

BMJ Open Knowledge, attitude and practice towards myopia among parents of primary school students: a cross-sectional study

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ABSTRACT

Background Myopia is a common visual condition that requires proper management and prevention strategies, especially among children.

Objective To investigate the knowledge, attitude and practice (KAP) towards myopia among parents of primary school-age children.

Design Cross-sectional study using a self-administered questionnaire.

Participants/setting A total of 552 parents of primary school-age children participated in the study, which was conducted at a primary school in Wuxi City, China, between October and November 2022.

Intervention No intervention was applied; the study was observational, collecting data through questionnaires.

Main outcome measures KAP scores regarding myopia among parents.

Statistical analyses performed Univariable and multivariable logistic regression analyses were performed to identify associations between demographic factors and KAP scores.

Results Mean scores for KAP were 8.38 ± 2.29 (theoretical minimum-maximum: 0–12), 25.01 ± 2.79 (theoretical minimum-maximum: 6–30) and 26.37 ± 3.96 (theoretical minimum-maximum: 6–33), respectively. Higher education, income, personal and child myopia and having two children were associated with better knowledge. Parental female gender, higher income, myopia and age 33–44 years were associated with positive attitudes. Better attitudes and having a child in the fourth grade were associated with proactive practices.

Conclusions Parents of primary school-age children showed positive attitudes and proactive practices but had inadequate knowledge about myopia. Targeted health education programmes for parents with lower education and income levels could be recommended to improve knowledge and maintain positive attitudes towards myopia management.

BACKGROUND

Myopia is a common condition that typically starts in childhood, in which light from distant objects focuses in front of the retina, resulting in blurred distance vision.^{1 2} While myopia is one of the most prevalent eye diseases globally, the highest prevalence in school children

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Identified specific demographics needing targeted health education, enhancing intervention effectiveness.
- ⇒ Cross-sectional design limits causal inference between knowledge, attitude and practice and demographic factors.
- ⇒ Self-administered questionnaires may introduce bias due to self-reporting inaccuracies.

has been reported in urban areas of Asia, including China.¹ The prevalence of myopia among Chinese primary school-age children (aged 7–12) is 30.7%–52.7%.^{3–6} Furthermore, the onset of myopia has shifted to a younger age, and the number of children diagnosed with high myopia has drastically increased in the past decades.^{3 7} Myopia can lead to decreased productivity and reduced vision-related quality of life in children. Severe forms of myopia are associated with an increased risk of other ophthalmic problems, leading to visual impairment and blinding complications.^{1 7 8} Myopia in school-age children is a global public health problem, and strategies to prevent myopia and limit its progression are urgently needed.

A recent review on the epidemiology of myopia in school children worldwide found that the risk factors for myopia in this population include female sex, low outdoor time, parental myopia, increasing age, time of near work or studying, and urban environment, high population density, and small home size.⁹ On the other hand, Biswas *et al*¹⁰ identified excessive near work as the sole solid risk factor for myopia, while other factors like visual environment, circadian rhythm, sleep, nutrition, smoking, socioeconomic status and education remain debatable. In addition, the development of myopia increased during the COVID-19 pandemic in school children

due to home confinement and decreased outdoor activities.^{3 11} A growing body of evidence demonstrates that myopia risk can be managed by interventions such as increased time spent outdoors and other optical and pharmacological treatments.^{12–14} Parents are essential in managing myopia in school children.¹⁵ They influence their children's lifestyle choices, behaviour modifications and environmental exposure, which can prevent or slow down myopia. They can work with teachers and school administrators to ensure the classroom environment is conducive to good eye health. Parental involvement is crucial for successfully managing myopia in children.¹⁶ Parents are also the main source of information about myopia in school-age children.¹⁷ However, a study in China showed that most parents misunderstood the influence of the environment and sports and extracurricular activities on myopia.¹⁸ A previous study showed that Indian optometrists had gaps in knowledge regarding childhood myopia,¹⁹ preventing the effective transfer of accurate knowledge, but the possible knowledge gap in parents remains poorly understood. It is particularly important to study their understanding since the awareness and practice of parents towards myopia will have a strong impact on the prevention and treatment of myopia in school children.

