

Knowledge and attitudes toward myopia control strategies among teenagers in Lurambi Constituency, Kenya



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Dates:

Received: 21 Nov. 2024
Accepted: 06 Apr. 2025
Published: 25 July 2025

How to cite this article:
Sarai DN, Munsamy AJ. Knowledge and attitudes toward myopia control strategies among teenagers in Lurambi Constituency, Kenya. *Afr Vision Eye Health*. 2025;84(1), a1023. <https://doi.org/10.4102/aveh.v84i1.1023>

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Background: Myopia is a growing public health issue, particularly among teenagers, due to rapid ocular growth that increases the risk of complications such as retinal detachment and glaucoma. With its global rise, understanding myopia control strategies (MCS) is crucial to reduce prevalence and prevent associated complications.

Aim: To evaluate teenagers' knowledge and attitudes towards MCS.

Setting: The study was conducted across all clinics in Lurambi Constituency, Kenya.

Methods: An analytical cross-sectional design was used. Teenagers attending selected clinics were recruited through census method. Data were collected using a self-administered, structured, and modified questionnaire. Ethical approvals were obtained from IERC, NACOSTI, and local clinics. Data were analysed using SPSS version 25, applying proportions, percentages, and Chi-square tests.

Results: Of the 115 teenagers surveyed, 69.8% had good knowledge of MCS, and 47.7% had adopted them. Among non-adopters, 62.7% demonstrated poor knowledge. Awareness of single-vision spectacles and contact lenses was noted in 49.6%, with 65.6% adoption among them. Only 34.8% were aware of progressive segmented spectacles and gentamycin eyedrops. Knowledge was significantly associated with uptake ($P = 0.033$). A positive attitude correlated with a 95.4% adoption rate. While general attitude was not significantly linked to uptake ($P = 0.127$), views on appearance and prevention of vision deterioration were ($P = 0.033$ and $P = 0.034$).

Conclusion: Although general knowledge of MCS is fairly high, understanding of specific, effective strategies remains limited.

Contribution: Targeted awareness efforts are recommended for teenagers, parents, and teachers, especially in low-resource settings.

Keywords: myopia; awareness; knowledge; attitudes; teenagers; Kenya.

Introduction

Myopia, commonly known as nearsightedness, is an escalating global public health issue, particularly among children and teenagers.¹ During adolescence, rapid ocular growth can lead to a significant progression of myopia, increasing the risk of long-term complications such as retinal detachment and glaucoma.² Several lifestyle factors, especially increased screen time and a reduction in outdoor activities, have been implicated in the rising prevalence of myopia among youth.³ This has been particularly evident in both urban and rural areas, though rural regions may face additional challenges in mitigating this growing issue. As a result, addressing the progression of myopia in teenagers is crucial, given their vulnerability during this developmental stage.

In Kenya, the prevalence of myopia among primary school students aged 12 to 15 years in Makueni County was approximately 1.7%.⁴ Overall understanding of the uptake of MCS in relation to knowledge scores. The primary source of MCS information was eye clinicians. Among the total sample ($N = 115$), 42 participants (36.5%) cited eye clinicians as their source. This included 35 individuals (50%) who had MCS uptake and 10 individuals (19.6%) who did not. In Kakamega County, the rate increases to 7.5% among secondary school students aged 13–19.⁵ In Nairobi, 9.4% of

Note: Additional supporting information may be found in the online version of this article as Online Appendix 1.

standard eight pupils aged 12–15 years in public schools are affected with myopia,⁶ and this figure rises to 15.6% among students aged 14–20 years in public high schools.⁷

Various strategies have been developed to control the progression of myopia, including the use of soft and rigid contact lenses (CL), orthokeratology and pharmacological treatments such as low-dose atropine.⁸ These interventions have been shown to be effective in slowing myopia progression, thereby reducing the risk of associated visual impairments.⁹ However, the success of these strategies largely depends on their timely adoption and consistent use by teenagers. In rural areas, such as the Lurambi Constituency in Kenya, where healthcare services are often less accessible, it is vital to explore the level of knowledge and awareness among the teenage population regarding these myopia control strategies (MCS).

