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Feature Article

## Investigating Vitamin D and Sleep Quality

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### Abstract

Insufficient sleep is a public health concern and is reported to affect the quality of life in 45% of the world's population. Approximately 1 billion people worldwide have been reported to have a vitamin D insufficiency. The purpose of this study was to examine the relationship between vitamin D levels and sleep quality. A cross-sectional retrospective chart review of 137 patients was completed. A review of polysomnography, the Epworth Sleepiness Scale, and vitamin D level results was compared among the patients. This study found no relationship between vitamin D and sleep quality.

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### Section snippets

#### Sleep Quality

Perceived sleep quality can be difficult to quantify because of the subjective nature of sleep. Although sleep is not uniform and differs among people, sleep quality can be measured objectively with polysomnography (PSG) and recorded sleep architecture. Sleep is divided into 2 distinct sleep phases: nonrapid eye movement (NREM) and rapid eye movement (REM). Sleep

architecture is the breakdown of the cyclic pattern of sleep as a person shifts between 2 different sleep phases (NREM and REM).<sup>22</sup>...

## Design

A cross-sectional design was used to evaluate the relationship of vitamin D levels and sleep quality (sleep architecture). A retrospective chart review was conducted for patients who presented to a private sleep disorder clinic in Austin, TX, between January 1, 2017, and January 1, 2019....

## Sample

There were no known published studies on which to base an effect size to estimate the sample size for this particular study; therefore, the research team looked to a moderate effect size ( $r = .3$ ) between vitamin ...

## Demographic Descriptors

Participant demographics of age, race, sex, and body mass index (BMI) and diagnoses were collected electronically from the patients' charts....

## PSG

The primary measurement tool for this study to assess sleep quality was PSG, which is a diagnostic tool that records general sleep and bodily functions overnight, including vital signs, breathing patterns, oxygen levels, and limb movements.<sup>22</sup> The primary descriptors of sleep architecture (sleep duration, sleep latency, sleep efficiency, arousal index, REM...

## Sample Characteristics

The patients (N = 137, see Table 1) were generally middle-aged (median = 61; range, 23-95), female (54.7%), married (41.6%), White (60.6%), and mainly overweight and obese (BMI: median = 28; range, 18-62). The majority (73.7%) of the patients were not on vitamin D supplementation. Although the patients had a range of vitamin D levels from 5 to 63 ng/mL (median = 31 ng/mL), the majority (55%) had normal levels of vitamin D (> 30 ng/mL) as per the study site's local laboratory test reference...

## Discussion

The purpose of this cross-sectional study was to explore the relationship between vitamin D levels and sleep quality. We had postulated that patients with low levels of vitamin D would have poorer sleep quality and a greater number and severity of sleep disorders compared with those with normal levels of vitamin D. This thought was not supported by our study. Vitamin D levels did not explain the sleep architecture descriptors, and the analysis did not indicate any significant relationship...

## Conclusion

This was an emerging area of study, and there were no prior studies to model and/or replicate. In the future, we would suggest using a broader sample of patients with representation of all ages across the life span. Because BMI and vitamin D levels were found to have a weak relationship, we would recommend evaluating patient groups by BMI levels (underweight, overweight, and obese) and vitamin D levels. Vitamin D levels should also be more diverse and include the evaluation of sleep quality of...

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