

## AN EVALUATION OF VITAMIN- D DEFICIENCY AMONG HOME MAKERS AND OFFICE GOING FEMALE SOUTH INDIAN POPULATION- A CROSS SECTIONAL STUDY

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### Abstract

Vitamin D deficiency is a common health problem faced by females in the present world. The causative behind this deficiency is not only a nutritional factor but being influenced by other factors like socio-economic, physiological, ethical issues. The present study highlights the importance of vitamin D and brings to the public concern the differences in the prevalence of vitamin D deficiency among the homemaker and office goers. A cross sectional study was performed among females of Chennai population and convenience sampling technique was used. A self-developed questionnaire consisting 14 questions was used to assess calcium deficiency among the participants was used. Factors like dietary habits, exercise routine, recent diagnosis on calcium deficiency or any treatment taken was assessed. Frequency analysis was done by SPSS software and results were analyzed. Among the participants majority of females were home makers and they belong to Hindu community. Even though their intake of green leafy vegetable and poultry and dairy product consumption were adequate, about 22 % homemakers were diagnosed for calcium deficiency. This may attributed to deficiency of vitamin D required for the absorption of calcium in the intestine. The study also emphasizes the importance of calcium homeostasis and other permissive effects of vitamin D in the human body and also addresses preventive measures to overcome this health problem.

Key words: Vitamin D, calcium, deficient, home maker

### INTRODUCTION

Vitamin D (cholecalciferol) is one of the essential fat-soluble vitamins that a body requires. This derivative of cholesterol mainly gained through sunlight. This cholecalciferol is hydrated in the liver and kidney under the enzymatic action of hydrolase forming 1,25 dihydroxycholecalciferol <sup>[1]</sup>.

This sunshine vitamin acts as hormone that play an important role in blood calcium level and is being influenced by Parathormone. Reports suggest that the vitamin D level above 30mg/ml prevents cardiovascular diseases. It boosts immunity and also possesses anti-carcinomic activity. It improves glycemic index by enhancing the insulin secretions and enhancement of beta cell functions. Studies suggest that vitamin D prevents dementia, depression, color cancers, squamous cell carcinoma, breast cancer etc. It has profound effects as antirachitic and antioxidant properties <sup>[2]</sup>

Literature states that an average daily requirement of Vitamin D is 200-400 IU. When the level of vitamin D is around 30ng/ml, is considered normal. Less than 20ng/ml is scarcity of the vitamin and 20-30 ng/ml, is considered insufficiency of vitamin 25(OH) D<sup>[3]</sup>. But unfortunately, many people especially woman of the nation are facing the shortage of the vitamin. Not only Indians, but the entire world of woman facing the deficiency of the vitamin. The deficiency is caused due to several physiological, ethical, social, nutritional factors and mostly the condition was underdiagnosed or undertreated <sup>[4]</sup>. This deficiency leads to osteomalacia, rickets with soft, pliable bones, cardiovascular diseases like atherosclerosis, coronary heart disease and hypertension <sup>[5]</sup>. With respect to neurology, vitamin D deficiency leads to dementia, Alzheimer's disease, and epilepsy etc. <sup>[6]</sup>. It may be also noted that in the pregnant women, the lack of vitamin may cause damage to the mother and fetus. The studies show that the deficiency may cause still birth, poor mental development /mental retardation or may even prone to cause thyroid disorder in the fetus. The mother is found to be weak and tired when the deficiency occurs<sup>[7]</sup>.

This study highlights the importance of vitamin D and brings to the public concern the differences in the prevalence of vitamin D deficiency among the homemaker and office goers.

#### **MATERIALS AND METHODS**

A cross sectional study was performed between July 2022 to November 2022 among females of South Indian population and convenience sampling technique was used. Inclusion criteria – Female participants who are homemakers and office goers in the age group between 25-70 years were included in the study. Informed consent was obtained.

A self-developed questionnaire consisting 14 questions was used to assess calcium deficiency among the participants. Factors like dietary habits, exercise routine, recent diagnosis on calcium deficiency or any treatment taken was assessed. Frequency analysis was done by SPSS software and results were analyzed.

