

Methods and Applications

Nomogram for Predicting Myopia Risk in Chinese Children and Adolescents Aged 5–19 Years — 10 PLADs, China 2020–2024

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ABSTRACT

Introduction: This study aimed to identify the determinants of myopia in children and adolescents across 10 provincial-level administrative divisions (PLADs) and develop a predictive nomogram to aid risk identification.

Methods: From November 2020 to July 2024, 32,075 students aged 5–19 years were selected using stratified cluster random sampling across 10 PLADs. Myopia screening and questionnaires were used to collect demographic, behavioral, and environmental data. To account for the hierarchical structure of the data, multilevel logistic regression was employed to identify the independent predictors of myopia. A nomogram was constructed based on the regression coefficients, following the Transparent Reporting of a multivariable prediction model for Individual Prognosis Or Diagnosis (TRIPOD) guidelines. The model performance was evaluated using receiver operating characteristic (ROC) curves, area under the curve (AUC), calibration plots, and decision curve analysis (DCA).

Results: The prevalence of myopia was 29.49% (9,460/32,075). Sex, daily frequency of school eye exercises, homework/reading and writing time after school, time spent on computers, 33-centimeter eye-to-book distance during reading and writing, 3-meter eye-to-TV distance, lying or prone position for reading/screen, parent-controlled game time, and parental myopia were identified as significant predictors. The nomogram demonstrated strong predictive ability, with AUCs of 0.80 (training) and 0.81 (validation), good calibration, and a high net clinical benefit in DCA.

Conclusion: The developed nomogram proved effective for identifying high-risk children, supporting personalized risk stratification, and targeting early intervention strategies.

The global prevalence of myopia has rapidly increased and has become a major public health concern, particularly among children and adolescents. Global myopia prevalence is projected to increase from 22.9% in 2000 to 49.8% by 2050, with 9.8% of the population expected to have high myopia (1). East and Southeast Asia have reported a particularly high prevalence of myopia, with China showing particularly elevated rates, affecting 53.6% of children and adolescents and over 90% of college students (2). Early onset myopia substantially increases the risk of sight-threatening complications, including retinal detachment, glaucoma, and myopic maculopathy, resulting in long-term health and socioeconomic burdens (3).

Although genetic susceptibility contributes to the development of myopia, the rapid increase in prevalence cannot be explained by genetic factors alone. Parental myopia is a well-established predictor, whereas modifiable behavioral factors, such as prolonged near work, insufficient outdoor activity, and excessive screen exposure, also play a critical role (4). Therefore, early identification of high-risk children is essential for implementing timely preventive and control strategies.

Nomograms provide an intuitive and practical approach for individualized risk prediction by integrating multiple predictors into a graphical model (5). However, the existing myopia prediction models are often complex and lack clinical applicability. This study aimed to develop and validate a concise nomogram to predict myopia risk among Chinese children and adolescents aged 5–19 years across 10 provincial-level administrative divisions (PLADs), supporting individualized risk assessment and prioritization of high-risk children for behavioral counseling.

This study is based on a national cross-sectional survey conducted by the National Disease Control and Prevention Administration of China between November 2020 and July 2024. Using a multistage stratified cluster sampling method, students were

recruited from kindergartens and primary, middle, and high schools across 10 PLADs in China (Beijing, Shanxi, Liaoning, Zhejiang, Shandong, Henan, Hunan, Guangdong, Chongqing, and Shaanxi). The detailed survey procedures have been described previously (6). In total, 34,563 students participated in the survey. After excluding 2,488 participants owing to missing refractive, demographic, or behavioral data, 32,075 students aged 5–19 years were included in the final analysis. Model development and reporting adhered to the Transparent Reporting of a multivariable prediction model for Individual Prognosis or Diagnosis (TRIPOD) guidelines (7).

Data were collected via a structured questionnaire covering demographics (age, sex, school level, and region), behaviors (daily eye exercise frequency, homework/reading and writing time after school, time spent on computers, 33-centimeter eye-to-book distance during reading and writing, 3-meter eye-to-TV distance, lying or prone position for reading/screen, and parent-controlled game time), and family history (parental myopia). For grades 1–3, questionnaires were completed jointly by parents and students, and for higher grades, questionnaires were completed by students alone. Myopia screening included measurement of uncorrected distance visual acuity and cycloplegic autorefraction. All examiners were trained and certified by health professionals. Screening myopia was defined as an uncorrected visual acuity of <5.0 and a cycloplegic spherical equivalent (SE) of ≤ -0.50 diopters (D) in at least one eye. The SE was calculated as the sphere power plus half the cylinder power.

