**Peer Review File**
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This is a review looking at the link between vitamin D and myopia.

The authors appear to have attempted a reasonable systematic review and meta-analysis. However, there are some major flaws in understanding of the background of myopia and it's understanding here. The relationship between vitamin D and myopia has been uncertain, however there are two studies which have performed Mendelian Randomisation, and indicated that there is no causative relationship between vitamin D and myopia at all. These have been missed in the introduction, and I do not think the authors are aware of these papers, or have not interpreted their understanding, as the results from those rather robust studies indicate that vitamin D is only a biomarker for time spent outdoors as a potential associated factor for myopia. Other similar systematic reviews of vitamin D and myopia exist already having done similar analyses, but again these do not contextualise the relationship that is already shown from Mendelian Randomisation.

I think some of the paper would benefit from grammatical or word choice revision (e.g light rays do not concentrate).

Line 37: no standard deviation for mean age.

Response: Thanks for the suggestion, we added the SD for mean age in line 37, page 2.
Chagens in the text: line 37, page 2.

Line 39: It is of concern/suspicion as to how your odds ratios for vitamin D serum levels and myopia are negatively correlated (and only just at 0.98), but yet the confidence intervals are VERY skewed 0.77-0.99. A P value would have been beneficial here, but would likely suggest no significance.

Response: Thanks for the suggestion, we added the P value, which is < 0.05 in line 37-46, page 2.
Chagens in the text: line 37-46, page 2.

Line 60: references 3, and 4 here aren't appropriate. In the field of myopia the 2050 global prevalence increase of myopia is well known, and comes from a meta-analysis (stated in this manuscript), but from Holden et al. 2016, not the ones referenced here.

Response: Thanks for the suggestion, we revised ref 3 and 4 in line269-279, page12.
Chagens in the text: line269-279, page12.

Line 61: You've classified myopia as a relatively harmless condition. I understand what you're trying to say, but I would dispute this statement. There is evidence that myopia negatively impacts quality of life, and a dependency on medical devices such as specs or contact lenses.

Response: Thanks for the suggestion, we revised the statement in line 60, page 3.

62: High myopia isn't associated with these sight threatening diseases, ALL myopia is. It increases with greater myopia, but it isn't just high myopia that is the problem.
Response: Thanks for the suggestion, we revised the statement in line 62, page 3.

The main flaw then comes from the aims in the introduction, you are trying to further elucidate the relationship, Currently, there is evidence that the relationship, through Mendelian Randomisation and causational studies, is a simple correlation rather than indicative of anything. Thus, the review here doesn't add anything new from it's approach. Interventional, or longitudinal observational studies would be more appropriate to find novel insights rather than a review like this, as prior reviews have indicated similar relationships already.

## Reviewer B

In statistics, since serum 25(OH)D-myopia relationship is not linear, the authors should not use serum 25(OH)D levels as a continuous variable in the logistic regression analysis. Please provide the scatter plot between serum 25(OH)D and prevalence of myopia and categorize serum 25(OH)D levels.
Response: Thanks for the suggestion, since the included data were binary based on myopia, which can only calculated one prevalence value. We don't have the location information of samples, regratefully we can't get the prevalence in each location and make the scatter plot between serum 25(OH)D and different prevalence.

1) First, the title needs to indicate the research methodology such as a cross-sectional study.
Response: Thanks for the suggestion, we revised the title in line 2, page 1.

2) Second, the abstract is not adequate. The background did not explain the limitations of prior studies and why the current data could address the controversy. The methods need to describe the inclusion of subjects, the assessment of baseline factors and serum 25(OH)D levels, and how the myopia was diagnosed. The results need to briefly report the baseline characteristics of the study sample. The conclusion needs comments for the implications of the findings.
Response: Thanks for the suggestion, we revised the abstract.

3) Third, the introduction needs to present the conflicting findings on serum 25(OH)D-myopia relationship, analyze the potential reasons and limitations of prior studies, and explain why the current data could help address the controversy.

Response: Thanks for the suggestion, we revised the introduction.
Chagens in the text: line 84, page 4.

4) Fourth, in the methodology of the main text, please describe the research methodology, sampling frame of NHANES, definition of children and adolescents, inclusion and exclusion criteria, quality control and survey procedures of NHANES. Please describe why these covariates were selected in this study. The authors need to describe the statistical analysis in a separate paragraph and put the logistic regression analysis under this part. Please describe how descriptive analysis was performed. Please consider to cite several related papers: 1. Bretz GPM, Campos JR, Veloso AA, Gomes KB, Fernandes AB. Impact of COVID-19 pandemic on serum 25-hydroxyvitamin D levels in Brazilian patients. J Lab Precis Med 2023;8:31. 2. Shen Y, Zhao J, Sun L, Zeng L, Chen Z, Tian M, Zhou X. The long-term observation in Chinese children with monocular myelinated retinal nerve fibers, myopia and amblyopia. Transl Pediatr 2021;10(4):860-869. doi: 10.21037/tp-20-452. 3. Wang A, Shen L, Yang C. Influence of orthokeratology lens treatment zone decentration on myopia progression: a systematic review with meta-analysis. Pediatr Med 2023;6:24. 4. Tan Y, Zhu W, Zou Y, Zhang B, Yu Y, Li W, Xu C, Hu L, Jin G, Liu Z. Evolution and trends of high myopia research from 2002 to 2021: a scientometric analysis. Ann Eye Sci 2023;8:17.

Response: Thanks for the suggestion, we polished the methodology and cite the meaningful articles.
Chagens in the text: line 94-100, page 4. Line 355-366, page 15.