A knowledge, attitude and practice (KAP) survey is a quantitative method widely used for evaluating the understanding and application of health-related topics based on the principle that knowledge impacts behaviour and practice of disease management.²⁰ Despite China having a high prevalence of myopia, research on the KAP of parents of primary school-age children remains limited. Only one study has reported that parents or guardians of children demonstrated adequate knowledge, positive attitudes and proactive practices in preventing and managing childhood myopia, but that study did not specifically enrol parents of primary school-age children.²¹ Gaining a better understanding of their KAP could inform strategies to improve myopia prevention and management among school-age children.

Therefore, this study aimed to assess the KAP towards myopia among parents of primary school-age children and to investigate the factors associated with the KAP levels, which would be valuable information in identifying parents who require further education on myopia.

METHODS

Patient and public involvement

The parents of primary school-age children were included in this study as participants, but they were not involved in the study design.

Study design and participants

This cross-sectional study was conducted between October 2022 and November 2022 in Wuxi City, China, involving parents of children attending a primary school in the Liangxi District. The school is in the city centre,

and the surrounding population has an intermediate socioeconomic status. It was selected because it was one of the myopia prevention and control experimental units of Wuxi Children's Hospital. The parents who declined to participate or did not clearly understand (self-reported) the research procedures were excluded from the study. This study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.²²

Procedures

The study questionnaire was self-developed based on two guidelines and one white paper applied in China.^{23–25} Following its initial design, the questionnaire underwent modifications based on feedback from three experts, including two ophthalmologists and one teacher.

The questionnaire included four dimensions (online supplemental file 1): the demographic information, knowledge dimension, attitude dimension and practice dimension. The knowledge dimension consisted of 12 questions scored 1 point for each correct answer and 0 points for wrong answers, resulting in a possible score range of 0–12 points. The attitude dimension included nine questions scored using a 5-point Likert scale ranging from 'very positive (5 points)' to 'very negative (1 point)' and the scoring was reversed for the negative questions, and three questions (questions 6–8) were not included in the total score. Therefore, the possible score range for the attitude dimension was 6–30 points. The practice dimension included 13 questions. Questions 1–3 were scored with 1 point for answering yes and 0 points for answering no. Questions 4–7 were descriptive and were not scored. Questions 8–13 were scored using a 5-point Likert scale ranging from 'very positive (5 points)' to 'very negative (1 point)', with the scoring being reversed for the negative questions. The total score for the practice dimension ranged from 6 to 33 points. Higher scores indicated more adequate knowledge, positive attitudes and proactive practice. For the quantitative analysis of the participants' KAP, the scores were assigned based on their responses to the KAP dimensions by the statistician.

The research team obtained permission from the headmaster of the selected primary school in the Liangxi district of Wuxi City to conduct the survey. Two trained research assistants explained the questionnaire to the teachers and provided them with training about the objective and how to answer the questions. The teachers assisted in administering the questionnaire. An electronic version of the questionnaire was generated using the Wen Juan Xing platform (<https://www.wjx.cn>), and a quick response code was created for the parents to scan and access the survey via WeChat. Each IP address was allowed to submit only one response to minimise the risk of duplicates. The research team reviewed all questionnaires to check for completeness, internal consistency and reasonableness based on the absence of impossible or out-of-range data or a questionnaire completed using all the same options (eg, all first choices). The Cronbach's α

score for the valid questionnaires was 0.729, indicating acceptable internal consistency.²⁶

Statistical analyses

The minimal sample size was estimated using Cochran's sample size formula for survey studies²⁷:

$$n = \frac{Z^2 \times p(1-p)}{e^2}$$

where Z^2 is the confidence coefficient, p is the proportion and e is the margin of error. The sample size is maximised when $p=0.5$. A 95% CI involves a Z -value of 1.96. Precision was assumed at 5%. Hence, a minimum of 385 participants were needed.

