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Global Journal of Cataract Surgery and Research in Ophthalmology

Article in Press

Original Article

Barriers to pediatric eye health: Insights from key stakeholders

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ABSTRACT

Objectives: Visual impairment affects millions of children globally and can have a lasting impact on academic learning and quality of life. The most common cause of visual impairment in children is refractive error, which can be treated with cost-effective interventions such as school-based eye screening programs and spectacle use. This study aimed to understand barriers to school-based eye care programs in Pwani, Tanzania.

Materials and Methods: Data were collected throughout July 2024 through purposeful sampling and in-depth interviews with diverse paediatric eye care stakeholders in Pwani, including teachers, parents and medical professionals. Semi-structured interviews, conducted in English or Swahili, utilised the availability, accessibility, affordability, acceptability and quality framework to explore participant perceptions. Recordings were transcribed and analysed using thematic content analysis to identify dominant themes.

Results: The perspectives of 12 stakeholders involved in paediatric eye care were included: four primary school teachers, three primary school parents, two ophthalmic nurses, two ophthalmologists from local hospitals and one respondent from the blindness relief non-governmental organisation (NGO), Vision care. The five dominant barriers to eye care were parental awareness and understanding (parents unaware children need eye examinations), affordability (cost of examinations and spectacles), cultural beliefs (reliance on traditional medicine, stigma of spectacles), limited access (scarcity of specialists and clinics) and lack of governmental support (lack of policy and funding).

Conclusion: Addressing barriers to paediatric eye care in Pwani requires collaborative efforts between NGOs, eye care providers, schools, parents and governmental entities. A combination of educational initiatives, financial support mechanisms and improved service delivery models are needed.

Keywords: Barriers to paediatric vision care, School-based vision screening, Eye care access in rural Tanzania, Cultural influences on health behaviour, Social determinants of paediatric health, Affordability of refractive error correction, Qualitative thematic analysis, Vision care treatment gaps in East Africa

INTRODUCTION

Visual impairment in childhood constitutes a significant global health problem. Approximately 450 million children worldwide have treatable eye conditions, with 90 million experiencing some form of sight loss.[1-3] Paediatric vision impairment encompasses a wide range of causes, from mild refractive error to severe ocular pathology resulting in blindness.[4-6] Regardless of the causes and severity, visual impairment in children can have long-term consequences on an individual's quality of life, academic learning and future economic prospects.[7]

While infections, trauma, unsafe traditional practices, perinatal issues and nutrition-related illnesses contribute to vision impairment, refractive error is treatable with cost-effective interventions such as eyeglasses (spectacles). However, only 36% of individuals with vision impairment due to refractive error globally have access to corrective spectacles globally.[4-6] Given the high prevalence of refractive error in paediatric populations globally, allocating resources to treat vision impairment can significantly impact a child's development, learning and well-being.

The lack of resource allocation for paediatric eye care in developing countries includes a significant shortage of paediatric ophthalmologists, optometrists, specialised eye care staff and ocular medications to treat infections.[8-12] These shortages are compounded by geographic barriers and lack of transportation infrastructure to access eye care providers.[13] In

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Received: 27 November 2024 **Accepted:** 01 January 2025 **Epub Ahead of Print:** 12 April 2025 **Published:** XXXXXX **DOI:** 10.25259/GJCSRO_45_2024

addition to systemic barriers, there are individual-level factors that hinder eye care utilisation. Even when services are available, the cost, misconceptions and stigma associated with spectacle use further hinder utilisation of eye care.[8-11,14,15] These barriers, some of which are readily addressable, highlight the critical need for education in paediatric vision care.

Integrating vision screenings into existing primary school health services has been proposed as a strategy to enhance paediatric eye care.[10,16-18] While screening school students for visual acuity and refractive error has been supported in diverse contexts,[17,19] the efficacy of its implementation remains understudied.

In East Africa, Tanzania remains one of the world's poorest countries, with the majority living in rural areas. The Pwani region is a coastal, largely rural region of Tanzania, with 2 million inhabitants and over 500 primary schools for children.[20] To better understand the barriers to paediatric eye health for primary school children in Tanzania, qualitative research methods were used to interview key stakeholders, including parents, teachers, healthcare professionals and non-governmental organisation (NGO) staff. This manuscript describes these results.

MATERIALS AND METHODS

Ethical approval and consent to participate

This study was approved by the Columbia University Institutional Review Board under protocol number (Protocol #IRB- AAAV2414).

Consent for publication

All study participants provided written informed consent for participation in the study and publication of direct quotations.

