Preplanned Studies

Prevalence and Influencing Factors of Myopia Among Primary and Secondary School Students — Zhejiang Province, China, 2023

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Summary

What is already known about this topic?

Myopia prevalence among Chinese children and adolescents ranks among the highest globally. Although numerous studies have investigated myopia risk factors, findings remain inconsistent across populations.

What is added by this report?

This study demonstrates that overall myopia prevalence among primary and secondary school students in Zhejiang Province reached 68.87% in 2023, with high myopia affecting 5.82% of students. Notably, regular consumption of a meat and egg-based breakfast emerged as a protective factor against myopia [odds ratio (*OR*)=0.96, 95% confidence interval (*CI*): 0.92, 0.99].

What are the implications for public health practice?

Effective myopia prevention requires intersectoral collaboration to reduce academic burden, promote outdoor activities, and implement early screening programs with targeted interventions for high-risk children.

ABSTRACT

Introduction: Myopia prevalence is rising globally, with particularly high rates observed in East Asia. This study evaluated the prevalence and associated factors of myopia among primary and secondary school students in Zhejiang Province, China.

Methods: A total of 192,704 students from 521 primary and secondary schools in Zhejiang Province were enrolled through multistage stratified cluster sampling as participants in the School-Based Chinese Adolescents' Health Survey (SCAHS) in 2023. All participants underwent comprehensive ophthalmic examinations. Demographic characteristics, parental myopia status, visual and lifestyle behaviors, and dietary habits were collected through structured questionnaires.

Results: The overall myopia prevalence among primary and secondary school students in Zhejiang Province was 68.87%, with a high myopia prevalence of 5.82%. Multilevel logistic regression analysis demonstrated that female sex, parental myopia, higher body mass index (BMI), an advanced school stage, homework duration ≥3 hours per day, and prolonged sedentary behavior were significantly associated with increased myopia risk. Conversely, residence in suburban counties, outdoor rest after class, outdoor exercise ≥3 hours per day, and vegetable intake ≥twice per day were associated with reduced myopia risk. Notably, consuming a meat and egg-based breakfast [odds ratio (*OR*)=0.96, 95% confidence interval (*CI*): 0.92, 0.99] emerged as a protective factor against myopia.

Conclusions: Myopia prevalence remains high among primary and secondary school students in Zhejiang Province, China. Future prevention efforts should prioritize early screening and targeted interventions for high-risk children and adolescents.

Myopia represents one of the most prevalent eye diseases globally, with its burden continuing to escalate (*1*). Projections indicate that by 2050, the global prevalence of myopia will reach 50% (approximately 5 billion individuals), with high myopia affecting 10% (approximately 1 billion individuals) (*2*). Asian children and adolescents experience the highest myopia rates, with an estimated 80% of school-aged children affected (*1*). In China, the 2022 overall myopia prevalence among children and adolescents was 51.9%, demonstrating a marked progression across educational stages: 36.7% in primary school, 71.4% in junior high school, and 81.2% in senior high school (*3*). Beyond

refractive error alone, the rapid increase in myopia prevalence parallels rising rates of vision-threatening complications, including macular degeneration, glaucoma, and blindness (*4*), thereby imposing substantial economic burdens on healthcare systems and society. Despite extensive research on myopia prevalence, regional variations and modifiable risk factors remain incompletely characterized, particularly in high-burden provinces. This study therefore investigated the prevalence and associated factors of myopia among primary and secondary school students in Zhejiang Province, China, to inform targeted prevention and early intervention strategies.

This cross-sectional study utilized data from the 2023 School-based Chinese Adolescents' Health Survey (SCAHS) conducted in Zhejiang Province. We employed a multistage stratified cluster random sampling method to obtain a representative sample of children and adolescents aged 6 to 21 years. The first stage involved stratification by urban districts and suburban counties within each city. From each urban district, we randomly selected two primary schools, two junior high schools, and three senior high schools, whereas from each suburban county, we randomly selected two primary schools, two junior high schools, and one senior high school. In the second stage, we randomly selected multiple classes from each grade within the chosen schools and enrolled all students from these selected classes. Sample size was calculated using the formula ($N = Z^2_{\alpha/2} \cdot P \cdot (1-P)/\delta^2$), with the expected myopia prevalence (P) set at 0.519 (*3*), α at 0.05, and the allowable error (δ) at 0.1P. Accounting for an expected non-response rate of 20%, the minimum required sample size was determined to be 428 participants. Ultimately, 193,823 children and adolescents from 521 schools across 11 cities participated in the survey, providing a representative assessment of myopia status among primary and secondary school students in Zhejiang Province.

