



# Relationship Between Vitamin D Level and DNA Breakage Index of Sperm in Men Referred to Omid Infertility Center in Hamedan, 2021-2023

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## ABSTRACT

**Introduction:** The prevalence of infertility in Iran and the world is increasing. In addition to psychological complications, heavy annual costs are imposed on the Ministry of Health. Limited research exists on the relationship between vitamin D and DNA fragmentation index (DFI). DFI is a measure of DNA damage in sperm cells and is used to evaluate male fertility. Some studies suggest that vitamin D may affect sperm health and fertility. Vitamin D receptors have been found in the testes, and therefore, vitamin D deficiency may be associated with impaired sperm quality, including increased DNA damage. However, the evidence for a direct link between vitamin D and DFI is still inconclusive, and research is needed to find a clear relationship. It is important to note that male fertility is affected by various factors, and vitamin D is only one potential factor among many factors that may affect DFI. If vitamin D affects male fertility, it can be prescribed. It increased the quality of sperm and the chances of fertility.

**Methods and Materials:** In this descriptive-analytical cross-sectional study using the census sampling method, 789 men referred to Hamedan Omid Infertility Clinic Center in 2021-2023 were included. Vitamin D serum level, DFI, program indices, and demographic characteristics (occupation, age, and body mass index) were collected by interviewing and reading records. Data were analyzed using SPSS version 27 software.

**Results:** Among men, 7.7% of those referred to the Omid Hamadan infertility clinic had DFI15% (abnormal). Increasing age has been associated with increasing DFI (95% CI: 1.06-3.03; OR = 1.79;  $p = 0.05$ ) The relationship between the increase in DFI and the decrease in normal sperm morphology was observed (95% CI: 1.43-4.20;  $p = 0.01$ ; OR = 2.45) and the relationship between the increase in DFI and the decrease in the progressive movement of sperm was seen (95% CI: 1.66-4.87;  $p = 0.05$ ; OR = 2.85) and also the relationship between DFI and the decrease in sperm count after removing the effect Confounding variables were observed (95%CI: 1.06-8.38;  $p = 0.05$ ; OR = 2.98). There is a significant relationship between DFI and vitamin D insufficient serum level ( $20 \leq \text{vitD30 ng/mL}$ ) and serum level having vitamin D deficiency (vit D20 ng/mL) before and after removing the effect of confounding variables.

**Conclusion and Discussion:** The relationship between DFI and independent variables can differ depending on the specific conditions and research study. It is important to note that the relationship between DFI and these independent variables may not be consistent across studies, and more research is needed to understand this relationship fully. In this study, considering the role of demographic characteristics and program indicators, no correlation exists between DFI and vitamin.

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