

## KNOWLEDGE , PRACTICE & AWARENESS OF CALCIUM AND VITAMIN D DEFICIENCY ASSOCIATED COMPLICATION IN PAKISTANI WOMEN

Maria Ayub\*,Amna Islam, Safina Siddique, Soofia Islam, Quratul-Ain Riaz.

Jinnah University for women, Karachi Pakistan.

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### ABSTRACT

Calcium and "Sunshine Vitamin" accounts for vital nutrients for women health. These Nutrients are very essential for maintenance of bone metabolism and other neurochemical functions. Deficiency of vitamin D & Calcium may produce early osteoporosis, rickets, skeletal muscle deformity, cancer, cardiovascular dysfunction & Cognitive changes. The authors are aimed to access the awareness, practice and complications of calcium and vitamin D in Pakistani women. The objective of this study is to evaluate the awareness, practice and complications of calcium and vitamin D deficiency in Pakistani women's in relation to their daily practices and knowledge about these essential nutrients. For the purpose of this study a cross sectional survey based on questionnaire distributed among women's (n =500) and 500 from college & university girls. They all evaluated in term of their perception, attitude and practices against vitamin D & Calcium deficiency associated consequences. In this cross sectional survey about 1000 females house wives 500, college 212 & 388 from university respectively. And the sample size distributed was evaluated as 30-50 participants were married women, 16-20 college girls used to participate and 20 to 25 from university. Highest frequency of married females showed rich source of calcium & vitamin D utilization as compare to bachelors group while studies suggested that university girls have more awareness about consequences and complications related to calcium and vitamin D deficiency than married women or college girls. Finally it is concluded that local serene population also has a steep prevalence of vitamin D frailty and the dominating contributing principle is restrictive sun exposure right to avoidance of sunlight and assigned to of the whole advantage except face and hands interim outdoor. Other factors commit also spring a less role. To differ this case it is selected to incorporate awareness to restore sunlight exposure and steep intake of vitamin D abundant food at mass freely and starting of Vitamin D food fortification system at legislature level.

**Key words:** vitamin D deficiency , calcium deficiency , consequences , preventive measures, diet recommendations

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## **INTRODUCTION:**

Deficiency of vitamin D is very prevalent in many parts of the world especially south Asian countries like Pakistan which are exposed to high amount of sunlight and is very commonly seen in women and elderly people [1]. The main reasons include diet which is poor in vitamins, and biggest is poverty. The normal serum level of vitamin D is 30ng/ml [2]. Sunlight exposure is the biggest source of vitamin D and one would expect the south Asian countries to be free of vitamin D deficiency due to sufficient sunlight but unfortunately there is a high risk of vitamin D deficiency due to lack of vitamin rich diet, low calcium intake, and people are more confined to their houses instead of doing outdoor activities [3]. The prevalence of vitamin D deficiency in south Asian women is also mainly due to social customs of these regions as women are more confined to houses [4]. Poverty and illiteracy is also included in one of the major causes of vitamin D deficiency. The impact of vitamin D deficiency includes rickets, osteoporosis, and osteomalacia and low bone mineral density [5]. Skin contains 7 dehydrate cholesterol which converts into cholecalciferol which is vitamin D3 on exposure to UV light [6].

Low levels of mother's vitamin D dangerously effect the brain development of fetus. Also in addition to rickets in infants they have also come up with hypocalcaemia, and dental enamel hypoplasia [7, 8]. Basically the newborn fetus mainly depends on the maternal stores of vitamin D and calcium and accounts for about 60% to 70% of mother's

