



# **Vitamin D Deficiency, its Relation to Bone, Back Pain, Tiredness and Mood Improving in Adult Sample Collected from Baghdad City**

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**نقص فيتامين د وعلاقته بالأم العظام والظهر والشعور بالتعب  
وتحسين الحالة المزاجية في عينة من البالغين من مدينة بغداد**

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## Abstract

Vitamin D deficiency is a global health problem. With all the medical advances of the century, vitamin D deficiency is still prevailing. Over a billion people worldwide are Vitamin D deficient or insufficient. In this study data collected from 58 outpatients Clinic from Bagdad city/Iraq, suffering from Vitamin D deficiency at different rate. They were either suffer from Vitamin D deficiency (10-19) ng/ml, insufficient (20-29) ng/ml or some suffer with sever deficiency < 10ng/ml. This study covered random samples of different gender (male and female) and from different life style, which include different symptoms (bone and back pain, tiredness, hair loss and mood improving).

Results showed that women were more accessible than men for Vitamin D deficiency due to woman loss more Vitamin D through menopause, pregnancy and lactation period and results showed that patients with age (40 to 59) year old and (60 to 69) year old were suffering from bone and back bone pain, were 25% of the sample study were suffering from hair loss. Most people covered in this study were felling tiredness and headache.

In this study samples collected from patients with Vitamin D deficiencies were treated by giving dosages of supplement medicine (like Cholecalciferol and Colecalciferol) to optimize level of 25-OH Vitamin D3. To increase Vitamin D rate in these patients.

Results also showed that the supplement medicine help and improve reducing hair loss, bone and back pain within two months of taken it, were 25% of the sample study suffering from felling tiredness and headache which they start to recovered their health gradually after taken medication within first and second month of treatment.



In relation to depression, it was concluded that depression was associated with low Vitamin D level in patients' especially old peoples and from the results, medical supplement found to be improves mood and reduce depression in a sample of people study especially in women.

**Keywords: Vitamin D deficiency, Diabetes, Hypertension, Depression, Osteoporosis, Colon cancer, Pain and Back pain.**

## المستخلص

يعد نقص فيتامين D مشكلة صحية عالمية ومع كل التطور في المجالات الطبية في هذا القرن لا يزال نقص فيتامين (D) سائداً بين البشر، إذ يعاني حوالي أكثر من مليار شخص في جميع أنحاء العالم من نقص فيتامين (D) أو عدم كفايته.

في هذه الدراسة، جمعت بيانات لـ (58) مريضاً من عدد من العيادة الطبية في مدينة بغداد \ العراق ممن يعانون من نقص فيتامين D بمعدلات مختلفة، إذ كانوا يعانون إما من نقص فيتامين D (10-19) نانوجرام \ مل، أو عدم كفاية الفيتامين (20-29) نانوجرام \ مل أو يعاني البعض من نقص حاد أقل >10 نانوجرام \ مل.

شملت هذه الدراسة عينات عشوائية للجنسين (ذكور وإناث) من أنماط حياتية مختلفة، والتي شملت أعراضاً لأمراض مختلفة [آلام العظام والظهر، والتعب، والكآبة، تدهور الحالة المزاجية].

أظهرت النتائج أن النساء أكثر عرضة من الرجال من نقص فيتامين D بسبب فقدان المرأة المزيد من فيتامين D خلال فترة انقطاع الطمث والحمل والرضاعة. أظهرت النتائج أن عينة المرضى الذين تتراوح أعمارهم من (40 إلى 59) سنة و(60 إلى 69) سنة من كبار السن عانوا من آلام العظام والظهر، و25% من عينة الدراسة عانوا من التعب والصداع. في هذه الدراسة، تمت متابعة علاج المرضى لنقص فيتامين D بإعطاء جرعات من الأدوية التكميلية (مثل Cholecalciferol و Colecalciferol) لتحسين مستوى OH-25 فيتامين D3 لزيادة نسبة فيتامين D في هؤلاء المرضى.

فضلا عن ذلك أظهرت النتائج مساعدة الدواء المكمل في الحد من تساقط الشعر وآلام العظام والظهر خلال شهرين من تناوله، وبدأ التعافي من الشعور بالتعب والصداع في صحتهم تدريجياً بعد تناول الدواء خلال الشهر الاول والثاني من العلاج. فيما يتعلق بالكأبة، أستنتج ارتباط الكأبة بانخفاض مستوى فيتامين (D) لدى المرضى ولاسيما كبار السن، وأخيراً أشارت النتائج الى وجود ارتباط بين المكملات الطبية ونقص فيتامين D حيث عملت هذه المكملات على تحسين المزاج وتقليل الكأبة (تحسن الحالة المزاجية) لدى الأشخاص الذي تمت دراستهم لا سيما عند النساء.