In rural settings, teenagers may face unique challenges in accessing eye care services and information about the available options for myopia control.¹⁰ Limited access to healthcare facilities and eye care practitioners (ECPs), combined with socioeconomic barriers, may contribute to a lack of awareness about effective myopia management interventions.¹¹ Moreover, cultural beliefs and perceptions about the use of spectacles or CL may influence attitudes towards these treatments.¹² Without proper awareness and positive attitudes towards MCS, teenagers in rural areas are at a greater risk of experiencing unchecked myopia progression, which could have lifelong implications for their vision.

Despite the global recognition of the importance of myopia control, there is a significant gap in the literature regarding the knowledge and attitudes of teenagers in rural settings towards these strategies. Most research has focused on urban populations, where access to healthcare and educational resources is relatively better.¹³ In Lurambi Constituency, rural Kenya, there are limited data on how well-informed teenagers are about myopia control options and the factors that influence their decision to adopt these interventions. Understanding these dynamics is essential to designing effective public health interventions that can improve the uptake of MCS in rural settings. Therefore, this study aimed to assess the knowledge and attitude of MCS among teenagers in the Lurambi Constituency, Kenya.

Materials and methods

The study employed an analytical cross-sectional study design and was conducted in all eye clinics of Lurambi Constituency, Kenya. Lurambi Constituency is one of the constituencies within Kakamega County, Kenya. The Constituency has 10 private eye clinics and 2 public eye clinics. Also, the availability of Kakamega Teaching and Referral Hospital, which serves as a referral centre for Kakamega County and neighbouring counties, made the area ideal for the study. This study was conducted on teenagers with myopia. Teenagers with myopia ≤ -0.50 Ds

and aged 13–19 years were included in the study. Teenagers with pathological eye conditions, such as cataracts, and those who did not consent to participate in the study were excluded. The sample size of teenagers was calculated using Cochran sampling¹⁴ with a minimum sample size of teenagers at 101 and a maximum sample size at 110 teenagers.

The study data were collected from all clinics in Lurambi Constituency using a purposive sampling strategy. At the clinic level, all teenagers were included in the study through a census approach, because of the lack of clear records on myopic teenagers attending some clinics. Data were collected using a structured modified questionnaire on knowledge, attitude and factors influencing the uptake of MCS (see Online Appendix 1).^{15,16,17} Before data collection, the questionnaire was piloted and adjusted accordingly. The questionnaire comprised closed-ended questions. By Cronbach's Alpha, the questionnaire gave a value of 0.7, indicating good reliability of the questionnaire. Teenagers from all clinics of Lurambi were invited to participate in the study using the modified questionnaire. Data were entered into a Microsoft Excel 2022 spreadsheet and checked by the principal researcher to ensure there was no missing or incorrectly entered data. The data were then exported to SPSS Statistics version 27 was developed by IBM Corp., (Armonk, New York, United States) for analysis. Descriptive statistics were analysed in proportions, and inferential statistics were analysed using the Chi-square test. Statistical significance was set at $P < 0.05$. Thereafter, the data were presented in tables. Before data analysis, knowledge scores as well as the attitude scores were calculated as explained next.

Knowledge score calculation

The knowledge score for understanding various MCS was determined through a series of questions. Participants received one point if they indicated awareness of MCS and zero if they did not. Additional points were awarded based on recognition of specific types of strategies: one point for knowing about single-vision (SV) spectacles & soft and rigid CL, segmented spectacles and addition spectacles, or segmented spectacles and atropine eyedrops; no points were given for incorrect answers such as additional spectacles and gentamycin eyedrops. For understanding the reasons behind using MCS, participants received points for correct responses: one point for knowing MCS slow nearsightedness from worsening and zero points for incorrect answers such as improving vision or looking intelligent. The maximum score achievable was three points. Participants' overall knowledge was classified based on their total score: 60–100 indicated good knowledge, 40–59 indicated fair knowledge, and 0–39 indicated poor knowledge.¹⁸

Attitude score calculation

Responses to questions about attitudes towards MCS were scored as follows: Strongly agree earned four points, agree received three points, neutral was awarded two points,

disagree got one point and strongly disagree scored 0 points. There were a total of 11 questions, each contributing a maximum of four points, totalling 44 maximum points across all questions. The general attitude score was calculated by dividing the total points achieved by the maximum points possible and multiplying by 100. Scores falling between 60–100 indicated a good attitude, 40–59 suggested a fair attitude and 0–39 reflected a poor attitude towards managing myopia.¹⁸