The statistical analysis was conducted using SPSS V.26.0 (IBM). A confirmatory factor analysis (CFA) was performed to examine the reliability of the questionnaire by calculating the confirmatory factor index (CFI) (>0.800 is considered good), the incremental factor index (IFI) (>0.800 is considered good), the Tucker-Lewis Index (TLI) (>0.800 is considered good) and the minimum discrepancy divided by its df (CMIN/DF) (1–3 is considered excellent, 3–5 is considered good).²⁸ Continuous data following a normal distribution were expressed as means±SD and compared using the t -test or analysis of variance. Continuous data following a skewed distribution were expressed as median (Q1, Q3) and compared using the Wilcoxon rank-sum test or Kruskal-Wallis H test. The categorical data were presented as n (%). Spearman correlation was used to analyse the correlation between KAP scores. Univariable and multivariable logistic regression analyses were performed to analyse the factors associated with KAP levels. The KAP scores were dichotomised as poor/good knowledge, negative/positive attitudes, and poor/proactive practices based on a cut-off of >70% of the total score for each dimension (ie, 8.4 for knowledge, 21 for attitudes and 23.1 for practice). A two-sided $p<0.05$ was considered statistically significant.

RESULTS

Questionnaire validation

The CFA (figure 1) showed that the CFI was 0.829 (>0.800 is good), the IFI was 0.830 (>0.800 is good), the TLI was 0.813 (>0.800 is good) and the CMIN/DF was 2.517 (>1; 1–3 is excellent, 3–5 is good), indicating that the questionnaire had good reliability.

PARTICIPANT DEMOGRAPHICS

Out of the 1244 parents with children attending the study school, 643 (51.69%) questionnaires were returned after obtaining informed consent. 91 (7.3%) questionnaires were excluded due to incomplete responses. In total, 552 (44.4%) non-problematic questionnaires were included. The majority of the participants were female (79.5%), employed (78.1%) and had completed junior college or bachelor's degrees (77.7%). In addition, 50.9% of the participants were in the 35–44-year-old age range,

while 55.3% reported having only one child. Monthly household income per person was 5000–10 000 yuan for 33.2% of participants. The data also showed that myopia was prevalent among the study population, with 64% of parents and 38% of students reporting the condition, as shown in table 1.

KAP towards myopia

The average knowledge score among participants was 8.38 ± 2.29 (theoretical minimum-maximum: 0–12). Parents with only one child ($p=0.005$), a master's degree or higher ($p<0.001$), employment ($p=0.004$), a higher income ($p=0.005$), parents with myopia ($p<0.001$) and children with myopia ($p=0.001$) had higher knowledge scores. In terms of attitude, participants had an average score of 25.01 ± 2.79 (theoretical minimum-maximum: 6–30). Females ($p=0.001$), a bachelor's degree or higher ($p=0.021$), a monthly household income per person of >10 000 yuan ($p=0.017$), and those with myopia ($p=0.001$) tended to have higher attitude scores. Regarding practice, participants had an average score of 26.37 ± 3.96 (theoretical minimum-maximum: 6–33). Parents with children in first or second grade ($p=0.009$), a master's degree or higher ($p=0.003$) and a monthly income of >20 000 yuan ($p=0.029$) had higher practice scores (table 1).

Regarding the knowledge dimension, participants performed best on questions related to the brightness of electronic devices (with a correct rate of 95.8%) and indoor lighting when reading (92.4%). However, they struggled with questions related to the causes of myopia (with a correct rate of only 27.2%) and outdoor exercise (with a correct rate of 20.3%). In terms of attitude, participants generally exhibited a positive attitude, except for the question about wearing glasses. Only 35.1% of the participants agreed (either 'extremely positive' or 'positive') with the negative statement, 'I believe that glasses should only be worn when necessary to correct vision'. Finally, with regard to the practice dimension, most participants reported positive practice, except for outdoor activities and reading while lying down (table 2).

Correlations

Pearson correlation analyses showed a significant positive correlation was found between knowledge-attitude ($r=0.2492$, $p<0.001$), knowledge-practice ($r=0.1736$, $p<0.001$) and attitude-practice ($r=0.2711$, $p<0.001$) (table 3).

