



# Vitamin D Level Screening and Supplementation During Hospital Stay

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## BACKGROUND

- Vitamin D is a nutritional supplement important in skeletal health.
- Deficiencies are linked with increased risk of low bone mineral density, type 1 diabetes, multiple sclerosis, rheumatoid arthritis and many common cancers.<sup>1</sup>
- Hypovitaminosis is estimated to occur in 29% of African Americans. Higher prevalence is observed in >60 years of age, in a minority group, lower education levels, obese, physically inactive, and/or current smokers.
- Vitamin D2 comes in the form of ergocalciferol and Vitamin D3 as cholecalciferol.

Table 1: Vitamin D Level Classification<sup>3</sup>

| Classification               | Level          |
|------------------------------|----------------|
| Deficient Vitamin D Level    | <12 ng/mL      |
| Insufficient Vitamin D Level | 12 - <20 ng/mL |
| Normal Vitamin D Level       | 20 – 50 ng/mL  |
| High Vitamin D Level         | >50 ng/mL      |

Table 2: Vitamin D Supplementation

| Categorization | Supplementation   |
|----------------|---|
| Insufficiency  | 500 – 700 units/daily   |
| Deficiency     | 50,000 units/weekly for 8-12 weeks then 1000 to 2000 units/daily. |

## OBJECTIVE

- To collect data on hospitalized patients screened for vitamin D while hospitalized and subsequently the prescribing patterns observed based on the vitamin D levels.

## DESIGN & METHODS

### Study design:

- Single-center retrospective chart review from Springfield Memorial Hospital, Springfield, IL.
- Admitted patients between 10/01/2021 – 11/15/2021.

### IRB approval:

- Southern Illinois University Edwardsville Institutional Review Board.

### Inclusion criteria:

- Hospitalized patients with a lab value result of 25-hydroxyvitamin D between the age of 18 – 82 years old

### Exclusion criteria:

- Patients pursuing hospice or comfort care
- Patients hospitalized for less than 48 hours

## RESULTS

Table 3: Demographics (n= 100)

|                                 | Deficient (n=27) | Insufficient (n=26) | Normal (n=41) | High (n=6) |
|---------------------------------|------------------|---------------------|---------------|------------|
| <b>Baseline Characteristics</b> |                  |                     |               |            |
| Average Age                     | 49               | 49                  | 49            | 73         |
| Average BMI                     | 28.7             | 28.8                | 29.4          | 26.0       |
| Average eGFR                    | 79               | 83                  | 78            | 52.5       |
| Average Length of Stay          | 11               | 8                   | 13            | 23         |
| Average Calcium Level           | 8.7              | 8.7                 | 9.1           | 8.7        |
| <b>Race</b>                     |                  |                     |               |            |
| White Patients                  | 17 (63%)         | 22 (85%)            | 38 (93%)      | 5 (83%)    |
| African American Patients       | 8 (30%)          | 4 (15%)             | 1 (2%)        | 0          |
| Multiple/Unknown Races          | 1 (3%)           | 0                   | 2 (5%)        | 1 (17%)    |
| Native American Patients        | 1 (3%)           | 0                   | 0             | 0          |
| <b>Disease States</b>           |                  |                     |               |            |
| Active Smoker                   | 8 (30%)          | 10 (38%)            | 12 (29%)      | 0          |
| Depression                      | 9 (33%)          | 12 (46%)            | 20 (49%)      | 0          |
| Anxiety                         | 6 (22%)          | 4 (15%)             | 21 (51%)      | 1 (17%)    |
| Chronic Kidney Disease          | 4 (15%)          | 3 (12%)             | 6 (15%)       | 3 (50%)    |
| Crohn's                         | 1 (4%)           | 0                   | 0             | 0          |
| Osteoporosis                    | 0                | 1 (4%)              | 1 (2%)        | 0          |
| <b>Medications</b>              |                  |                     |               |            |
| Calcitonin                      | 0                | 1 (4%)              | 0             | 0          |
| Colestipol                      | 0                | 1 (4%)              | 0             | 0          |
| Oral/IV Steroids                | 8 (30%)          | 8 (31%)             | 10 (24%)      | 1 (17%)    |
| Laxatives                       | 6 (22%)          | 5 (19%)             | 11 (27%)      | 1 (17%)    |
| Multivitamin                    | 7 (26%)          | 7 (27%)             | 11 (27%)      | 3 (50%)    |

- The R<sup>2</sup> = 0.1023 for the linear coefficient between the length of stay and the vitamin D level.
- 46% of the patients that obtained levels were admitted to psychiatry.