status of vitamin D and calcium concentration [9]. The calcium demand increases from 2 to 3 folds during lactation and pregnancy this is mainly due the rise in 1, 25 dihydroxyvitamin D3 which is the active metabolite of vitamin D and it increases the uptake of calcium from the gut. It increases during the 2<sup>nd</sup> and 3<sup>rd</sup> trimester [10]. The fastest treatment protocol includes ergocalciferol (vitamin D2) or cholecalciferol (vitamin D3) for the deficiency of vitamin D in infants. The etiology of vitamin D frailty could be multifactorial as besides hydroxylation of vitamin D occurs alternately in liver followed by instant hydroxylation in kidney to show the biologically wary 1, 25(OH)2D by 1-hydroxylase enzyme. In the kidney, another enzyme; 24-hydroxylase converts 1, 25(OH)2D to 1, 24, 25(OH)2D limiting its availability and while shunting accessible substrate 25OHD from 1-hydroxylase. 24 hydroxylase gene is under stringent transcriptional approach by 1,25(OH)2D itself providing a competent means of proximate negative feedback process of the approach of 1,25(OH)2D restrained in and reported from the kidney. Altered physiology of vitamin D endocrine program as intended by increased reaction of 24-hydroxylase in Indo-Asians of Southern United States make out be an additional foundation as shown by Awumey et al. [13]. The subside in serum 25OHD and urinary calcium by all of secondary hyperparathyroidism and restore in serum 1, 25(OH)2D resulting from deficiency of 25OHD commit not be reversible due to life fantasize stimulation produced by vitamin D attrition or deficiency. [11-12]

the weakness source of vitamin D is acknowledgment to Ultra Violet B (UVB) rays in sunlight. Cutaneous synthesis of vitamin D, involves photo quantum leap of 7-dehydrocholesterol (7-DHC) disclose mainly in the stratum spinosus and basale of epidermis to pre-cholecalciferol (pre-D3), which as a consequence undergoes isomerization to constitute cholecalciferol (D3). Subsequent hydroxylation in the liver produces 25OHD which besides undergo 2nd hydroxylation in the kidney to constitute the observant form of vitamin D; 1,25(OH)<sub>2</sub> D . Unlike manifold Western countries that have a VD food fortification procedure, Pakistan does not have a essential VD fortification practice in place. More active measures are inadequate to rebound awareness to durability benefit professionals and their clients virtually the power of vitamin D for health, including the wish for dis closure to sunlight, decent dietary intake of vitamin D and implementation of advanced recommendations to refresh their vitamin D status.[13]

The authors are aimed to access the awareness, practice and complications of calcium and vitamin D in Pakistani women. The objective of this study is to evaluate the awareness, practice and complications of calcium and vitamin D deficiency in Pakistani women's in relation

to their daily practices and knowledge about these essential nutrients.

### **Methodology:**

This retrospective study was conducted from July 2015- November 2015 among married women's and young girls (n=100). This descriptive cross sectional based on questionnaire distributed between females of different age group [shown in Figure 1] to evaluate the perception, knowledge & attitude regarding importance of vitamin D & Calcium in their life. As college & university girls are more aware but less practicing daily intake of essential nutrients in their life due to burden of social, educational & economical factor [shown in Table 1] compare to married women. This study has been approved by dean of faculty of pharmacy of Jinnah University & all participants included voluntary were brief informed about objective and informed consent. All data evaluated carefully and calculated statistically.

### **RESULT & DISCUSSION:**

In this cross sectional survey about 1000 females house wives 500, college 212 & 388 from university respectively. All females evaluated in term of their knowledge, practice & complication associated with deficiency of vitamin D & Calcium [shown in figure 1].

