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Original Article

A Cross Sectional Study to Evaluate Adverse Outcomes of Vitamin D Deficiency in Females of Lahore, Pakistan

Tallat Anwar Faridi[1],Akash John[2], NeelamIqbal[3], Arsalan Ahmed [4],MuhammadBakir Hussain[5]

[1] Assistant Professor, University Institute of Public Health, The University of Lahore
[2] Lecturer, University Institute of Radiological and Medical Imaging Sciences, The University of Lahore, Gujrat Campus
[3] Institute of Molecular Biology and Biotechnology, The University of Lahore
[4] District Blood Transfusion officer Specialized health care and medical Education department, Govt of Punjab
[5] Laboratory Incharge Horizon Hospital Johar town Lahore
Tallat.anwar@pht.uol.edu.pk

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***Corresponding Author:**
Tallat Anwar Faridi
Assistant Professor, University Institute of Public Health, The University of Lahore
Tallat.anwar@pht.uol.edu.pk

ABSTRACT

Vitamin D is a group of fat-soluble sec steroids responsible for increasing intestinal absorption of calcium, magnesium, and phosphate, and multiple other biological effects. The most important compounds in human are vitamin D_3 and vitamin D_2. Vitamin D is essential for strong bones, because it helps the body use calcium from the diet. Vitamin D deficiency has been associated with rickets, a disease in which the bone tissue doesn't properly mineralize, leading to soft bones and skeletal deformities. A cross sectional study was conducted from 30th January 2021 to 30th June 2021 to evaluate adverse outcomes of Vitamin D level among 370 females of aged 20-60 years were recruited through non-probability convenient sampling technique from students and Faculty ofColleges and Universities in Lahore, Pakistan. The data was collected through a Semi-Structured Questionnaire.A total 370 participantswere included age groups of female ranging from 20-60. Comparing age and level of Vitamin D was more common in reproductive age of females with more association in young females of 20 to 30 years. 81.9 % participants had general awareness regarding deficiency of vitamin D. 80% People eat Vitamin D Rich Diet While only 20% use vitamin D supplements and only 41.9 % females drinks a Cup of Cow Milk. 73.8% participants had suffered weakness and general body aches and 82.2% females reported musculoskeletal pain.This studyevaluated thatMost of Educated People are unaware of Vitamin D knowledge and intake. They take insufficient amount of Vitamin D and experience discomfort in Muscoskeletal system.

INTRODUCTION

Vitamin D popularly known as "sunshine vitamin," is a fat-soluble vitamin that belongs to the secosteroids family. It helps maintain calcium homeostasis and regulates bone metabolism. Vitamin D3 and D2 are the two primary forms of the vitamin, which were originally recognized in 1921. These two vitamins, often known as cholecalciferol and ergocalciferol, differ solely in their side-chain structure chemically. Vitamin D is made in the skin and then converted to active metabolites in the liver and kidney. When pro-vitamin D3 7-dehydrocholesterol in the skin is exposed to UV radiation, it is converted to pre-vitamin D3, which is later converted to more stable vitamin D. Skin production from sun exposure and dietary consumption are the two main sources of vitamin D. Vitamin D levels in the blood reflect both endogenous production from sunshine exposure and external consumption from food. Long-term vitamin D insufficiency has been linked to proximal muscle weakness, increased body wobble, and an increased risk of falling. Hypovitaminosis D in adults can result in a skeletal mineralization deficiency. Rickets and osteomalacia in adults are the most well-known outcomes of Hypovitaminosis D in children, which can lead to osteopenia and osteoporosis later in life. As a result, people with osteomalacia frequently experience irritable feelings of

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localized or generalized bone soreness, as well as muscle and joint problems. Fatigue, general body pains, headache, joint discomfort, diarrhea or constipation, depression, and persistent body pain are all indications of vitamin D deficiency. The usual laboratory value for Vitamin D is >75 nanomols per litre (nmol/L). A shortfall of 25 nmol/L indicates severe deficiency as a result of insufficient food intake or solar exposure. Aging, skin tone, female gender, obesity, sunscreen use, and chronic renal illness are some of the variables that put people at risk for vitamin D deficiency. Vitamin D deficiency became more common as people became older, and it was more common in women. To address this escalating public health crisis, fast action is required. Vitamin D status determination across different age groups in a community and in different climates of a country is crucial and has important implications for general Health. Reduced exposure of women to sunlight (often owing to the usage of veil or sun blocks on exposed skin), extensive cooking, inadequate nutrition, unbalanced diet, and intake of unfortified foods appear to be the main causes of vitamin D insufficiency in the Pakistani population. Our community's vitamin D status must be determined. The degree of the deficit detected in the population necessitates fortified food items. It's more necessary to educate doctors about the significant prevalence of vitamin D insufficiency in otherwise healthy people. To eliminate the presence of vitamin D deficiency, measures to improve vitamin D status are required. In our society, this subject is still understudied and requires attention. In our region, there is a lack of awareness about vitamin D intake, which leads to an increase in vitamin D deficiency in women. The current research will aid them in identifying important elements that lead to Hypovitaminosis D. Given the number of risk factors identified in this study, it appears that increasing female public awareness of vitamin D and its health benefits will be a significant study outcome. It has the potential to alter societal attitudes on food behaviors, solar exposure, and other risk factors. It will prevent those facing debilitating conditions and lessen burden of diseases in society.