Factors associated with KAP towards myopia

Multivariable logistic regression showed that having a junior college or bachelor's degree (OR 3.072, 95% CI 1.566 to 6.025, $p=0.001$), having a master's degree or above (OR 6.259, 95% CI 2.327 to 16.835, $p<0.001$), having a monthly household income per person of 10 000–20 000 yuan (OR 1.999, 95% CI 1.029 to 3.883, $p=0.041$), having myopia (OR 1.547, 95% CI 1.028 to 2.330, $p=0.037$), having a child with myopia (OR 1.923, 95% CI 1.314 to 2.813, $p=0.001$) and having two children (OR 0.650,

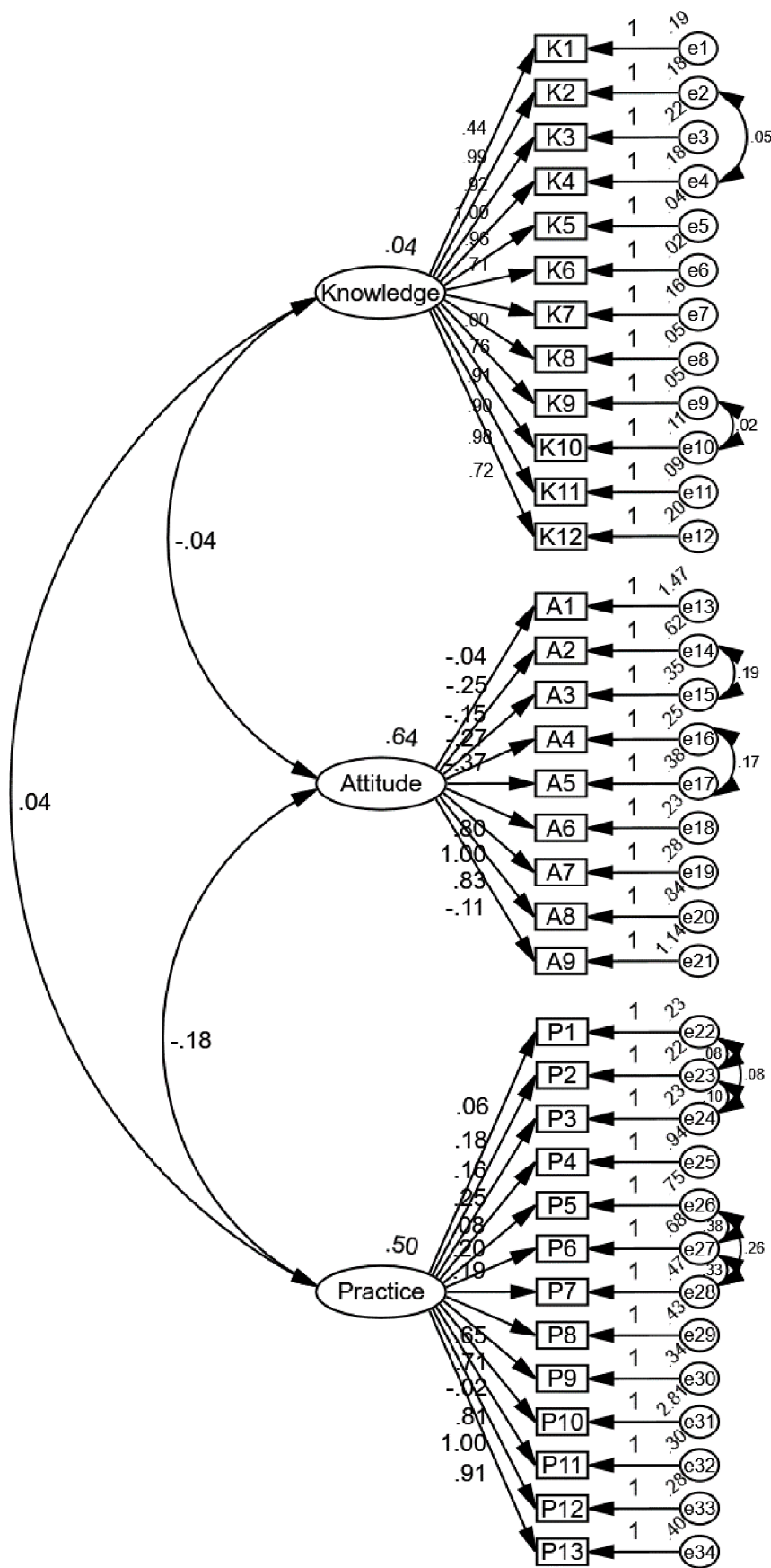


Figure 1 Confirmatory factor analysis for KAP. KAP, knowledge, attitude and practice.