Trained ophthalmologists performed refractive examinations using an automatic refractometer (RM-800, TOPCON, Tokyo, Japan). The spherical equivalent (SE) was calculated as the spherical power plus half of the cylindrical power (SE=sphere+1/2 cylinder). Myopia was defined as SE≤–0.50 D, and high myopia as SE≤–6.00 D. Weight was measured with an electronic scale (accuracy: 0.1 kg) and height with a stadiometer (accuracy: 0.1 cm). Body mass index (BMI) was calculated as weight divided by the square of height (kg/m^2). All participants were confirmed to be free of systemic diseases and ocular disorders through medical history review and clinical examination. Trained researchers administered a structured questionnaire to collect demographic, behavioral, and dietary data. Demographic variables included sex, age, nationality (Han/non-Han), school stage (primary school/junior high school/senior high school), and region (urban district/suburban county, based on 2023 administrative divisions of Zhejiang Province). Parental myopia status was categorized as none, one parent with myopia, or both parents with myopia. Behavioral variables encompassed daily homework load (<3 hours/≥3 hours), daily screen time duration (hours), performance of eye exercises (yes/no), break intervals for near work (<3 hours/≥3 hours, defined as the continuous duration of writing or reading before taking a break), after-class rest location (indoors/outdoors), daily outdoor activity duration (<3 hours/≥3 hours), daily sleep duration (hours), daily sedentary time (hours), and secondhand smoke exposure (yes/no). Dietary variables assessed intake frequency over the past 7 days for sugary drinks, fried foods, milk and soy drinks (never/<once per day/≥once per day), fruits and vegetables (never/<twice per day/≥ twice per day), and breakfast composition including grains and tubers (yes/no), meat and eggs (yes/no), and dairy products (yes/no). After excluding 1,119 participants with unavailable refractive data, 192,704 participants were included in the final analysis, of whom 138,330 completed valid questionnaires.

Statistical analyses were performed using R statistical software (version 4.4.1, R Foundation for Statistical Computing, Vienna, Austria). Continuous variables were presented as mean ± standard deviation, while categorical variables were expressed as frequency (percentage). Independent samples *t*-tests, Welch *t*-tests, and chi-square tests were employed to compare differences between myopia and non-myopia groups (Supplementary Tables S1 and S2, available at https://weekly.chinacdc.cn/). To account for the hierarchical data structure — with students nested within schools and schools nested within cities — we applied multilevel logistic regression models with random intercepts at both the school and city levels to identify factors associated with myopia. Multicollinearity was assessed and ruled out by examining variance inflation factors. Effect sizes were reported as odds ratios (*OR*) with 95% confidence intervals (*CI*). Statistical significance was defined as P<0.05.

This study included 192,704 children and adolescents aged 6 to 21 years (mean age: 11.85±3.47

years), comprising 101,527 males and 91,177 females. The overall myopia prevalence was 68.87%, with high myopia affecting 5.82% of participants. Females demonstrated a significantly higher myopia rate (70.94%) compared to males (67.01%, $P<0.001$). Myopia prevalence increased markedly with age, rising from 24.23% at age 6 years to 93.20% at 18 years and older ($P<0.001$). Significant differences in myopia prevalence were observed across educational stages: 51.04% in primary school, 85.36% in junior high school, and 92.71% in senior high school ($P<0.001$). Notable variation was observed in myopia rates across cities in Zhejiang Province. Hangzhou exhibited the highest prevalence (72.42%), followed by Quzhou (72.18%), whereas Wenzhou (64.93%), Jinhua (65.60%), and Lishui (67.04%) demonstrated comparatively lower rates. Urban districts (70.43%) had significantly higher myopia rates than suburban counties (67.53%, $P<0.001$) (Figure 1 and Table 1).