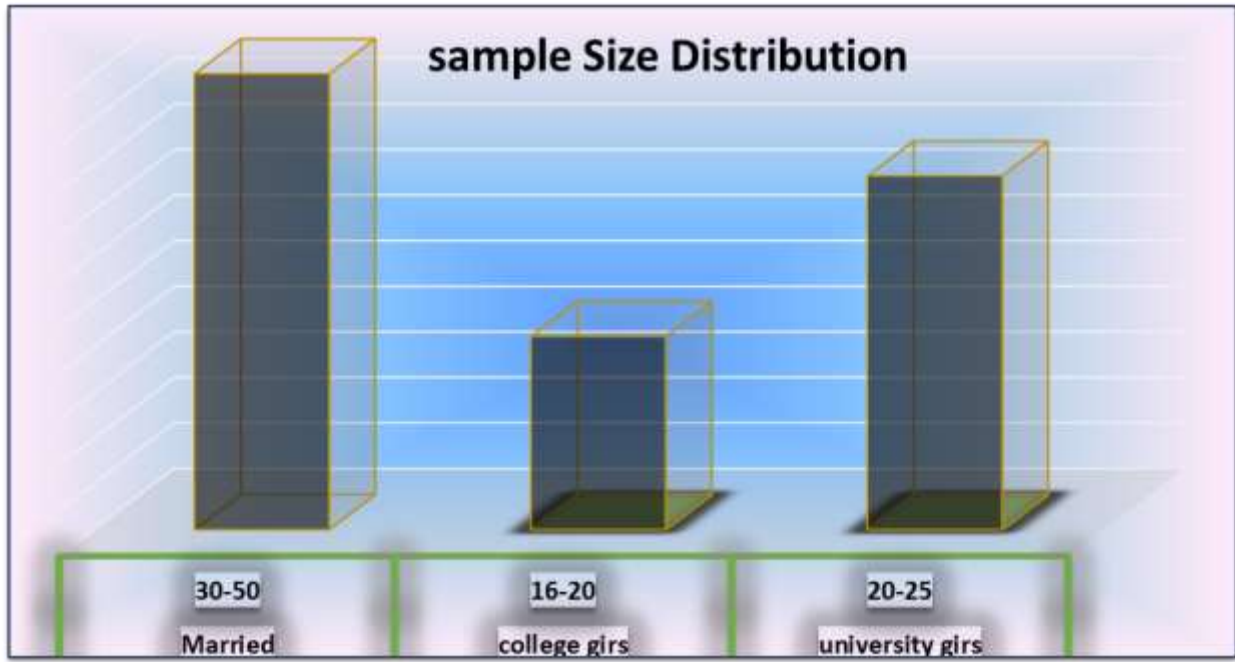


Figure 1 sample size distribution

All respondent from three different categories showed positive response in this survey with highest frequency of married females showed rich source of calcium & vitamin D utilization compare to bachelors group [shown in figure 3]