#### **RESULT;-**

Among the 200 participants 63.5% were home makers and 36.5% were office goers. (Fig 1) 24.5% belong to the age group 25-30 years. 15.5% belong to the age group 31-35 years, 14.5% belong to the age group 36-40 years, 18.5% belong to the age group 41-45 years, 15.5% belong to the age group 46-50 years, 7.5% belong to the age group 51-55 years and 4% belong to the age group above 55 years. Among the participants 75.5% were Hindus 15% were Muslims 9% were Christians and 0.5% were Jains. (Fig 2). About 52.5% of the population were aware of osteoporosis and 47.5% were unaware. (Fig 3). Based on the duration of exposure to sunlight in office goers, about 26.1% were exposed to 15 mins, 34.4% for 10 mins, 15.5% for nil exposure. (Fig 4)

Among the participants 22% of them were diagnosed recently for calcium and vitamin D deficiency and about 15% were receiving treatment for it. (Fig 5). Regarding the dietary dairy consumption 64.5% had 1-2 servings per day, 18.5% had 2-4 servings per day and 17% had 1-2 servings per week. (Fig 5) Vegetable consumption was found to be 24.5% had 3-5 servings per day 39% had less than 3 servings per day and 36.5% had no regular pattern. And the poultry consumption was found to be 13% had 2-3 servings per day, 18% had less than 2 servings per day, 49.5% had no regular pattern and 19.5% do not consume poultry at all. Regarding their

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exercise pattern, 68.5% had no regular programme 21.5% does exercise less than 3 hours per week and 10% does exercise more than 3 hours per week and the barrier they face was 56.5% had no time to work out 26.5% lacks motivation 13.5% had injury or health issues and 4% cost of the gym facility.

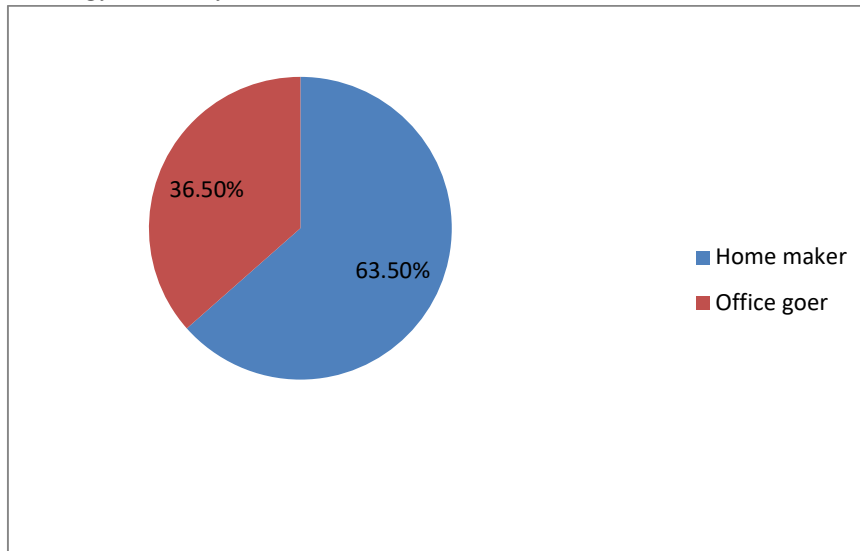


Figure 1 depicts the number of homemaker and office going participants

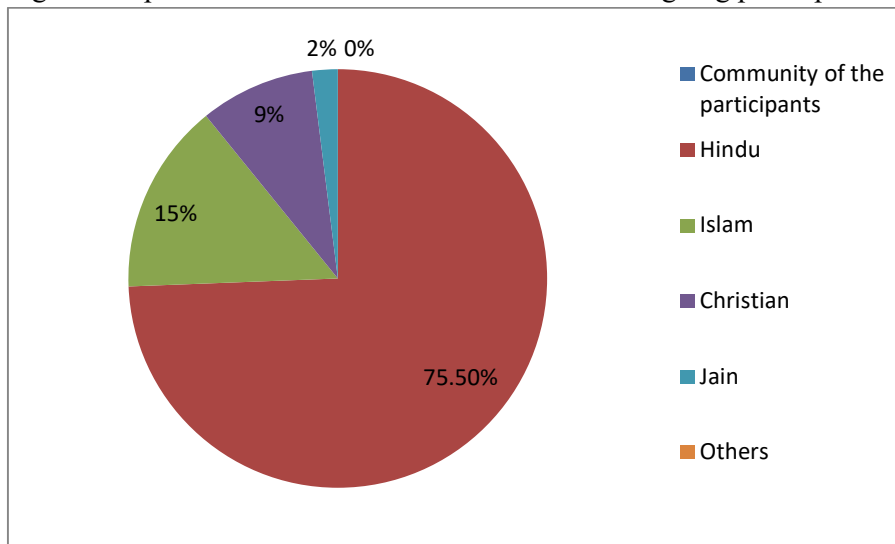


Figure 2 depicts the community of the participants

AN EVALUATION OF VITAMIN- D DEFICIENCY AMONG HOME MAKERS AND OFFICE GOING FEMALE SOUTH INDIAN POPULATION- A CROSS SECTIONAL STUDY