Multiple multilevel logistic regression analyses demonstrated that myopia risk was significantly elevated in females compared to males (*OR*=1.37, 95% *CI*: 1.33, 1.41). Children with one myopic parent exhibited increased risk (*OR*=1.64, 95% *CI*: 1.58, 1.70), while those with both parents myopic showed substantially higher risk (*OR*=2.60, 95% *CI*: 2.47, 2.73) relative to children with non-myopic parents. Compared to primary school students, myopia risk was markedly higher among junior high school students (*OR*=2.87, 95% *CI*: 2.61, 3.15) and senior high school students (*OR*=7.03, 95% *CI*: 6.31, 7.83). Several modifiable factors were associated with increased myopia risk, including higher BMI (*OR*=1.05, 95% *CI*: 1.03, 1.06), homework duration ≥3 hours per day (*OR*=1.07, 95% *CI*: 1.01, 1.13), and prolonged sedentary time (*OR*=1.05, 95% *CI*: 1.03, 1.07). Conversely, several protective factors were identified. Students residing in suburban counties demonstrated lower myopia risk than those in urban districts (*OR*=0.80, 95% *CI*: 0.69, 0.93). Children who rested outdoors after class had reduced risk compared to those resting indoors (*OR*=0.94, 95% *CI*: 0.91, 0.97). Additional protective factors included outdoor activities ≥3 hours per day (*OR*=0.95, 95% *CI*: 0.92, 0.98), vegetable intake ≥twice per day (*OR*=0.92, 95% *CI*: 0.86, 0.99), and consuming a meat and egg-based breakfast (*OR*=0.96, 95% *CI*: 0.92, 0.99) (Table 2). The multilevel model revealed substantial clustering effects, with a random intercept variance of 0.171 (95% *CI*: 0.145, 0.201) at the school level and 0.010 (95% *CI*: 0.005, 0.027) at the city level, confirming significant variability across both hierarchical levels.

DISCUSSION

In 2023, the overall myopia prevalence among primary and secondary school students in Zhejiang Province reached 68.87%, with high myopia affecting 5.82% of students. This prevalence substantially exceeds that reported in Hubei Province (34.35% among children aged 3–18 years) (5) but aligns closely with findings from Shaanxi Province (67.4%, with high myopia at 4.6%) (6), demonstrating considerable

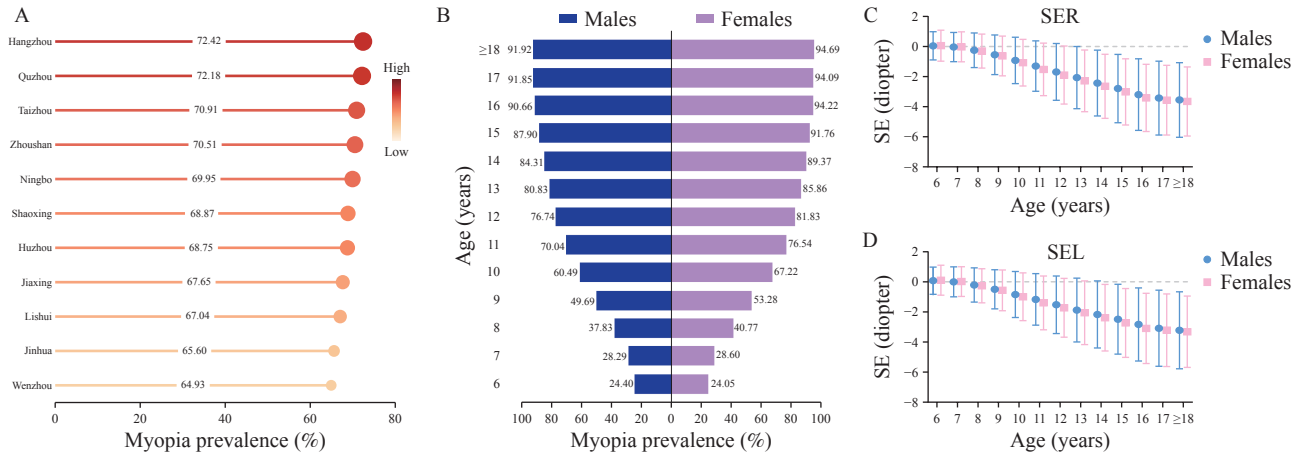

FIGURE 1. Epidemiological characteristics of myopia among primary and secondary school students in Zhejiang Province, China, 2023. (A) Myopia prevalence across different cities; (B) Myopia prevalence stratified by sex and age groups; (C) Refractive distribution of the right eye by sex and age groups; (D) Refractive distribution of the left eye by sex and age groups.
Abbreviation: SER=spherical equivalent right; SEL=spherical equivalent left.