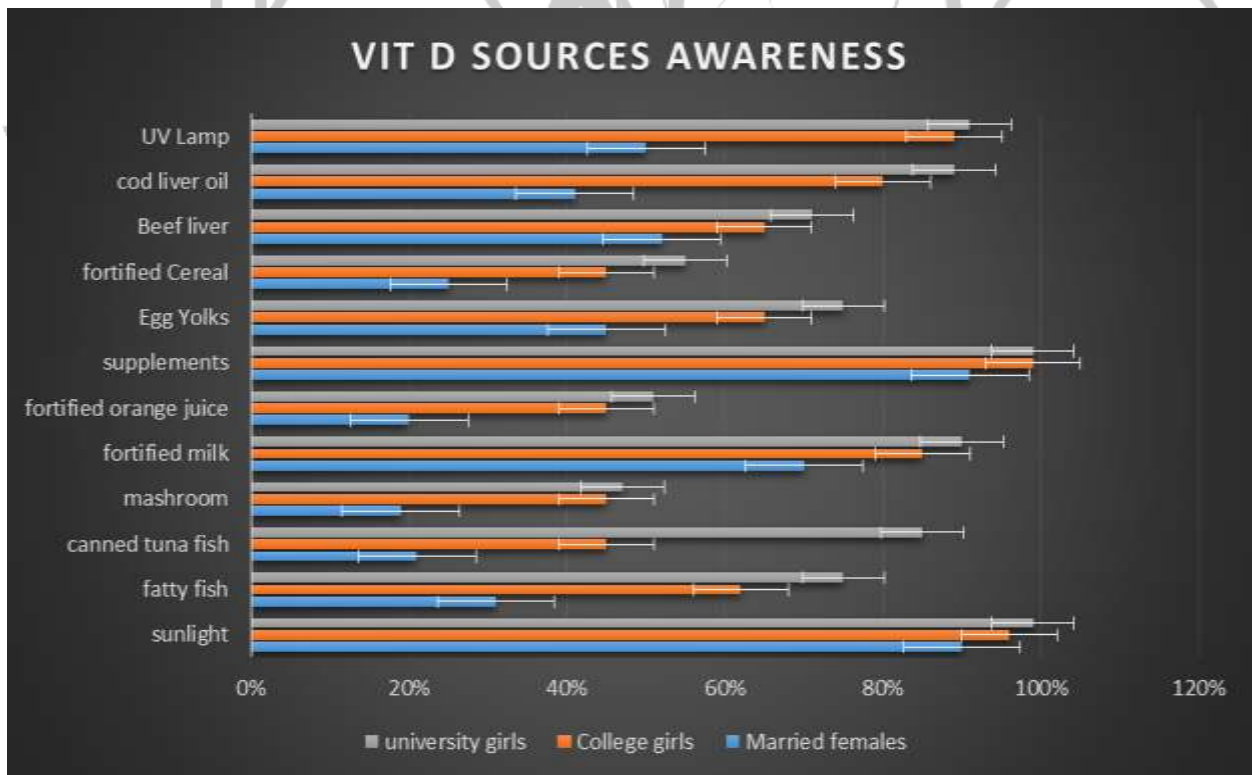


Figure 2 sources of vitamin D awareness

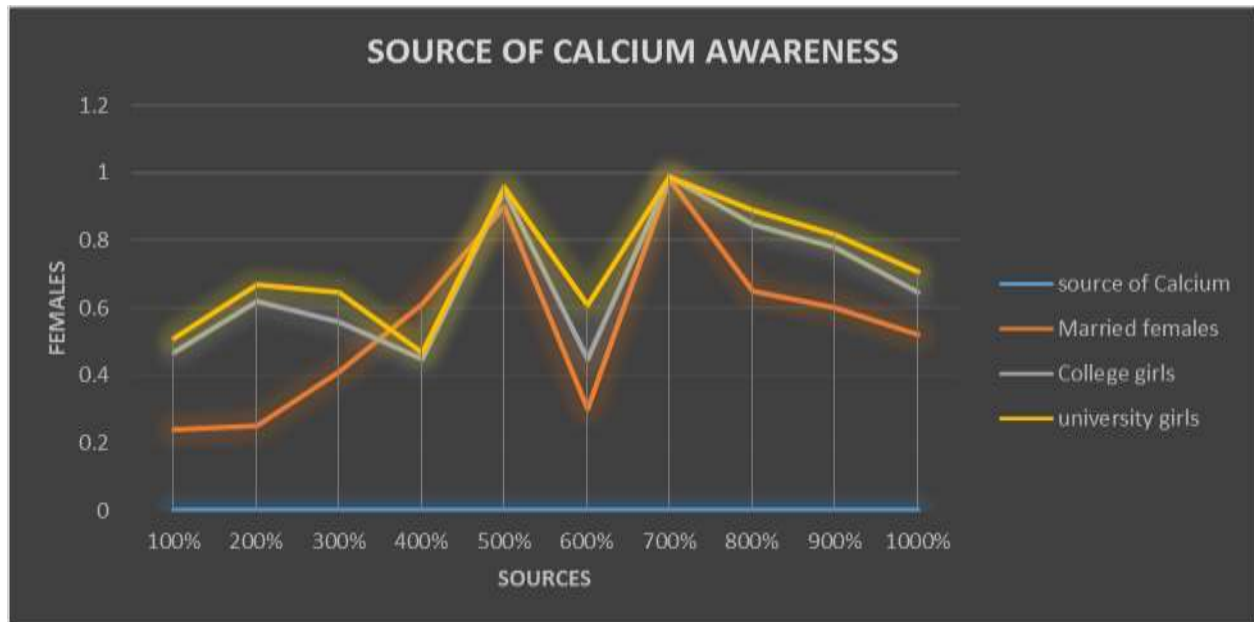


Figure 3 sources of Calcium awareness

The nutritional awareness about vitamin D and calcium supplements is as shown in figure 4 and the complications associated with these deficiencies is as shown in figure 5.