The participants were randomly divided into training (70.00%) and validation (30.00%) sets. To account for the potential clustering effects of students within different PLADs and school grades, a multilevel logistic regression model with random intercepts for PLAD and grade was employed to identify the independent predictors of myopia. Covariates were selected based on clinical plausibility and the primary objectives of the study, including demographic, behavioral, and familial factors associated with myopia in school-aged populations. Age and school grade were highly collinear; therefore, the grade was included as a random intercept to reflect cumulative academic exposure. A nomogram was constructed based on the regression coefficients of the model. Model performance was evaluated using the area under the receiver operating characteristic curve (AUC), calibration plots with 1,000 bootstrap resamples, and

decision curve analysis (DCA). Calibration plots were used to assess the agreement between the predicted and observed probabilities with ideal calibration along the 45° reference line. DCA quantifies net benefit across threshold probabilities by comparing the model against "treat-all" and "treat-none" strategies. Statistical analyses were performed using R software (version 4.4.2; R Foundation for Statistical Computing, Vienna, Austria), with a two-sided $P < 0.05$ considered statistically significant.

The overall prevalence of myopia among the 32,075 students included in this analysis was 29.49% (9,460/32,075). The SE of the left and right eyes showed a strong correlation ($r = 0.94$, $P < 0.05$); therefore, data from the right eye were used for all subsequent analyses. Significant differences were observed between students with and without myopia in terms of age, sex, residency status, school grade, region, and SE (all $P < 0.05$), whereas no significant differences in ethnicity were observed ($P > 0.05$) (Table 1).

Univariate analyses revealed significant differences in the daily frequency of school eye exercises, homework/reading, and writing time after school, computer use time, 33-centimeter eye-to-book distance during reading and writing, 3-meter eye-to-TV distance, reading or screen use in lying or prone positions, parental control of game time, and parental myopia status between students with and without myopia (all $P < 0.05$) (Supplementary Table S1, available at <https://weekly.chinacdc.cn/>). The multilevel logistic regression analysis identified several factors associated with myopia in both children and adolescents (Supplementary Table S2, available at <https://weekly.chinacdc.cn/>). The intraclass correlation coefficient for the null multilevel model was 0.42, suggesting that a substantial proportion of the total variance in myopia risk was attributable to differences across PLADs and school grades. Female sex [odds ratio (OR)=1.12, 95% confidence interval (CI): 1.05, 1.20], homework/reading and writing time ≥ 2 h per day (OR=1.25, 95% CI: 1.14, 1.37), often/always lying or prone position during reading or screen use (OR=1.22, 95% CI: 1.10, 1.35), lack of parental control of game time (OR=1.16, 95% CI: 1.06, 1.27), and parental myopia (unilateral: OR=1.68, 95% CI: 1.55, 1.81; bilateral: OR=2.49, 95% CI: 2.27, 2.74) were associated with higher odds of myopia. Maintaining an eye-to-book distance of ≥ 33 cm (OR=0.86, 95% CI: 0.80, 0.92) and an eye-to-TV distance ≥ 3 m (OR=0.84, 95% CI: 0.79, 0.90) were associated with lower odds of myopia.

TABLE 1. Baseline characteristics of participants from 10 PLADs, China, 2020–2024 ($n=32,075$).

Variables	Without myopia ($n=22,615$)	With myopia ($n=9,460$)	χ^2/t^*	P
Age (years)	7.87 $\pm$ 1.82	10.66 $\pm$ 2.99	-84.29	<0.001
Spherical equivalent (Diopter)	0.70 $\pm$ 0.88	-2.29 $\pm$ 1.76	156.71	<0.001
Sex			25.99	<0.001
Male	11,712 (51.79)	4,604 (48.67)		
Female	10,903 (48.21)	4,856 (51.33)		
Ethnicity			0.25	0.621
Han Chinese	21,507 (95.10)	8,984 (94.96)		
Others	1,108 (4.90)	476 (5.03)		
Whether live in school			1,005.69	<0.001
Yes	756 (38.77)	1,194 (61.23)		
No	21,859 (72.56)	8,266 (27.44)		
School level			7,306.56	<0.001
Lower primary (Grades 1–3)	18,153 (80.27)	3,259 (34.45)		
Upper elementary (Grades 4–6)	3,841 (16.98)	3,751 (39.65)		
Middle school	432 (1.91)	1,386 (14.65)		
High school	189 (0.84)	1,064 (11.25)		
Area			679.84	<0.001
Northeastern	1,428 (6.31)	1,327 (14.03)		
Eastern	7,658 (33.86)	2,844 (30.06)		
Central	11,054 (48.88)	3,860 (40.80)		
West	2,475 (10.94)	1,429 (15.11)		

* Continuous variables (Age, Spherical equivalent) were analyzed using independent samples t-test and presented as mean $\pm$ standard deviation, with test statistic reported as t ; categorical variables (Sex, Ethnicity, Whether live in school, School level, Area) were analyzed using Chi-square test and presented as n (%), with test statistic reported as χ^2 .

Based on the independent predictors identified, a nomogram was constructed incorporating sex, daily frequency of school eye exercises, homework/reading and writing time after school, time spent on computers, 33-centimeter eye-to-book distance during reading and writing, 3-meter eye-to-TV distance, lying or prone position for reading/screen, parent-controlled game time, and parental myopia to estimate the individual myopia risk (Figure 1). To facilitate practical application of the nomogram, two representative case examples (high-risk and low-risk profiles) are provided to demonstrate the step-by-step procedure for calculating individual myopia risk (Supplementary Figure S1, available at <https://weekly.chinacdc.cn/>).