Ethical considerations

The questionnaire was administered to participants following the signing of a consent form. The study adhered to all human research protocols in accordance with the Helsinki Declaration. Necessary approvals were obtained from the National Commission for Science, Technology, and Innovation (NACOSTI P/24/34252) and ethical clearance from an accredited Masinde Muliro Ethics Review Committee (MMUST/COR: 40312 Vol 6(01). Emphasis was placed on participant privacy, confidentiality and voluntary participation. Consent from legal guardians was required for all participants, with guardians receiving a simplified informed consent form written in English. In addition, participant assent was obtained regardless of their age. Confidentiality and anonymity of the teenage participants were strictly upheld. Each participant was assigned a unique code to ensure anonymity, and personal information was protected in accordance with the *Protection of Personal Information Act (POPIA)*. Data were anonymised for analysis and securely stored in password-protected files. Any physical data were kept in a locked cupboard for a period of 5 years.

Results

Demographic profile of teenagers of Lurambi Constituency, Kenya

A total of 115 teenagers were sampled, of whom 61 (53.0%) were female and 54 (47.0%) were male. Of these, 85 (73.9%) were from public clinics and 30 (26.1%) were from private clinics. The majority of participants, 50 (43.5%), were aged between 15–18 years, followed by 39 (33.9%) aged 19 years and 26 (22.6%) aged 13–14 years. Education-wise, 7 teenagers (6.1%) were in primary school, 15 (13.0%) in junior secondary, 57 (49.6%) in upper secondary and 36 (31.3%) in college. Most participants, 76 (79.1%), had mild myopia of 0.50–3.00 Ds, followed by 16 (13.9%) with moderate myopia of 3.25–6.00 Ds and 8 (7.0%) with high myopia of greater than 6.00 Ds. The mean age of the participants was 15.8 ± 5.6 years, whilst the mean of refractive error was 0.64 ± 0.29 Ds. Table 1 shows the demographic profile of the teenager sample population.

Knowledge of myopia control strategies among teenagers of Lurambi Constituency, Kenya

Level of knowledge

General knowledge of the uptake of MCS according to knowledge score. Table 2 shows out of 115 teenagers, 81 (69.8%) reported having good knowledge about MCS with 31 (47.7%) having uptake of MCS. Majority of teenagers

TABLE 1: Demographic data for teenagers uptake of myopia control strategies among teenagers of Lurambi Constituency, Kenya.

Demographic data	Total number of participants		MCS			
	n	%	n	%	n	%
Sample size	115	-	64	-	51	-
Gender						
Female	61	53.0	31	48.4	30	58.80
Male	54	47.0	33	51.6	21	41.20
Age (years)						
13–14	26	22.6	11	17.2	15	29.40
15–18	50	43.5	26	40.6	24	47.10
19	39	33.9	27	42.2	12	23.50
Type of clinic of visit						
Public	85	73.9	47	73.4	12	23.50
Private	30	26.1	17	26.6	38	74.50
School and/or class grade						
Primary	7	6.1	1	1.6	6	11.80
Junior secondary	15	13.0	8	12.5	7	13.70
Upper secondary	57	49.6	33	51.7	24	47.10
College	36	31.3	22	34.3	14	27.45
Refractive error						
0.50–3.00 Ds	76	79.1	47	73.5	44	86.30
3.25–6.00 Ds	16	13.9	9	14.0	7	13.70
> 6.00 Ds	8	7.0	8	12.5	0	0.00

MCS, myopia control strategies.

(32, 49.6%) without uptake of MCS recorded a poor knowledge. Regarding knowledge of various MCS, 58 (49.6%) teenagers knew about SV spectacles and soft and rigid CL with 40 (65.6%) having adopted MCS. Forty (34.8%) teenagers were aware about progressive segmented spectacles and use of gentamycin eyedrops. Regarding reasons for using various MCS, 55 (47.8%) teenagers didn't know why they were using MCS.

Source of knowledge

The major source of MCS was from eye clinician; for the total sample of $N = 115$ was at 42 (36.5%), of those with uptake 35 (50%) and of those without uptake 10 (19.6%).