Study design

Cross-sectional, qualitative study using in-depth interviews of key stakeholders involved in primary school eye screenings in the Pwani region of Tanzania.

Participant selection

From 1 July 2024 to 20 July 2024, purposive sampling was used to select participants for the interviews. Four primary school teachers, three parents, two ophthalmic nurses, two ophthalmologists and one staff member from a blindness relief NGO were interviewed. The three primary schools, chosen for their diversity in location, student population, size and history of eye screening training, program implementation, served as the source for the selection of parents and teachers. The ophthalmic nurses and ophthalmologists were selected for their specialist knowledge and experience in eye screenings in the Pwani region. The NGO staff member represented Vision Care (www.visioncareusa.org), the organisation coordinating school-based eye screenings in Pwani since 2022.

Non-residents of Tanzania and individuals not connected to primary school health programs, such as policymakers or unrelated healthcare professionals, were not included in this study. In addition, minors were not included, as the study focused on adult stakeholders involved in primary school eye screenings. Demographic details were captured at the beginning of each interview.

Data collection

Semi-structured interviews were conducted by the researchers (IM, SMM) in a private setting at the primary school to ensure confidentiality. Interviews were conducted in English or Swahili with a translator depending on the participant's preference and were audio-recorded with participants' consent.

Interviews utilised the availability, accessibility, acceptability and quality framework as a guide to explore the perceptions, experiences and beliefs of our participants regarding eye care programs.[21] The topic guide incorporated open-ended questions and probing techniques. Interviews covered overarching themes, beginning with understanding the participants' backgrounds and experiences, providing context for their involvement in primary school eye health initiatives. Unique challenges and successes in delivering eye care services within schools were explored in all interviews. These included resource availability, eye care accessibility and affordability, sensitivity and acceptability of eye care programs and the impact of current efforts on eye health outcomes for students.

Statistical analysis

All interviews were digitally recorded and transcribed verbatim and translated into English if necessary. The transcripts were checked for accuracy against the digital recording. Two researchers (IM and SMM) independently coded the data with NVivo® software (version 11), employing a generic thematic analysis approach.[22,23] Themes were identified through an iterative process, with discrepancies resolved through consensus involving a third author (LP). The final themes were discussed among all authors to ensure consistency and minimise bias. Relevant quotes were extracted and organised under each theme to illustrate the participants' perspectives.

RESULTS

Participant demographics

A total of 12 in-depth interviews were conducted with key stakeholders involved in eye care in Tanzania. The majority of

participants were female (75%), with a median age of 45 years. All participants were residents of Tanzania, including parents (25%), teachers (33%), NGO staff (8%), ophthalmic nurses (17%) and ophthalmologists (17%) [Table 1].

Dominant barriers to vision care

While there was an overarching sentiment of satisfaction amongst participants regarding primary school-based eye screenings, several barriers to successful implementation and application of these screening services were identified. Notably, teachers and parents expressed interest in continuation of primary school-based eye screening programs to further their understanding of paediatric eye health and ability to recognise certain eye conditions. District hospital eye care providers, including nurses and ophthalmologists, also noted an increase in teacher and parental awareness at the schools that received eye screening training and educational interventions. The ophthalmologists reported an increase in the proportion of eye disease diagnoses in school-age children in the region since the implementation of the school-based eye screenings beginning in 2022. The identified was barriers to effectively applying the knowledge and skills gained from the eye screenings were categorised into five dominant themes [Table 2].

Parental awareness and understanding

A significant barrier to the success of the utilisation of eye screening programs was the lack of awareness among parents. Many parents, particularly those with limited education, were unaware of the importance of eye examinations for their children and the potential for eye problems, as evidenced in the quote from a nurse: *'They really don't know about eye conditions until you explain it to them. Even after explaining, some understand, but many don't. They don't think that children can also have eye problems'*. This lack of awareness was compounded by parental disbelief in the impact of eye issues on their children's education and development. One participant, a nurse noted that, '*They don't think that children can also have eye problems. They think that only adults who normally get eye problems can get eye problems*'. The sentiment of parental lack of awareness was further supported by another participant, a parent who stated that her husband did not believe in eyesight problems for their child.

Table 1: Participant demographics.

Variable	Total
Total *n*, (%)	12 (100%)
Demographics, *n*, (%)	
Female	8 (75%)
Age, years (median, SD)	45 (±7)
Tanzanian resident	12 (100%)
Key stakeholder *n*, (%)	
School teacher	4 (33)
Parent	3 (25)
Ophthalmic nurse	2 (17)
Ophthalmologist	2 (17)
NGO staff	1 (8)

SD: Standard deviation, NGO: Non-governmental organisation

Affordability

The cost of eye examinations and spectacles was cited as a financial barrier by both parents and healthcare professionals. One parent mentioned that they could not afford medication nor the cost of eye care services, stating, '...most (people) cannot afford the drugs. They cannot afford to pay for the services.' This suggests that families face financial difficulties when it comes to accessing comprehensive eye care. These financial barriers were further supported by an ophthalmologist who noted that parental consent for treatment was sometimes challenging due to parents' economic concerns regarding payment for the treatment.