**الكلمات المفتاحية: نقص فيتامين د، مرض السكري، الشعور بالتعب، الكأبة، آلام العظام والظهر.**

## Introduction

Vitamin D deficiency is a global health problem. With all the medical advances of the century, Over a billion people or more worldwide are Vitamin D deficient or insufficient (*Holick and Chen,2008*), (*Lips,2010*) Yet no international health organization or governmental medical program has declared a health emergency to warn the public from the urgent need of achieving sufficient vitamin D blood levels (*Calvo, et al.,2007*).

Vitamin D, which described as “the Sun Vitamin” is a steroid with hormone like activity. It regulates the functions of over 200 genes and is essential for growth and development (*Calvo, et al.,2007*), it has powerful effects on several systems throughout the body, unlike most vitamins, and every single cell in our body has a receptor for it (*Al- meri Rawa,2020*).

Still there are people in the world which are suffering from for Vitamin D deficiency due to their modern life style that reduces their exposure to sun light, as people using car and automobile for running to the day work (*Iqbal and Khan,2010*).



Serum 25-hydroxyvitamin D [25 (OH) D] concentration is the parameter of choice for the assessment of vitamin D status. Recently, many studies have used 30 ng/ml as a cut-off value and most experts, now recommend the normal level of 25-hydroxyvitamin D (25OHD) to be  $\geq 30$  ng/ml. (*Sadat Ali and Al-Eiq, 2006*),(*Bandeira and Gris,2006*).

Vitamin D insufficiency is defined insufficient when the levels are between 20–29 ng/ml and at levels of  $\leq 20$  ng/ml, and the patient is considered vitamin D deficient while the level below 10ng/ml concenter to be sever deficiency (*Sadat –Ali et al. 2009*),(*Mirhosseini et al. 2017*).

Many research reported that vitamin D deficiency can result in obesity, diabetes, hypertension, depression, fibromyalgia, chronic fatigue syndrome, osteoporosis and Nauru-degenerative diseases like (Alzheimer’s disease). Vitamin D deficiency may even contribute to the development of cancers, especially breast, prostate, and colon cancers and also enhance ageing (*Lappi et al.,2017; Nadkarni and Odejayi, 2014*) and actually one researcher emphasis that Vitamin D deficiency accelerates ageing and age-related diseases (*Berridge,2017*).

Vitamin D3 is believed to play important role in controlling immune system (possibly reducing one’s risk of cancers and autoimmune diseases), while some reported that it's increasing neuromuscular function and improving mood and potentially reducing pain Some controlled studies have shown that giving vitamin D to people who are deficient helps to improve depression, in which researches determine that a depressed mood may also be a sign of deficiency (*Karen and Cathleen,2010; VinTangpricha,2017; Ceasr de Oliveira, 2018*). Bone pain and lower back pain may be signs of inadequate vitamin D levels in the blood.Large observational studies have



found a relationship between a deficiency and chronic lower back pain study for old people (Ju *et al.*,2013 ; Holick,2001).

A study suggested that there is a relationship between serum levels of 25(OH) D and symptoms of depression in overweight obese people supplementation them with high doses of vitamin D seems to ameliorate these symptoms (Jorde *et al.*,2008).

## **Aim of the Study**

The aim of this study is to focus on the relationship of Vitamin D level and body health especially for some diseases that covered in this study like Bone and Back Pain, it was expected that with the use of Vitamin D on adult patients, Tiredness and Mood can be improved. Also, treated patients with Cholecalciferol medication for the period of one and two month would improve too.

## **Materials and Methods**

Tools and Instruments Serum Vitamin D level was assessed by using 25(OH) Vitamin D ELISA kit, which was available in most labs. Data were collected and analyzed for 58 out patients Clinic suffering from Vitamin D deficiency at different rate (male and female) with various age in Baghdad city as shown in (Table 1). The study includes different characters of unhealthy patients that suffer different symptoms specially bone and back pain, tiredness, hair loss, mood improving and depression.

