

Knowledge and practices of teachers about child eye healthcare in the public sector in Swaziland



Authors:

Velibanti N. Sukati¹ 
Kathutshelo P. Mashige² 
Vanessa R. Moodley² 

Affiliations:

¹Department of Optometry,
School of Healthcare
Sciences, University of
Limpopo, Polokwane,
South Africa

²Department of Optometry,
School of Health Sciences,
University of KwaZulu-Natal,
Durban, South Africa

Corresponding author:

Velibanti Sukati,
mavegy@gmail.com

Dates:

Received: 08 Sept. 2020
Accepted: 08 June 2021
Published: 21 Sept. 2021

How to cite this article:

Sukati VN, Mashige KP,
Moodley VR. Knowledge and
practices of teachers about
child eye healthcare in the
public sector in Swaziland.
Afr Vision Eye Health.
2021;80(1), a613. [https://doi.
org/10.4102/aveh.v80i1.613](https://doi.org/10.4102/aveh.v80i1.613)

Copyright:

© 2021. The Authors.
Licensee: AOSIS. This work
is licensed under the
Creative Commons
Attribution License.

Read online:



Scan this QR
code with your
smart phone or
mobile device
to read online.

Background: Vision-related problems have a negative impact on the learning abilities and school performance of a child. Adequate knowledge and practices of teachers enable the early identification and intervention of school children with visual deficits.

Aim: This study aimed to investigate the knowledge and practices of teachers about child eye healthcare in the public education system in Swaziland.

Setting: The setting for this study was Swaziland.

Methods: This was a cross-sectional quantitative study using a survey instrument containing closed-ended questions to investigate the knowledge and practices of teachers about child eye health in the public sector.

Results: Two hundred and forty-three ($N = 243$) teachers responded to the questionnaire. The majority (90.1%) of teachers indicated that they were able to detect signs and symptoms of eye diseases. Most teachers without a family member wearing spectacles were more likely to be informed about eye health ($p = 0.001$) than those who had family wearing spectacles. A significant proportion (44%) of teachers indicated that refractive errors were not serious among school children. Above one-third (38.7%) of the teachers indicated that they referred children with vision problems to public hospitals. One hundred and fifty-five (63.8%) reported that health officials have never visited their schools. One hundred and forty-nine (61.3%) teachers agreed that they did not monitor children wearing spectacles and 94 (38.7%) monitored them. Monitoring children wearing spectacles was significantly associated with teachers who indicated being well informed about eye health ($p < 0.001$) and teachers who were more likely to advise parents to take their children for eye testing ($p = 0.003$).

Conclusion: The lack of adequate knowledge by some teachers may contribute to the already existing barriers for children to access eye health. Addressing the broader issues of child eye health requires the participation of well-trained and knowledgeable teachers.

Keywords: children; eye health; teachers and eye care awareness; public health and education; teachers.

Introduction

The World Health Organization (WHO) advocates for promotive, preventive, curative and rehabilitative health services for all.¹ These services also extend to children's eye health and welfare to eradicate preventable visual impairment and blindness.¹ Reports suggest that the promotion of preventative health initiatives including eye health among children is the most effective way to avoid wasteful expenditure.^{2,3,4} However, in the developing world, such as on the African continent, availability of eye care services is a challenge. In communities where eye health services are readily available, inaccessibility and unaffordability are common existing barriers hindering access and utilisation of services.⁵

Swaziland is one of the poorest countries in the world and has a population of approximately 1.1 million people.⁶ The poor economic climate, social problems, chronic shortage of health and other professionals such as eye care practitioners continue to pose major challenges for development in this country, particularly in the health field.⁷ The current health policies in Swaziland do not adequately address eye health issues. The WHO estimated the prevalence of visual impairment and blindness to be approximately 1%⁸ in Swaziland. However, prevalence figures among children are not available. Hence, the burden of visual impairment and blindness among this group is unknown. In addition, the absence of any established policies aimed at health prevention and promotion negatively impacts on the sustainability of health system in the future.^{2,3,4}