Association between uptake of myopia control strategies and knowledge

A Chi-square test was conducted to assess the association between knowledge of MCS and their uptake. The results revealed a significant relationship, with a $P < 0.001$.

Attitude of myopia control strategies among teenagers of Lurambi Constituency, Kenya

Attitudes

As shown in Table 3, majority of the sample had a good attitude at 48.3% whilst 42.2% had an attitude that was regarded as fair as per the attitude score. Those teenagers who had adopted MCS had a positive attitude at 95.4%. Regarding comfort and self-perception, 67.6% of teenagers did not feel embarrassed about wearing optical devices for myopia correction, whilst 67.0% believed that using MCS would not worsen their vision. Furthermore, 61.0% felt that using MCS did not restrict them from engaging in near activities, 68.7% believed that MCS were important for

TABLE 2: Knowledge of myopia control strategies among teenagers of Lurambi Constituency, Kenya.

Knowledge of MCS	Total number of participants (N = 115)		MCS			
	n	%	Uptake (n = 64)	%	Non-uptake (n = 51)	%
General knowledge in the uptake of MCS as per knowledge score						
Good knowledge (> 60%)	81	69.8	31	47.7	19	37.3
Fair knowledge (40–60%)	0	0.0	25	38.5	0	0.0
Poor knowledge (< 40%)	34	30.2	8	13.8	32	62.7
Have you heard about various nearsightedness management approaches						
Yes	83	72.2	60	93.8	23	45.1
No	32	27.8	4	6.2	28	54.9
Type of MCS you have heard						
SV spectacles and soft and rigid CL	58	49.6	40	65.6	16	31.4
Bifocal spectacles and progressive spectacles	0	0.0	0	0.0	0	0.0
Bifocal spectacles and atropine eyedrops	17	14.8	17	26.6	0	0.0
Progressive segmented spectacles and gentamycin eye drops	40	34.8	7	7.8	35	68.6
How did you come to know about nearsightedness management approaches						
Self	12	10.4	11	17.1	1	2.0
Through eye clinician	42	36.5	32	50.0	10	19.6
Through the teacher	5	4.3	4	6.3	0	0.0
Parent reference	2	1.7	4	6.3	0	0.0
Media	6	5.2	2	3.1	2	3.9
Through friends	3	2.6	1	1.6	2	3.9
Through health awareness	12	10.4	6	9.4	6	11.8
None of the above	33	28.7	4	6.3	29	56.9
Why do you choose to use or not use approaches for managing nearsightedness						
I don't know	55	47.8	4	6.1	51	100.0
Improve vision	46	40.0	46	71.9	0	0.0
Look intelligent	0	0.0	0	0.0	0	0.0
Protect eyes from excessive light and injuries	7	6.1	7	10.9	0	0.0
Slows nearsightedness from worsening	7	6.1	7	10.9	0	0.0

MCS, myopia control strategies; CL, contact lenses; SV, single-vision.

young people, and 63.5% thought that those who wore optical devices for myopia control took good care of their eyes. Lastly, 51.3% believed that MCS should be used regularly.

Majority of the participants, 86.9%, reported a positive attitude towards informing their parents if they experienced eye problems and 74.8% believed that MCS were important. With regards to the appearance and optical device use, 45.2% had a neutral attitude, thinking that these individuals did not look smart, whilst 39.1% had a negative attitude, disagreeing that such individuals looked unattractive. Furthermore, 47.8% expressed a positive attitude, stating that MCS did not affect someone's attractiveness.

Attitude associations with uptake of myopia control strategies

The Chi-square test was used to determine the association between attitudes and the uptake of MCS among teenagers. No association between teenagers' general attitudes and the uptake of MCS ($P = 0.127$) was observed. However, a significant association with the uptake of MCS was found only among teenagers who used optical devices for myopia control. Specifically, those who perceived that these devices did not negatively impact their appearance showed a significant relationship ($P = 0.033$). In addition, teenagers who believed that using MCS would prevent further deterioration of their vision during near tasks also

demonstrated a significant association with uptake ($P = 0.034$).

