



# Prevalence of Vitamin D Deficiency among Libyan Pregnant Women

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## ABSTRACT

Vitamin D deficiency is a common health concern worldwide. We aim to assess the prevalence of vitamin D deficiency among sample of Libyan pregnant patients. A cross-sectional retrospective study was conducted in May 2024 to examine vitamin D status level among Libyan pregnant women. Data on vitamin D status were analyzed from available sample for 97 women collected from different gynecological clinics in Akhoms city, Libya. Our results showed that the average vitamin D level in all women was  $15.72 \pm 10.5$  ng/mL. Pregnant women showed differences in BMI, parity, and daily sunlight exposure. The number of women was higher in the insufficient group, and their mean vitamin D level was lower ( $15.13 \pm 2.34$ ) than sufficient groups ( $33.95 \pm 20.71$  ng/mL). Supportive programme should be implemented and more widely promoted, and physicians should be better informed about the program's content during pregnancy.

## Keywords:

Vitamin D, Deficiency, Pregancy, Libya.

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## Introduction

Vitamin D deficiency is a common concern during pregnancy due to increased demands on the mother's body to support fetal development [1]. Several studies have investigated the prevalence of vitamin D deficiency among pregnant women to understand the extent of this issue [2].

Research indicates that the prevalence of vitamin D deficiency among pregnant women varies across different regions and populations [3]. Factors such as geographical location, cultural practices, dietary habits, and sun exposure significantly influence the prevalence rates. In regions with limited sunlight exposure or cultural practices that involve covering most of the skin, the risk of vitamin D deficiency tends to be higher [4].

Studies have shown that vitamin D deficiency during pregnancy can have serious implications for both the mother and the developing fetus [5,6]. Maternal vitamin D deficiency has been associated with an increased risk of complications such as gestational diabetes, preeclampsia, and preterm birth [7]. Additionally, inadequate levels of vitamin D in pregnant women may lead to developmental issues in the offspring, including impaired bone growth and a higher risk of certain chronic diseases later in life [8].

To address the issue of vitamin D deficiency among pregnant women, healthcare providers often recommend supplementation with vitamin D during pregnancy. Prenatal vitamins containing adequate amounts of vitamin D are commonly prescribed to ensure that pregnant women meet their nutritional requirements.

Regular monitoring of vitamin D levels through blood tests is also recommended for pregnant women at risk of deficiency. This proactive approach allows healthcare providers to identify deficiencies early and intervene with appropriate measures to prevent adverse outcomes for both the mother and the baby [6].

The prevalence of vitamin D deficiency among pregnant women is a significant concern, given its potential impact on maternal health and fetal development. Healthcare professionals emphasize the importance of adequate vitamin D intake through supplementation and monitoring to ensure optimal health outcomes for both mothers and their babies. Therefore, the current study was conducted to assess the prevalence of Vitamin D deficiency among pregnant women attended different gynecological clinic in Akhoms.

## Methods

A cross-sectional retrospective study was conducted in May 2024 to examine vitamin D status level among Libyan pregnant women. Data on vitamin D status were analyzed from available sample for 97 women collected from different gynecological clinics in Akhoms city, Libya. The study was conducted according to the guidelines of the Declaration of Helsinki and data privacy were kept anonyms.

The analysis for serum 25 (OH)D was done by electrochemiluminescence protein binding assay (ECLIA) using Roche Diagnostics, Cobas e411 analyzer.

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Vitamin D status was analyzed according to cut-off values proposed by Institute of Medicine (IOM) in 2011: insufficient (25(OH)D level between 30 and 50 nmol/l), sufficient (25(OH)D level >50 nmol/l).

To analyses the data, descriptive statistics were used and were given via tables.

## Results

This retrospective study included ninety-seven pregnant women. The average vitamin D level in all women was 15.72±10.5 ng/mL. Pregnant women showed differences in BMI, parity, and daily sunlight exposure. Table 1 shows the characteristics of each group.