Serum 25-hydroxyvitamin D [25 (OH) D] concentration was the parameter that used to assess vitamin D status. Patients were follow-up after treatment with Vitamin D supplements (like Cholecalciferol, also known as vitamin D3



and Colecalciferol) for one and two month (Table 1). The health of patients were follow-up by physician doctors through the period of the study to improve the positive effect of Vitamin D treatment in the characters study. (Al-Ameri,2020; Sadat- Ali et al.,2018; Sadat- Ali, et al.,2009).

## Results and Discussion

The data for Vitamin D deficiency of 58 out patients clinic with the data of 25 OHD after one to two months of Vitamin D supplementations were shown in (Table-1) for male and female in different ages, also the result of 25 OHD after one and two month of Vitamin D supplementation were shown in (Table 1).The date of Vitamin D deficiency was analyzed statistically in which the mean and standard deviation were calculated for data after first and second month of medical supplement. Statistical T-test analysis for data were used and the result of T-test showed that there was highly significant difference for serum 25 OHD for patients after 1st and 2nd month of treatment in the ( $P= 0.05= 1.658$ ) level ( $t= 55.4$  and  $18.20$  after first and second month of treatment). These results support the idea that supplementations of Vitamin D will reduce the suffering of the patients from the back pain and tiredness, and improve the mood of the patients and reducing hair loss but hair loss need more time to enhance this character (Table1). (Hernando et al., 2020; Silva et al., 2013; Soma Das, 2008; Mann et al.,2006; Sadat-Ali and Al-Eiq,2006).



**Table 1. Vitamin D deficiency in samples from outpatient Clinic and 25 serums OHD level after one and two month of treatment.**

Case No.	Gander	Age	Result(25OHD) ng/ml Vitamin D deficiency	Result(25OHD) ng/ml After 1 month treatment of	Result(25OHD) ng/ml After 2 month treatment of
Case 1	Male	27	17.0	43.2	67.5
Case 2	Male	49	13.4	31.0	49.4
Case 3	Male	40	23.1	39.5	25.9
Case 4	Female	35	11.6	36.0	55.2
Case 5	Male	30	19.7	46.1	68.9
Case 6	Male	32	25.2	52.0	73.8
Case 7	Female	23	17.8	37.8	58.1
Case 8	Female	41	21.9	36.7	46.9
Case 9	Female	37	16.8	23.2	49.6
Case 10	Female	42	26.3	41.1	57.5
Case 11	Male	26	27.6	40.1	61.5
Case 12	Female	24	21.7	49.8	68.5
Case 13	Female	34	9.2	29.9	54.7
Case 14	Female	39	14.7	31.0	48.9
Case 15	Male	60	18.4	34.3	50.2
Case 16	Female	23	8.5	29.5	46.8
Case 17	Male	25	24.1	49.2	78.6
Case 18	Female	20	15.2	33.6	52.9
Case 19	Female	62	13.1	28.2	39.5
Case 20	Female	33	19.4	38.2	56.5
Case 21	Female	29	12.7	28.9	50.1
Case 22	Female	24	18.3	43.6	64.9
Case23	Male	34	26.3	48.7	70.1
Case 24	Female	27	13.5	36.4	64.7
Case 25	Female	13	11.3	42.5	69.3
Case 26	Female	28	14.9	40.2	62.7
Case 27	Female	22	16.0	45.6	68.1
Case 28	Female	42	11.9	27.8	45.6