Cultural beliefs

Traditional medicine and stigma surrounding spectacles was a repeated barrier mentioned by the stakeholders. Participants reported a strong belief among Tanzanians that spectacles are not suitable for children and may even cause harm, as quoted by a nurse: *'They (people) are afraid of using spectacles...They really believe that spectacles are not for children. They think the spectacles make the children go blind'*. In addition, a taboo against seeking hospital treatment was noted, with several parental participants preferring to consult traditional figures such as '*witch doctors*'.

Limited access

Scarcity of specialists, clinics and diagnostic tools was another prevalent barrier to the success of these programs. An ophthalmologist highlighted this concern: '*Even if you find some problems in the child, when you need to diagnose them, you have to take them to higher care centres...but most of our facilities, even hospitals, don't have these things*'. This barrier particularly affects those in rural areas, as a teacher pointed out: '*For people who are located… in rural areas, it is difficult to access medical material. Very, very difficult*'.

Systemic barriers

Systemic barriers stemming from a lack of governmental support for paediatric eye care were identified. One participant, a Vision Care NGO staff member highlighted this

Table 2: Dominant barriers to vision care themes and corresponding quotes from in-depth qualitative interviews.

Barrier to ophthalmic care	Salient quote from interview
Parental awareness and understanding (parents unaware children need eye examinations)	*'They really don't know about eye conditions until you explain to them. Even after explaining, some understand but many don't. They don't think that children can also have eye problems. They think that only adults who normally get eye problems can get eye problems'. (Nurse)*
	'What makes it more difficult is if someone has not gotten a formal education. If someone has no formal education, it is extremely difficult to convince this person that if you give medical treatment in a modern way, someone will get helped'. (Teacher)
	'Even when we prescribe eyeglasses, most children don't wear them. This is because their parents tell them not to wear glasses. So they really don't understand'. (Ophthalmologist)
Affordability (cost of examinations and spectacles)	*'About medicine, I am not afraid...but most (people) just cannot afford the drugs.They cannot afford to pay for the services'. (Parent)*
	'We need the parents' consent so that we can… treat the children. The cooperation from the parents is sometimes difficult since they fear it. Maybe it is... because of their economic situation'. (Ophthalmologist)
Cultural beliefs (reliance on traditional medicine, stigma of spectacles)	*'They (people) are afraid of using spectacles...They really believe that spectacles are not for children. They think the spectacles make the children to go blind'. (Nurse)*
	'One of the taboos is that they don't want to go to the hospital because they believe that if you go to the hospital, the child will get hurt...they prefer not to take medication from the hospitals but go to witch doctors instead'. (Ophthalmologist)
Limited access (scarcity of specialists and clinics)	*'Even if you find some problems in the child, when you need to diagnose them, you have to take them to higher care centres whereby you can get the diagnostic materials, like a hospital. But most of our facilities, even hospitals, don't have these things'. (Ophthalmologist)*
	'For people who are located in the background, such as rural areas, it is difficult to access the medical material. Very, very difficult'. (Teacher)
	'We don't have enough tools...diagnostic tools, and educational material'. (Teacher)
Systemic barriers (lack of governmental policies/funding)	*'The government budget... the lack of policies…lack of funding for school health programs, which limits eye care for children. There is no priority given to eye screenings'. (NGO staff)*
	'There is a shortage [of ophthalmologists], especially in paediatric ophthalmology... They are only available in specialised centres'. (Ophthalmologist)
	'The NGO provides us with all of the tools for the annual vision screenings and also provides free glasses for those who need it…but I do not do VA tests on my own'. (Teacher)

NGO: Non-governmental organisation, VA: Visual acuity.

issue, stating, '*The government budget.the lack of policies...lack of funding for school health programs, which limits eye care for children. There is no priority given to eye screenings*'. Insufficient funding for school health programs and a lack of priority given priority to eye screenings were noted as significant challenges. These policy-level issues, when coupled with a shortage of paediatric ophthalmologists create a complex barrier that is difficult to overcome without systemic change.

DISCUSSION

Our findings highlight the several critical barriers to eye care for school-aged children in Tanzania, including lack of parental awareness and understanding, treatment affordability issues, cultural beliefs, limited access to specialised resources and governmental policy shortcomings.