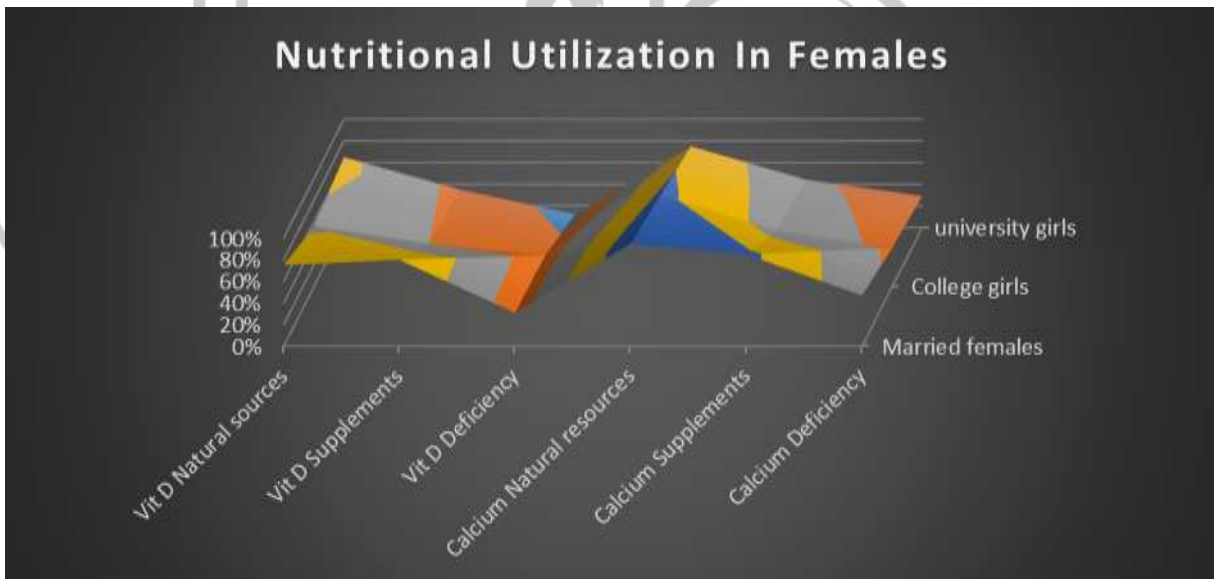


Figure 4 practice utilization of Nutritional source by females

More active measures are inadequate to rebound awareness to durability benefit professionals and their clients virtually the power of vitamin D for health, including the wish for dis closure to sunlight, decent dietary intake of vitamin D and implementation of advanced recommendations to refresh their vitamin D status.

