Reviewer’s report

Title: Near work, outdoor activity, and myopia in children in rural China: The Handan Offspring Myopia Study

Version: 0 Date: 15 Jun 2017

Reviewer: Barbara Junghans

Reviewer's report:

This simple study relates to investigating just one aspect of a larger set of data. The area is a topic of hot interest, although this study does not address other than descriptive correlative aspects already described by others and thus does not present novel potential causes for myopia onset and/or progression. The value of this project is therefore limited to the input of reliable refractive data from two generations which as the authors state, is comparatively rare.

I started correcting grammar, but in reality there is a lot of fine-tuning to be done - this should be done by the native English-speaker in the author group or an independent native English-speaker used to reading scientific literature. There are some spaces missing between sentences? Tab stops at the beginning of paragraphs should be removed.

It is good to see the high level of attention to detail in the reference list at the end.

Introduction

Page 3. Line 3. It is insufficient to say 'in Chinese children' - where? I think the sentence may be grammatically incorrect for what it intends to say? Did you mean that ethnic Chinese children around the world have a greater prevalence of myopia than other ethnicities at the same location? This sentence needs clarification.

Line 12. The citation [25] should come immediately after Lu et al.

Line 23. The citation [27] is out of place and has no relationship to the contents of the sentence. Presumably this sentence should have the citation [28] associated with it: "(HOMS), [28]"

Participants and Methods.

Page 4. Line 1. Grammar? Information 'relating to' the parents was obtained….

Line 46. Ditto.
Page 5. Line 3. These are non-standard definitions of refractive error and is a major flaw in the analysis of the data if anyone wants to compare findings across other studies (e.g. using data in Table 1). Indeed, children with refractions of exactly -0.50DS and +0.50 are excluded from the definitions of the categories used in the study (i.e. "between -0.50 and +0.50" excludes the endpoints of -0.50 and +0.50). It is customary to use a definition of myopia that includes -0.50DS according to the RESC protocol "Refractive Error Study in Children: Sampling and Measurement Methods for a Multi-Country Survey". Am J Ophthalmol 2000;129: 421-426. Also, whilst I agree with including low hyperopes as a category, data relating to those with moderate/high hyperopia ≥+2.00DS should be also presented.

Line 43. In Table 1 it is shown that the mean refractive error is by definition emmetropic. It would be helpful to the reader and to those trying to compare the results of this study with results of other studies, if a histogram was provided that indicated frequency of refractive errors in 0.25D steps. This would clearly show the number high myopes, high hyperopes according to whatever cut-off criteria the reader wishes to infer. It would also help the reader understand the potential for associations with nearwork etc because one could say with more students being emmetropic/hyperopic than myopic, the power for this study to draw conclusions regarding nearwork/outdoors and myopia is weak. Furthermore, the histogram would be more useful still if the bars were broken into sections indicating age groups (as a minimum, <10.5 and >10.5 yrs) - which would reveal those that are more likely to be pathological myopia and outside of the arguments for an environmental influence.

Line 51 onwards. Given the large standard deviations, I think that one decimal place is quite sufficient when stating means/standard deviations (except for data in units 'dioptre sphere', when two decimal places is the international convention).

Line 58 and over the page. I do not understand this sentence regarding further pairwise comparisons and parental education.

Page 7. Line 19. Express this '…. as per the multiple logistic analysis…'

Page 8. Line 8. I do not believe speculation regarding the role of dopamine is warranted. Citation 23 does not cover dopamine in their study design and the authors simply offer dopamine levels as a speculative option to account for their results. Citation 38 covers work on chickens and it is too speculative at this stage to extrapolate those results to humans. We cannot say that higher release of dopamine per se leads to inhibition of myopia development. I think these two sentences should be deleted.
Results.

I would like to see a frequency histogram for the refractive errors (also incorporating the function of age) as detailed above in the Methods section.

Statistical analysis is not a strength I would claim. However I do query whether the issue of familial bias has been accounted for, that is, whether siblings with the one set of parents cannot be regarded as 'independent' cases? I believe this issue should be explicitly addressed with reporting of how this was (or was not) handled during statistical analyses.

Discussion.

This is a simple discussion and does not overwork the results.

The limitation of the unknown activity levels for the non-responders is acknowledged, however the age bias reported earlier in the Methods should be reiterated and a likely bias towards greater nearwork due to the demands of schooling be mentioned.

Whether to include more references is a moot point. However, I believe acknowledgement of Sherwin's relatively recent meta-analysis of the outdoor story should be included.

Tables.

Table 3. Attention to justification of the text within the first column is required.

Figures.

Figure 1. An asterisk should be used on the moderate-outdoors/high-nearwork column to indicate significance. Otherwise, the figure is deceiving because all other columns look significantly higher by simple inspection, and thus infer higher odds for myopia when your statistical outputs are not actually significant.

The final sentence is grammatically incorrect.

References.

p.12. Line 25. There should be a capital H in the word Handan.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

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