In an attempt to address the health challenges faced by children attending public schools, the government of Swaziland established the school health programme.^{9,10,11} The programme includes social workers, psychologists, mental health nursing, oral health services, public health nursing, environmental health services and eye care nursing. However, eye healthcare in Swaziland is not yet well established as there are no documented protocols for child eye healthcare and vision screening is lacking within the school health programme. The school health document places sole responsibility on the head teachers or principals to ensure that the objectives of the programme are achieved by using a school self-assessment tool.¹² A review of the school health document revealed shortcomings of crucial aspects that have not been explicitly defined compared to school health documents of other countries such as South Africa.¹² For example, the school health package which details quality assurance and management aspects such as the required health professional to patient ratio, monitoring and evaluation of patients, roles and responsibilities, health human resource implication and education status are not explicitly defined in the Swaziland document.

In 2005, the Southern African Development Community (SADC), of which Swaziland is a member, adopted a resolution to support each other to address issues pertaining to health and education.¹³ The resolution further suggested that different health professionals needed to be incorporated into the education system in order to educate and encourage teachers to provide a conducive learning environment for the children's well-being.¹³ As children spend much of their time in the school environment interacting with teachers most of the day, teachers can be utilised as a useful resource in a classroom setting in terms of observing learners with potential visual and eye problems, and can give parents advice about taking their children for visual examination. Countries such as India and Tanzania have shown that teachers can play an important role in eye healthcare, thus reducing the workload of eye care professionals in a health system that is already overburdened.^{14,15} In South Africa, Seethal and Karim¹⁶ found that the assessment conducted by teachers using the Teacher Vision Awareness Programme (TVAP) was useful to detect children with and without visual problems. The authors therefore suggested that the programme be incorporated in teacher training programmes, and be implemented as a primary vision care intervention and in health education programmes. This is necessary because of the assumption that in the absence of relevant healthcare and eye care services and policies, the knowledge of the population about children eye health is likely to be poor. With teachers being the first line detectors of potential eye and vision problems, an evaluation of their knowledge and practices about child eye care health is important. The aim of this study therefore was to investigate the knowledge and practices of teachers in relation to child eye care health in the public education system in Swaziland. This information may be useful in the development of eye health policies in the country.

Methods

A cross-sectional quantitative study design was employed using a questionnaire (Appendix 1) for data collection consisting of three sections: general and demographic questions, knowledge about eye care and practice about eye care. Two of Swaziland's four regions were purposively selected for the study: Hhohho, a more affluent urban region, and Lubombo, a rural and less affluent region of Swaziland. Teachers from Hhohho and Lubombo districts were randomly selected from the four districts in Swaziland. The sampling frame consisted of all 110 and 200 public schools in the Hhohho and Lubombo districts, respectively (Figure 1). Hhohho is an urban area and Lubombo is a rural area. The validated questionnaire contained questions that were designed to investigate their knowledge and practices about child eye health in Swaziland. Teachers from public schools within the sampling frame were included and those not in the selected schools were excluded. Two strata were created (Figure 1), one for primary and the other for secondary schools (15 primary and two secondary schools in Lubombo region; 20 primary and five secondary schools in the Hhohho region). At each of the primary schools, 10 teachers were identified for participation, while this increased to 20 at the secondary schools. This resulted in a total anticipated sample size of 240 teachers, with the level of knowledge being estimated to be approximately 16% and a 95% probability, assuming that 50% of teachers were knowledgeable, based on the advice of the statistician as calculated by the formula:

$$n = \frac{Z^2(P)(1-P)}{B^2} \quad [\text{Eqn1}]$$

where $P = 0.5$, $B = 0.16 \times 0.5 = 0.08$ and $Z = 2.0$ for a 95% confidence interval.