Discussion

The study found that most teenagers had good knowledge of MCS, with those actively using these strategies showing greater awareness than those who were not. Single-vision spectacles, soft and rigid CL were the most recognised measures. Eye care practitioners emerged as the primary source of information for these strategies. A significant relationship was identified between knowledge levels and the actual uptake of MCS. Whilst the majority of teenagers displayed a positive attitude towards these strategies, no significant correlation was found between general attitudes and their uptake. However, an association was observed among those who had adopted MCS; teenagers who felt these devices did not negatively affect their appearance and those who believed using these strategies could prevent further vision deterioration during near tasks were more likely to adopt them.

Knowledge of myopia control strategies among teenagers of Lurambi Constituency, Kenya

Knowledge acquisition, retention and utilisation regarding MCS among teenagers were assessed in this study. The study explored local knowledge, beliefs and awareness of the risks associated with myopia management.

TABLE 3: Attitude of teenagers in the uptake of myopia control strategies of Lurambi Constituency, Kenya.

Attitude in uptake of MCS	Total number of participants (N = 115)		MCS			
	n	%	n	%	n	%
General attitude in uptake of MCS as per attitude						
Good attitude	56	48.3	62	95.4	25	49.0
Fair attitude	49	42.2	0	0.0	24	47.1
Poor attitude	10	9.5	2	4.6	2	3.9
When I have an eye problem, I will tell my parents						
Good attitude	100	86.9	57	89.1	57	89.1
Fair attitude	8	7.0	3	4.7	3	4.7
Poor attitude	7	6.1	4	6.2	4	6.2
I think nearsightedness management approaches are very important						
Good attitude	86	74.8	45	70.3	45	88.2
Fair attitude	5	4.3	16	25.0	3	5.9
Poor attitude	9	7.8	3	4.7	3	5.9
People who wear optical devices for nearsightedness control do not look smart						
Good attitude	32	27.8	15	23.4	17	33.3
Fair attitude	52	45.2	31	48.4	21	41.2
Poor attitude	31	27.0	18	28.1	13	25.5
People who wear optical devices for nearsightedness control do not look ugly						
Good attitude	32	27.9	28	43.8	19	37.2
Fair attitude	38	33.0	21	32.8	19	37.3
Poor attitude	45	39.1	15	23.4	13	25.5
Optical devices for control of nearsightedness do not make someone look handsome/beautiful						
Good attitude	55	47.8	19	29.7	29	56.9
Fair attitude	31	27.0	19	29.7	10	19.6
Poor attitude	29	25.2	26	40.6	12	23.5
I don't feel embarrassed when I wear an optical device for nearsightedness correction						
Good attitude	25	21.7	13	20.3	14	27.5
Fair attitude	18	15.7	9	14.1	7	13.7
Poor attitude	72	62.6	42	65.6	30	58.8
I feel my vision will not worsen when I use any nearsightedness management approach						
Good attitude	25	21.7	12	18.8	12	23.6
Fair attitude	13	11.3	5	7.8	9	17.6
Poor attitude	77	67.0	47	73.4	30	58.8
I feel using any nearsightedness management approach does not restrict me from doing activities						
Good attitude	70	61.0	45	70.3	34	66.7
Fair attitude	14	12.0	4	6.3	8	15.7
Poor attitude	31	27.0	15	23.4	9	17.6
I feel young people should use any nearsightedness management approach to correct their vision						
Good attitude	79	68.7	40	62.5	29	56.8
Fair attitude	12	10.4	6	9.4	11	21.6
Poor attitude	24	20.9	18	28.1	11	21.6
I feel people who use nearsightedness management approaches take care of their eyes as well						
Good attitude	73	63.5	45	70.3	34	66.7
Fair attitude	15	13.0	4	6.3	8	15.7
Poor attitude	27	23.5	15	13.0	9	17.6
I feel those who use nearsightedness management approaches must use them regularly						
Good attitude	59	51.3	33	51.6	23	45.1
Fair attitude	27	23.5	14	21.8	16	31.4
Poor attitude	29	25.2	17	26.6	12	23.5

MCS, myopia control strategies.

The majority of teenagers reported having good knowledge about MCS. Those who had adopted myopia control measures exhibited a better understanding of these strategies compared to those who had not adopted MCS.

The difference in knowledge levels between teenagers who adopted MCS and those who did not can be attributed to several factors, including personal experience, direct medical guidance and proactive educational initiatives.

