenopausal women is more prevalent in women belonging to lower economic class and it develops later in women taking calcium and vitamin D supplements and those frequently using milk and milk products, than in women not using them.

**Keywords:** Osteoporosis; Menopause; Vitamin D; Calcium

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## **INTRODUCTION**

Osteoporosis is a skeletal disorder characterized by low bone mass and increased bone fragility and susceptibility to fractures<sup>1</sup>. Osteoporosis is characterized by a decrease in bone mass and density, causing bones to become fragile and increasing the risk of fractures. In the United States 26% of women who are 65 years or older, and more than 50% of women who are 85 years or older have osteoporosis. Over 1.5 million fractures, requiring about 500,000 hospitalizations and costing the health care system about 12 billion dollars, occur every year as a result of osteoporosis<sup>2</sup>. Men are not immune to osteoporosis, but the incidence is significantly lower than women<sup>3</sup>. It is estimated that 1 in 3 women and 1 in 10 men now aged 55 years or older are destined to develop osteoporosis within their lifetime<sup>4</sup>.

Healthy-eating advice to decrease sodium intake, to increase potassium intake, and to consume more fresh fruits and vegetables is unlikely to be detrimental to bone health and may be beneficial. Several studies have shown that vitamin D deficiency is widespread. Researchers at Boston University School of Medicine found that 52% of postmenopausal women with osteoporosis had

abnormally low vitamin D levels and commensurate high levels of PTH<sup>5</sup>.

Osteoporosis is classified as either primary or secondary depending on its underlying causes. Primary osteoporosis is subdivided into two types: Postmenopausal [Type I] osteoporosis occurs 15 to 20 years after menopause in females, following a decline in estrogen levels. Age-associated, or senile [Type II] osteoporosis occurs after approximately age of 70 years in both genders. In contrast to these two types of primary osteoporosis, secondary osteoporosis is the result of specific conditions such as disease, surgery, and drugs<sup>6</sup>.

Pakistani females keep themselves busy in household chores and don't pay attention in taking proper diet. Situation in Pakistan is not different from other developing countries where on average every woman gives birth to 5 children at least; these women lose a lot of calcium during lactation and don't replace it accordingly. Multiple studies reveal that in Pakistan > 6 million people are suffering from osteoporosis. Risk of osteoporosis can be reduced by taking diet rich in dairy products, vegetables, fresh fruits, calcium and vitamin D supplements<sup>7,8,9</sup>.

Osteoporosis is associated with deficient calcium intake, and excess intake of animal protein, lack of exercise, caffeine and alcohol intake. In this modern era, people prefer cold drinks, chocolates,

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fast food, instead of taking proper nutritious diet which in turn increases risk of osteoporosis<sup>10,11</sup>.

Since very little work in Pakistan has been done so far in this important field, so this study was planned. The objective of this study was to assess the role of nutrition in osteoporosis in women presenting in our OPD.

## MATERIALS AND METHODS

A descriptive cross-sectional study was conducted at outpatient department of orthopedic & gynaecology departments of Services hospital, Lahore. This study was conducted over a period of two months from January to February 2027. After approval from ethical review board a total 50 females diagnosed as case of osteoporosis, aged above 45 and having menopause were included in this study. These females were explained the purpose of the study and after taking verbal consent, structured questionnaire was used to collect data. SPSS software version 20 was used for analysis of data. Chi-square test was applied on the qualitative outcome and P value  $\leq 0.05$  was taken as significant.

