Author’s response to reviews

Title: Different patterns of myopia prevalence and progression between internal migrant and local resident school children in Shanghai, China: A 2-year cohort study

Authors:

Yingyan Ma (mYy_29@163.com)
Senlin Lin (13681631090@yeah.net)
Jianfeng Zhu (jfzhu1974@hotmail.com)
Xun Xu (drxuxun@sjtu.edu.cn)
Lina Lu (lulina781019@qq.com)
Rong Zhao (zhaorong@smhb.gov.cn)
Qiangqiang Li (263103164@qq.com)
Huijuan Zhao (bsyanfang@sina.com)
Zhiyuan Hou (zyhou@fudan.edu.cn)
Xiangui He (xianhezi@163.com)
Haidong Zou (zouhaidong@hotmail.com)

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Author’s response to reviews:

Dear Editors and Reviewers:

Thank you for your letter and for the reviewers’ comments concerning our manuscript entitled “Different patterns of myopia prevalence and progression between internal migrant and local resident school children in Shanghai, China: A 2-year cohort study” (BOPH-D-17-00753). Those comments are all valuable and very helpful for revising and improving our paper, as well as the important guiding significance to our researches. We have studied comments carefully and have made correction which we hope meet with approval. Revised portion are highlighted in yellow background in the paper. The main corrections in the paper and the responds to the reviewer’s comments are as flowing:

Editor Comments:
Please complete a point by point response to all the questions raised by the reviewers.

Reviewer reports:

Jian Li, MD, PhD (Reviewer 1): The present study reported the prevalence of myopia in migrant and local children at 4 primary schools of Shanghai, China. Moreover, the different patterns of myopia progression between the two groups of children were investigated after a 2-year follow-up. The study reported data from both cross-sectional investigation and longitudinal follow-up which is useful information to the field. There are several points needing clarification before being considered for publication.

1. Major issues

(1) This study aims to reveal the effect of migration on myopia occurrence and progression. It is reasonable to compare the differences of the myopic status between migrants and locals. One of the important results is that the time spent on homework (near work), but not time spent on outdoor activities, affected myopia progression. However, in a paper published in BMC Ophthalmology recently [Lin, Z., et al. (2017). "Near work, outdoor activity, and myopia in children in rural China: the Handan offspring myopia study." BMC Ophthalmol 17(1): 203], no association between near work and myopia was found in Chinese rural children. And protective effect of outdoor activity against myopia was observed. The reasons why this study reported contrary results should be discussed thoroughly.

Respond: Thank you for your comments. We have read the paper by Dr. Lin Z and associates and we added the discussion for the discrepancy of the results between the two papers in the discussion section.

(2) To "uncover myopia problems for migrant children in urban China", 841 migrant students and 1081 local students from two migrant schools and two local schools may not be representative of the intended study population. Moreover, the mixture of migrants and locals in the selected schools could eliminate some potential differences between the two groups. An even greater sample size might be required to determine the effects of some factors.

Respond: Thank you for your comments. We agree that our sample size is not big enough and the only two schools from each group could not be representative of the whole population. However, the two migrant schools and two local schools were randomly selected, and could decrease the bias to some extent. In addition, we calculated the sample size before the study, with the estimated prevalence of primary school children (25%) to detect an anticipated 5% difference (alpha=0.05, power=0.8), a total of 862 children were required for each group, a little more than the number of migrant children, however more than the number of local children included.
During the time while we carried out the baseline visit, most of migrant children can only enter migrant schools, therefore, children in migrant schools are all migrants without urban ‘HuKou’. However, not all children in local schools were resident children. We have mentioned this limitation in the discussion part. Children with urban ‘Hukou’ in local schools could also move from other parts of China, however, their family could have resided in Shanghai for a relatively long period to achieve the local ‘Hukou’, thus their environmental risk factors being similar to local resident children. Our study presented the different patterns of myopia prevalence and progression of between children in local schools and children in migrant schools. Children in local schools represented local children and migrant children with urban ‘Hukou’, which means that they or their parents might come to Shanghai for a relatively long time. Children in migrant schools represented migrant children, especially those who newly moved to Shanghai.

We added this limitation in the discussion (the last paragraph), and also pointed out that future studies with larger sample size, and with a mixture of both local and migrant children in the same schools were needed to further clarify the phenomenon.

(3) Furthermore, as heterogeneities in personal and environmental factors also existed in migrants, more detailed information, such as the variety of time they migrate to the city and their living environment, could be important. In the current study, all of these factors are represented by 'migrant' in the analysis.

Respond: Thank you for your comments. While we design the study, the purpose was only to compare children in the two different kinds of schools. Therefore, we didn’t collect the information such as the variety of time they migrate to the city and their living environment, which could be important to understand the potential reasons for the discrepancy between the two populations. The major content of the manuscript is to describe the difference between the two population and we did it in detail in the manuscript. The analyses of the outdoor time and near work time is only an attempt to explain the difference we observed, but not the purpose of the study. We admitted that the risk factors were not collected completely in the study, and added the limitation in the discussion (the last paragraph).