### References

- Michael F Holick, Vitamin D: importance in the prevention of cancers, type 1 diabetes, heart disease, and osteoporosis, The American Journal of Clinical Nutrition, Volume 79, Issue 3, March 2004, Pages 362–371, <https://doi.org/10.1093/ajcn/79.3.362>.
- Kaya MO, Pamukcu E, Yakar B. The role of vitamin D deficiency on COVID-19: a systematic review and meta-analysis of observational studies. Epidemiol Health. 2021;43:e2021074. doi: 10.4178/epih.e2021074. Epub 2021 Sep 23. PMID: 34607398; PMCID: PMC8769802.
- "Vitamin D - Fact Sheet for Health Professionals." NIH Office of Dietary Supplements, U.S. Department of Health and Human Services, [ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/](https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/). Accessed 28 Nov. 2023.

## RESULTS

Figure 1: Supplementation of Vitamin D for Deficient and Insufficient Patients

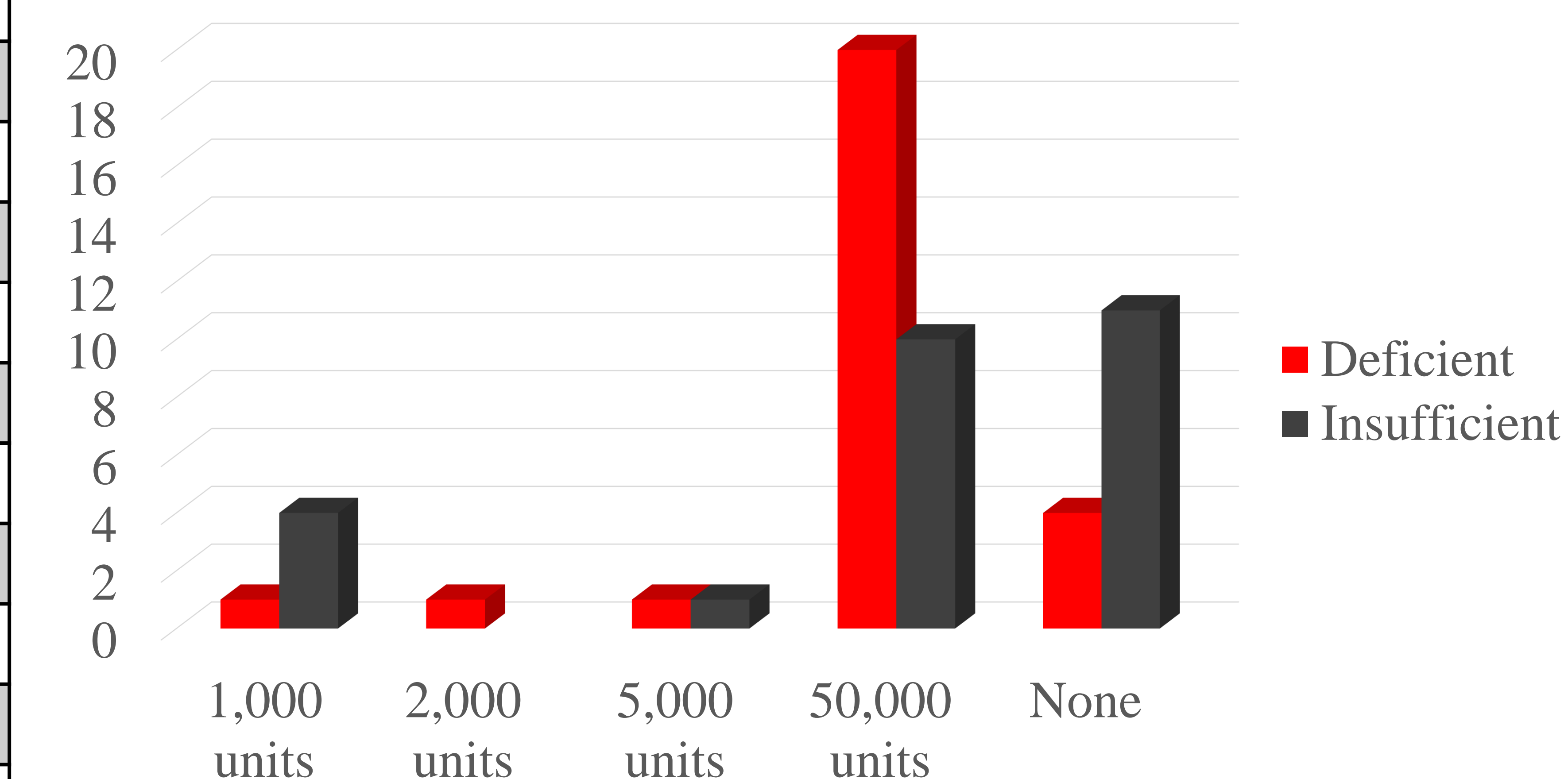
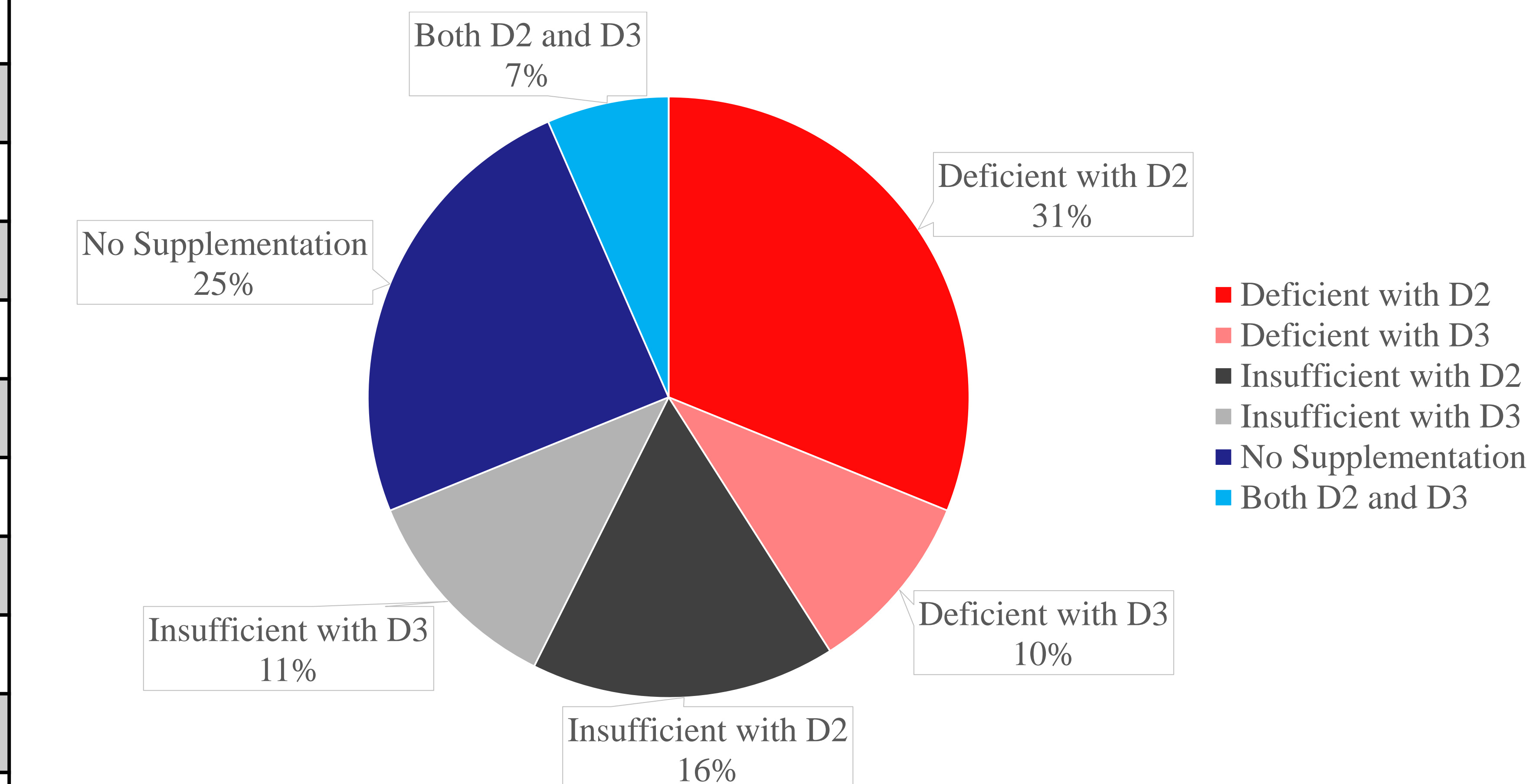


Figure 3: Vitamin D2 vs D3 Supplementation for Low Vitamin D Levels



## LIMITATIONS

- Small sample size, single institution, retrospective design.
- Lack of data post supplementation.

## CONCLUSION

- Most patients with deficient and insufficient vitamin D levels are supplemented with either 1000 units daily or 50000 units weekly.
- Quarter of the patients were not supplemented even with low levels.
- Most patients that were screened were admitted to psychiatrics.
- Chronic Kidney Disease and lower eGFR patients had higher Vitamin D levels.