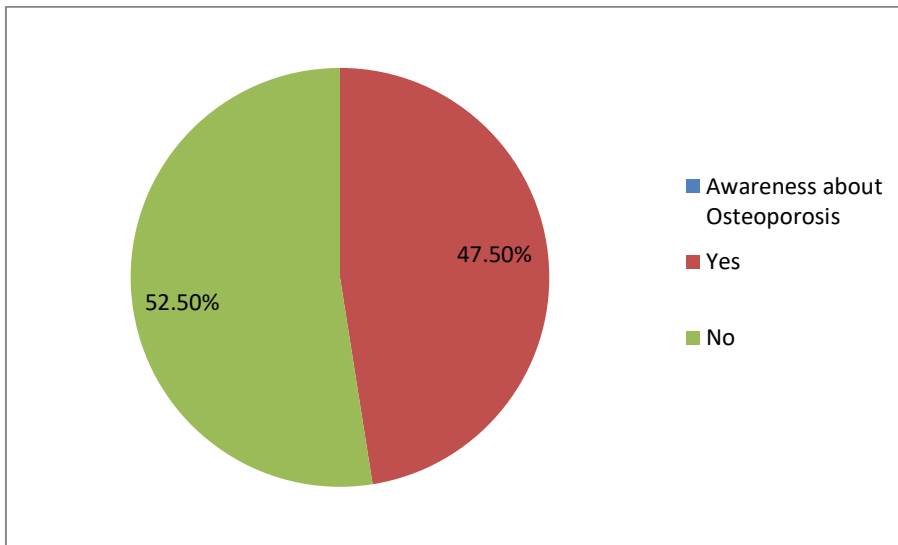


Figure 3 depicts the awareness of osteoporosis among the participants

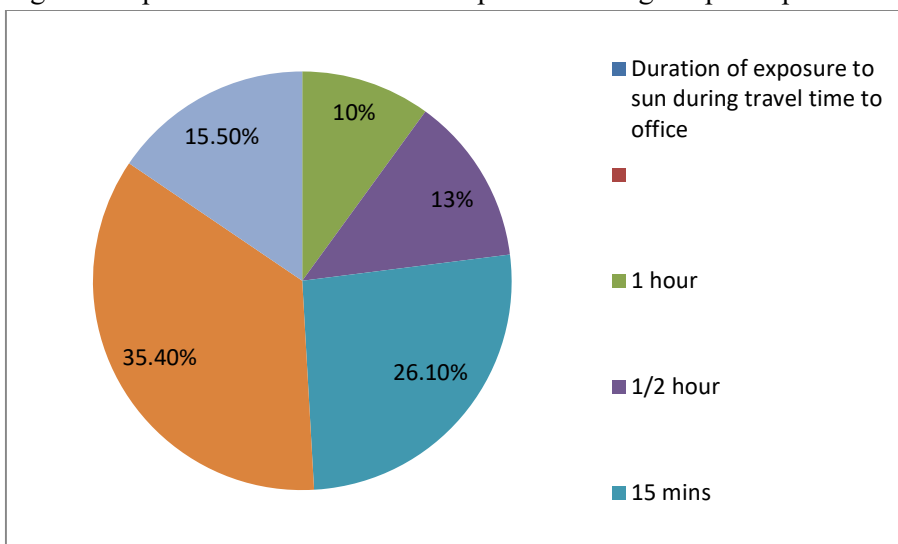


Figure 4 depicts the duration of exposure of sun during travel time to office among office goers