(4) In line 382, "Reading and outdoor hours were assessed by a brief investigation". The "brief investigation" should be clarified in the Methods section. How did the authors assess the near-work and outdoor activities? The authors have to prove the validity of the investigation.

Respond: Thank you for your comments. We added a detailed explanation for the investigation in the methods.

(5) In this study, migrants in grade 3 had longer reading time and outdoor time than the locals. The authors also assumed that migrants spent longer time on entertainment, such as watching TV and playing computer games, than local children. Therefore, the relationship among study pressure, reading time, and outdoor time must be assessed to support the conclusion of “The acceleration of myopia prevalence and progression of migrant children might be resulted from
respond to the change of environment, such as intensive education pressure. Moreover, the background, methods, and results in the abstract also did not support this conclusion. Please revise.

Respond: Thank you for your comments. We added the description for hours spent on homework and outdoor activities in the methods and results part of the abstract to support the conclusions.

2. Minor points

(1) The authors should be careful to avoid typos and grammatical mistakes, such as a missing of "a" for "China" in the title, and in line 342 to 345, "Reasons could be 1) as time goes on, the study pressure rose in migrant children, but remained unchanged in resident children; 2) apart from study pressure, other environmental risk factors existed, which did more harms to migrant children than to resident children."

Respond: Thank you for your comments. We have revised the mistakes you mentioned, and checked the whole manuscript to revise the problems.

(2) The tables and figures should be presented at a standard level. For example, the unit should be marked on Figure 2. And the directions of Y-axis titles of Figure 3 should be corrected.

Respond: Thank you for your comments. We have revised the figures according to your suggestions.

Yuanbo Liang (Reviewer 2): Title

"Chin" should be "China"

Respond: Thank you for your comments. We have revised the typo.

Method

1. "In 2000, two private primary schools... Baoshan District as the study sites." Here, referred to established the migrant school and selected; also the local school as control groups were selected? A little confused, please make clear.

Respond: Thank you for your comments. We have randomly selected two migrant schools and two normal schools in Baoshan District, Shanghai. We have revised the presentation in the manuscript.

2. "Our study chose the longitudinal research design, and followed the students for two years." Please clarify the exact time range (e.g. Jun 2015 to May 2015) for baseline and follow up.
Respond: Thank you for your comments. We have revised the statement as ‘Our study chose the longitudinal research design, and followed the students for two years with the first visit during May 2010 to April 2011 and the second visit during May 2012 to April 2013. The examination order for the four schools was the same during the two visits, in order to ensure the two year gap between the visits’.

3. "Considering the full length of primary schools in Shanghai (5 years or grades totally)" should be 5 years of grades?

Respond: Thank you for your comments. The reason that we didn’t include grade 5 students is that in the pressure to enter junior high school, the participation rate of grade 5 children is very low. Therefore, we only include children of grade 1 to 4 in the study. We added explanation for excluding grade 5 students in the method section, the second paragraph of Study Settings and Participants.

4. why tropicamide "five times"? usually 3 times is enough

Respond: Thank you for your comments. We did the cycloplegia according to our clinical standards to diagnose refractive errors. Maybe three drops is enough, however more drops might be better than less drops (for example, 1 or 2 drops) to guarantee a full cycloplegia.

Results

1. The mean follow up time should be mentioned

Respond: Thank you for your comments. The mean follow up time is about 24 months. We added the time in the beginning of the results.

2. "In the baseline analyses, after excluding those without written informed consents and those who were incooperative with the examinations" were there any other ocular diseases excluded?

Respond: Thank you for your comments. We mentioned in the methods section that ‘Children with severe ocular diseases other than refractive error, such as congenital cataract, and children who are not cooperative with the examinations were also excluded from the study.’ As you suggested, we changed the statement to ‘In the baseline analyses, after excluding those without written informed consents, those who were incooperative with the examinations and those who suffered from severe ocular diseases other than refractive error, 752 (89.3%) children in migrant schools and 926 (85.7%) children in local schools were included.’.

3. "7.42% for residents and 8.15% for migrants" had better provide a p value.
Respond: Thank you for your comments. We added the P value in the results.

4. "significantly less than grade 2 (42.6%) (P=0.0828" not so accurate to say "significant" with a p value >0.05

Respond: Thank you for your comments. We deleted the word ‘significant’ in the sentence.

5. "the prevalence increases significantly (p=0.0003 for grade 3 and p=0.0972 for grade 4)" not so accurate to say "significantly" with a p value >0.05

Respond: Thank you for your comments. We deleted ‘significantly’ in the sentence and changed the sentence to ‘however, for internal migrant children, the prevalence increases, though not statistically significant for grade 4 children’.

6. "we did a quick assessment on the average time spent on homework and outdoor activities per week among the participants in 2010" How the assessment was performed? by questionnaire? please clarify with details in Method part.

Respond: Thank you for your comments. We added a detailed explanation for the investigation in the methods.

Discussion

The data from urban (Beijing) and rural (Handan) area of China reported a generational shift/progression of refractive error, which also suggesting the effect of environmental factors. These could be also discussed.


Respond: Thank you for your comments. We added the two references in the discussing the environmental factors on the increasing myopia prevalence.