TABLE 1. Prevalence of myopia and refractive status among primary and secondary school students in Zhejiang Province, China, 2023.

Variables	Count	Myopia [*n* (%)]	High myopia [*n* (%)]	SER (D)	SEL (D)
Total	192,704	132,722 (68.87)	11,216 (5.82)	−1.71±2.21	−1.54±2.18
Sex					
Male	101,527	68,038 (67.01)	5,725 (5.64)	−1.64±2.20	−1.47±2.17
Female	91,177	64,684 (70.94)	5,491 (6.02)	−1.79±2.21	−1.62±2.19
Age (years)					
6	6,582	1,595 (24.23)	14 (0.21)	0.05±0.98	0.09±0.95
7	20,098	5,716 (28.44)	52 (0.26)	−0.03±0.98	0.01±0.99
8	15,654	6,138 (39.21)	56 (0.36)	−0.27±1.14	−0.23±1.14
9	17,643	9,060 (51.35)	76 (0.43)	−0.58±1.32	−0.53±1.32
10	15,405	9,807 (63.66)	154 (1.00)	−0.99±1.55	−0.92±1.56
11	16,760	12,254 (73.11)	300 (1.79)	−1.40±1.71	−1.28±1.75
12	15,810	12,513 (79.15)	505 (3.19)	−1.78±1.91	−1.62±1.94
13	16,223	13,490 (83.15)	890 (5.49)	−2.16±2.06	−1.96±2.12
14	16,166	14,018 (86.71)	1,329 (8.22)	−2.53±2.16	−2.27±2.22
15	14,916	13,385 (89.74)	1,580 (10.59)	−2.90±2.24	−2.60±2.31
16	14,580	13,469 (92.38)	2,111 (14.48)	−3.30±2.31	−2.96±2.39
17	13,851	12,874 (92.95)	2,403 (17.35)	−3.49±2.39	−3.15±2.47
≥18*	9,016	8,403 (93.20)	1,736 (19.25)	−3.60±2.40	−3.26±2.47
School stage					
Primary school	101,578	51,842 (51.04)	889 (0.88)	−0.68±1.50	−0.61±1.49
Junior high school	49,007	41,833 (85.36)	3,407 (6.95)	−2.38±2.13	−2.15±2.19
Senior high school	42,119	39,047 (92.71)	6,920 (16.43)	−3.42±2.36	−3.08±2.44
Region					
Urban districts	89,223	62,844 (70.43)	5,818 (6.52)	−1.82±2.26	−1.64±2.24
Suburban counties	103,481	69,878 (67.53)	5,398 (5.22)	−1.62±2.15	−1.46±2.13

Abbreviation: SER=spherical equivalent right; SEL=spherical equivalent left; D=diopter.
* The maximum age was 21 years.

regional variation across China. Internationally, Zhejiang's myopia rates markedly surpass those observed in Western countries, where prevalence ranges from 3.3% to 19.9% in Ireland (*7*). These disparities likely reflect regional differences in genetic susceptibility, educational systems, academic pressure, lifestyle behaviors, and socioeconomic conditions.

Our findings are consistent with previous studies (*5*,*8*). Elevated myopia risk was associated with female sex, parental myopia, higher BMI, an advanced school stage, homework duration ≥3 hours, and prolonged sedentary behavior. Conversely, protective factors included residence in suburban counties, outdoor rest after class, ≥3 hours of outdoor activity per day, and vegetable intake ≥twice per day. Collectively, these findings underscore the critical influence of genetic, academic, and lifestyle factors on myopia development among children and adolescents. Accordingly, myopia prevention and control strategies should prioritize female students, implement early targeted interventions for children with myopic parents, reduce academic workload, and promote outdoor activities and physical exercise.