Teenagers diagnosed with myopia are more likely to seek information and adhere to recommended strategies because of direct involvement in managing their condition.¹⁹ This proactive approach is often reinforced by personalised education from eyecare practitioners and supportive input, further enhancing their understanding and application of MCS. In addition, schools and health programmes frequently target individuals with myopia with specific educational resources, thus reinforcing their knowledge.²⁰

This study supports the findings from the study conducted by RavenStijn et al. who reported a 44.0% good knowledge rate among myopia patients in the Netherlands, as well as Vankudre and Noushad, who found a similar proportion among public school students in Oman.^{21,22} Studies in Gondar City, Ethiopia²³ also reported good knowledge rates of 63.0% and 53.8%, respectively. These positive knowledge rates across these diverse regions suggest the effectiveness of increased awareness and education campaigns about myopia and its management internationally.

Targeted community health initiatives in Lurambi Constituency have played a crucial role in spreading awareness among teenagers. In the Netherlands, advanced healthcare infrastructure and access to specialised eye care have ensured well-informed patients.²⁴ Public school students in Oman benefit from integrated health education programmes, fostering early understanding of eye health.²⁵ Similarly, educational institutions and non-governmental organisations in South Africa and Gondar City, Ethiopia, have emphasised regular eye check-ups and MCS, contributing to positive knowledge outcomes.^{26,27}

Contrastingly, the current study disagrees with findings from the study done by Chikasirimobi et al., who reported very low knowledge about CL among patients at the Academic Vision Center (AVC) of Kakamega.²⁸ Ferdiana et al. also observed poor knowledge regarding myopia and its management among students in Nusa Tenggara Barat Province, Indonesia.¹⁷ In addition, a study among undergraduate students in Ghana revealed that 66% of the population was unaware of the use of spectacles to relieve ocular symptoms.²²

Several factors account for these differences. The current study focused on teenagers attending clinics in Lurambi Constituency, where all teenagers with myopia are diagnosed and educated about myopia and its management by ECPs, justifying the high positive knowledge rate. In contrast, the low knowledge among contact lens users in Kakamega may justify the low prevalence of contact lens use (1.1%) in the area.²⁸ In Ghana, the majority of undergraduates' unawareness about the use of spectacles highlights a gap in public communication and accessibility to eye care services.

The present study found that most teenagers were aware of SV spectacles, soft and rigid CL, which reflects the widespread availability and promotion of these vision correction methods. Single-vision spectacles are commonly prescribed for general vision correction, making them familiar to a broad audience, including teenagers. The awareness of CL, both soft and rigid, suggests that these options are also well-publicised and accessible, potentially because of their popularity among individuals seeking alternatives to spectacles.

The relatively high awareness of progressive segmented spectacles among teenagers indicates exposure to more

advanced myopia control options, which may be recommended by ECPs for myopia cases and its progression. However, the fact that some teenagers were aware of gentamycin eyedrops, despite it not being a recognised myopia control strategy, shows a gap in knowledge regarding various MCS. Gentamycin is an antibiotic typically used to treat bacterial infections rather than for myopia control.²⁹

The primary source of information about MCS was eye clinicians, underscoring the role of ECPs as key influencers.³⁰ Moreover, ECPs are often the first point of contact for individuals experiencing vision issues, making them a trusted source of information and guidance. They provide comprehensive eye examinations, diagnose myopia and are well-equipped to explain various MCS among teenagers. Their ability to offer detailed advice based on individuals' specific needs and eye health status ensures that the information is relevant and actionable. Moreover, the credibility and authority of ECPs encourage teenagers and parents to take their recommendations seriously, leading to better awareness and adherence to the myopia control strategy. These direct and professional interactions help bridge the knowledge gap and empower teenagers to manage their myopia effectively.

Majority of teenagers with myopia in this study were using MCS to improve their vision as a provided reason for using MCS. This may also be attributed to the alarming prevalence of myopia of 7.5% within the study region.⁵ It also reflects concerns among teenagers and their guardians about the immediate need to enhance visual clarity for academic activities, necessitating the practical and essential nature of vision corrections.

