

In patients diagnosed with major depressive disorder (MDD) and comorbid vitamin D deficiency, does supplementation with vitamin D help reduce depressive symptoms determined by an improvement in objective screening tool scores?

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Abstract

Background: Major depressive disorder (MDD) is the leading cause of disability and increases morbidity and mortality worldwide. Despite several available therapies, depression is often treatment resistant. MDD has been associated with vitamin D deficiency, so supplementation may be considered as monotherapy or adjunct therapy in treatment.

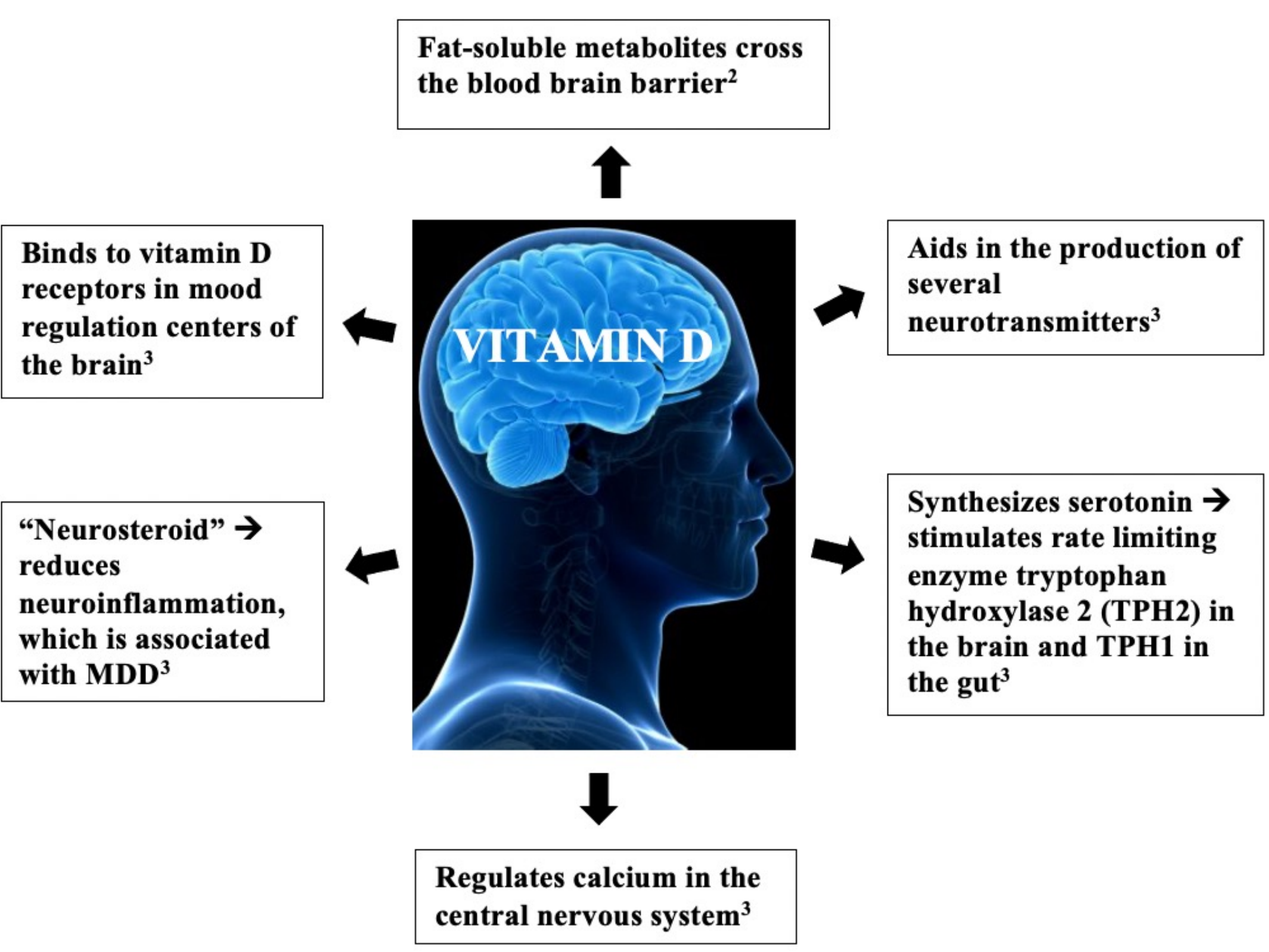
Purpose: The purpose of this review is to evaluate the effects of vitamin D supplementation on improving depressive symptoms in patients with vitamin D deficiency and MDD.

