

## Survey on Prevalence of Vitamin D as Well as Calcium Deficiency Plus Awareness about Osteopenia and Osteoporosis in Females

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### Abstract

**Introduction:** Calcium as well as vitamin D is crucial for bone health. Their deficiency may lead to weak bones by lowering the density of bones, called to be as “osteopenia”. It is alarming sign for patient and healthy life style and adequate diet can control the further damage of bone. Inadequate care may lead to “Osteoporosis”, in which corrosion of bone tissue plinths and disruption of bone architecture take place, the bone becomes consequently fragile that a relatively minor smash or fall causes a fracture or vertebrae to ruin. The subsequent fracture may lead to loss of movement and individuality or freedom.

**Objective:** Our study aims to realize the Frequency of Vitamin D and Calcium deficiency in females and also about awareness of osteopenia and osteoporosis in females in Karachi, Pakistan.

**Method:** A cross-sectional and random method was used to collect data from females about their vitamin D and calcium level and also about the osteopenia and osteoporosis in Karachi, Pakistan in the month of January-March, 2015.

**Results:** According to our survey on vitamin D and Calcium deficiency, we find 41% females are deficient to Ca and Vitamin D, 78% females feel pain in back, legs and joints, only 11% females have tested their Vitamin D level and 12% females have tested their Calcium levels. According to our survey on awareness about osteopenia and osteoporosis, we find that only 34% females have knowledge about osteopenia and osteoporosis.

**Conclusion:** According to our survey, we find that many females are Vitamin D and Calcium deficient but they are not aware about their deficiencies. Very less number of females has tested their Vitamin D and Calcium levels. Awareness about the osteopenia and osteoporosis is also less in females. Steps should be taken at National level to provide its awareness through booklets and proper usage of social media and also to measure blood levels of vitamin D for those who cannot afford it.

**Keywords:** Vitamin D; Calcium; Bones; Osteopenia; Osteoporosis

### Introduction

Vitamin D is precise significant for bone health. It supports build stronger bones, somewhat by amassed the absorption of calcium [1]. Calcium and vitamin D have extended been documented as vital and mandatory nutrients for bone health and looking after. The persistence of calcium as well as vitamin D in a patient with bone loss is critical for prime care. Regrettably, 90% of women may not be attainment abundant calcium and above 50% of women treated on behalf of bone loss have insufficient vitamin D echelons [2,3]. Vitamin D deficiency is pervasive in South Asian population and is subsidizing to affliction of disease in this region [4]. For a country that acquires consequently plentiful sun, it's pretty unbelievable that so many Pakistanis are vitamin-D deficient [5]. A high percentage of the asymptomatic adult population having low levels of vitamin D [6]. There stayed a high pervasiveness of vitamin D scarcity in the Pakistani parturients and their newborns [7]. In Pakistan endocrinologists and bone health concerns suggest Vitamin D oral doses like “In drop D” or Vitamin D shots (Calcitriol Injections) [8]. Females had considerably lesser mean Vitamin D levels (56.2%) compared to males (15.3%). Insufficiency has been reported by 11.3% individuals with 9.65% females and 1.65% males [9]. Low vitamin D levels are associated with increased overall and cardiovascular mortality, cancer incidence in addition to mortality, and autoimmune diseases such as multiple sclerosis [10]. Osteopenia denotes to bone density that is subordinate than normal peak density but not low abundant to be classified as osteoporosis. Osteopenia has no symptoms [11]. Osteopenia refers to initial signs of bone loss that can develop

into osteoporosis [12]. Not everybody with osteopenia will cultivate osteoporosis [13]. The most precise way to analyze osteopenia and osteoporosis is from side to side bone mineral density testing. This is frequently obsolete dual-energy X-ray absorptiometry (DEXA) scan [11]. DEXA scan fallouts are reported as T-scores:

- Normal bone: T-score beyond -1
- Osteopenia: T-score sandwiched between -1 and -2.5
- Osteoporosis: T-score further down -2.5

Patients with osteoporosis are more probable to have a antiquity of insufficient alimentary calcium intake [14]. Calcium is a vital constituent in the human physique and is necessary to numerous cell functions. Calcium is not only significant to bone health; on the