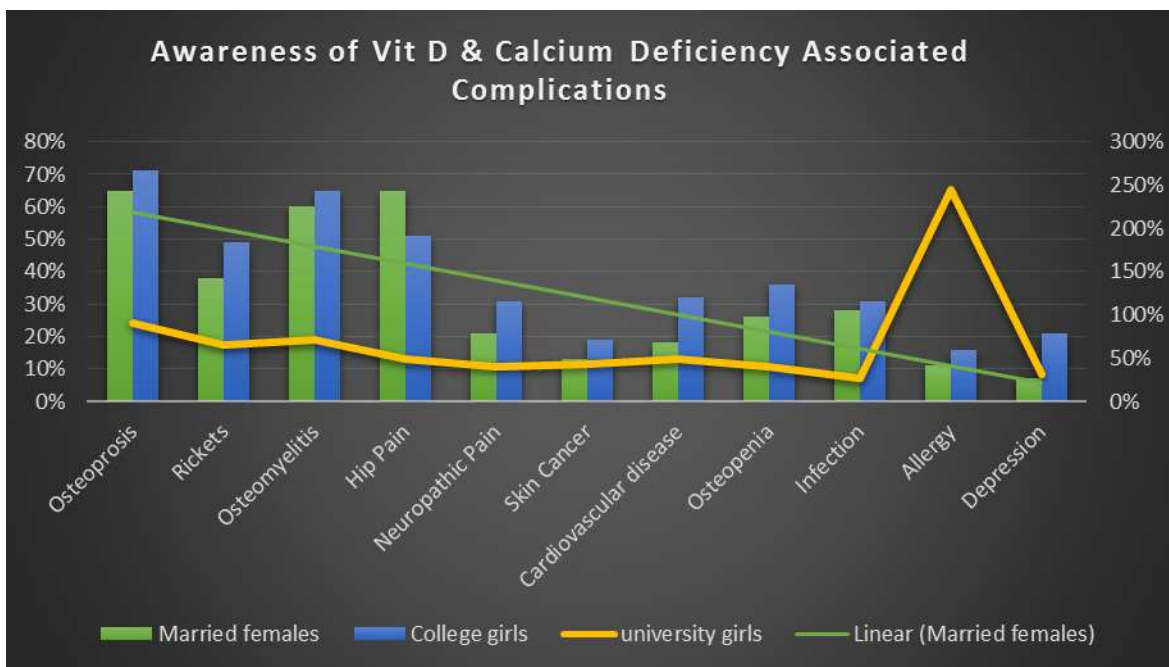


Figure 5 complication awareness different females categories

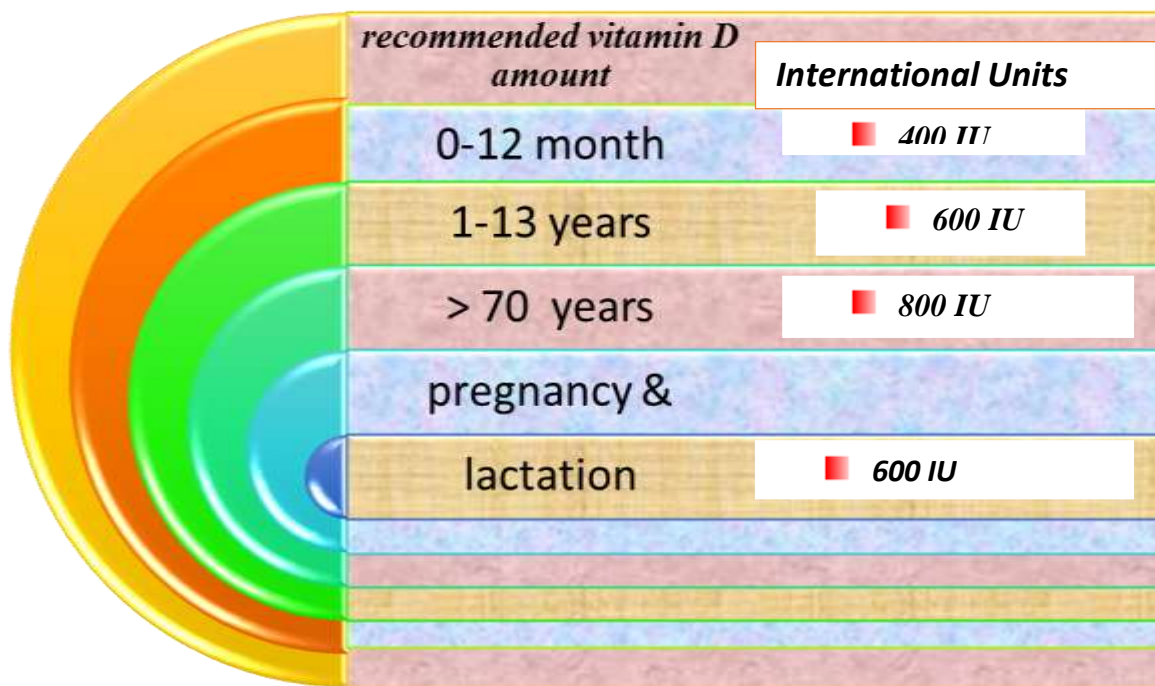
As in table 1 it shows different complications of human body which are co related with deficiency of calcium and vitamin D. different food sources of vitamin D and calcium including fish, orange juice, milk and many more food items are as shown in table 2 along with the amount. The recommended vitamin D requirement for different age group is as shown in figure 6.

