

Comment on: Development and Validation of a Novel Nomogram for Predicting the Occurrence of Myopia in Schoolchildren: A Prospective Cohort Study



DEAR EDITOR,

In the recent article published by Guo et al,¹ the authors used data from second- and third-graders to develop a nomogram to predict myopia onset in schoolchildren. Given that myopia can progress to high myopia, which is in turn a risk factor for pathologic myopia, prediction tools are timely and relevant. We would like to provide insights into other limitations and offer suggestions that can inform future works.

In terms of study design, although the authors state that the limited age range of the sample and geographic distribution restricts the generalizability of the results, there is insufficient information regarding their sampling method, which may be a source of other limitations such as non-random selection. For example, given that the mean spherical equivalent refraction (SER) at baseline was 0.02 diopter (D) and 0.23 D (depicted in Figure 1 of the paper), in myopic and non-myopic children, respectively, there seems to be an over-representation of pre-myopic children at baseline. Additionally, the article does not provide information regarding missing data (eg, how much was missing per student), and thus we cannot establish whether the missing was random. If so, more appropriate methods should be applied for handling the missing data and making comparisons to justify imputations.²

The authors state that the use of non-cycloplegic refraction may be a limitation because it tends to overestimate myopic refraction. However, as discussed by Morgan et al, this can be the major limitation of their study for various reasons.³ For example, the younger the child, the greater the misestimate, and therefore there would be different degrees of misestimation at baseline compared to follow-up visits, which needs to be accounted for in the analyses.

The inclusion of axial length (AL) and corneal refractive power (CR) as predictive variables raises several points of concern. First, ocular biometrics are different between cycloplegic and non-cycloplegic states, and this effect may vary by type of refractive error.⁴ Second, there are gender-based differences in ocular biometrics and refractive errors,

which decrease with age.⁵ Although gender was included in the final model, age was not, and this could be attributable to the very narrow age range of the study population. Third, both SER and AL were included in the same model without consideration of the collinearity that may exist between these variables. LASSO regression to overcome collinearity was mentioned, but more details are needed, at least for SER and AL. Also, because some variables in these data tend to change over time, accounting for time-varying covariates in the Cox regression model is recommended to provide more accurate hazard ratios.⁶

Overall, despite the limited generalizability and external validity of their results, their novel work shows some of the challenges of studying myopia progression. For future work, we recommend using large population-based data sets from wide age ranges and various geographic regions. Furthermore, artificial intelligence and machine learning could be useful tools for developing more robust and accurate predictions.

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