**Table 1. Serum 25-hydroxyvitamin D levels in pregnant women**

Variables	n(%)	25(OH)D levels (ng/mL) (mean ± SD)
<b>All pregnant women</b>	97(100%)	15.72±10.5
<b>Age</b>		
25-35	51(52.6%)	15.4±10.6
>35	46(46.6%)	14.2±11.2
<b>BMI</b>		
<18	3(3.1%)	8.11±0.3
18-24	56(57.7%)	15.9±14.2
>25	38(62.2%)	14.7±14.4
<b>Parity</b>		
1	38(39.0)	15.38±12.8
2	36(37.0)	14.19±5.71
≥3	23(24.0)	14.95±15.88
<b>Daily sunlight exposure</b>		
Yes	41 (42.3%)	15.13±11.05
No	56 (57.7%)	14.41±12.10

The number of women was higher in the insufficient group, and their mean vitamin D level was lower (15.13±2.34) than sufficient groups (33.95±20.71 ng/mL) (Table 2).

**Table 2. laboratory results**

Variables	Insufficient	Sufficient
Number of women (n, %)	83 (85.6%)	14 (14.4%)
25(OH)D (ng/mL) (mean ± SD)	15.13±2.34	33.95±20.71

## Discussion

Vitamin D deficiency causes serious health problems for both mothers and their infants, as the mother's vitamin D store is the primary source of vitamin D for the fetus [9].

The World Health Organization recommends that pregnant women take 200 IU of vitamin D per day [10].

The Institute of Medicine recommended that the "Estimated Average Requirement" and "Recommended Dietary Allowance" (RDA) for pregnant women be 400 and 600 IU/day, respectively [11]. According to recent studies, pregnant women should take more than 1000 IU per day to achieve adequate levels [12]. The safe dose during pregnancy is unknown, but Hollis et al [13] demonstrated that vitamin D supplementation of 4000 IU/day for achieving adequate levels was both safe and effective in pregnant women.

According to studies from various countries, the prevalence of vitamin D deficiency in pregnant women and infants varies from 4% to 60% and 3% to 86%, respectively [14, 15]. In an Egyptian study, El Koumi et al [16] found that only 35.8% of pregnant women had blood levels above 20 ng/mL. A study from India found that 84% of pregnant women had vitamin D concentrations below 22.5 ng/mL [17]. A Belgian national survey identified 74.1% vitamin D insufficiency (<30 ng/mL) and 44.6% deficiency (<20 ng/mL) [18].

Earlier research has demonstrated that vitamin D deficiency is common among pregnant women in Turkey. In 1998, Alagöl et al [19] discovered that vitamin D levels were low in 66.6% of women of reproductive age in Istanbul. In 2003, Pehlivan et al [20] found that 94.8% of mothers and 24.6% of their infants had levels less than 16 ng/mL. In a subsequent study by Ergur et al. (2009) [21], only 18.6% of mothers and 2.9% of neonates had normal vitamin D levels. In 2008, Halicioglu et al [22] discovered that 50.4% of pregnant women in Turkey, had blood vitamin D levels of ≤10 ng/mL. A 2010 study in Turkey found that 62.6% of pregnant women and 58.6% of infants had vitamin D deficiency (≤20 ng/mL) [23]. All of these studies were conducted prior to the implementation of the national pregnancy vitamin D supplementation program. The study found that pregnant women had a mean vitamin D level of 14.82±11.45 ng/mL.

Vitamin D deficiency in mothers was 49.5%. All of these findings confirm that vitamin D deficiency remains a problem in pregnant women and in Libya.

## Conclusion

Vitamin D deficiency in pregnant women and their infants remains a major health concern in Libya. Supportive programme should be implemented and more widely promoted, and physicians should be better informed about the program's content during pregnancy.

**Conflict of interest.** Nil

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