The nomogram demonstrated good discriminative performance, with an area under the ROC curve (AUC) of 0.80 (95% CI: 0.80, 0.81) in the training cohort (Figure 2A) and 0.81 (95% CI: 0.80, 0.82) in the validation cohort (Figure 2B). Calibration curves showed good agreement between the predicted and observed probabilities in both cohorts (Figure 2C–D).

Decision curve analysis indicated that the nomogram provided a positive net clinical benefit across a wide range of threshold probabilities (0.10–0.80) in both the training and validation cohorts (Figure 3A–B), supporting its potential clinical applicability.

DISCUSSION

Predicting the risk of myopia is a major public health priority. Using data from children and adolescents aged 5–19 years across 10 PLADs, this study integrated key demographic, behavioral, and familial factors to develop a nomogram for individualized myopia risk prediction. The model demonstrated good discrimination, calibration, and clinical utility, providing a practical tool for early identification of high-risk populations to inform targeted behavioral recommendations.

Consistent with previous studies, myopia prevalence increased with age and school level, with secondary school students showing a higher prevalence than

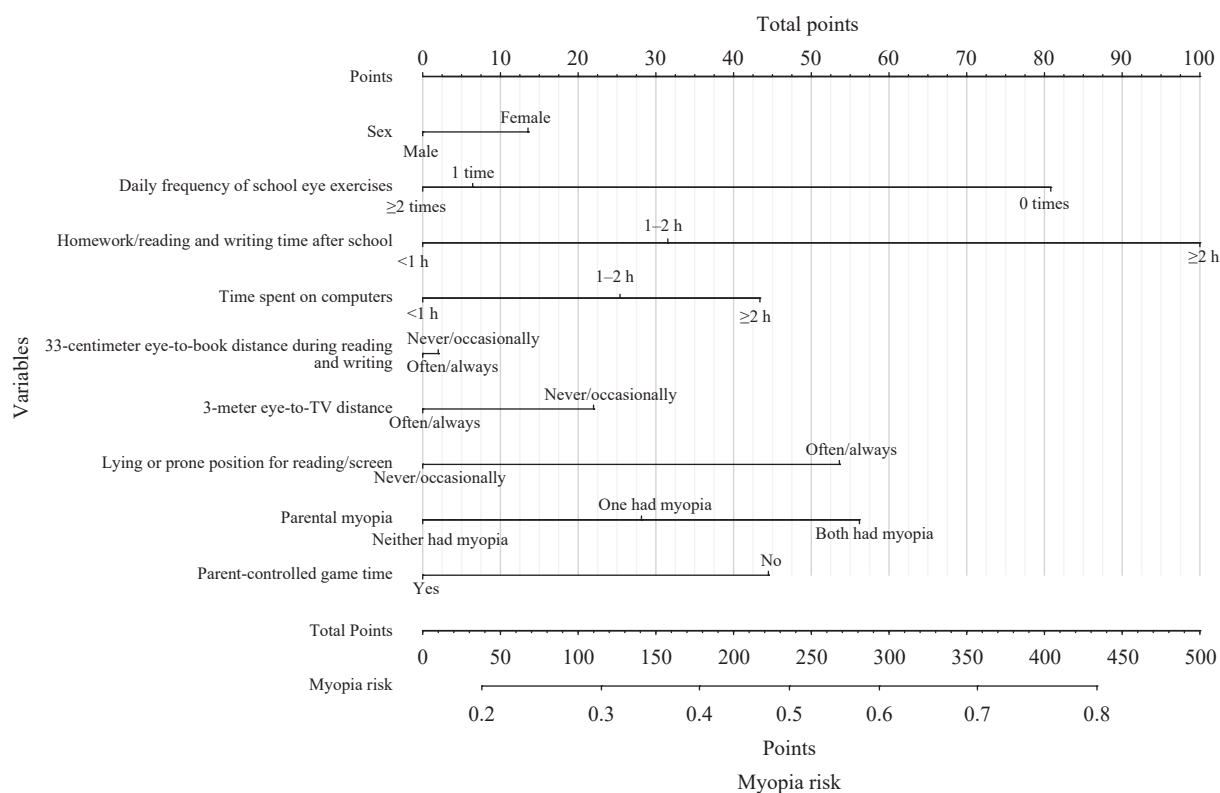


FIGURE 1. Nomogram for predicting myopia risk in children and adolescents aged 5–19 years from 10 PLADs, China, 2020–2024.

primary school students, likely reflecting increasing academic demands and prolonged near-work exposure (8). A slightly higher prevalence was observed among women, in line with previous international findings (9), which is possibly related to sex-specific physiological changes during adolescence. In addition, resident students generally had a higher prevalence of myopia, which may be associated with less regular daily routines and limited opportunities for rest and outdoor activities.