Table 1 Baseline characteristics and KAP scores

	N (%)	Knowledge		Attitude		Practice	
		Median (Q1, Q3)	P value	Median (Q1, Q3)	P value	Median (Q1, Q3)	P value
Gender							
Male	113 (20.47)	9(7, 10)	0.411	25(22, 26)	0.001	26(23, 29)	0.098
Female	439 (79.53)	9(7, 10)		26(24, 27)		27(24, 29)	
Age							
Less than 35 years old	120 (21.74)	9(7, 10)	0.295	26(24, 27)	0.059	27(24, 29)	0.962
35–44 years old	281 (50.91)	9(7, 10)		25(23, 26)		27(24, 29)	
45 years old and above	151 (27.36)	9(7, 10)		25(23, 27)		27(24, 29)	
Child's grade							
1	79 (14.31)	9(8, 10)	0.246	26(23, 27)	0.553	28(25, 30)	0.009
2	66 (11.96)	9(7, 10)		26(24, 26)		28(25, 30)	
3	100 (18.12)	9(7, 10)		26(23.5, 27)		26(23.5, 29]	
4	155 (28.08)	9(7,10)		26(23,27)		26(23,29)	
5	75 (13.59)	9(8, 10)		25(23, 27)		25(24, 29)	
6	77 (13.95)	9(7, 9)		25(23, 27)		26(24, 29)	
Number of siblings							
0	305 (55.25)	9(8, 10)	0.005	26(24, 27)	0.143	27(24, 30)	0.906
1	206 (37.32)	9(7, 10)		25(23, 27)		27(24, 29)	
≥2	41 (7.43)	9(7, 10)		25(23, 27)		27(24, 28)	
Education							
High school/technical secondary school and below	90 (16.30)	7.5(6, 9)	<0.001	24.5(22, 26)	0.021	25(23, 28)	0.003
Junior college/ bachelor's degree	429 (77.72)	9(8, 10)		26(24, 27)		27(24, 29)	
Master's degree and above	33 (5.98)	10(9, 10)		26(24, 27)		28(26, 30)	
Work status							
Employed	431 (78.08)	9(8, 10)	0.004	26(24, 27)	0.427	27(24, 29)	0.765
Unemployed	37 (6.70)	8(6, 9)		26(23, 28)		26(24, 29)	
Self-employed	55 (9.96)	9(7, 10)		25(23, 26)		27(24, 30)	
Full-time homemaker	29 (5.25)	7(6, 10)		25(23, 26)		27(25, 30)	

Continued

Table 1 Continued							
	N (%)	Knowledge		Attitude		Practice	
		Median (Q1, Q3)	P value	Median (Q1, Q3)	P value	Median (Q1, Q3)	P value
Monthly household income per person, yuan			0.005		0.017		0.029
<5000	76 (13.77)	8(6, 9)		24(22, 26)		25.5(23, 28.5]	
5000–10 000	183 (33.15)	9(7, 10)		25(23, 27)		27(23, 29)	
10 000–20 000	170 (30.80)	9(8, 10)		26(24, 27)		27(24, 29)	
>20 000	123 (22.28)	9(7, 10)		26(24, 27)		28(25, 30)	
Do the parents have myopia?			<0.001		0.001		0.243
Yes	353 (63.95)	9(8, 10)		26(24, 27)		26(24, 29)	
No	199 (36.05)	8(6, 10)		25(23, 26)		27(24, 29)	
Does the child have myopia?			0.001		0.854		0.074
Yes	210 (38.04)	9(8, 10)		25.5(24, 27)		26(24, 29)	
No	342 (61.96)	9(7, 10)		25(23, 27)		27(24, 29)	
KAP, knowledge, attitude and practice.							