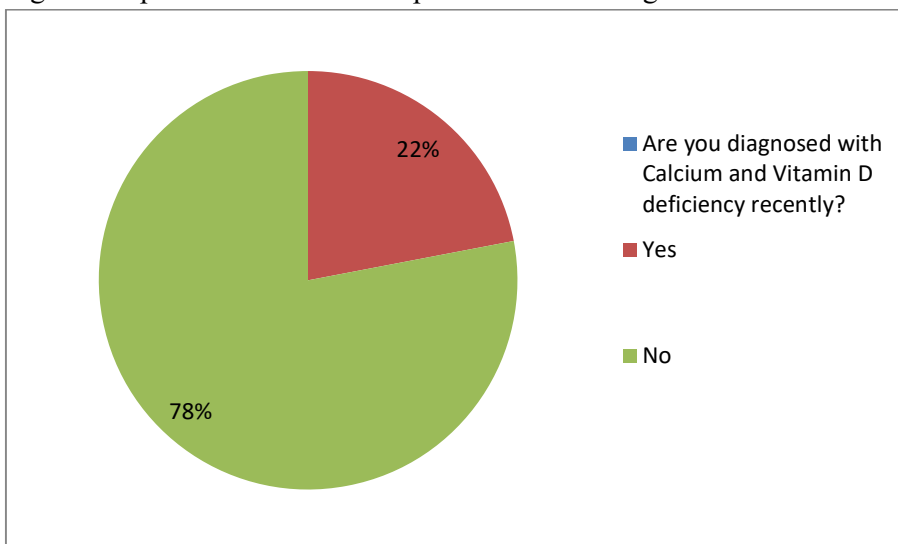


Figure 5 depicts the participants recently diagnosed with calcium and vitamin D deficiency

### **DISCUSSION:**

In the study, majority of participants were Hindus. Ethically the people's dressing and clothing style is one of the causes that promoted Vitamin D deficiency. Reports explain that activated vitamin D synthesis takes place at higher levels mainly in regions like trunk, arms.[8]. Indians wear cloth which is completely covered thus less area is directly exposed to sunlight. India experiences a tropical climate where there is adequate exposure to sunlight, but instead the timing of exposure is less because some people remain at home most of the time without any sun exposure. Other factors might be that many cities are overloaded and people live in small size building and storeyed buildings; so there is much less chances of sun exposure.

In the study, 22% were recently diagnosed with calcium deficiency disorders and this may be attributed to the lack of awareness of how calcium deficiency affects the body and the importance of sun exposure is being ignored. Even office goers cover themselves to avoid sun exposure with the fear of getting tanned or acquiring a dark complexions, skin reddening and melisma on long term sun exposure. The other reason is may be due to fact that lack of vitamin D in the diet. Reason for choosing female participants in the study was that the woman are mostly susceptible for the osteoclastic activity increased level as age advance due to the hormonal activity.<sup>[9]</sup>

In majority of participants, the dietary intake of 1-2 serving of dairy serving per day was 64.5% and the servings of green leafy vegetable per day was adequate among half of the participants. That could be reason that some parts of the participants are not diagnosed for calcium deficiency. In the study, majority of participants do not have a regular exercise regimen Reports suggest that Women and men above 20 years with regular exercise can effectively prevent bone loss. Exercise helps to maintain muscle strength, coordination, and balance in muscle movement. It prevent falls and related fractures in older adults and people suffering from osteoporosis. Vitamin D deficiency is not only seen in India but in the developed nation like US, Canada, Singapore, China, Japan, Germany which also faces severe crisis of it. A Report suggested that in a data of 2000 women collected in northern parts of India 74% of the women have vitamin D deficiency at level low than 20mg/ml and among those 74%, 41.5% had shown server deficiency of the vitamin. <sup>[10]</sup>. In a United Arab Emirates, a data of 834 women have elucidated that 87.8% had serum 25(OH)D level less than 30ng/ml and about 10% of the woman are severely deficient with level below 12.5ng/ml<sup>[11-13]</sup>

### **Strategies to enhance vitamin D**

National Institute for health and care excellent (NICE) have promoted few guidelines to prevent people from vitamin D deficiency. They include increased awareness, improved food fortification, enough exposure to sunlight. The primary fortification is done against this problem is wheat and barley food fortification, increased usage of vitamin-D enhanced milk powder for the women<sup>[14]</sup>

## Conclusion

Vitamin D deficiency is one of the common health problem faced by female population in India. This study is a extension of previous studies on the fact that adult women are suffering from Vitamin D deficiency. In the present study, few home makers who were unexposed to sun light throughout the day were recently diagnosed for calcium deficiency. This deficiency was attributed to decreased exposure to sunlight as they as indoors, decreased intake of dietary calcium in the form of green leafy vegetables and dairy products. But limitation of the study is attributed to the decreased sample size. Studies with increased sample size would add substantial evidence for the prevailing problems of calcium deficiency and promote awareness among the people to prevent complications arising out of it.

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**AN EVALUATION OF VITAMIN- D DEFICIENCY AMONG HOME MAKERS AND OFFICE GOING FEMALE SOUTH INDIAN POPULATION- A CROSS SECTIONAL STUDY**

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