Behavioral factors related to near-work are strongly associated with myopia. Longer homework and reading times after school, prolonged computer use, inappropriate reading postures (lying or prone positions), and shorter eye-to-book or eye-to-screen distances were all linked to an increased risk of myopia, consistent with earlier evidence (10–11). These behaviors may contribute to sustained accommodative stress and visual fatigue, thereby promoting the progression of myopia. Conversely, maintaining appropriate reading distance (≥ 33 cm) and screen distance (≥ 3 m) was associated with a lower myopia prevalence, highlighting the importance of proper visual habits in daily life. Frequent school eye exercises were associated with a reduced risk of myopia,

particularly when performed two or more times per day. This finding aligns with previous reports suggesting that massage-based eye exercises may improve accommodation and visual function (12). As expected, parental myopia remained a strong risk factor, underscoring the combined influence of genetic susceptibility and shared environmental exposure on the development of childhood myopia (13). Children with two parents with myopia had the highest risk. For these high-risk children, healthy visual habits may be particularly beneficial, and our nomogram can help identify those who require early behavioral interventions.

Compared with conventional risk scores or "black-box" machine learning approaches, the nomogram developed in this study offers greater transparency and clinical interpretability. Visual integration of multiple risk factors allows clinicians and public health practitioners to estimate individual myopia risk without complex calculations (14). Internal and external validations demonstrated stable performance, supporting its potential application in school-based screening and risk-based intervention planning.

This study has some limitations. First, the cross-sectional design precludes causal inferences between