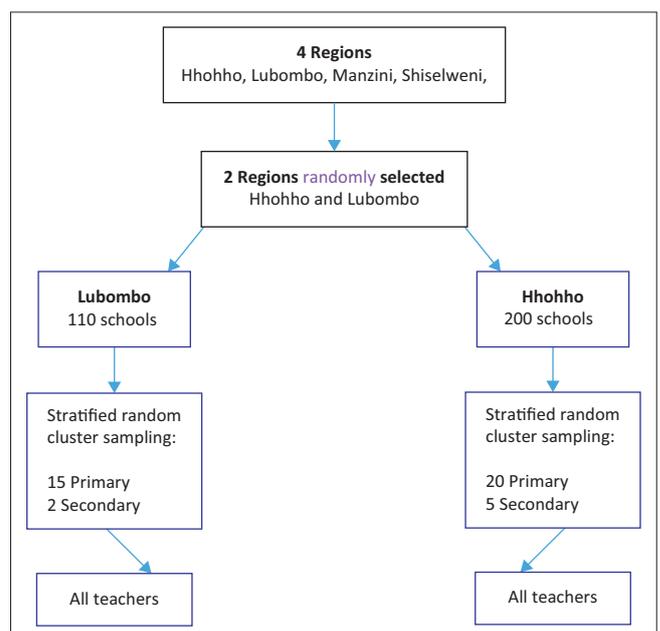


FIGURE 1: Flow diagram for the sampling procedure for this study.

Prior to preparing the sampling frame, the support of local education authorities and school officials was sought. A pilot study was conducted in a school that was not in the main study area to assess logistical and operational aspects of the study. Self-administered questionnaire containing closed-ended questions were distributed to and collected from the respective schools. All questions requiring positive and negative responses were followed by reasons stating why a particular response was chosen to eliminate errors and bias. These questionnaires were distributed by trained research assistants familiar with the contents of the questionnaires. The quantitative data were captured and analysed using the Statistical Package for Social Sciences (SPSS, version 24) statistical package in consultation with a statistician. Findings are presented as descriptive statistics in tables and figures. The statistical analysis included frequency counts, cross tabs and Chi-square tests for correlations. Statistical significance was set at a 95% confidence interval and all p -values < 0.05 were considered statistically significant. The data will be stored in a lockable cupboard for 5 years after which it will be shredded.

Results

Demographic characteristics of teachers

A total of 243 questionnaires were completed and returned by teachers working at primary and secondary government schools in the Hhohho and Lubombo regions of Swaziland, of whom 144 (59.3%) were women and 99 (40.7%) were men. Two hundred and thirty-five (96.7%) were black teachers and the rest were white and mixed race. Other demographic characteristics are illustrated in Table 1. More teachers without a family member wearing spectacles were more likely to be informed about eye health compared to those who had relatives wearing spectacles ($p = 0.001$).

One hundred and eighty (44.3%) teachers reported having access to WhatsApp, 135 (33.3%) to Facebook and eight (2%) to BlackBerry Messenger. Other responses regarding access

TABLE 1: General and demographic characteristics of teachers.

Item	<i>n</i>	%
General and demographic characteristics		
Immediate relatives wore spectacles	125	51.4
Immediate relatives did not wear spectacles	107	44.2
Unsure whether relatives wore glasses or not	11	4.4
Children in immediate families born or went blind	33	13.6
Children in immediate families never born or went blind	203	83.5
Unsure whether children born or gone blind in immediate family	7	2.9
Time taken to get to nearest facility offering ophthalmic services		
16–30 min	96	39.5
More than an hour	53	21.8
31–60 min	49	20.2
15 min	45	18.5
Mode of transport to get to nearest facility offering ophthalmic services		
Private cars	96	39.5
Minibuses or taxis	66	27.2
Buses	43	17.7
Walked	36	14.8
Other modes of transport, such as trains	2	0.8

to social media are shown in Figure 2. Two hundred and two (33.5%) indicated that they had access to mainstream media, such as television (TV). Similarly, 202 (33.5%) reported having access to radio, 198 (31.3%) had access to newspapers and 10 (1.7%) had access to other media, such as Internet and Skype.

