Reviewer's report

Title: Hyperopia: a systematic review of prevalence and associated factors among school-aged children

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Reviewer: Brendan Barrett

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Major comments:

1. Relationship to myopia studies. The authors do mention the fact that populations with high rates of myopia “generally have low prevalence of myopia…” [discussion]. But to me this point is crucially important and so deserves much more attention in this paper. How can the story of hyperopia prevalence be told without talking extensively about the prevalence of other refractive errors (in particular myopia)? If myopia is more prevalent and of greater magnitude in population 1 versus population 2, might not this fact alone dictate differences in the % of hyperopia in the two populations? I’m not sure therefore about the value, or even the validity, of presenting hyperopia data alone. Indeed most of the papers/studies cited here present refractive error data in general. In my view, this issue of the value and justification for considering hyperopia data alone needs to be tackled explicitly before this paper can be considered for publication. To elaborate: in one sense, comparison of prevalence rates of hyperopia can only be usefully be made when differences in myopia prevalence are taken into account. At the very least, for any population in which hyperopia prevalence is considered, we also need to know the rates of other refractive errors. One possibility would be to present hyperopia prevalence data separately for populations with different underlying myopia rates. This is not trivial to address because of course the myopia prevalence rate changes (dramatically in some populations) over the age range considered here.

2. Prevalence data are presented but there is little or no mention of the severity/magnitude of this hyperopia. In Table 3 there is mention of differences in the amount of hyperopia in different ethnic groups (e.g. Ip et al., 2008 study) but to me severity/magnitude information must go hand in hand with prevalence. As the authors point out, prevalence depends on the cut-off/criterion. For example, the prevalence of low hyperopia might differ markedly between two populations, but prevalence might be very similar in the two populations when considered in terms of the proportions of samples with moderate or severe hyperopia. Thus, to understand hyperopia in any population, don't we need to know about both magnitude and prevalence? In my view, I think that we do.

3. Presentation:
(a) Table 1 & 2 could be combined into one table. They both deal with prevalence as a function of age. Where there are age-specific prevalences presented for
children at different ages within the sample these can be presented in a final right hand column. Where no age-specific prevalence is presented, this column will have no entry.

(b) I would like to have seen a figure of age v prevalence. This could help to draw together the huge volume of results presented in the Tables. As well as showing the decline in prevalence with age in childhood, it would show the variation across studies. An age v hyperopia severity figure would also be useful.

(c) The information in Table 3 is useful but not that easy to understand; in my view it could be presented in a much shorter and clearer fashion. Take the very 1st study in Table 3 (Ip et al., 2008) as an example: Does “in the same age range (p=0.005)” refer to the results for 6 year-olds or across age more generally? If for 6 years olds, then it would be much clearer if “the same age range” was deleted. You have given a p-value for 6 year olds comparison of males v females, but why not do the same in 12 year olds? Another example: for Gao (2012) you say “no association” between urban and rural hyperopia rates? What does ‘no association’ mean? That urban and rural rates of hyperopia were significantly different (the figures you quote look different)? Or that they were not significantly different? Rather than using language like ‘no association’ I suggest reducing the volume of text and saying something like: Urban (% (CI) v Rural (% (CI): NS, p=???? [use NS for non-significant, S for significant etc..]. You can abbreviate the others also by listing for example, “Age 12, Maternal Education, p=????” rather than saying “Paternal Education: (maternal education) at age 12, less maternal education was borderline significant factor associated with hyperopia (p…..)” A more consistent style of presenting the data throughout Table 3 would make it much more helpful.

(d) Much of the text in the ‘results’ section replicates what is provided in the tables. This is particularly true in the case of ‘ethnicity and hyperopia’ results section. I suggest that this duplication is reduced and only the main points/trends rather than specifics are included in the text.

Specific comments:

In the Tables, please explain (perhaps using footnotes) “Response rate” and make it clear that “hyperopia definition” was based on “mean sphere” (if this is indeed the case in all the studies that are included). It should be made clear in the Tables which studies examined one eye only and which studies examined both eyes. In other words are there instances where the prevalence quoted refers to the proportion of “eyes” that are hyperopic? Because some studies examined both eyes, won’t prevalence in these cases refer to the proportion of “children” that are hyperopic.

Where cycloplegia retinoscopy/autorefraction was used in studies of say children aged 6 to 18 years, was cycloplegia only used in the case of the younger children, was it always used in all of the children, irrespective of their age?

In my version, something appears odd with the formatting in Table 2 for the He (2007) and Saw (2007) results (specifically, “Gombak district” appears twice, and out of place.)
Methods “The searches were limited to the age range of 0-18 years, and English language”. Does this mean that no study that include data from both children and adults was included? Also, I can see why it makes it easier to exclude articles not written in English but is this valid?

There is mention of “outliers” in the text. But I didn’t see any description of what definition they used for ‘outlier’.

I don’t understand “07 cited papers were included in the selected articles” that appears Figure 1 and at the end of the results section.

Table 1: ‘Not staded’ appears in several places instead of ‘not stated’. Also ‘rigth’ instead of ‘right’ (Czepita studies). “Table 1” is headed “Tabela 1”. There are many other typographical errors in the document.