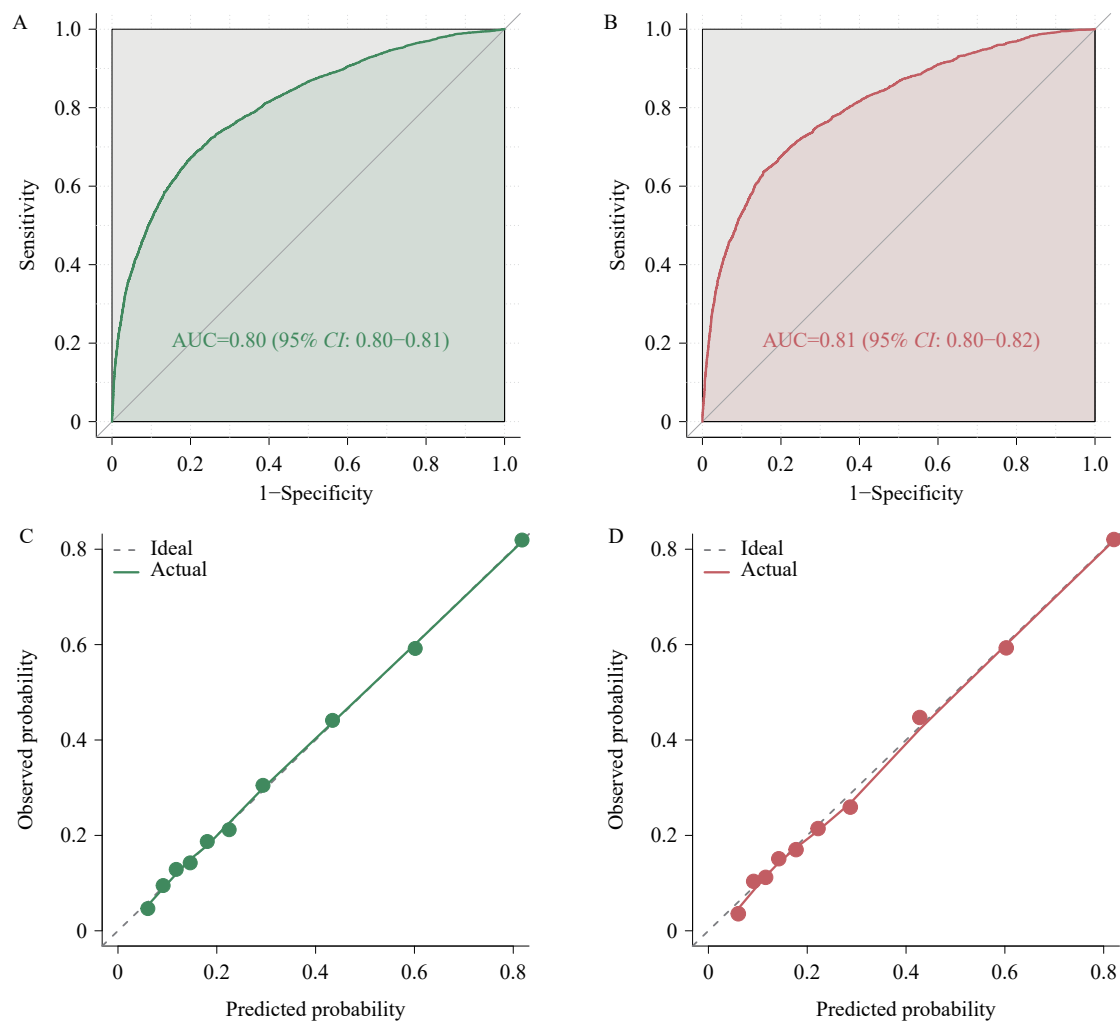


FIGURE 2. Performance of the nomogram for predicting myopia among children and adolescents from 10 PLADs, China, 2020–2024. (A) Receiver operating characteristic (ROC) curve in the training cohort; (B) ROC curve in the validation cohort. The x-axis represents 1-specificity and the y-axis represents sensitivity; (C) Calibration curve in the training cohort; (D) Calibration curve in the validation cohort.

Abbreviation: ROC=receiver operating characteristic; AUC=area under the curve; CI=confidence interval.

the risk factors and myopia development. Longitudinal studies are needed to validate the predictive value of these nomograms over time. Second, the behavioral variables were self-reported and may have been subject to recall or social desirability bias. Future studies that incorporate objective measures are warranted. Finally, the inclusion of additional socioeconomic and environmental factors may further improve the generalizability and predictive accuracy of the model.

In conclusion, a nomogram integrating school level, sex, key visual behaviors, and parental myopia effectively predicted the risk of myopia among Chinese children and adolescents. This model provides a simple and practical tool to support individualized risk assessment and early targeted intervention by identifying children with the highest probability of

myopia.

Conflicts of interest: No conflicts of interest.

Acknowledgments: All staff members participated in this study, including those from Beijing, Zhejiang, Chongqing, Shaanxi, Liaoning, Henan, Guangdong, Shandong, Hunan, and Shanxi provincial-level administrative divisions.

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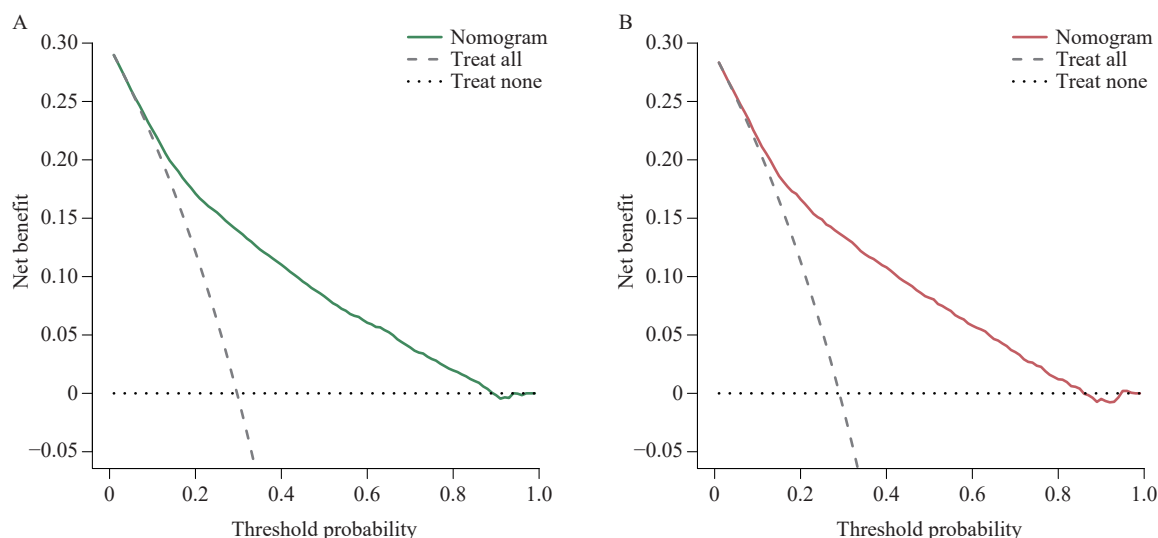


FIGURE 3. Clinical utility of the nomogram evaluated by decision curve analysis (DCA) among children and adolescents from 10 PLADs, China, 2020–2024. (A) Decision curve in the training cohort; (B) Decision curve in the validation cohort. Abbreviation: DCA=decision curve analysis.