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other hand it is also crucial aimed at neuromuscular activity, blood coagulation, and normal cardiac function. It is a vigorous constituent of bone architecture or structural design and is compulsory for sworn testimony of bone mineral throughout life. Although the body stores beyond 99% of its calcium in the bones and teeth, it is also found in the extracellular fluid (ECF) or plasma. It is the intensities of plasma calcium that mandate calcium balance. If the plasma level declines, bone resorption increases to restore plasma levels. Adequate intake of calcium is necessary to maintain this balance. Calcium is absorbed in the small intestines with the aid of vitamin D [15]. Vitamin D is an essential nutrient in the maintenance of bone health. The primary functions of vitamin D are the regulation of intestinal calcium absorption and the stimulation of bone resorption leading to the maintenance of serum calcium concentration [16]. Sources of vitamin D take account of sunlight, diet, and supplements. In vitamin D deficiency shapes, decreased calcium absorption occurs from the intestines, causing increased osteoclast manufacture, which enhances the mobilization of calcium from the bone. If vitamin D deficiency is not corrected, calcium continues to be pulled from the bone and rickets can occur in youngsters, while osteomalacia and osteoporosis can occur in grown-ups [17]. The best common scientific tool to diagnose osteoporosis and predict fracture threat is a bone mineral density (BMD) test. A measurement of bone density is often deliberated when it will help guide decisions concerning treatment to avert osteoporotic fractures. The NOF commends analysis all women age 65 and older and men age 70 and older, regardless of clinical possibility influences [18]. Menopause often front-runners to increases in bone loss with the most rapid rates of bone loss occurring during the first five years after menopause [19]. A fall in estrogen production after menopause results in amplified bone resorption, and diminished calcium absorption [20,21]. Struggles to prevent bone loss and osteoporosis must twitch with appropriate edification about a healthy lifestyle, including optimal calcium as well as vitamin D and exercise in adolescence. This training should continue all the way through life, with emphasis for the duration of intervals of augmented bone loss such as the menopause alteration [17].

## Methodology

This is a survey based study on the awareness about prevalence of vitamin D as well as Calcium deficiency and also about the awareness of osteopenia and osteoporosis. A cross sectional and random sampling was used to collect data from 252 females (n=252). Data was collected from different public and private places, universities, hospitals, parks and shopping malls of Karachi, Pakistan in the month of January-March, 2015. Different question were asked for the collection of data like are you vitamin D or Calcium deficient, do you feel pain in joints, legs and back, have you performed test to evaluate your vitamin D levels, have you performed test to evaluate your Calcium levels, and Do you know about osteopenia and osteoporosis.

## Inclusion and exclusion criteria

Only females having basic education were incorporated. Males and uneducated females were not recruited in this study.

## Results

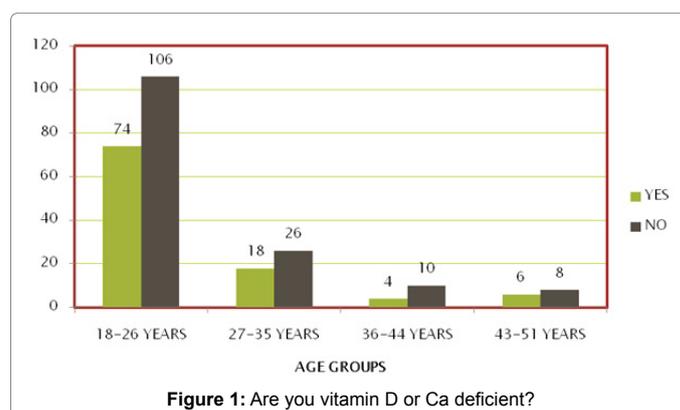
According to our survey on vitamin D and Calcium deficiency, we find 102 females out of 252 are deficient to Ca and Vitamin. D, 196 females feel pain in back, legs and joints, only 28 females have tested their Vitamin D level and 30 females have tested their Calcium levels. According to our survey on awareness about osteopenia and osteoporosis, we find 86 females out of 252 have knowledge about osteopenia and osteoporosis.

## Discussion

Most of participants do not have performed a blood measurement of their vitamin D and calcium levels, but they believe that are vitamin d or calcium deficient. A reason of which may be appearance of symptoms in the very young age may be due to lack physical activity or nutritional deficiency. Asymptomatic Vitamin D deficiency is also common. The monetary cost of vitamin D blood level measurement may not be affordable from all.

In our survey on the Prevalence of Vitamin D as well as Calcium deficiency, the first question was asked about the deficiency, that is Are you vitamin D or Ca deficient? This question was asked from 252 females belonging to different age groups. All the 252 female have answered this question. In the first age group of females that is 18-26 years, this question was asked from 180 females. 74 females answered that yes, they are deficient to Calcium and Vitamin D while 106 females answered that they are not deficient to Calcium as well as Vitamin D. In the second age group of females that is 27-35 years, this question was asked from 44 females. 18 females answered that yes, they are deficient to Calcium and Vitamin D while 26 females answered that they are not deficient to Calcium as well as Vitamin D. In the third age group of females that is 36-44 years, this question was asked from 14 females. 4 females answered that yes, they are deficient to Calcium and Vitamin D while 10 females answered that they are not deficient to Calcium as well as Vitamin D. In the fourth age group of females that is 43-51 years, this question was asked from 14 females. 6 females answered that yes, they are deficient to Calcium and Vitamin D while 8 females answered that they are not deficient to Calcium as well as Vitamin D (Figure 1).