Ninety-one (28.4%) teachers reported that none of the health activities took place in their schools, and 33 (10.3%) indicated that vision screening was conducted in their community. Other responses regarding the type of health activities that took place in their communities are shown in Figure 3.

One hundred and forty (57.2%) teachers indicated that their schools admitted children with visual problems, 68 (28%) reported to the contrary and 35 (14.4%) were unsure. Two hundred (82.3%) teachers reported that vision screening was not a requirement for admission, 17 (7%) indicated that it was and 26 (10.7%) were unsure.

Teachers' knowledge about eye care

One hundred and forty-eight (50.7%) teachers indicated that they were aware of optometrists, and 46 (15.8%) reported that they knew about ophthalmic nurses and opticians. Eighteen (6.2%) indicated being aware of the eye care team and 27 (9.25%) did not, while seven (2.4%) teachers were aware of ophthalmologists (Figure 4).

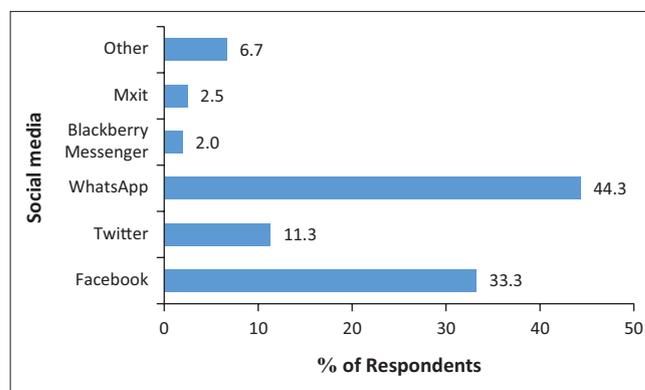


FIGURE 2: Teachers who reported that they had access to social media.

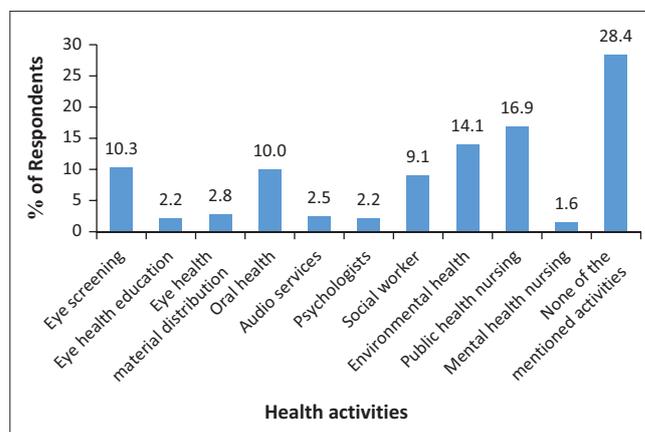


FIGURE 3: Teachers who reported health-related activities in their communities.

Table 2 illustrates teacher's responses on eye care knowledge, facilities for children with special needs and management of refractive errors (REs).

One hundred and forty-eight (60.9%) strongly agreed that having healthy eyes was an important factor for better performance at school, 63 (25.9%) agreed, 21 (8.6%) strongly disagreed and 11 (4.5%) were unsure. This was significantly associated with teachers who indicated being well informed about eye health ($p = 0.004$). A cross tabulation between RE management and teachers who indicated being well informed about eye health showed that the association between these two categories was significant ($p = 0.008$). Two hundred and one (82.7%) indicated that lighting in the classroom had a significant role in school performance and 42 (17.3%) had a contrasting view.