Table 2 Knowledge, attitudes and practices

Knowledge	N=552		
	Correct (%)	Wrong/unclear (%)	
1. Myopia is the result of overdevelopment of the eyeball, which is essentially a shortening of the eye axis.	150 (27.17)	402 (72.83)	
2. The complications of high myopia are mainly fundus lesions, such as retinal detachment, retinochoroidal atrophy, macular haemorrhage, macular fissure, etc.	380 (68.84)	172 (31.16)	
3. Low-concentration atropine drops are effective in slowing the development of myopia.	267 (48.37)	285 (51.63)	
4. Mydriasis is a routine form of eye examination and treatment.	369 (66.85)	183 (33.15)	
5. To give your eyes adequate rest, get up and move around every 20 min when working and studying, and stand in front of a window and look 20 feet (6 m) away for at least 20 s.	507 (91.85)	45 (8.15)	
6. During home Internet classes, you should ensure that the room is well-lit and adjust the brightness of your child's electronic devices appropriately, not too bright or too dark.	529 (95.83)	23 (4.17)	
7. Outdoor exercise is also crucial to myopia prevention and control, but it does not matter whether the child is under daylight or not; he/she should be allowed to do more outdoor activities.	112 (20.29)	440 (79.71)	
8. Children should not read at home in too much or too little light. Make sure that indoor lighting and eye protection lamps are on at the same time.	510 (92.39)	42 (7.61)	
9. Wearing frame glasses is one of the best ways to control myopia; moreover, there are other options, such as Keratoscope, as well as reducing close reading & learning and increasing outdoor activities.	503 (91.12)	49 (8.88)	
10. If you need to do screen reading for a long time, you should wear anti-blue light glasses to block the harmful blue light to the eyes as much as possible.	462 (83.70)	90 (16.30)	
Attitude	N (%)		
	Extremely positive/ agree	Positive/agree	Neutral
A1. I believe that glasses should only be worn when necessary to correct vision. (N)	62 (11.23)	132 (23.91)	91 (16.49)
A2. I don't think regular vision checks are necessary until there are signs of unclear vision. (N)	11 (1.99)	15 (2.72)	17 (3.08)
A3. I don't think it matters whether my child reads in a lying down position or uses electronic devices. (N)	3 (0.54)	2 (0.36)	11 (1.99)
		210 (38.04)	57 (10.33)
			230 (41.67)
			360 (65.22)

Continued

Table 2 Continued

Knowledge	N=552		
	Correct (%)	Wrong/unclear (%)	
A4. I fully support promoting the importance of vision protection for primary and secondary school students. (P)	430 (77.90)	104 (18.84)	16 (2.90)
A5. If a 'vision protection' parent-child activity is offered by the school or community, I would be interested in participating. (P)	335 (60.69)	167 (30.25)	46 (8.33)
A6. I am concerned that my child's myopia may impact their future life and studies.	330 (59.78)	165 (29.89)	38 (6.88)
A7. I am worried that my child's myopia may affect their appearance.	273 (49.46)	165 (29.89)	74 (13.41)
A8. I am concerned that my child's myopia may lead to low self-esteem.	112 (20.29)	75 (13.59)	217 (39.31)
A9. If I am nearsighted, I think that glasses should only be worn when necessary, but not necessarily all day. (N)	20 (3.62)	71 (12.86)	64 (11.59)
Practice	N (%)	N (%)	
	Yes	No	
P1. Encourage your child to participate in outdoor activities for at least 2 hours a day.	208 (37.68)	344 (62.32)	–
P2. Supervise your child to perform eye exercises regularly.	334 (60.51)	218 (39.49)	–
P3. Attend scientific lectures or activities on children's and adolescents' vision health.	316 (57.25)	236 (42.75)	–
P4. Take your child for optical coherence tomography once a year.	118 (21.38)	216 (39.13)	89 (16.12)
	Always	Sometimes	Rarely
	118 (21.38)	129 (23.37)	89 (16.12)
	Often	Never	–
	216 (39.13)	–	–