**Table 1: consequences related with calcium and vitamin D deficiency with respect to different organs:**

Consequences of vitamin D deficiency & calcium:	
🌐 <i>psychiatric</i>	■ Schizophrenia & depression ,memory loss
🌐 <i>infections</i>	■ Tuberculosis & urinary infections
🌐 <i>Circulatory</i>	■ Coronary heart diseases and hypertension
🌐 <i>Cancer</i>	■ Breast , colon and rectal cancer
🌐 <i>Pulmonary</i>	■ Wheezing
🌐 <i>Bone &amp; muscle</i>	■ Muscle ache, osteoarthritis, osteoporosis, osteomalacia and rickets. Numbness & tingling
🌐 <i>other</i>	■ Obesity and diabetes
🌐 <i>mouth</i>	■ Toothache , gingivitis,

***Table 2: food sources of vitamin D & calcium:***

<b>Selected food sources of vitamin D</b>		<b>Food sources of calcium</b>	
<b>food</b>	<b>IU per serving</b>	<b>food</b>	<b>milligrams</b>
<b>Cod liver oil</b>	1,360	yogurt	415
<b>Tuna fish</b>	154	Milk 1 cup	300
<b>Orange juice</b>	137	Orange juice	300
<b>Milk, grains</b>	115-124	broccoli	21
<b>Margarine</b>	60	Cottage cheese	138
<b>Egg</b>	41	sardines	324
<b>cheese</b>	6	Cheddar cheese	204



**Figure 6 : recommended vitamin D requirements in different age groups:**

The regularity of vitamin D lack in sound populace was an eye-opener and in addition a teaser. There are a developing number of reports on the high predominance of low coursing serum fixations connected to limited daylight presentation and lacking vitamin D admission in ladies of child bearing age. High predominance of vitamin D insufficiency in females may be on account of they are not presented to daylight appropriately and are for the most part house-wives included in household work. The opportunities to uncover their bodies are not accessible regardless of the fact that they go out in light of the fact that they wear garments covering the vast majority of their body aside from face and hands. This is because of the social, social and religious standards existing in our general public. The absence of mindfulness with respect to solid adjusted eating regimen and the overcooking of

nourishment are a couple of other contributing variables to the overarching vitamin D lack. Vitamin D lack likewise remains a regular reason for auxiliary hyperparathyroidism in ladies and there are around 200 qualities whose expression has been modified with vitamin D levels. The consequences of vitamin D levels are additionally utilized as a guide for the appraisal of bone digestion system. Vitamin D supplements are given to improve the muscle quality and diminish the fall rate by around half.

Methodologies to anticipate vitamin D inadequacy and accomplish satisfactory admission of vitamin D and calcium in ladies would avert rickets in newborn children as well as lessen the danger of osteoporosis and in addition other long-dormancy ailment forms that have been connected with vitamin D lacking states. This may be one of the more essential preventive general wellbeing activities. The



Government responsibility and backing are expected to battle this pestilence. A national project on the supplementation of vitamin D and an open mindfulness battle are desperately required. The ideal opportunity for activity is presently. Prevalence of hypovitaminosis D among serene Pakistanis is valuable and degree of sun dis closure is the virtually common predictor of hypovitaminosis D. In local community avoidance of sun light due to anxiety of darkening of skin and situated of whole advantage religiously or desolate exposing confront and hands traditionally particularly in girl subjects when going outdoor were the potent attributing factors. Male subjects furthermore avoid sun dis closure not only due to steep temperature in summer season in this symbol of the survival nonetheless besides have misconception concerning harmful chattels personal of sunlight and incapacity showing the connection of Vitamin D. Effect of sunlight on Vitamin D situation has been readily documented and confirms the restraint of sunlight leak in the synthesis of vitamin D<sup>29,30</sup> Sunlight confession was the virtually important determinant of Vitamin D levels in the design population. Area of skin unprotected and term of sunlight exposure nicely correlated mutually Vitamin D levels in this design as unprotected similarly by contrasting studies. As unseeing skin requires greater sun exposure than scanty pigmented skin to show similar approach of vitamin D<sup>30</sup> it is not unexpected that hypovitaminosis D is so ubiquitous in this country.