Materials and Methods: Research was conducted using PubMed, Google Scholar, and Ovid to search the keywords “vitamin d deficiency”, “major depressive disorder”, “vitamin d supplementation”, and “25-hydroxyvitamin D3”. Parameters included human subjects with MDD and vitamin D deficiency and full access to text in the English language omitting articles older than 10 years, meta-analyses, and systematic reviews. 24 articles met inclusion criteria.

Results: 14 of the 24 studies concluded that patients with vitamin D deficiency and MDD had overall improvement in both objective screening tool scores and depressive symptoms after supplementation. While several studies did not show significant improvement, anecdotal responses from family members and clinicians indicated moderate improvement in depressive symptoms.

Conclusions: Supplementation of vitamin D as monotherapy or adjunct therapy in patients with MDD and vitamin D deficiency improved depressive symptoms in most studies. However, there is some conflicting evidence on the significance of these improvements. Further research is needed with larger sample sizes and longer study durations evaluating the best route of administration, dosage, timing, and frequency of supplementation.

Functions of Vitamin D in the Brain



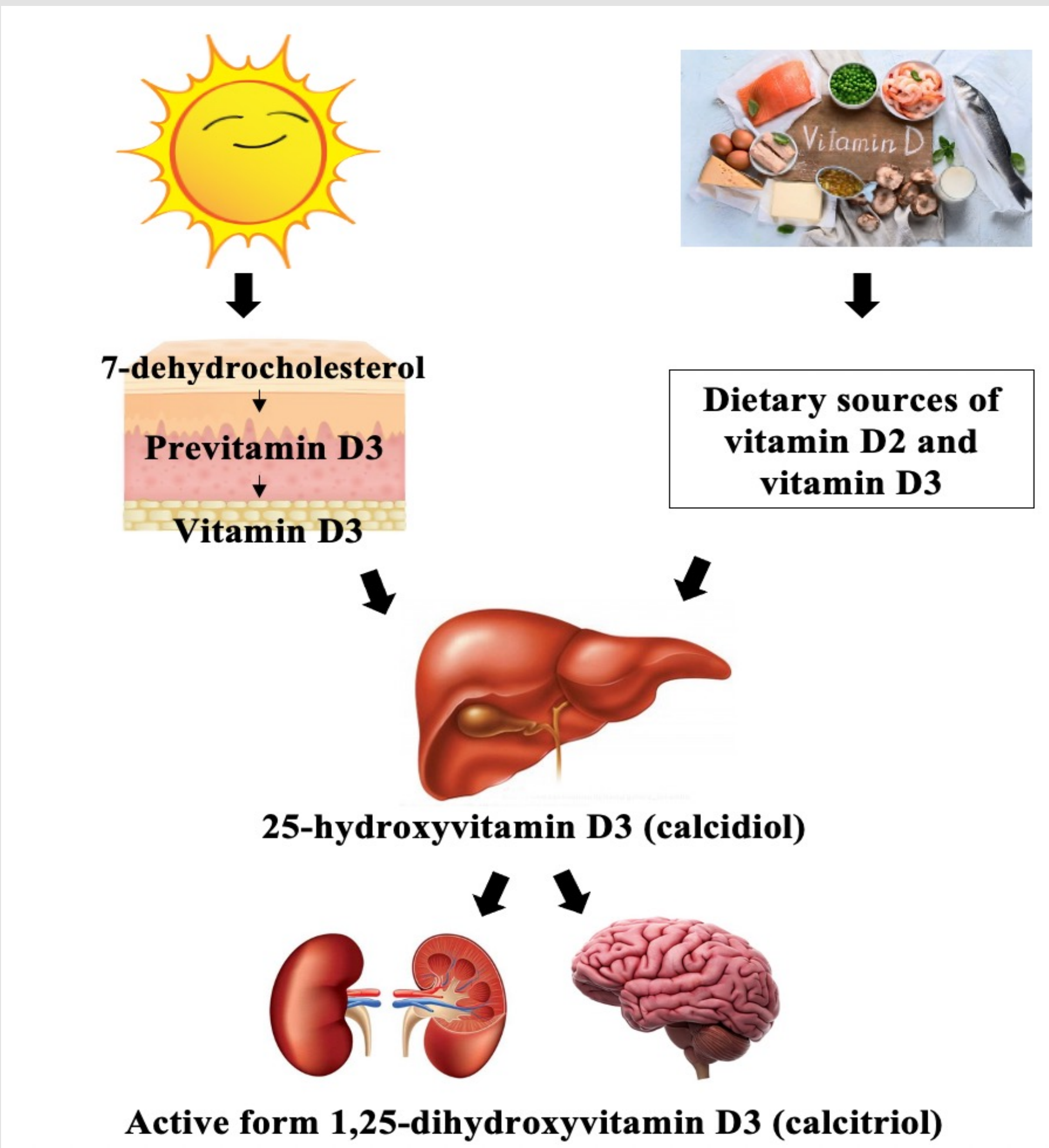
Depression Screening Tool Comparison ^{4,5}						
	BDI-II	HDRS	WHO-5	PHQ-9	CES-D	GDS
Number of Questions	21	17	5	9	20	15
Rating Scale	0-3	0-4	0-5	0-3	0-3	Yes/No
Scoring Range	Range: 0-63 Minimal: 0-13 Mild: 14-19 Moderate: 20-28 Severe: 29-63	Range:0-54 Normal: 0-7 Mild: 8-16 Moderate: 17-23 Severe: >24	Raw scoring range: 0-25 Raw score x 4 = % of well being Poorest well-being: 0% Maximum well-being: 100%	Range: 0-27 Normal:0-4 Mild: 5-9 Moderate:10-14 Moderately severe: 15-19 Severe: 20-27	Range: 0-60 Depression >16	Range: 0-15 Normal: 0-4 Mild: 5-8 Moderate: 8-11 Severe: 12-15
Specificity	73.5%	84.9%	83.0%	85.8%	76.5%	77.4%
Sensitivity	85.7%	88.6%	93.0%	83.4%	79.7%	84.4%
Administration Time	10 min	20 min	5-10 min	<5 min	20 min	5-10 min