There was a significant relationship between the level of knowledge about myopia control and the actual uptake of these strategies. This indicates that the adoption of these strategies is not because of random chance but is likely influenced by specific factors that are effectively addressed by these interventions. Factors contributing to this relationship could include increased awareness and education about myopia and its consequences. The availability and accessibility of certain MCS significantly influence teenagers' knowledge and their decisions to adopt these strategies.³¹

Attitude of myopia control strategies among teenagers of Lurambi Constituency, Kenya

Attitude is defined as a psychological tendency that is expressed by evaluating a particular decision with some degree of favour or disfavour. This was aligned to individual feelings and inclination towards MCS.¹⁷ The majority of teenagers reported good attitude regardless of uptake status. The relatively good attitude towards MCS among teenagers with uptake of MCS and good attitude among those without uptake may be attributed to increased community initiatives and medical camps regarding MCS.¹⁵ These efforts, often led by local health authorities and

schools, aim to ensure that teenagers are well-informed about the benefits of myopia control.

Firstly, these initiatives play a key role in increasing teenagers' awareness and understanding of myopia control strategies. Secondly, ECPs who actively engage with teenagers during routine eye check-ups play a crucial role.³⁰ Eye-care practitioners not only diagnose and manage myopia but also emphasise the importance of adhering to control strategies, fostering a fair and good attitude among their patients. Thirdly, the high prevalence of myopia in the Lurambi region,⁵ might heighten awareness and concern among teenagers and their families, driving a more favourable attitude towards any measures that could mitigate the progression of the condition.

This study is in agreement with a study conducted in Nusa Tenggara Indonesia that found students' attitudes towards glasses to be moderately fair, 78.8% disagreed that glasses could worsen vision, 60.6% disagreed that wearing glasses was uncomfortable, 60.9% disagreed that glasses could worsen their vision, and 60.9% disagreed that wearing glasses restrict their activities.¹⁷ Among public schools in Gondar City, Ethiopia, 52.1% had good attitude towards spectacles whilst Nyamai et al. in a study among students attending public high schools in Nairobi County, found a good attitude towards spectacles use.^{5,23} Nyamai et al. also observed that at the teenage stage where conforming to the group is the norm and wearing spectacles may be a source of teasing.⁵

However, the above-mentioned studies in Indonesia, Oman, Ethiopia and Kenya contradict the norm by attributing a good attitude towards MCS highlighted earlier on to the growing trend of spectacle use among celebrities popular to this age group.^{5,17,23}

However, a study done on university students in Oman found a good attitude towards MCS at 53.5%, a poor attitude at 36.5% and a fair attitude at 10.0%.²² This study is particularly noteworthy as it is one of the few that directly examines attitudes towards MCS, as opposed to the more commonly studied topic of spectacle use for myopia correction. The findings underscore the variability in attitudes within a population, which can influence the overall uptake of myopia control measures. For instance, a good attitude among a majority might drive higher adoption rates of strategies such as orthokeratology or atropine eye drops, whilst a poor or fair attitude could hinder widespread acceptance and utilisation. In comparison to other studies that primarily focused on the uptake of spectacles, the study conducted by Vankudre and Noushad offers a broader perspective on the challenges and opportunities in promoting MCS. It highlights the need for targeted education and awareness programmes to improve attitudes and, consequently, the adoption of effective myopia management practices. This insight is crucial for understanding the context of our study in Lurambi Constituency, where similar dynamics might be at play, and where efforts to enhance specific knowledge and attitudes towards myopia control could significantly impact the uptake of these strategies.

The similarity in good attitude is attributed to several converging factors. Firstly, across these diverse regions (Nusa Tenggara in Indonesia, Oman, Gondar City in Ethiopia and Nairobi County), increased awareness and targeted educational campaigns have played a crucial role in shaping good attitudes towards eye health interventions. Health education programmes integrated into school curricula and community health initiatives ensure that students understand the importance of managing myopia effectively. Secondly, the involvement of ECPs in these regions provides authoritative and personalised guidance, reinforcing good attitudes through routine interactions and consistent messaging about the benefits of using corrective measures. In addition, the prevalence of vision problems in these regions heightens awareness and concern among students and their families, leading to a greater appreciation of the importance of spectacles and MCS. Thus, a combination of education, professional influence and personal experience drives similar good attitudes towards MCS and spectacles among teenagers in Lurambi and their counterparts in Nusa Tenggara, Oman, Gondar City and Nairobi County.