One hundred and ninety-two (79%) teachers were aware of the difficulties encountered by children with visual

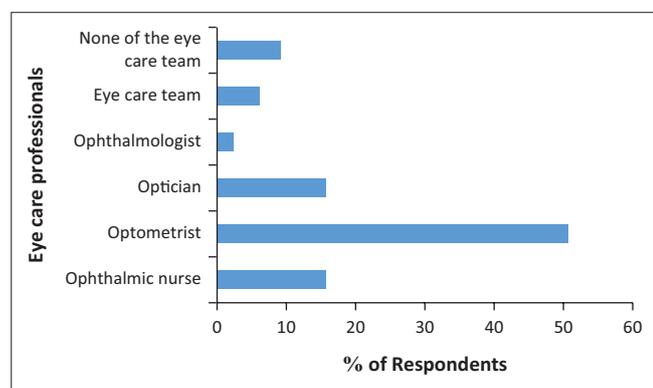


FIGURE 4: Teachers responses regarding knowledge of eye care professionals.

TABLE 2: Teacher's responses on eye care knowledge, facilities for children with special needs and management of refractive errors.

Question or item	Yes		No		Unsure	
	n	%	n	%	n	%
In your training as a teacher, were you ever taught how to detect children with visual problems?	126	51.9	110	45.3	7	2.9
Do you know any school for the blind and visual impairment in the country?	205	84.4	38	15.6	-	-
Do you know about facilities for children with special needs, for example, children with albinism?	117	48.2	95	39.1	31	12.8
If yes, what do you do to assist these children?	-	-	-	-	-	-
Always wearing glasses	125	51.4	-	-	-	-
Well protected from sunlight	54	32.7	-	-	-	-
Give them extra time to complete class work	27	16.4	-	-	-	-
Sit in front of class	37	22.4	-	-	-	-
Are you aware of visual problems that an albino child presents with?	160	65.8	83	34.2	-	-
The most common management or treatment of refractive error (short sighted, far sightedness or astigmatism) is:	121	69.9	52	30.1	-	-
Spectacles	192	79	-	-	-	-
Eye drops	43	17.7	-	-	-	-
Surgery	6	2.5	-	-	-	-
Other	2	0.8	-	-	-	-

Other: home remedies, traditional medicine.

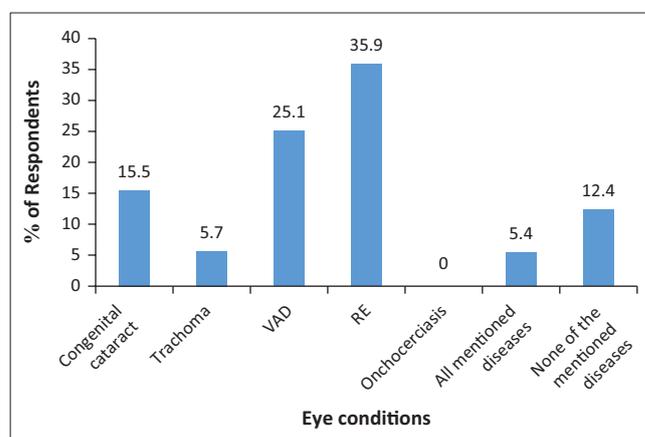
problems and 51 (21%) were not. This finding was significantly associated with teachers who indicated being well informed about eye health ($p = 0.035$). One hundred and eighty-four (75.7%) reported that they have never attended a training workshop to detect children with visual problems and 59 (24.2%) reported attending such workshop. Attending workshops was significantly associated with being well-informed about eye health ($p < 0.001$). One hundred and thirty-one (53.9%) teachers agreed that there was lack of eye screening in schools, 67 (27.6%) strongly agreed, 15 (6.2%) strongly disagreed, 12 (4.9%) disagreed and 18 (7.4%) reported being unsure. Regarding knowledge of eye conditions, 135 (35.9%) teachers reported that they knew about REs. Other responses regarding knowledge of eye conditions among the teachers are shown in Figure 5.