In our survey on the Prevalence of Vitamin D as well as Calcium deficiency, the second question was asked about the pain, that is do you feel pain in joints, legs and back? This question was asked from 252 females belonging to different age groups. All the 252 female have answered this question. In the first age group of females that is 18-26 years, this question was asked from 180 females. 136 females answered that yes, they feel pain in joints, legs and back while 44 females answered that they do not feel pain in joints, legs and back. In the second age group of females that is 27-35 years, this question was asked from 44 females. 36 females answered that yes, they feel pain in joints, legs and back while 8 females answered that they do not feel pain in joints, legs and back. In the third age group of females that is 36-44 years, this question was asked from 14 females. 12 females answered that yes, they feel pain in joints, legs and back while 2 females answered that they do not feel pain in joints, legs and back. In the fourth age group of females that is 43-51 years, this question was asked from 14 females. 12 females answered that yes, they feel pain in joints, legs and back while 2 females answered that they do not feel pain in joints, legs and back (Figure 2).



In our survey on the Prevalence of Vitamin D as well as Calcium deficiency, the third question was asked about the test or diagnosis of Vitamin D levels, that is have you performed test to evaluate your vitamin D levels? This question was asked from 252 females belonging to different age groups. All the 252 female have answered this question. In the first age group of females that is 18-26 years, this question was asked from 180 females. 20 females answered that yes, they have tested their Vitamin D level; while 160 females answered that they have not tested their Vitamin D level. In the second age group of females that is 27-35 years, this question was asked from 44 females. 4 females answered that yes, they have tested their Vitamin D level; while 40 females answered that they have not tested their Vitamin D level. In the third age group of females that is 36-44 years, this question was asked from 14 females. 2 females answered that yes, they have tested their Vitamin D level; while 12 females answered that they have not tested their Vitamin D level. In the fourth age group of females that is 43-51 years, this question was asked from 14 females. 2 females answered that yes, they have tested their Vitamin D level; while 12 females answered that they have not tested their Vitamin D level (Figure 3).

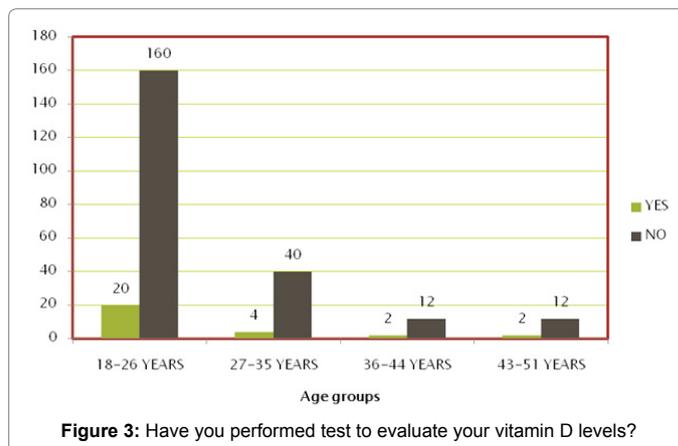


Figure 3: Have you performed test to evaluate your vitamin D levels?

In our survey on the Prevalence of Vitamin D as well as Calcium deficiency, the fourth question was asked about the test or diagnosis of calcium levels, that is have you performed test to evaluate your calcium levels? This question was asked from 252 females belonging to different age groups. All the 252 female have answered this question. In the first age group of females that is 18-26 years, this question was asked from 180 females. 22 females answered that yes, they have tested their calcium level; while 158 females answered that they have not tested their calcium level. In the second age group of females that is 27-35 years, this question was asked from 44 females. 4 females answered that yes, they have tested their calcium level; while 40 females answered that they have not tested their calcium level. In the third age group of females that is 36-44 years, this question was asked from 14 females. 2 females answered that yes, they have tested their calcium level; while 12 females answered that they have not tested their calcium level. In the fourth age group of females that is 43-51 years, this question was asked from 14 females. 2 females answered that yes, they have tested their calcium level; while 12 females answered that they have not tested their calcium level (Figure 4).