The absence of a significant association between teenagers' general attitudes and the uptake of MCS suggests that broader perceptions or general opinions do not play a decisive role in whether or not these strategies are adopted. However, significant relationships were found for specific factors, such as the use of optical devices for myopia control not affecting appearance and the belief that vision would not worsen during near activities whilst using a myopia control strategy, highlighting that practical and immediate concerns are more influential. These findings indicate that teenagers are more likely to adopt MCS if they believe these measures will not compromise their aesthetics or exacerbate their vision problems during common activities. Therefore, targeted information addressing these specific concerns could be more effective in encouraging the uptake of MCS among teenagers.

Strengths and limitations

This study had several strengths, including the clear definition of objectives, which ensured that the data collected were accurate and relevant to the study's aims. The use of a pilot study was another key strength, as it helped to identify and address ambiguities, confusing questions, and potential issues with recall, thus improving the clarity and effectiveness of the questionnaire. In addition, the piloting process allowed participants to offer suggestions, which further minimised question bias and enhanced the validity of the study's findings.

However, there were also notable weaknesses. The use of a questionnaire, rather than direct observation, may have introduced recall bias, as participants had to recount their knowledge, attitudes and factors influencing the uptake of MCS. This lead to overestimation of teenagers' knowledge and attitudes on myopia strategies. Furthermore, there was a risk of non-response bias, response bias and question bias, which are difficult to eliminate entirely when using self-

reported data. Despite efforts to minimise these biases through piloting, they remain potential limitations that could affect the accuracy and objectivity of the findings.

Recommendations

Programmes should be targeted to improve the knowledge of teenagers, parents and teachers, using culturally appropriate and acceptable information materials regarding MCS. Information should be targeted to teenagers with poor knowledge and negative attitudes regarding MCS, particularly those with low education and low income. Information should contain relevant information regarding the importance of eye health and myopia control in children. Where, how and how often eye checkups should be performed for children with myopia causes, signs, prevention and effective treatment of myopia in children and the benefits of using MCS. Availability of eye healthcare and various MCS in primary health centres costs for eye healthcare and MCS. This study only focused on teenagers of Lurambi Constituency which may not be a true representation of Kenya. A study should be conducted on knowledge, attitude and factors influencing myopia control in the entire Kenya.

Conclusion

Although teenagers reported good knowledge and attitude of MCS, their understanding of effective approaches is still quite limited. Furthermore, concern about the rising cases of paediatric myopia remains low among this age group, regardless of whether they have adopted any strategies.

Acknowledgements

This article is partially based on the author's thesis entitled 'Knowledge, attitude, and factors influencing uptake of myopia control strategies among teenagers and eye-care practitioners of Lurambi Constituency, Kenya' submitted in partial fulfillment of the requirements for the degree of Master of Optometry and Vision Sciences in the Department of Optometry and Vision Science, Masinde Muliro University of Science and Technology, Kenya, under the supervision of Prof. Alvin Jeffreery Munsamy and Dr Christine Wanjala. The thesis was submitted to the university library and the Directorate of Postgraduate Studies on 30 November 2024, submitted in partial fulfillment of the requirements for the degree of Master of Optometry and Vision Sciences in the Department of Optometry and Vision Science, Masinde Muliro University of Science and Technology, Kenya. The thesis was submitted to the university library and the Directorate of Postgraduate Studies in 30-November-2024, under the supervision of Prof. Alvin Jeffreery Munsamy and Dr. Christine Wanjala.

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article. The author, A.J.M., serves as an editorial board member of this journal. The peer review process for this submission was handled independently, and the author

had no involvement in the editorial decision-making process for this manuscript. The author has no other competing interests to declare.

Authors' contributions

D.N.S. was responsible for conceptualising and designing the study, conducting the research and analysing the data. D.N.S. also prepared the manuscript, including drafting and revising the content, and oversaw all aspects of the research process, including data collection, interpretation of results, and final approval of the manuscript. A.J.M. served as the main optometry supervisor, providing guidance throughout the research and approved the final version of the article.

Funding information

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Data availability

The data supporting the findings of this study are available from the corresponding author, D.N.S., upon reasonable request. Because of ethical and privacy considerations, the data, which include sensitive information about teenage participants, have been anonymised. Access to the data is subject to compliance with institutional and legal data protection policies, including the *POPIA*. Data will be securely stored for a period of 5 years following the study's completion.

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