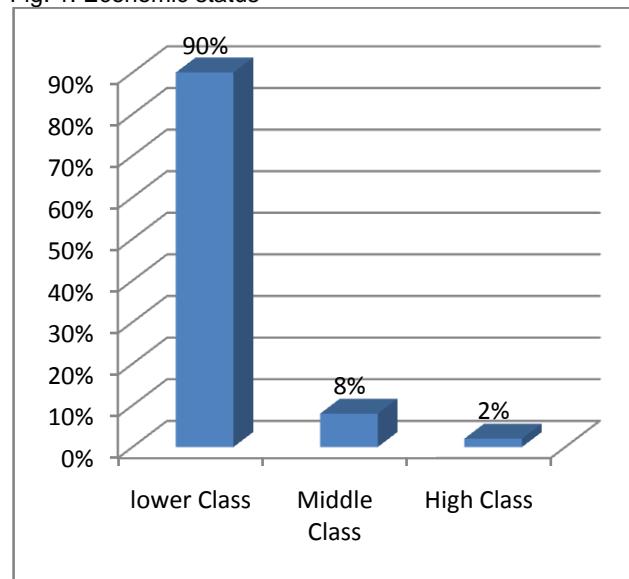
## RESULTS

A total of 50 female patients were interviewed. The age of patients ranged from 30 to 51 years. Among them, 42(84%) women had age of onset of menopause between 42 and 52 years & 8(16%) women having menopause between 30 to 41 years of age. Patients were divided into three groups according to family income per month. Regarding economic status, patients were grouped in 3

Fig. 2 Frequency of dietary habits of the women

economic classes, according details shown in figure 1. Regarding dietary habits, 42(84%) of the patients reported having fruits weekly whereas 33(66%) of the females interviewed were having vegetables on daily bases. Also 41(82%) of the women were having meat and 22(44%) of the women were having milk weekly, all the details are summarized in figure 2. It was found 70% (35) of the ladies had never taken Calcium or Vitamin D supplements whereas remaining 15(30%) of the patients took Calcium & vitamin D supplements& details shown in figure 3

Fig. 1: Economic status



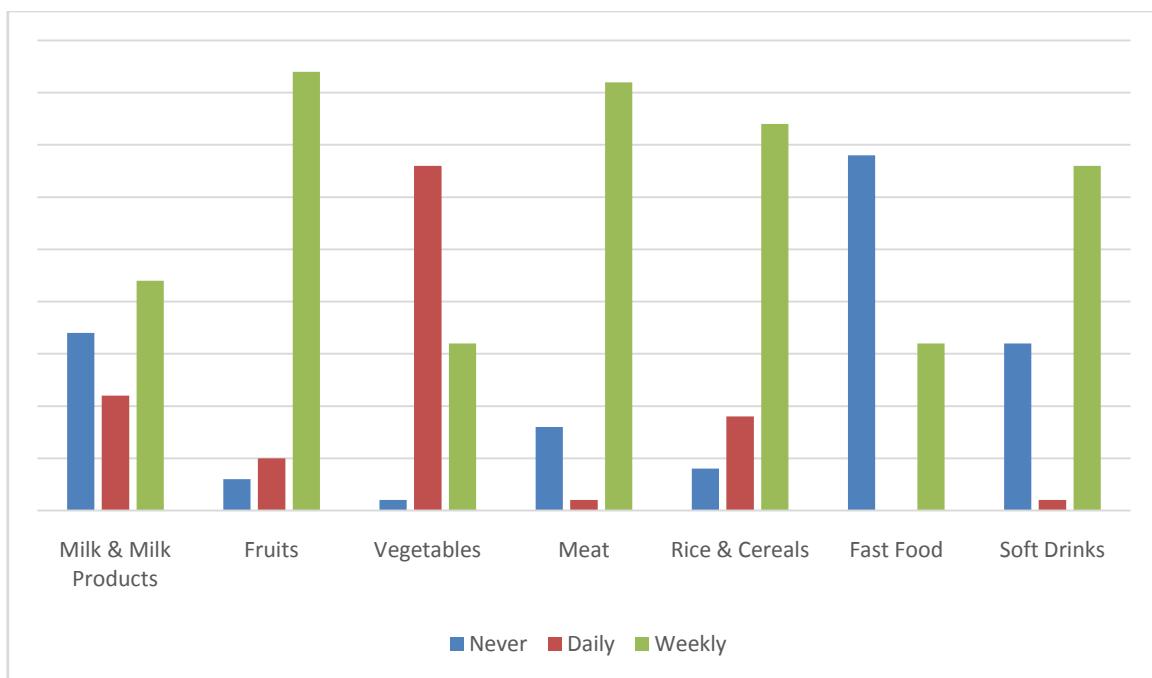
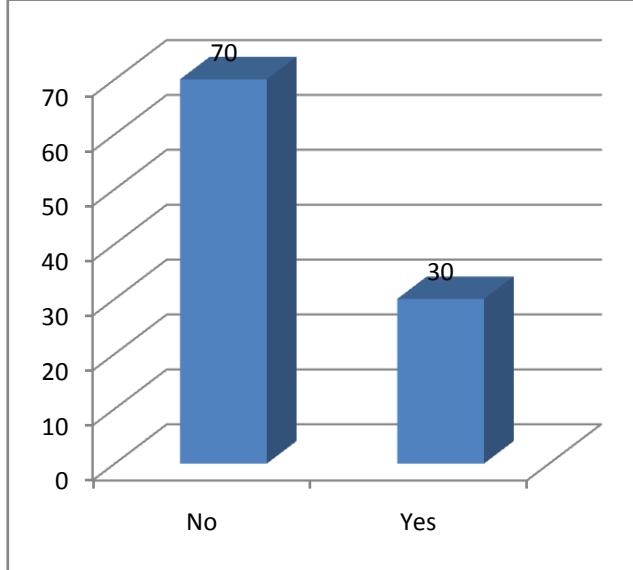