A particularly noteworthy finding was that consuming a meat and egg-based breakfast was associated with reduced myopia risk (*OR*=0.96, 95% *CI*: 0.92, 0.99). This protective effect may be explained by the high-quality protein content of meat and eggs. Supporting this interpretation, Yin et al. (*8*) reported that a protein-rich dietary pattern significantly reduced myopia risk in Chinese children (*OR*=0.78, 95% *CI*: 0.66, 0.92). Current evidence indicates that the scleral extracellular matrix (ECM) remodeling represents a key pathological mechanism underlying myopia onset

TABLE 2. Regression analysis of factors associated with myopia.

Variables	Simple analysis		Multiple analysis	
	OR (95% *CI*)	*P*	*OR* (95% *CI*)	*P*
Sex				
Male	Ref.		Ref.	
Female	1.23 (1.20, 1.26)	<0.001	1.37 (1.33, 1.41)	<0.001
BMI (per 1 SD)*	1.26 (1.24, 1.27)	<0.001	1.05 (1.03, 1.06)	<0.001
Nationality				
Han	Ref.		Ref.	
Non-Han	0.89 (0.83, 0.95)	<0.001	0.99 (0.90, 1.09)	0.779
School stage				
Primary school	Ref.		Ref.	
Junior high school	5.86 (5.36, 6.41)	<0.001	2.87 (2.61, 3.15)	<0.001
Senior high school	13.44 (12.19, 14.82)	<0.001	7.03 (6.31, 7.83)	<0.001
Region				
Urban districts	Ref.		Ref.	
Suburban counties	0.82 (0.68, 1.00)	0.053	0.80 (0.69, 0.93)	0.022
Parental myopia status				
None	Ref.		Ref.	
One parent	1.65 (1.59, 1.70)	<0.001	1.64 (1.58, 1.70)	<0.001
Both parents	2.60 (2.47, 2.73)	<0.001	2.60 (2.47, 2.73)	<0.001
Homework				
<3 hours	Ref.		Ref.	
≥3 hours	1.10 (1.05, 1.16)	<0.001	1.07 (1.01, 1.13)	0.013
Screen time (per 1 SD)*	1.22 (1.19, 1.24)	<0.001	0.99 (0.97, 1.00)	0.163
Eye exercises				
No	Ref.		Ref.	
Yes	0.94 (0.85, 1.05)	0.285	0.98 (0.87, 1.11)	0.762
Near-work break interval				
<3 hours	Ref.		Ref.	
≥3 hours	1.04 (0.98, 1.11)	0.218	1.05 (0.97, 1.13)	0.243
Resting place				
Indoors	Ref.		Ref.	
Outdoors	0.87 (0.85, 0.90)	<0.001	0.94 (0.91, 0.97)	<0.001
Outdoor activity				
<3 hours	Ref.		Ref.	
≥3 hours	0.93 (0.90, 0.96)	<0.001	0.95 (0.92, 0.98)	0.035
Sleep duration (per 1 SD)*	0.98 (0.96, 0.99)	0.026	1.02 (1.00, 1.04)	0.051
Sedentary time (per 1 SD)*	1.10 (1.08, 1.11)	<0.001	1.05 (1.03, 1.07)	<0.001
Sugary drinks				
Never	Ref.		Ref.	
<Once per day	1.08 (1.01, 1.17)	0.033	1.02 (0.93, 1.11)	0.711
≥Once per day	1.09 (1.00, 1.18)	0.048	1.02 (0.93, 1.12)	0.707
Fried foods				
Never	Ref.		Ref.	