METHODS

A cross sectional study was conducted on 370 females aged 20-60 years of Lahore from January 2021 to June 2021in Colleges and Universities. A written ethical permission was taken from heads of universities, colleges to conduct a survey from Faculty and Students. This study was conducted in different setups according to their ethical practices and consent. A specially designed semi-structure questionnaire consisting of four sections related to general information, health information, dietary Information and sunning practices that covered almost all the aspects of Vitamin D deficiency was used. Pilot testing was done via Public Health Experts and validity of the questionnaire was assessed using cronbach alpha which came out to be 0.86. To explain the purpose of this study, its significance and to take the agreement of participation in this research, consent form was attached. 400 questionnaires were distributed among females of Lahore fulfilling inclusion criterion (age between 20- 60 years) were included. The survey questionnaire was collected regarding age, weight, education, duration of sunlight exposure and dietary habits were recorded. Detail of every question was given side by side. Efficacy was provided via online Internet resource that provided the participants ease to fill the form at their own places. Paramount importance was given to the simultaneous recording of data with the received responses. Data was analyzed via SPSS version 21 (Statistical package for social sciences) software. Frequencies and Percentages were calculated.

RESULT

A cross sectional study was done on female participants of Lahore, Pakistan. The aim of this study was to evaluate the associated adverse outcomes of vitamin D deficiency among females of Lahore. A total of 370 Participants were included and evaluated through Questionnaire. The inclusion criteria were followed and four age groups were made. Table 1shows the age groups of female ranging from 20-60. Comparing age and level of Vitamin D was more common in reproductive age of females with more association in young females of 20 to 30 years of age. Table 2 shows that 81.9 % participants had general awareness regarding importance and deficiency of vitamin D. Table 3 shows that 80% People eat Vitamin D Rich Diet While Table 4 states that only 20% use vitamin D supplements and 41.9 % females drink a Cup of Cow Milk Daily shows in Table 5. 73.8% participants had suffered from weakness and general body aches were vitamin D deficiency in Table 6. 82.2% females reported musculoskeletal pain for different known and unknown reasons and frequency shown in Table 7.

Age groups					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	134	36.2	36.2	36.2
	31-40	94	24.4	24.4	61.6
	41-50	82	22.2	22.2	83.8
	51-60	60	16.2	16.2	100.0
	Total	370	100.0	100.0	

Table 1: Distribution of Age

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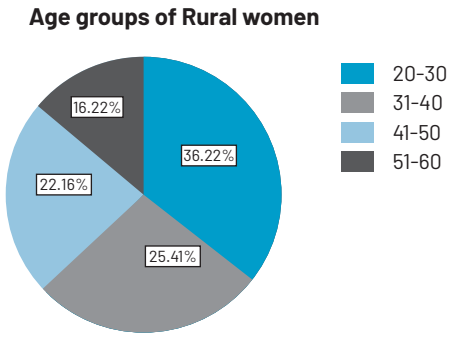

Figure 1: Showing the Age Distribution

Knowledge About vitamin D					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	303	81.9	81.9	81.9
	No	67	18.1	18.1	100.0
	Total	370	100.0	100.0	

Table 2: Knowledge and Awareness of Vitamin D

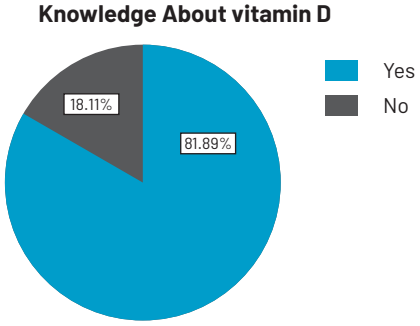

Figure 2: Showing the Percentage of Knowledge and Awareness of Vitamin D

Vitamin D Rich Diet Intake					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	296	80.0	80.0	80.0
	No	74	20.0	20.0	100.0
	Total	370	100.0	100.0	

Table 3: Knowledge and Practice of Vitamin D Rich Intake

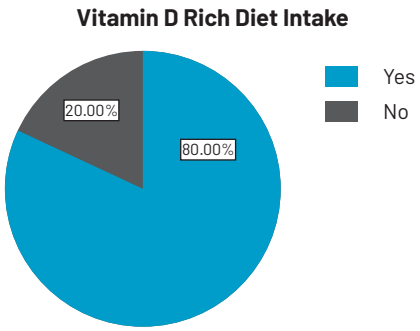

Figure 3: Showing the Percentage of Knowledge and Practice of Vitamin D Rich Intake

Use of Vitamin D Supplements					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	74	20.0	20.0	20.0
	No	296	80.0	80.0	100.0
	Total	370	100.0	100.0	