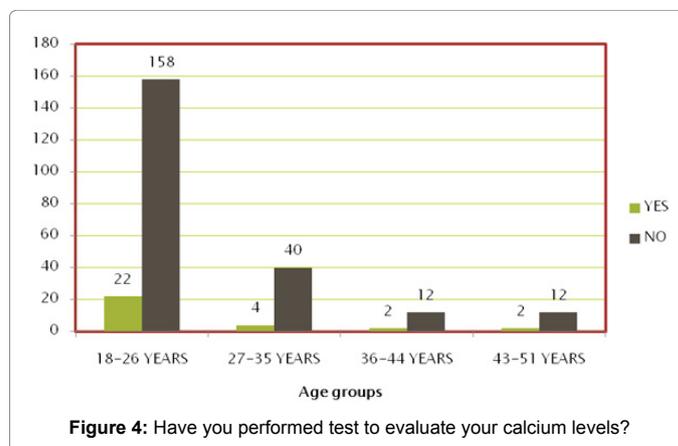


Figure 4: Have you performed test to evaluate your calcium levels?

In our survey on the Prevalence of Vitamin D as well as Calcium deficiency and awareness about osteopenia and osteoporosis, the last question was asked about the awareness about osteopenia and osteoporosis. This question was asked from 252 females belonging to different age groups. All the 252 female have answered this question. In the first age group of females that is 18-26 years, this question was asked from 180 females. 78 females answered that yes, they have awareness

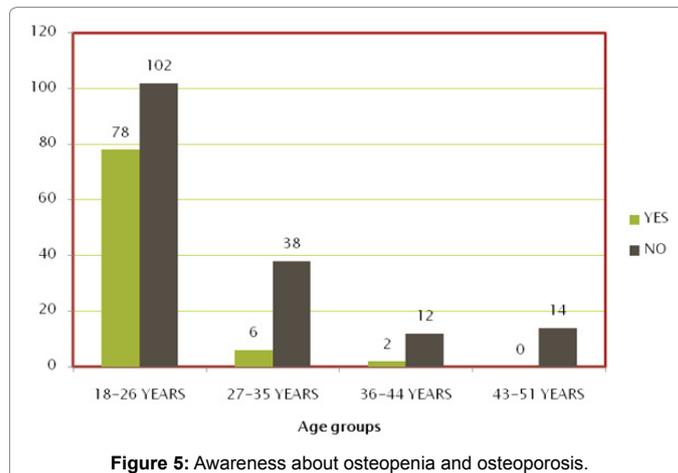


Figure 5: Awareness about osteopenia and osteoporosis.

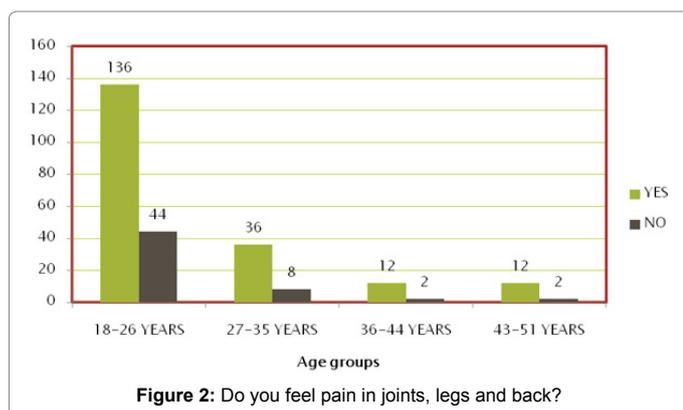


Figure 2: Do you feel pain in joints, legs and back?

about osteopenia and osteoporosis; while 102 females answered that they have no awareness about osteopenia and osteoporosis. In the second age group of females that is 27-35 years, this question was asked from 44 females. 6 females answered that yes, they have awareness about osteopenia and osteoporosis; while 38 females answered that they have no awareness about osteopenia and osteoporosis. In the third age group of females that is 36-44 years, this question was asked from 14 females. 2 females answered that yes, they have awareness about osteopenia and osteoporosis; while 12 females answered that they have no awareness about osteopenia and osteoporosis. In the fourth age group of females

that is 43-51 years, this question was asked from 14 females. All the 14 females answered that they have no awareness about osteopenia and osteoporosis (Figure 5).

The study sample is not homogenous, which means that most of participants (180 female responders) belongs to an age group (18-26) which is not at risk for osteoporosis, and their partially awareness regarding vitamin d deficiency and osteoporosis may reflect possible notions acquired in school or social media, but what seems important is the fact that most people which belong to age groups (36-44 and 43-51) at risk for osteoporosis are little aware of the disorder.

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