

Vitamin D and its Relation with Female Outfit Dressing Style

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ABSTRACT

Background: Vitamins, minerals, and other important nutrients we get from food can keep our bodies healthy, and to get strong bones, we need calcium and vitamin D. Vit D3 titled the “sunshine vitamin,” is one of the important nutrients needed for a female’s health. Vit D had a constant function in adaptive and inherent immunity. Exposure to sunlight has a major role in providing adequate Vit D for most people in the world.

Aim of the study: Our study aims to evaluate Vit D and calcium levels in healthy young females of child-bearing age and to inspect the effects of their outfit dressing.

Methods: A total of 108 women were included, those wearing full cover outfit style clothing covering all body leaving the face area and hand exposed group I (74 women), and uncovered women with exposed head, arms, and legs group II (34 women). A quantitative test was used to determine 25-hydroxy Vit D in human serum using minividas and for total calcium measurement atomic absorption spectrophotometry.

Results: All women in both groups had a blood test for calcium (Ca) and Vit D3 level levels, and a calculation of body mass index (BMI) was done. Using t-test for the comparison between (group I and group II). A significant difference ($p < 0.005$) was found in serum Vit D3, which was lower in group I with a mean (12.09 ± 7.59), and for group II, it was (16.56 ± 7.61). Serum calcium was slightly elevated in group II than in group I, but there was no significant between the two groups. The mean serum calcium level was (9.41) in group I and (9.56) ($p < 0.3$) in group II.

Although body mass index was higher in group I mean (28.73 ± 0.61) than group II mean (27.25 ± 4.88), it was statistically not significant ($p < 0.2$).

Conclusion: The finding of this study revealed that many factors could affect Vit D levels, like clothing styles and lifestyle. Inadequate Vit D intake and covered dress style can lead to low Vit D levels.

A recommendation that has been suggested when there is no Vit D intake is to expose the face area, arms, and hands for a short duration in the middle of the day many times a week to have normal Vit D levels.

Keywords: BMI, Calcium, Dressing style, Vit D.

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INTRODUCTION

Vitamins, minerals, and other important nutrients we get from food can keep our bodies healthy, and to get strong bones, we need calcium and Vit D.

Vit D3 called the “sunshine Vit,” is one of the important nutrients needed for women’s health. Vit D had constant function in adaptive immunity as well as inherent immunity.¹

Exposure to the sun has a major role in providing enough vit.D for most of the people in the world. 7-Dehydrocholesterol (pro-vit D3) which presents in the skin absorbs ultra-violet light over wavelengths of 290–300 nm and it changes to pre-vit D3 which induced isomerization to vit D3 thermally, which needs 2 to 3 days to be completed. The quantity (intensity) and quality

(appropriate wavelength) of sunlight are both important for its synthesis. Aging, poor exposure to sunlight, sunscreens and seasonal changes could affect the cutaneous formation of this Vit and hormone.^{1,2}

Vit D deficiency is associated with many chronic diseases, like autoimmune diseases, cardiovascular and pulmonary diseases, renal impairment, and cancer. High-risk groups like elderly women, anticonvulsant use, and obesity.³

Hypovitaminosis D predisposes children to respiratory infections. Ultraviolet radiation and cod liver oil decrease the incidence of viral pulmonary infections,⁴ and if a person is not taking Vit D supplements, this will lead to impaired neuromuscular function, bone loss, and fractures.⁵

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The non-usual actions of Vit D, namely antiproliferation, pro-differentiation, pro-apoptosis, anti-inflammation, and immune system regulation, have received great attention during the past years. New studies show the increasing incidence of many types of cancer with Vit D deficiency.⁶

Epidemiological studies submit that Vit D inadequacy is associated with a number of disorders often observed among the elderly, such as colon, breast, and prostate cancers, type II diabetes (T2D), and cardiovascular disease like hypertension. Daily oral administration of 800 IU (20 microg) Vit D in combination with calcium reduces blood pressure in old females.⁷

Testing for Vit D levels for most individuals is important because it D deficiency is common.¹

SUBJECTS

We suggested that serum Vit D levels in young females were associated with clothing styles and investigated this by a cross-sectional study. It was conducted between January to June 2021. Subjects consisted of 108 women who were seen in a private clinic. They included those wearing full cover-out fit style clothing, covering the whole body but leaving the hand and face exposed (group I), and uncovered women with exposed heads, arms, and legs (group II).

Group I: Seventy-four women, the mean ± SD of their age was 31.65 ± 9.17 years.

Group II: This group includes 34 women, their mean age ± SD was 31.58 ± 7.08 years.

A Questionnaire form was Applied to all Subjects

Exclusion Criteria Included: Women taking calcium and Vit D supplements or suffering from mal-absorption diseases, hepatic impairment, and renal impairments, were excluded.

