Dietary intake with supplementation of Vitamin D, Vitamin B6, and Magnesium on depressive symptoms: A Public Health Perspective

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Introduction

- Nutritional psychiatry is defined as "the practice of using food and food supplements as alternative treatments for mental health disorders (Dimitratos, 2018; Hanson-Baiden, 2022).
- Several studies have suggested that lifestyle factors such as diet quality contribute to mental illnesses and play an important role in the risk of depression (O'Neil et al., 2013).
- Many individuals who have depression are reported to have insufficient levels of vitamins D, B6, and magnesium (Botturi et al., 2020).
- Many types of vitamins and minerals, such as vitamins D, B6, and magnesium, are known to help with an individual's mental health (Eby & Eby, 2006).

Purpose

The primary objective of this study was to fully understand the aspects of diet quality with supplementation of Vitamin D, Vitamin B6, and Magnesium on depressive symptoms in adults aged 20 years and older living in the US.

Research Question

Does the intake of vitamin D, vitamin B6, and magnesium impact depressive symptoms in adults aged 20 years and older living in the US?

Methods

Data were obtained from the National Health and Nutrition Examination Survey (NHANES) 2017-March 2020 database to conduct secondary analysis (Centers for Disease Control and Prevention [CDC], 2021a).

Data Collection

- Demographic variables such as age at screening, gender, highest level of education, household and adult food security status stayed the same as the original dataset
- Dosages for vitamin D, B6, magnesium and the ratio of family income to poverty were organized into binary categories provides by SAS
- Race was combined into four categories, marital status was recoded into two categories and the presence of depression was recoded as a binary variable

*Full listing of dietary data and limited access (depression) can be search at the Centers for Disease Control and Prevention (CDC). National Center for Health Statistics (NCHS). National Health and Nutrition Examination Survey Data. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, [2021a][https://wwwn.cdc.gov/nchs/nhanes/continuousnhanes/default.aspx?cycle=2017-2020].

Statistical Analysis

- All examinations will be completed through SAS software (version 9.4; SAS Institute, Cary, NC).
- Data was weighted to reflect complex weighted data.
- A Chi-Square Test of Independence was used to examine the relationship between the supplementation of Vitamins D and B6 and Magnesium and the symptoms of depression.
- A multinomial logistic regression analysis was completed to assess the nutritional status of magnesium and vitamins D and B6 on depression symptoms.

Results

IRB Determination 23-134-H

Table 1

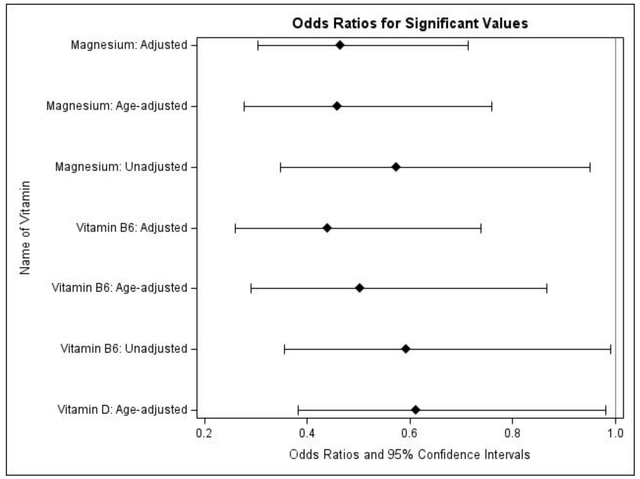
Responses of participants by depression indicated by vitamin D, vitamin B6, and magnesium, NHANES (n=8544)

	Total (n= 8544)	Depression		Statistics	*P*
		Yes	No		
Vitamin D[a], n (SD), %				x^2 = 3.6661	*p* = 0.0555
Low	1133 (1.29)	94 (25.44)	612 (33.56)		
High	2160 (1.29)	210 (74.56)	1123 (66.44)		
Missing	*5251*	*533*	*2666*		
Vitamin B6[a], n (SD), %				x^2 = 4.4207	*p* = 0.0355
Low	749 (1.60)	56 (20.07)	417 (29.75)		
High	1810 (1.60)	162 (79.93)	946 (70.25)		
Missing	*5985*	*619*	*3038*		
Magnesium[a], n (SD), %				x^2 = 45.1914	*p* = 0.0227
Low	664 (2.04)	53 (23.54)	376 (34.90)		
High	1380 (2.04)	137 (76.46)	706 (65.10)		
Missing	*6500*	*647*	*3319*		
Depression[a], n (%)					
No Symptoms of Depression	4401 (85.30)				
Symptoms of Depression	837 (14.70)				
Missing	*3306*				

Note. *N* = 837 reflects the number of individuals who responded as having depressive symptoms and *N*= 4401 reflects the number of participants who responded as not having depressive symptoms.
[a]Data were from the NHANES study.

Figure 1

Odds ratios and 95% CIs for association of vitamin D, vitamin B6, and magnesium on symptoms of depression among individuals over the age of 20, NHANES study (n=8544)



Note. Unadjusted: Not adjusted for any covariates; Age-adjusted: adjusted for age; Adjusted: Adjusted for the following covariates: age at screening, gender, race/ethnicity, marital status, education, the ratio of family income to poverty, household food security, and adult food security.
Excluded vitamin D: unadjusted and vitamin D: Adjusted as the values were not significant

Discussion and Conclusions

The results showed a significant association between depression and vitamin B6 and magnesium intake.

When adjusted for age, a lower intake of vitamins D, B6, and magnesium showed higher odds of developing depression. When adjusting for the confounders, only vitamin B6 and magnesium were identified as having higher odds of reporting depressive symptoms. This goes to show that supplementation of vitamin B6 and magnesium on depression symptoms is important when considering age and other sociodemographic factors.

The data support the hypothesis that there is a relationship between varying intakes of vitamins and minerals on symptoms of depression.However, these findings indicate the need for further research on the impact of diet on mental health. Future prospective cohort studies examining these relationships, with a focus on daily dietary supplementation, are needed to further establish the direction of causation and understand the underlying mechanisms.

One limitation is the difference in sample sizes between the participants who responded for each vitamin/mineral. The distribution of responses showed notable differences between the groups in comparison to the initial sample size of this dataset. Furthermore, there is a possibility of survey bias for responses of the predictor variables.

References

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Scan the code with your mobile phone camera to access references.

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