Table 4: Knowledge and Practice of usage Vitamin D Supplements

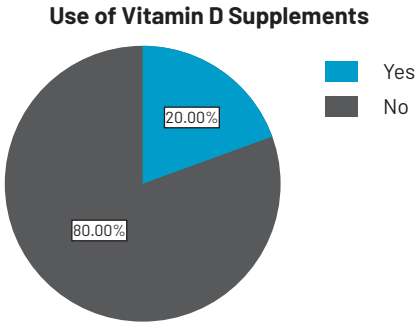

Figure 4: Showing the Percentage of Knowledge and Practice of usage Vitamin D Supplements

Use of the Fresh Milk (Cow)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	155	41.9	41.9	41.9
	No	215	58.1	58.1	100.0
	Total	370	100.0	100.0	

Table 5: Knowledge and Practice of usage Fresh Milk

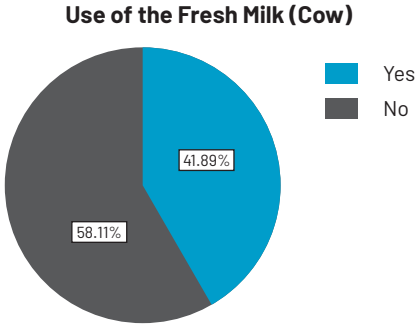

Figure 5: Showing the Percentage of Knowledge and Practice of usage Fresh Milk

Weakness and Body Ache					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	273	73.8	73.8	73.8
	No	97	26.2	26.2	100.0
	Total	370	100.0	100.0	

Table 6: Feelings of Weakness and Body Ache

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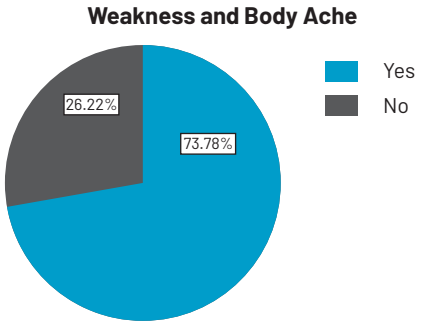

Figure 6: Showing the Percentage of Feelings of Weakness and Body Ache

Pain in Joints & Muscles					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	196	53.0	53.0	53.0
	No	174	47.0	47.0	100.0
	Total	370	100.0	100.0	

Figure 6: Showing the Percentage of Feelings of Weakness and Body Ache

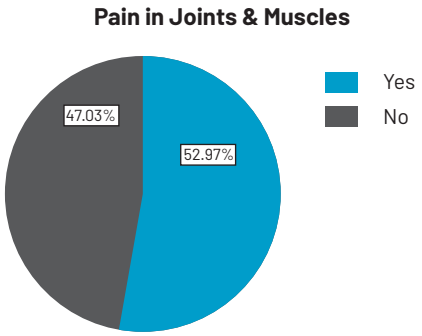

Figure 7: Showing the Percentage of Feelings of Joint and Muscle Pain(Muscoskeletal)

DISCUSSION

The highlight of this study focused on the knowledge and Awareness of Vitamin D deficiency and its causative agents or associated risk factors leading to this condition in females living in Lahore, Pakistan.Severe Hypovitaminosis D was most commonly observed in young females of Lahore.Three major problems which were examined in this study were awareness about importance of Vitamin D, Dietary intake of Vitamin D rich food or supplements and exposure to the sunlight and other physical activities. A study by Karin in 2020 research displays the same results as Vitamin D is definitely not a cure-all, and it is likely to be effective only in cases of insufficiency. It may be a useful, affordable, and safe adjuvant therapy for many diseases, given its infrequent side effects and relatively wide safety margin, but future big and well-designed trials should explore this further. To avert severe vitamin D deficiency, a global public health effort that incorporates vitamin D supplementation in particular risk groups and systematic vitamin D dietary fortification would appear to be critical. The current international literature on vitamin D insufficiency is reviewed in this narrative review, its relevance, and therapeutic options are discussed. With the growing prevalence of vitamin D deficiency across the United States and its association with these leading causes of mortality, it has become more important than ever to delineate vitamin D's role in the pathogenesis of these diseases and use data to pinpoint established risk factors for vitamin D deficiency.Deficiency syndromes associated with very low intake of specific vitamins and essential minerals which can be treated by administering the specific micronutrient at the proper dose for the necessary duration before irreversible pathology occurs. In current study reduced generalized body aches and bone weakness have been reported in young females having low levels of vitamin D. All the previous evidences strongly supports findings of the current study that vitamin D deficiency is more prevalent among females due to reduced sunning practice, dietary intake of vitamin D and lack of awareness regarding importance of vitamin D intake.

CONCLUSION

In Conclusion the findings revealed that higher incidence of musculoskeletal related issues in Vitamin D deficient females.This study evaluated thatMost of Educated People are unaware of Vitamin D knowledge and Proper dietary intake Habits. They take insufficient amount of Vitamin D and experience discomfort as weakness and tiredness in joints and muscles.

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