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REFERENCES

- Holden BA, Fricke TR, Wilson DA, Jong M, Naidoo KS, Sankaridurg P, et al. Global prevalence of myopia and high myopia and temporal trends from 2000 through 2050. *Ophthalmology* 2016;123(5):1036 – 42. <https://doi.org/10.1016/j.ophtha.2016.01.006>.
- National Health Commission of the People's Republic of China. Transcript of the press conference on "China's White Paper on Eye Health". 2020. <https://www.nhc.gov.cn/xcs/c100122/202006/064726a60a334b3a9424943c045d3ff6.shtml>. [2026-2-27]. (In Chinese).
- Haarman AEG, Enthoven CA, Tideman JW, Tedja MS, Verhoeven VJM, Klaver CCW. The complications of myopia: a review and meta-analysis. *Invest Ophthalmol Vis Sci* 2020;61(4):49. <https://doi.org/10.1167/iovs.61.4.49>.
- Morgan IG, Wu PC, Ostrin LA, Tideman JW, Yam JC, Lan WZ, et al. IMI risk factors for myopia. *Invest Ophthalmol Vis Sci* 2021;62(5):3. <https://doi.org/10.1167/iovs.62.5.3>.
- Li HM, Tian Y, Niu HW, He LL, Cao GL, Zhang CX, et al. Derivation, validation and assessment of a novel nomogram-based risk assessment model for venous thromboembolism in hospitalized patients with lung cancer: a retrospective case control study. *Front Oncol* 2022;12:988287. <https://doi.org/10.3389/fonc.2022.988287>.
- Liu Y, Qin R, Xiong Y, Gu F, Shi W, Liu JM, et al. Reference values of non-cycloplegic spherical equivalent for screening and predicting myopia among children and adolescents - China, 2020-2024. *China CDC Wkly* 2025;7(9):298 – 303. <https://doi.org/10.46234/ccdcw2025.048>.
- Collins GS, Reitsma JB, Altman DG, Moons KGM. Transparent reporting of a multivariable prediction model for individual prognosis or diagnosis (TRIPOD): the TRIPOD statement. *BMJ* 2015;350:g7594. <https://doi.org/10.1136/bmj.g7594>.
- Huang HM, Chang DST, Wu PC. The association between near work activities and myopia in children-a systematic review and meta-analysis. *PLoS One* 2015;10(10):e0140419. <https://doi.org/10.1371/journal.pone.0140419>.
- Jones-Jordan LA, Sinnott LT, Chu RH, Cotter SA, Kleinsteinst RN, Manny RE, et al. Myopia progression as a function of sex, age, and ethnicity. *Invest Ophthalmol Vis Sci* 2021;62(10):36. <https://doi.org/10.1167/iovs.62.10.36>.
- Karthikeyan SK, Ashwini DL, Priyanka M, Nayak A, Biswas S. Physical activity, time spent outdoors, and near work in relation to myopia prevalence, incidence, and progression: an overview of systematic reviews and meta-analyses. *Indian J Ophthalmol* 2022;70(3):728 – 39. https://doi.org/10.4103/ijo.IJO_1564_21.
- Paudel P, Ramson P, Naduvilath T, Wilson D, Phuong HT, Ho SM, et al. Prevalence of vision impairment and refractive error in school children in Ba Ria - Vung Tau province, Vietnam. *Clin Exp Ophthalmol* 2014;42(3):217 – 26. <https://doi.org/10.1111/CEO.12273>.
- Li SM, Kang MT, Peng XX, Li SY, Wang Y, Li L, et al. Efficacy of Chinese eye exercises on reducing accommodative lag in school-aged children: a randomized controlled trial. *PLoS One* 2015;10(3):e0117552. <https://doi.org/10.1371/journal.pone.0117552>.
- Cheng HC, Chang K, Shen E, Luo KS, Ying YH. Risk factors and behaviours of schoolchildren with myopia in Taiwan. *Int J Environ Res Public Health* 2020;17(6):1967. <https://doi.org/10.3390/ijerph17061967>.
- Balachandran VP, Gonen M, Smith JJ, DeMatteo RP. Nomograms in oncology: more than meets the eye. *Lancet Oncol* 2015;16(4):e173 – 80. [https://doi.org/10.1016/S1470-2045\(14\)71116-7](https://doi.org/10.1016/S1470-2045(14)71116-7).

SUPPLEMENTARY MATERIALS

SUPPLEMENTARY TABLE S1. Univariate analysis of factors associated with myopia among children and adolescents from 10 PLADs, China, 2020–2024.

Variables	Without myopia (n=22,615)	With myopia (n=9,460)	χ^2	P
Daily frequency of school eye exercises			315.15	<0.001
0 times	1,018 (4.50)	915 (9.67)		
1 time	8,016 (35.45)	3,198 (33.81)		
≥2 times	13,581 (60.05)	5,347 (56.52)		
Homework/reading and writing time after school			859.29	<0.001
<1 h	7,996 (35.36)	2,319 (24.51)		
1–2 h	9,589 (42.40)	3,590 (37.95)		
≥2 h	5,030 (22.24)	3,551 (37.54)		
Time spent on computers			328.40	<0.001
<1 h	19,241 (85.08)	7,321 (77.39)		
1–2 h	2,113 (9.34)	1,145 (12.10)		
≥2 h	1,261 (5.58)	994 (10.51)		
33-centimeter eye-to-book distance during reading and writing			44.52	<0.001
Never/occasionally	13,324 (58.92)	5,952 (62.92)		
Often/always	9,291 (41.08)	3,508 (37.08)		
3-meter eye-to-TV distance			52.14	<0.001
Never/occasionally	10,674 (47.20)	4,883 (51.62)		
Often/always	11,941 (52.80)	4,577 (48.38)		
Lying or prone position for reading/screen			314.99	<0.001
Never/occasionally	20,201 (89.33)	7,763 (82.06)		
Often/always	2,414 (10.67)	1,697 (17.94)		
Parent-controlled game time			285.15	<0.001
Yes	18,684 (82.62)	7,036 (74.38)		
No	3,931 (17.38)	2,424 (25.62)		
Parental myopia			147.73	<0.001
Neither had myopia	10,277 (45.44)	3,741 (39.55)		
One parent had myopia	8,636 (38.19)	3,698 (39.09)		
Both had myopia	3,702 (16.37)	2,021 (21.36)		

Abbreviation: TV=television.