Continued

Variables	Simple analysis		Multiple analysis	
	OR (95% *CI*)	*P*	*OR* (95% *CI*)	*P*
<Once per day	1.03 (1.00, 1.07)	0.087	1.00 (0.96, 1.05)	0.847
≥Once per day	0.99 (0.92, 1.07)	0.872	1.00 (0.91, 1.09)	0.930
Fresh fruits				
Never	Ref.		Ref.	
<Twice per day	0.99 (0.96, 1.02)	0.579	0.99 (0.95, 1.03)	0.677
≥Twice per day	0.96 (0.90, 1.02)	0.216	0.99 (0.91, 1.07)	0.725
Vegetables				
Never	Ref.		Ref.	
<Twice per day	0.99 (0.92, 1.04)	0.639	0.97 (0.90, 1.03)	0.361
≥Twice per day	0.92 (0.86, 0.98)	0.011	0.92 (0.86, 0.99)	0.023
Grains and tubers				
No	Ref.		Ref.	
Yes	1.07 (1.04, 1.10)	<0.001	1.02 (0.99, 1.05)	0.279
Meat and eggs				
No	Ref.		Ref.	
Yes	0.96 (0.93, 1.00)	0.013	0.96 (0.92, 0.99)	0.032
Dairy products				
No	Ref.		Ref.	
Yes	1.00 (0.97, 1.03)	0.962	0.98 (0.95, 1.01)	0.168

Abbreviation: *OR*=odds ratio; *CI*=confidence interval; BMI=body mass index; SD=standard deviation.
* Continuous variables were z-score standardized, and *ORs* are reported per one standard deviation increase.

and progression, with collagen — the major ECM component — playing a critical role in scleral remodeling (*9*). Consequently, increased protein intake may mitigate myopia development by promoting scleral collagen synthesis. Furthermore, monitoring data from 101,464 students in Liaoning Province revealed that students who only occasionally consumed breakfast exhibited a 4% higher myopia risk compared to those eating breakfast daily (*OR*=1.04, 95% *CI*: 1.01, 1.08) (*10*). These findings collectively suggest that regular consumption of protein-rich breakfasts, particularly those containing meat and eggs, may serve as a protective factor against myopia in children and adolescents.

Despite its considerable strengths, including a large sample size and broad geographic coverage, this study has several important limitations. First, we employed non-cycloplegic automated refraction rather than cycloplegic refraction, the clinical gold standard, which may have resulted in misclassification of some myopia cases. Second, data on influencing factors were collected via self-reported questionnaires, introducing potential recall and reporting biases. Third, the cross-sectional design only permits inference of associations but not causality. Finally, results may not be generalizable to other regions with different educational and dietary contexts.

In conclusion, our study revealed high myopia prevalence among primary and secondary school students in Zhejiang Province. To effectively prevent myopia, it is essential to strengthen early identification and targeted interventions for susceptible children and adolescents. Additionally, intersectoral collaboration among health, education, and family sectors should be mobilized to establish a comprehensive prevention system. Future longitudinal studies are needed to confirm causal relationships.

Ethical statement: Adhered to the principles of the Declaration of Helsinki and received approval from the Ethics Committee of the Zhejiang Provincial Center for Disease Control and Prevention (Ethics approval number 2024-026-01). Written informed consent was obtained from parents or legal guardians of all participants following comprehensive explanation of the study objectives and methodology.

Conflicts of interest: No conflicts of interest.

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SUPPLEMENTARY MATERIALS

SUPPLEMENTARY TABLE S1. Demographic characteristics of participants.

Variables	Total	Non-myopia	Myopia	*P*
Sex* [*n* (%)]				<0.001
Male	101,527	33,489 (32.99)	68,038 (67.01)	
Female	91,177	26,493 (29.06)	64,684 (70.94)	
Age (years)†	11.85±3.47	9.38±2.79	12.96±3.16	<0.001
Height (cm)†	148.60±21.19	136.21±21.02	154.20±18.75	<0.001
Weight (kg)†	43.83±20.84	33.88±20.24	48.32±19.51	<0.001
BMI (kg/m^2)†	18.98±4.13	17.43±3.60	19.67±4.16	<0.001
SER (D)§	−1.71±2.21	0.31±0.74	−2.62±2.04	<0.001
SEL (D)§	−1.54±2.18	0.36±0.81	−2.40±2.06	<0.001
Nationality* [*n* (%)]				<0.001
Han	187,611	58,128 (30.98)	129,483 (69.02)	
Non-Han	5,093	1,854 (36.40)	3,239 (63.60)	
School stage* [*n* (%)]				<0.001
Primary school	101,578	49,736 (48.96)	51,842 (51.04)	
Junior high school	49,007	7,174 (14.64)	41,833 (85.36)	
Senior high school	42,119	3,072 (7.29)	39,047 (92.71)	
Region* [*n* (%)]				<0.001
Urban districts	89,223	26,379 (29.57)	62,844 (70.43)	
Suburban counties	103,481	33,603 (32.47)	69,878 (67.53)	

Abbreviation: SER=spherical equivalent right; SEL=spherical equivalent left; D=diopter.
* Chi-square test.
† Independent samples *t*-test.
§ Welch *t*-test.