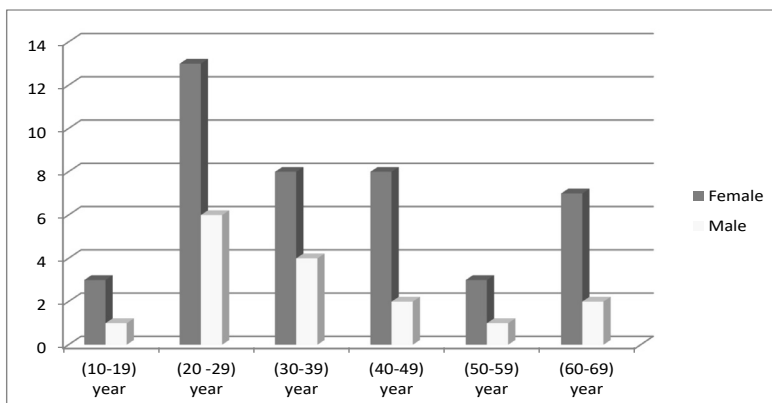
Case No.	Gender	Age	Result(25OHD) ng/ml Vitamin D deficiency	Result(25OHD) ng/ml After 1 month treatment of	Result(25OHD) ng/ml After 2 month treatment of
Case 29	Female	18	12.2	39.2	62.4
Case 30	Female	46	17.1	33.7	52.8
Case 31	Female	36	9.3	35.8	57.1
Case 32	Female	41	11.9	28.1	47.6
Case 33	Female	32	10.1	36.8	59.2
Case 34	Female	42	16.5	33.4	47.1
Case 35	Female	64	18.3	29.3	40.4
Case 36	Female	62	13.8	31.9	45.7
Case 37	Female	59	19.0	32.8	47.1
Case 38	Female	65	12.1	24.3	35.5
Case 39	Female	25	8.2	35.8	60.4
Case 40	Female	24	6.9	32.2	61.4
Case 41	Female	48	11.7	31.1	43.5
Case42	Female	59	13.4	27.3	39.9
Case43	Female	58	16.8	34.6	47.4
Case 44	Female	67	14.6	24.9	38.1
Case 45	Female	25	6.0	30.4	58.6
Case 46	Female	27	9.2	32.1	65.4
Case 47	Male	29	17.3	38.8	61.5
Case 48	Male	44	8.3	25.7	41.0
Case 49	Female	40	9.2	28.9	45.3
Case 50	Female	18	28.4	42.7	68.2
Case 51	Male	10	13.1	35.5	61.4
Case 52	Male	22	6.4	30.1	58.5
Case 53	Male	60	25.2	37.7	44.0
Case 54	Female	31	7.6	32.6	48.9
Case 55	Male	51	10.7	26.2	44.5
Case 56	Female	64	18.3	32.0	64.3
Case 57	Male	26	11.3	37.1	64.4
Case 58	Male	38	20.9	33.5	45.8



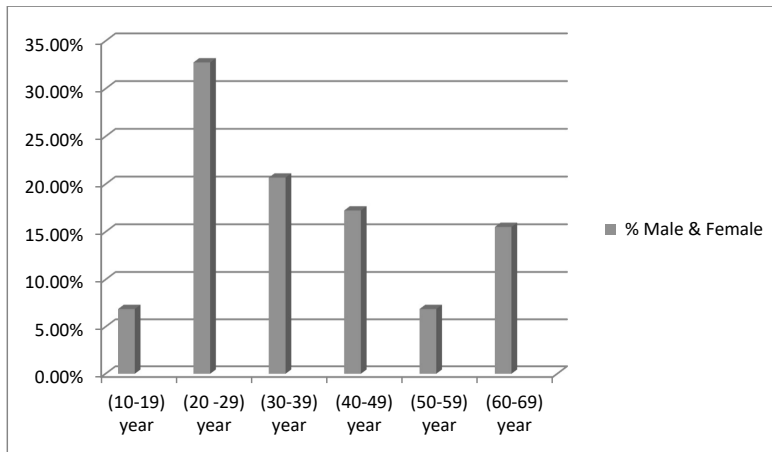
While analysis of the results in (Table- 2, Figure1 and Figure2) for the total and percentage showed that there is relation between age and gender in Vitamin D deficiency and their percentage. These results determined that, in all age categories (10-19 year, 20- 29 year.....etc.) females patients were more suffering for Vitamin D deficiency than men which may be related many reasons, such as that the females were less expose to sun light than men due to the nature of their work and their life style in Iraq. Breast feeding and menstrual cycle lead to loss Vitamin D inconsiderable amounts. From this study, it seemed that women cannot gain enough quantities of Vitamin D in their meals especially for peoples not following proper life style as illustrated in (Figure -1 and Figure -2)(Al- Ameri Rawa,2020; Sadat-Ali et al.,2018).