BDI-II: Beck Depression Inventory II; HDRS: Hamilton Depression Rating Scale; WHO-5: World Health Organization Well-being Index 5; PHQ-9: Patient Health Questionnaire 9; CES-D: Center for Epidemiological Depression; GDS: Geriatric Depression Scale

Introduction

- Worldwide, MDD is the leading cause of disability and has been associated with vitamin D deficiency.¹

Synthesis of Vitamin D



Purpose

- Evaluate effects of vitamin D supplementation on improving depressive symptoms in patients with vitamin D deficiency and MDD.
- Improvement measured by changes in depressive screening tool scores listed in the table.

Research Methodology

- Search engines: PubMed, Google Scholar, Ovid with keywords: “vitamin d deficiency,” “major depressive disorder,” “vitamin d supplementation,” and “25-hydroxyvitamin D3.”
- Parameters: human subjects with MDD and vitamin D deficiency.
- Full access to text in English, omitting articles older than 10 years, meta-analyses, and systematic reviews.
- 24 articles met inclusion criteria.

Results

- 14 of 24 reviewed articles concluded patients with vitamin D deficiency and MDD had overall improvement in objective screening tool scores, depressive symptoms, and vitamin D levels post supplementation.
- In many studies without significant change in scoring, families and clinicians noted anecdotal improvement in depressive symptoms.
- Improvement in scores did not differ based on ethnicity or race, but women had more improvement than men in some of the studies.

References

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Images:
<https://solarsystem.nasa.gov/solar-system/sun/overview/>
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Conclusion

- In patients with comorbid MDD and vitamin D deficiency/insufficiency, vitamin D supplementation improves depressive symptoms as rated by the scoring measures listed above.
- Vitamin D’s low side effect profile makes an excellent option for monotherapy or adjunctive therapy.
- Future research is needed with larger population size, longer study duration, route of administration, dosing, timing, and frequency to further establish vitamin D as treatment.