Continued

Table 2 Continued

Knowledge	N=552			
		Correct (%)	Wrong/unclear (%)	
P5. Ensure a balanced diet that includes eggs, meat, fish, or animal liver.	11 (1.99)	200 (36.23)	167 (30.25)	174 (31.52) –
P6. Provide dairy or soy products for your child.	6 (1.09)	128 (23.19)	158 (28.62)	260 (47.10) –
P7. Offer plenty of fresh vegetables and fruits.	3 (0.54)	58 (10.51)	151 (27.36)	340 (61.59) –
	Extremely positive	Positive	Neutral	Negative
P8. Supervise your child's reading and writing posture.	181 (32.79)	254 (46.01)	101 (18.30)	Extremely negative 2 (0.36)
P9. Discourage your child from using electronic devices such as television, cell phone, or tablet computer in the dark.	364 (65.94)	142 (25.72)	29 (5.25)	12 (2.17) 5 (0.91)
P10. Do not allow your child to lie down while reading books or using electronic devices.	149 (26.99)	90 (16.30)	58 (10.51)	48 (8.70) 207 (37.50)
P11. Discourage your child from reading books or looking at electronic products while using mobile transportation (bus, car).	360 (65.22)	136 (24.64)	42 (7.61)	7 (1.27) 7 (1.27)
P12. Discourage your child from rubbing their eyes.	286 (51.81)	176 (31.88)	68 (12.32)	14 (2.54) 8 (1.45)
P13. Encourage your child to take breaks and relax their eyes during class breaks.	275 (49.82)	172 (31.16)	77 (13.95)	24 (4.35) 4 (0.72)
‘p’ indicates a positive statement, while ‘N’ indicates a negative statement The questions marked with ‘N’ were reverse-scored.				

Table 3 Spearman correlation analyses

	Knowledge	Attitude	Practice
Knowledge	1		
Attitude	0.2492 (p<0.001)	1	
Practice	0.1736 (p<0.001)	0.2711 (p<0.001)	1

95% CI 0.434 to 0.974, $p=0.037$) were independently associated with adequate knowledge. The knowledge scores (OR 1.239, 95% CI 1.131 to 1.357, $p<0.001$), being female (OR 2.080, 95% CI 1.307 to 3.310, $p=0.002$), having monthly household income per person of 10 000–20 000 yuan (OR 1.842, 95% CI 1.010 to 3.359, $p=0.046$), having monthly household income per person over 20 000 yuan (OR 2.296, 95% CI 1.211 to 4.351, $p=0.011$), having myopia (OR 1.549, 95% CI 1.056 to 2.273, $p=0.025$) and being aged 33–44 years old (OR 0.533, 95% CI 0.334 to 0.851, $p=0.008$) were independently associated with positive attitudes. The attitude scores (OR 1.163, 95% CI 1.076 to 1.258, $p<0.001$) and having a child in the fourth grade (OR 0.478, 95% CI 0.265 to 0.859, $p=0.014$) were independently associated with proactive practice (online supplemental table 1).

DISCUSSION

This study found that parents of primary school-age children had inadequate knowledge, positive attitudes and proactive practice regarding myopia, which might provide valuable insights for future intervention studies to enhance myopia education and promote better eye health for children.

In the present study, 64% of the parents reported having myopia and reported myopia in 38% of their children. Such values are within the Chinese ranges for myopia prevalence. Indeed, the prevalence of myopia in Chinese adults is 36%–86%.^{29 30} For Chinese primary school children (aged 7–12), the prevalence of myopia is 30.7%–52.7%.^{3–6}

McCrann *et al* reported that 76% of parents of school-age children recognised the potential health risks of digital technology for the eyes.¹⁶ One study conducted in rural China by Li *et al* highlighted that some parents have no clear idea of what myopia is, and only a small number knew the anatomical definition of the condition.³¹ Another study in China highlighted the insufficient understanding of the importance of minimising near work in children, having adequate sleep duration, adopting a proper reading distance, maintaining adequate indoor illumination and encouraging sports and outdoor activities.¹⁸ Another study comparing myopia control perceptions between parents in the UK and Hong Kong also found low awareness of the effects of myopia, especially in the UK,³² which was consistent with the findings observed here. In addition, in the present study, the knowledge among parents was suboptimal; they correctly understood the impact of electronic devices and

indoor lighting, but they had poorer knowledge of the cause of myopia and the impact of outdoor exercise. The vast majority agreed that wearing glasses is one of the best ways to control myopia; however, in Li *et al*'s study, parents had the misconception that glasses-wearing should be delayed in children and might harm the eyes.³¹ This discrepancy can be explained by the fact that the study was conducted in an urban area, and parents might have had higher awareness.