**Table 2. Age group (male and female) for Vitamin D deficiency.**

No.	Age Range	Female	Male	Total	%
1	(10-19) year age	3	1	4	6.89%
2	(20 -29) year age	13	6	19	32.76%
3	(30-39) year age	8	4	12	20.69%
4	(40-49) year age	8	3	11	18.97%
5	(50-59) year age	3	1	4	6.89%
6	(60-69) year age	6	2	8	13.79%



**Figure 1. The bar chart shows Vitamin D deficiency distribution according to the age group (male and female).**



**Figure 2. The bar chart shows the percentage (%) of age group male and female sample for Vitamin D deficiency.**

Results of (Table 2) showed that the percentage of female's deficiency for Vit. D according to age, these results showed that category group (20-29 age) was more than other the group for Vitamin D deficiency. This may be related to environmental culture in Iraq, in which, this age group was considered to be the best age for marriage and pregnancy which reflects the reducing in Vitamin D efficiency in female body. (Banderi and Gris, 2006; Sadat et al., 2009)

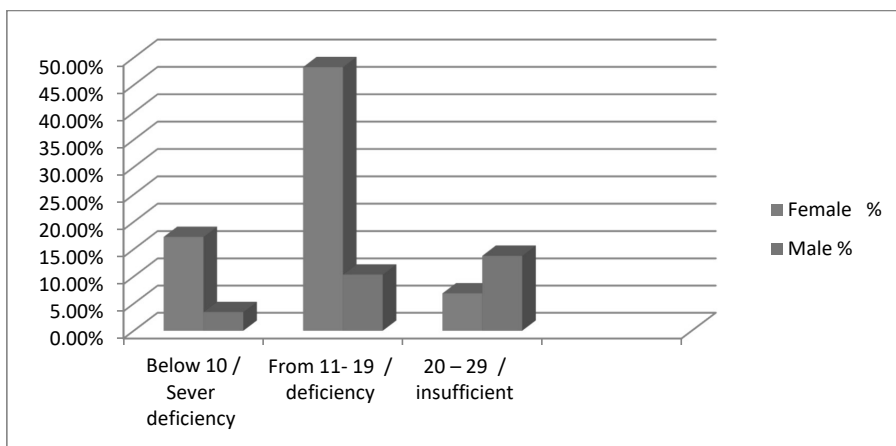
**Table 3. Age group number and different Vitamin D deficiency category with percentage (%) in sample.**

Rate of Deficiency ng/ml	Female	Male	Female %	Male %
Below 10 ng/ml / Severe deficiency	9	2	15.51%	3.44%
≤11- 19 ng/ml / deficiency	27	7	46.55%	12.08%
≤20 – 29 ng/ml / insufficient	5	8	8.62%	13.79%

Results in (Table 3) showed the classification of Vitamin D deficiency and rate of deficiency in relation to gender (male and female). Results



showed that the rate of deficiency (below 10ng/ml) are more in number and percentage in female than in men, that is due to breastfeeding which consume Vitamin D from women body during lactation, as well as, weakness of woman body compare to man and less exposer of female to sun light in country study(because of long hot summer) that why the women suffering early from hair loss, knee and back bone more than men .....etc.



**Figure 3. The bar chart shows the distribution of sex groups' percentage according to Vitamin D category (Insufficient, deficiency and sever deficiency).**

Results in (Table-3) showed that deficiency rate from (11-19 ng/ml) of Vitamin D were more in female than in male, this may be due to that woman is not exposed enough to sunlight. (Al- Ameri Rawa,2020; Sadat-Ali et al.,2018)

Results also showed increasing in serum 25 OHD with first and second month of medical treatment which give appositve effect in patients specially for bone and back bone treatment and reducing tiredness feeling and improve moods and reducing depression while reduction in hair loss



will take more time to improve its effect. (*Hernando et al.,2020; Olivia and Ankura, 2016; Zittermann et al.,2014; Nowson et al.,2012; Jorde et al.,2008 Arya et al.,2004*).

## Conclusion

From this study it concluded that adult women were more suffering than men for Vitamin D deficiency since women loss more Vitamin D through menopause, pregnancy and lactation period, also it can concluded that patients age group (40 – 59 ; 60 - 69 year old) had suffering from bone and back bone pain,were 25% of the sample study were suffered from felling tiredness and headache. They were recovered their health within two months of treatment by taking Vitamin D supplements. (*Cesarde Oliveria et al.,2018; Vin Tangpricha,2017; Ju et al.,2013; Sadat- Ali et al.,2009; Banderia and Gris, 2006*).

In relation with depression, it seemed that depression was associated with low Vitamin D level in patient's especially old ones. The supplements of Vitamin D improves mood and reduce depression especially in women. (*Cesar de Oliveria et al.,2018; Markus et al.,2016; Nadharni and Odejayi, 2014; Ju et al.,2013; Jorde et al.,2008; Arya et al.,2004*).



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