PRACTICAL APPLICATION OF THE NOMOGRAM WITH CASE EXAMPLES

To facilitate the clinical and public use of the developed nomogram, we provided two representative scenarios (cases A and B) to demonstrate how to calculate individual myopia risk.

Calculation Procedure

Locate levels: For each risk factor, identify the specific level of the student on the corresponding axis.

Assign points: Draw a vertical line upward from that level to the "points" axis at the top to read the score.

Sum total points: Add the points from all factors to obtain the "total points."

Predict risk: Locate the calculated sum on the "total points" axis and draw a vertical line downward to the "myopia risk" axis to read the predicted probability.

SUPPLEMENTARY TABLE S2. Multilevel logistic regression analysis of factors associated with myopia among children and adolescents from 10 PLADs, China, 2020–2024.

Variables	Parameter estimate (95% CI)	P	OR (95% CI)
Sex			
Male			1
Female	0.12 (0.05, 0.18)	<0.001	1.12 (1.05, 1.20)
Daily frequency of school eye exercises			
0 times			1
1 time	0.03 (−0.13, 0.19)	0.673	1.03 (0.88, 1.21)
≥2 times	0.02 (−0.15, 0.18)	0.852	1.02 (0.87, 1.19)
Homework/reading and writing time after school			
<1 h			1
1–2 h	0.05 (−0.03, 0.13)	0.250	1.05 (0.97, 1.14)
≥2 h	0.22 (0.13, 0.31)	<0.001	1.25 (1.14, 1.37)
Time spent on computers			
<1 h			1
1–2 h	−0.05 (−0.16, 0.06)	0.388	0.95 (0.85, 1.06)
≥2 h	0.09 (−0.05, 0.22)	0.204	1.09 (0.95, 1.25)
33-centimeter eye-to-book distance during reading and writing			
Never/occasionally			1
Often/always	−0.16 (−0.23, 0.08)	<0.001	0.86 (0.8, 0.92)
3-meter eye-to-TV distance			
Never/occasionally			1
Often/always	−0.17 (−0.24, 0.10)	<0.001	0.84 (0.79, 0.90)
Lying or prone position for reading/screen			
Never/occasionally			1
Often/always	0.20 (0.10, 0.30)	<0.001	1.22 (1.1, 1.35)
Parent-controlled game time			
Yes			1
No	0.15 (0.06, 0.24)	<0.001	1.16 (1.06, 1.27)
Parental myopia			
Neither had myopia			1
One had myopia	0.52 (0.44, 0.59)	<0.001	1.68 (1.55, 1.81)
Both had myopia	0.91 (0.82, 1.01)	<0.001	2.49 (2.27, 2.74)

Abbreviation: TV=television; OR=odds ratio; CI=confidence interval.