The barriers to eye care identified in our study are consistent with those reported in other East African countries.[21-25] A review of school-based eye health programs in sub-Saharan Africa identified important challenges, including limited resources, inadequate training of personnel and poor linkage to eye care services.[12,15,24-28] In addition, a study from Ethiopia emphasised the importance of parental involvement and community engagement in ensuring the success of school-based eye screening programs.[25] A qualitative study from Uganda found that eye care was often not a priority for individuals or the government, and cultural beliefs and stigma influenced help-seeking behaviours.[18,29] Similarly, a review of eye care services in rural Kenya highlighted the lack of infrastructure, limited human resources and inadequate funding as significant challenges.[24]

The influence of cultural beliefs and stigma on vision care-seeking behaviours has been documented in several East African studies. For example, a study from Nigeria reported that the stigma associated with wearing spectacles

among youth was a barrier to the uptake of refractive error corrections.[30]

The barriers identified in our study share similarities with those reported for healthcare beyond ophthalmology in Tanzania. Affordability, cultural beliefs and limited access to specialists and infrastructure are common challenges across various healthcare sectors in the country. For instance, studies on maternal and child health have found that cost, traditional beliefs and distance to health facilities are significant barriers to accessing antenatal care, skilled birth attendance and postnatal care.[31] This indicates that the barriers to vision care for children are part of a broader set of systemic and cultural challenges within the Tanzanian healthcare system.

Addressing barriers and future directions

Our study uncovered distinct challenges to paediatric eye care that have received less attention in the Pwani region. For example, the lack of awareness among parents about children's eye health and persistent belief that spectacles worsen vision has not been reported. Moreover, the disbelief in the impact of eye problems on children and on learning has not been extensively explored in the previous studies.

Improving access to eye care for children in rural East Africa demands a multifaceted strategy that targets barriers. First, educational initiatives to improve public knowledge about children's eye health are important. Including trusted community members such as teachers and local healthcare professionals in these efforts may help to disseminate information, dispel misconceptions and promote early intervention. Integrating eye health lessons into existing school curricula, incorporating traditional healers[32] or engaging influential community leaders may help with the effectiveness of interventions within communities.

The affordability of eye care is another critical barrier to paediatric eye care in Pwani. Financial assistance programs or insurance coverage specifically targeted at children's vision care may improve parents' economic burden of getting their children appropriate treatment. As noted in the present study, collaborations between NGOs and governments can play a pivotal role in providing financial support and ensuring the availability of free vision care.

In addition to improving targeted primary school programming efforts, systemic changes are required to increase the availability of specialised vision care services and professionals in rural areas. Systemic change includes advocating for government policies and investments that prioritise children's eye health and support the development of paediatric ophthalmology as a specialty within the region. Task-shifting, where appropriately trained non-physician healthcare workers, such as school health coordinators or educators, provide basic vision care services, can help improve access and reduce the burden on specialised centres. Investing in infrastructure and equipment is essential, as is providing on-going training and support to healthcare workers.

Limitations

Our study has limitations. Interviews were conducted in a specific region of Tanzania, potentially limiting the transferability of our findings to other contexts within the country. Second, while we included a range of stakeholders, the sample size of 12 interviews was small and the views of other potentially relevant groups, such as policymakers or traditional healers, may not be represented.

CONCLUSION

Our study provides valuable insights that can inform the development of targeted interventions to improve access to eye care for school-aged children in similar settings. The inclusion of a diverse range of stakeholders provided a holistic perspective on the barriers to eye care for children and the in-depth interviews allowed for a qualitative exploration of participants' experiences and perceptions.

Addressing these challenges through school-based interventions, improved transportation infrastructure in rural regions and government-supported paediatric eye care can enhance eye health, quality of life, academic learning and overall well-being in children. Future research could build on these findings by evaluating the effectiveness of specific interventions designed to overcome these barriers and improve access to eye care and outcomes for children in similar settings.

Ethical approval: The research/study was approved by the Institutional Review Board at Columbia University, number IRB-AAAV2414, dated 7th July, 2024.
Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent.
Financial support and sponsorship: Nil.
Conflicts of interest: Dr. Lisa Park is on the editorial board of the Journal.
Use of artificial intelligence (AI)-assisted technology for manuscript preparation: The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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How to cite this article: Mannstadt I, Mtenga SS, Hark LA, Park L. Barriers to pediatric eye health: Insights from key stakeholders. Glob J Cataract Surg Res Ophthalmol. doi: 10.25259/GJCSRO_45_2024