SUPPLEMENTARY TABLE S2. Comparison of factors between myopia and non-myopia participants [*n* (%)].

Variables	Total	Non-myopia	Myopia	*P*
Parental myopia status*				<0.001
None	69,329	14,869 (21.45)	54,460 (78.55)	
One parent	46,996	7,534 (16.03)	39,462 (83.97)	
Both parents	22,005	2,622 (11.92)	19,383 (88.08)	
Homework*				<0.001
<3 hours	114,398	22,179 (19.39)	92,219 (80.61)	
≥3 hours	19,780	2,181 (11.03)	17,599 (88.97)	
Unknown	4,152	665 (16.02)	3,487 (83.98)	
Screen time†	1.03±1.91	0.89±1.83	1.07±1.93	<0.001
Eye exercises*				<0.001
No	4,596	497 (10.81)	4,099 (89.19)	
Yes	133,734	24,528 (18.34)	109,206 (81.66)	
Near-work break interval*				<0.001
<3 hours	130,011	23,838 (18.34)	106,173 (81.66)	
≥3 hours	8,319	1,187 (14.27)	7,132 (85.73)	

Continued

Variables	Total	Non-myopia	Myopia	*P*
Resting place*				<0.001
Indoors	103,276	17,506 (16.95)	85,770 (83.05)	
Outdoors	35,054	7,519 (21.45)	27,535 (78.55)	
Outdoor activity*				<0.001
<3 hours	113,615	20,357 (17.92)	93,258 (82.08)	
≥3 hours	16,109	3,174 (19.70)	12,935 (80.30)	
Unknown	8,606	1,494 (17.36)	7,112 (82.64)	
Sleep duration†	8.13±1.30	8.50±1.27	8.04±1.29	<0.001
Sedentary time†	5.57±4.51	4.46±4.08	5.81±4.56	<0.001
Secondhand smoke*				0.354
No	74,953	13,493 (18.00)	61,460 (82.00)	
Yes	63,377	11,532 (18.20)	51,845 (81.80)	
Sugary drinks*				<0.001
Never	33,451	6,597 (19.72)	26,854 (80.28)	
<Once per day	94,269	16,821 (17.84)	77,448 (82.16)	
≥Once per day	10,610	1,607 (15.15)	9,003 (84.85)	
Fried foods*				<0.001
Never	29,031	5,823 (20.06)	23,208 (79.94)	
<Once per day	102,573	18,181 (17.72)	84,392 (82.28)	
≥Once per day	6,726	1,021 (15.18)	5,705 (84.82)	
Fresh fruits*				<0.001
Never	5,994	1,024 (17.08)	4,970 (82.92)	
<Twice per day	112,134	19,920 (17.76)	92,214 (82.24)	
≥Twice per day	20,202	4,081 (20.20)	16,121 (79.80)	
Vegetables*				<0.001
Never	10,881	1,905 (17.51)	8,976 (82.49)	
<Twice per day	40,789	7,144 (17.51)	33,645 (82.49)	
≥Twice per day	86,660	15,976 (18.44)	70,684 (81.56)	
Milk and soy drinks*				0.065
Never	4,822	884 (18.33)	3,938 (81.67)	
<Once per day	47,354	8,408 (17.76)	38,946 (82.24)	
≥Once per day	86,154	15,733 (18.26)	70,421 (81.74)	
Grains and tubers*				<0.001
No	43,443	8,187 (18.85)	35,256 (81.15)	
Yes	94,887	16,838 (17.75)	78,049 (82.25)	
Meat and eggs*				<0.001
No	68,704	12,045 (17.53)	56,659 (82.47)	
Yes	69,626	12,980 (18.64)	56,646 (81.36)	
Dairy products*				<0.001
No	40,998	7,185 (17.53)	33,813 (82.47)	
Yes	97,332	17,840 (18.33)	79,492 (81.67)	

* Chi-square test.
† Independent samples *t*-test.