High-risk Case Demonstration (case A) — Refer to Supplementary Figure S1A

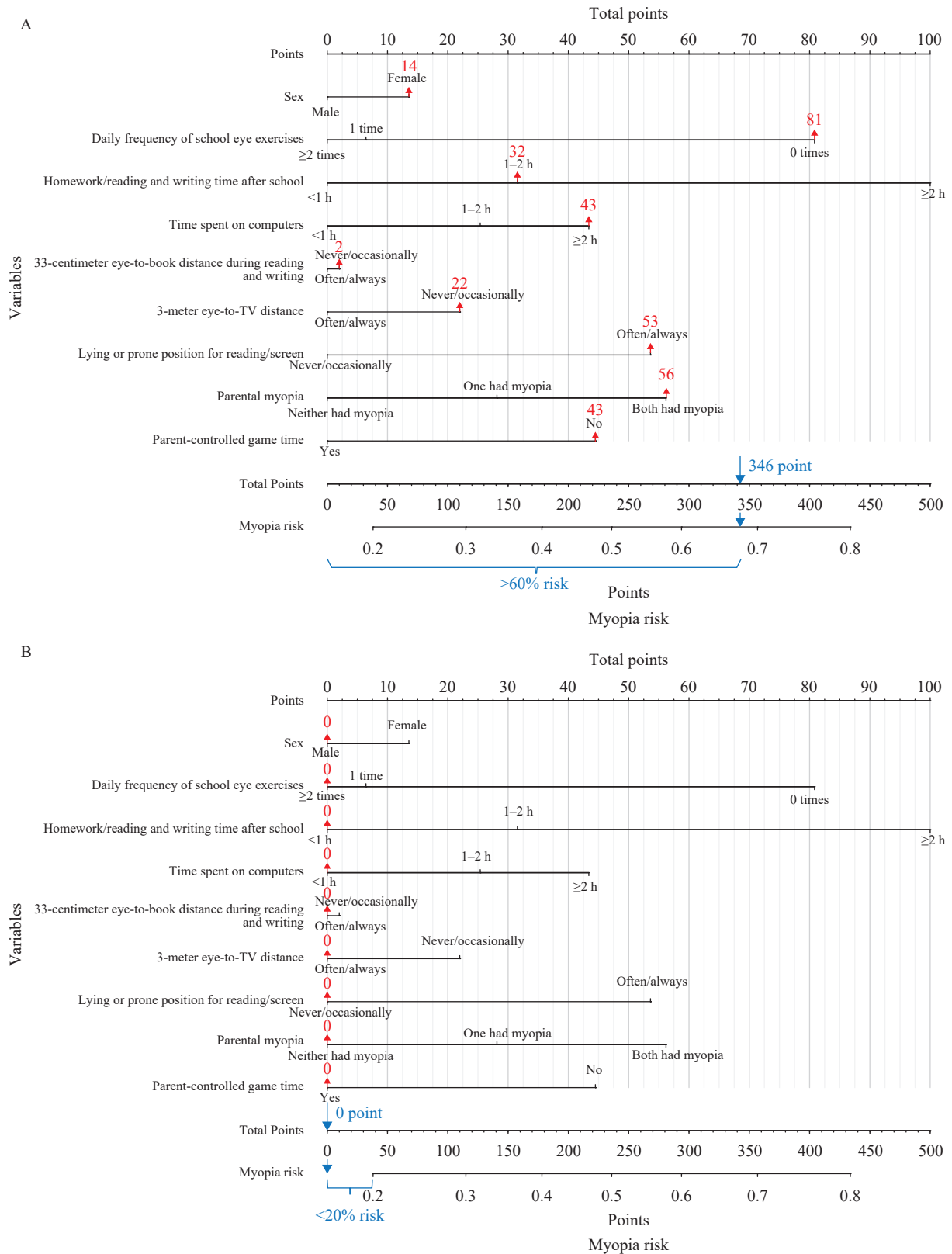
(A) High myopia risk student (Case A): A female student who never performs school eye exercises, spends 1–2 h on homework and ≥2 h on computers after school. She never maintains a 33-centimeter eye-to-book distance during reading and writing or a 3-meter eye-to-TV distance and often reads or uses screens in a lying or prone position. Both her parents had myopia, and her game time was not controlled by her parents.

Point Calculation

Sex (Female): 14 pts

Daily frequency of school eye exercises (0 times): 81 pts

Homework/reading and writing time after school (1–2 h): 32 pts.



SUPPLEMENTARY FIGURE S1. Demonstration of the myopia risk nomogram's practical application with case examples among children and adolescents from 10 PLADs, China, 2020–2024. (A) High myopia risk student (case A); (B) Low myopia risk profile (case B).

Abbreviation: TV=television.

Time spent on computers (≥ 2 h): 43 pts

33-centimeter eye-to-book distance during reading and writing (never/occasionally): 2 pts

3-meter eye-to-TV distance (never/occasionally): 22 pts

Lying or prone position for reading/screen (often): 53 pts

Parental myopia (both): 56 pts

Parent-controlled game time (no): 43 pts

Total points: $14 + 81 + 32 + 43 + 2 + 22 + 53 + 56 + 43 = 346$

Predicted risk: Mapping 346 points on the total points axis downward resulted in a risk of 0.68 (68%).

Interpretation: This student had a 68% absolute probability of developing myopia.

Low-risk Case Demonstration (Case B) — Refer to Supplementary Figure S1B

(B) Low myopia risk profile (Case B): This example demonstrates the nomogram application for a male student exhibiting predominantly protective visual behaviors: daily frequency of school eye exercises ≥ 2 times, homework/reading and writing time after school < 1 h, time spent on computers < 1 h, often/always maintenance of ≥ 33 -centimeter eye-to-book distance during reading and writing and ≥ 3 -meter eye-to-TV distance, never/occasionally using a lying or prone position for reading/screen presence of parental game time control, and no parental myopia.

Point calculation: All factors map to 0 points.

Total points: 0

Predicted risk: Mapping 0 on the total points axis downward resulted in a risk of < 0.20 (20%).

Interpretation: The students had a low absolute probability ($< 20\%$) of developing myopia.

Clarification of Risk Values

The values on the "myopia risk" axis (e.g., 0.20, 0.50, and 0.80) represent the predicted absolute probability. For instance, a risk of 0.6 indicates a 60% chance of myopia in a student with a specific combination of risk factors. This probability was derived using a logistic link function, incorporating the intercept of the model to reflect the baseline risk of the population.