Dietary element was another determinant of the raw material regarding fancy prevalence as approximately of our participant were consuming soft amount of vitamin D fruitful food True estimate of vitamin D saturation was not convenient owing to unawareness regarding degree of consuming congress by participants and unavailability of food composition database for Vit D used in Pakistan. Furthermore there is no Vitamin D food fortification in Pakistan and no antiquity of manage of calcium and Vitamin D supplements among raw material subjects were furthermore contributing in steep prevalence anyhow some soon studies showed no a well known association whereas contrasting studies showed pertinent correlation.

### **Conclusion:**

More active measures are inadequate to rebound awareness to durability benefit professionals and their clients virtually the power of vitamin D for health, including the wish for dis closure to sunlight, decent dietary intake of vitamin D and implementation of advanced recommendations to refresh their vitamin D status. Air pollution is another attributing factor of hypovitaminosis D. Karachi is one of the intensively polluted city of the reality so the pollution could be an attributing component in design subjects but this was likewise our design scope to manage pollution effects.

Finally it is concluded that local serene population also has a steep prevalence of

vitamin D frailty and the dominating contributing principle is restrictive sun exposure right to avoidance of sunlight and assigned to of the whole advantage except face and hands interim outdoor. Other factors commit also spring a less role. To differ this case it is selected to incorporate awareness to restore sunlight exposure and steep intake of vitamin D abundant food at mass freely and starting of Vitamin D food fortification system at legislature level.

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### **Disclosure:**

Authors declare no conflict of interest.

### **References:**

**Holick MF.** Vitamin D, Deficiency. N Engl J Med 2007;357:266-81.

**Thomas MK, Lloyd-Jones DM, Thadhani RI, Shaw AC, Deraska DJ, Kitch BT,** et al. Hypovitaminosis D in medical patients. N Engl J Med ;338:777-83.1998

**Atiq M, Suria A, Nizami SQ, Ahmed I.** Vitamin D status of breast-fed Pakistani infants. Acta Paediatr ;87(7):737-40. 1 998

**Bodnar LM, Simhan HN, Powers RW, Frank MP, Cooperstein E, Roberts JM.** High prevalence of vitamin D deficiency in black and white pregnant women residing in the northern United States and their neonates. J Nutr ;137(2):447-52.2007

**Ogunkolade WB, Boucher BJ, Bustin SA, Burrin JM, Noorian K, Mannan N,** et al. Vitamin D metabolism in peripheral blood mononuclear cells is influenced by chewing "betel nut" (Areca catechu) in vitamin D status. J Clin Endocr Metab;91(7):2612-7. 2006

**Champe PC, Harvery RA, Ferrier DR.** Lippincotts' Illustrated Reviews: Biochemistry, 3rd edition, Philadelphia, Lippincott Williams & Wilkins, ;384-7.2005

**Brunvand L, Quigstad E, Urdal P, Haug E.** Vitamin D deficiency and fetal growth. Early Hum Dev;45:27-33 1996

**Mughal MZ, Salama H, Greenaway T, et al.** Florid rickets associated with prolonged breast feeding without vitamin D supplementation. BMJ;318:39-40.6.1999

**Blond MH, Gold F, Pierre F, et al.** Nutritional fetal rickets. A case report. J Gynecol Obstet Biol Reprod;26:834-6. 1997

**Walters B, Godel JC, Basu TK.** Perinatal vitamin D and calcium status of northern Canadian mothers and their newborn infants. J Am Coll Nutr;18:122-6. 1999

**Zhu Y, Goff JP, Reinhardt TA, Horst RL** Pregnancy and lactation increase vitamin D-dependent intestinal membrane calcium adenosine triphosphatase and calcium binding protein messenger ribonucleic acid expression. Endocrinology;139:3520-4. 1998

**Seely EW, Brown EM, DeMaggio DM, et al.**  
A prospective study of calciotropic hormones in pregnancy and post partum: reciprocal changes in serum intact parathyroid hormone and 1,25-

dihydroxyvitamin D. *Am J Obstet Gynecol*;176:214–17. 1997  
Royal College of Paediatrics and Child Health. *Medicines for Children*. London: RCPCH Publications Ltd, :109. 1999