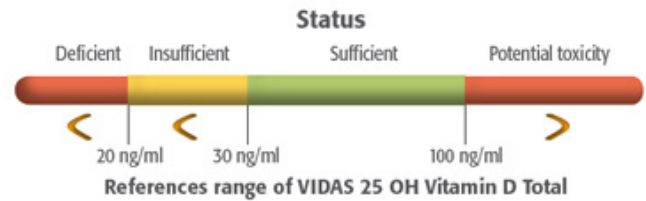
Complete physical examination and blood pressure measurement was done. All women went for measurement of body weight, height, and calculation of BMI was done.

Blood Sampling and Laboratory Analysis: Five milliliters of venous blood samples were obtained from all women for biochemical analysis. By standard antecubital venipuncture, blood was drawn into plain tubes and allowed to clot in a water bath at 37°C. Then centrifuged blood samples were at 5000 rpm for 5 minutes, and serum was isolated and stored at -18°C until required for analysis. Thawing of the samples was allowed to occur at room temperature before measuring the biochemical parameters, which include serum calcium and serum Vit D3. All biochemical assays were determined via standard laboratory tests by using various reagent kits purchased from international suppliers and companies.

Measurement of Vit D

Quantitative test for the determination of 25-hydroxy Vit D in serum using Minividase is an immunoassay system with compact automated characters and relies on principles of the Enzyme-Linked Fluorescent Assay (ELFA) technique. The kit is VIDAS 25 OH Vit D. (bioMérieux, France). Serum 25-hydroxy Vit D was measured in nanograms per liter (ng/L).

It needs 200 microns of serum, then places SPR and strip into the machine, then press start key.⁸



Measurement of Calcium

BIOLABO kit list number (REF) 80004 was used for the quantitative determination of calcium using atomic absorption spectrophotometry.⁹

Statistical Analysis

Clinical and laboratory data were collected and statistically analyzed with the use of the Statistical Package for Social Sciences (version 21; SPSS). The following statistical methods were used for the analysis of the data.¹⁰

- For quantitative values, data were expressed as mean ± standard deviation (SD).
- Student t-test used for the differences between means of a variable.

Statistical significance was for all tests at p < 0.05.

RESULTS

The results of the data analysis of this study are presented in the following Tables 1 and 2 and Figure 1:

Group I: Seventy-four covered women. The mean ± SD of their age was 31.65 ± 9.17 years, and the number of children was 3.09 ± 2.48.

Group II: this group includes 34 uncovered women. Their mean age ± SD was 31.58 ± 7.08 years the number of children was 3.44 ± 3.09.

All women in both groups had a blood test for calcium (Ca) and Vit D3 levels, and a calculation of BMI was done. The following results were obtained using a t-test for the comparison between (group I) and (group II). A significant difference (p < 0.005) was found in serum Vit D3, which was lower in group I with a mean (12.09 ± 7.59), and for group II, it was (16.56 ± 7.61) (Table 1), (Figure 1).

Serum calcium was slightly higher in group II than group I but without a significant difference between the two groups. The mean serum Ca level was 9.41 in group I and group II (9.56), (p < 0.3).

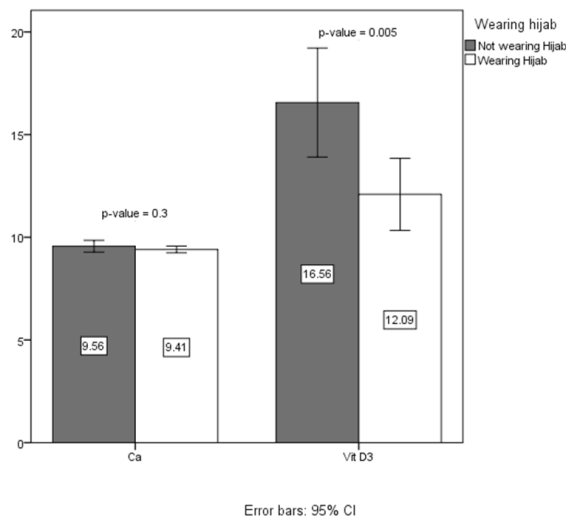
Although body mass index was higher in group I mean (28.73 ± 0.61) than group II mean (27.25 ± 4.88). It was statistically not significant (p < 0.2) (Table 2).

Table 1: Comparison of the Calcium level and Vit D3 between (group I and group II).

Variables	Group (I)	Group II	p-value
	n = 74	n = 34	
	Mean ± SD	Mean ± SD	
Vit D3 ng/L	12.09 ± 7.59	16.56 ± 7.61	0.005
Calcium mmol/L	9.41 ± 0.71	9.56 ± 0.82	0.3

Table 2: Comparison of the BMI and number of children between (groups and group II).