The study by He *et al* on parents of primary school students also revealed that family income and parents' education level significantly affected their myopia knowledge.³³ Tao *et al*¹⁸ also showed that lower parental education was associated with myopic progression in their children. Furthermore, parents with myopia might have more related knowledge through their experience and more opportunities to seek information from professionals. Therefore, educational interventions need to focus on parents with no myopia history and those whose children have no myopia, as well as parents with lower income and education levels.

One similar survey study conducted in Ireland found parental attitudes to myopia were nonchalant.¹⁶ Only 14% of parents of school-age children expressed that they would be concerned if their children were diagnosed with myopia, and 46% considered myopia to be a health risk to their children.¹⁶ The lack of parental concern in the previous study might be due to the low myopia prevalence in Ireland: only 10% of the children had myopia, compared with around 40% in the present study. McCrann *et al* also found that myopic parents considered myopia as more of an inconvenience and were more likely to consider limiting screen time.¹⁶ Parents' attitudes towards children's visual care were associated with a lower risk of myopia in children, and it is important to enhance their attitude towards myopia.³⁴

Jiang *et al*'s study on parents' intention towards preschool children's myopia-prevention behaviours also found that parental attitude was associated with their myopia-preventive behaviours.³⁵ Parental beneficial behaviours (eg, spending less time on near work and electronic device use) are positively associated with children's myopia.³³ The practice score was adequate in the present study. Furthermore, a higher attitude score was significantly associated with better practice scores, while having a child in the fourth grade was associated with poorer practice. The primary school system in China usually has six grades (grades 1–6). The children usually start attending school (grade 1) at 6 years

old. Hence, children in grade 4 are usually 9 years old, which is around the peak for myopia incidence in children in China.^{3–6} Still, this study examined associations, not causality, and the results could highlight that the peak of parental carelessness about myopia could occur when their children are around that age. Additional studies are necessary to examine that point. This finding reaffirmed the relationship between KAP and that adequate knowledge can lead to a positive attitude to inform better practice.^{36 37} This study also found significant correlations between knowledge-attitude, knowledge-practice and attitude-practice. In the practice dimension, most parents answered positively, except on the items of outdoor activities and reading while lying down.

There were several limitations in this study. First, this study was conducted in a single school in China, and the results might not be generalised to other cities. The school was selected because it was one of the myopia prevention and control experimental units of the hospital, which could introduce bias. Second, due to the self-reporting nature of the study, the results might deviate from the actual practice. The parents who did not have a clear self-reported understanding of the research procedures were excluded, which could introduce bias. Furthermore, most participants provided positive answers in the attitude and practice dimensions, while knowledge scores were poor, and the results might be affected by the social desirability bias or overconfidence. Third, 44% of the parents in the selected school returned a non-problematic questionnaire, and there might be a non-response bias. Fourth, the teachers helped administer the questionnaire, but it could introduce a 'classroom effect' bias.

CONCLUSIONS

Parents of primary school-age children had inadequate knowledge but a positive attitude and proactive practice towards myopia. Education programmes focusing on the causes and risk factors of myopia, prevention measures, and early detection and treatment should be designed and implemented for parents. There is a need for health education programmes that target parents with lower education and income levels to improve knowledge about myopia. Efforts should be made to maintain positive attitudes and improve the knowledge and practice towards myopia by highlighting the benefits of outdoor activities and limiting screening time. In addition, healthcare professionals should encourage parents to take proactive measures such as scheduling regular eye check-ups and creating a myopia-friendly environment at home, that is, maximising outdoor activities, minimising near work and having proper lighting intensity and spectral composition.¹⁰

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