Fig. 3 Intake of calcium and vitamin D



## DISCUSSION

Osteoporosis is one of the commonest problems faced by postmenopausal women. Risk of osteoporosis can be reduced by taking diet rich in dairy products, vegetables, fresh fruits, calcium and vitamin D supplements. In this modern era people prefer cold drinks, chocolates, fast food, instead of taking proper nutritious diet which in turn increases risk of osteoporosis<sup>12</sup>.

Thus, many studies have shown that milk plays a vital role in the prevention of osteoporosis after menopause as those women who took milk daily

developed osteoporosis later than those who never took milk<sup>13, 14</sup>. Similar results were presented in the study conducted in the Nutritional Science Laboratory, Saitama, Japan which states that milk is recommended as an excellent calcium source for bone health. Moreover, milk is considered to contain other components effective for bone health<sup>15, 16</sup>. According to another research conducted by Joanna Cadogan and Richard Eastell on milk intake and bone mineral in adolescent girls, adolescence is a critical time for bone mineral acquisition. An increase in milk consumption among adolescent girls resulted in significant gains in bone mineral over an 18 month period. This simple intervention indicates that increased milk consumption may be associated with higher peak bone mass. They thus concluded that increased milk consumption enhances bone mineral acquisition in adolescent girls and can favorably modify attainment of peak bone mass<sup>17</sup>.

Moreover, according to our research, 35(70%) of the women never took Vitamin 'D' or calcium supplementations after menopause. In them, 52% of the women developed osteoporosis in 2-5 years and 16% developed osteoporosis in 1 year. However, 30% took vitamin D and Calcium supplementations, in them 18% developed osteoporosis in 2-5 years and 3(6%) developed osteoporosis in a year after menopause<sup>18</sup>. Similar results were seen in previous studies which found that 52% of postmenopausal females with osteoporosis had abnormally low vitamin D levels. Study conducted by Meryl LeBoff and colleagues at Brigham and Women's Hospital in Boston concluded that 50% of ladies admitted with acute osteoporosis-related hip fracture were vitamin

D deficient which backs out study<sup>19</sup>. Also daily supplementation with 1200 mg of calcium and 800 IU of vitamin D3 (cholecalciferol) for 3 years reduces the risk of osteoporosis by 23%. The researchers also noted that the bone density in calcium/vitamin D supplemented women increased by 2.7% over an 18-month period. In a study from Johns Hopkins found that optimal intakes of both calcium and vitamin D are relatively cost-effective, safe, and easily implemented approaches to maintain existing bone mass and assist in the prevention of fractures<sup>20</sup>.

According to our research, 29(58%) of the women never took fast food in which 21(42%) developed osteoporosis in 2-5 years. 33(66%) took soft drinks weekly in them 20(40%) developed osteoporosis in 2-5 years after menopause. So according to our study there is no statistical significant relationship between intake of fast food and soft drinks with the development of osteoporosis.

## CONCLUSION

Osteoporosis among postmenopausal ladies develops later in those who frequently use milk and milk products, than in women not using them.

**Limitations:** Also there were some limitations of this study. It was a short duration study. Also it had small sample size, so care must be taken while projecting these results to whole population. This study was conducted in single institute so variation from these results can occur while considering all hospitals.

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