Variables	Group (I)	Group (II)	p-value
	n = 74	n = 34	
	Mean ± SD	Mean ± SD	
Number of children	3.09 ± 2.48	3.44 ± 3.09	0.5
BMI	28.73 ± 0.61	27.25 ± 4.88	0.2

**Figure 1:** Comparison of the Calcium level and Vit D3 between groups I and II.

DISCUSSION

Our study revealed that many factors could affect Vit D levels, like clothing styles and lifestyle. Inadequate Vit D intake and covered dress style can lead to low Vit D levels.

A significant difference ($p < 0.005$) was found in serum Vit D3, which was lower in group I with a mean (12.09 ± 7.59), and for group II, it was (16.56 ± 7.61)

Clothes are considered the main blocker to sun exposure, so they affect Vit D synthesis and status; higher levels of Vit D are seen in females with uncovered outfits than in those wearing full cover outfits.¹¹ Dress styles covering all body have unhealthy effects on Vit D levels and may lead to secondary hyperparathyroidism.¹²

Buyukuslu *N et al.* stated that the levels of Vit D in young females are related to clothing style and the age at which a female starts wearing cover-style clothing.³ Deficient Vit D is found in breastfeeding mothers with a covered style of clothing and insufficient Vit D intake even in the presence of adequate sunshine,¹³ but inadequate sunlight does not cause a problem if a person gets enough Vit D from their diet like eating fish or dairy products or take Vit D tablet.

A high percentage of Arab women cover their forearms, legs, and head when they go outdoors.¹³ A recommendation that has been suggested when there is no Vit D intake is to increase the exposure of the face, arms, and hands for a short duration at the middle of the day many times a week to have normal Vit D, Sunlight is actually the main source of vitamin D for many people, but it increases the risk of skin cancer without proper protection.¹⁴

The prevalence of deficient Vit D in people with low sunlight exposure because of their clothing habits is high. Still, the degree of overall sun exposure was not predictive of Vit D status, can not be explained exactly why civilian participants were more prone to have deficient Vit D than those living in semi-urban areas. Tropospheric ozone is a common pollutant in central urban areas and may decrease the synthesis of Vit D in the skin; this may lead to deficiency in Vit D.¹⁵

Serum calcium was slightly higher in group (II) than in group (I) but without a significant difference between the two studied groups. The mean serum calcium level was 9.41 in the group (I) and group (II) (9.56), ($p < 0.3$).

Serum assessment of trace elements is of high concern in clinical and research aspects because of their role in preserving health and physiological function.¹⁶ Calcium is essential for blood clotting and the heart, muscles, and nerves to function well. Insufficient calcium significantly contributes to the development of osteoporosis.

Vit D is a fat-soluble hormone that majorly affects calcium homeostasis and bone mineralization. Many studies showed that low levels of Vit D inversely affect the mineralization of bone, causing rickets in children and osteomalacia in adults.¹¹

Normal calcium level in the body is controlled by Vit D, which has a classic role in maximizing the intestinal efficacy of Ca absorption. Insufficient calcium absorption from the diet because of low Vit D results in the utilization of calcium from its stores in the skeleton, weakening and deformities in the bone such as rickets in children and osteomalacia in adults.¹⁷

Although body mass index was higher in group I mean (28.73 ± 0.61) than group II mean (27.25 ± 4.88), it was statistically not significant ($p < 0.2$). Our study results are in match with previous researchers who concluded that obese people are more prone to Vit D deficiency.

The ability of the body to use Vit D decreased with obesity. The cause for the negative relationship between Vit D and BMI is that adipose tissue sequesters 25-hydroxy Vit D. Vit D deficiency was correlated with dyslipidemic triglyceride levels in the overweight or obese adolescents,¹⁸ a trial of placebo-controlled Vit D supplement done among postmenopausal white female with Vit D insufficiency revealed that overweight and obese women had low levels of 25-hydroxy Vit D concentration (about 12.5 nmol/L and 17.5 nmol/L, respectively) in comparison with a female with normal-weight at 12 months even so whether the Vit D dose was administered or not.

The recommendation to the obese people by the Endocrine Society is to take Vit D (at least 6,000 to 10,000 IU/day) for prevention and treatment of Vit D deficiency.¹⁹

CONCLUSION

The present study evaluates Vit D and calcium concerning clothing style. The finding revealed that many factors, like clothing styles and lifestyle, could affect Vit D levels. Inadequate Vit D intake and covered dress style can lead to low Vit D levels. And we can prevent its deficiency; the cost of prevention is not expensive.

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