Seventy seven (20%) teachers indicated that they received information about eye conditions from newspapers. Other sources where teachers reported receiving information about eye conditions from are shown in Figure 6.

Two hundred and nineteen (90.1%) teachers indicated that they were able to detect signs and symptoms of eye diseases. However, this was insignificantly associated with those who indicated being well informed about eye health ($p = 0.089$). Of these, 15.7% were able to detect red eyes and 7.2% were able to detect all signs and symptoms that children presented with, with the other responses being illustrated in Table 3.

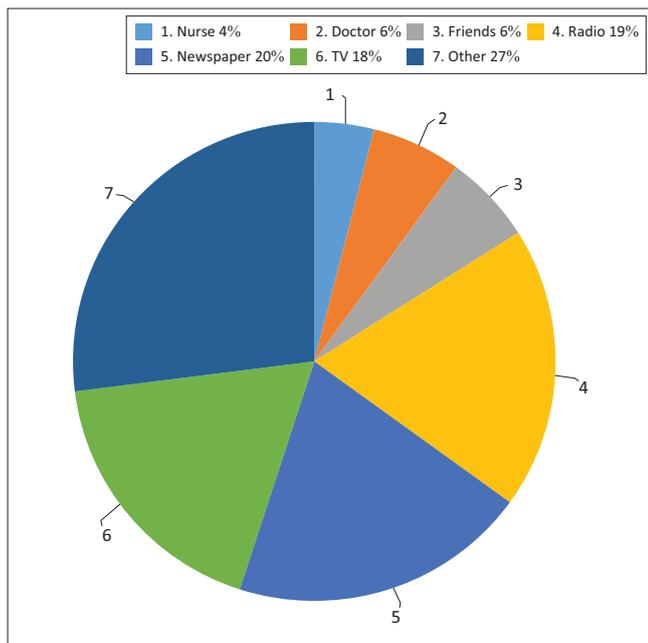
Two hundred and four (84%) teachers reported having seen children with visual problems in their teaching experience and 39 (16%) did not. Of those who reported having seen this, 143 (44.8%) observed them holding a book close to the face, with other responses being shown in Table 4.

One hundred and sixty-seven (79.2%) reported that they advised children or parents to go to the hospital following detecting any sign of visual problems and 34 (16.1%) advised them to go to the clinic. Four (1.9%) teachers advised the children to sleep or to wash their faces and return to class.



VAD, vitamin A deficiency; RE, refractive error.

FIGURE 5: Teachers who reported knowledge of different eye conditions.



TV, television.

FIGURE 6: Percentages of the source of information about eye conditions. 'Others' refers to information received during teacher training.

TABLE 3: Teachers responses about knowledge of ocular signs and symptoms.

Item	Yes		No	
	<i>n</i>	%	<i>n</i>	%
Total	219	90.1	24	9.9
If yes				
Copying from friends notes	63	8.2	-	-
Red eyes	121	15.7	-	-
Persistent headache	107	13.8	-	-
Continuous eye rubbing	95	12.3	-	-
Squinting eyes	58	7.5	-	-
Making mistakes when taking down information	83	10.7	-	-
Closing or covering one eye	41	5.3	-	-
Holding a book close to the face	94	12.2	-	-
Losing his or her place while reading	55	7.1	-	-
All of the above	56	7.2	-	-

TABLE 4: Teacher's responses regarding their experiences on children with visual problems.

Item	Yes		No	
	<i>n</i>	%	<i>n</i>	%
Total	204	84	39	16
If yes				
Holding a book close to the face	143	44.8	-	-
Squinting	81	25.4	-	-
Losing his or her place while reading	55	17.2	-	-
Closing or covering one eye	27	8.5	-	-
Other vision-related problems	13	4.1	-	-

One hundred and five (43.0%) teachers were unsure if children in their classes had squints or not. Sixty-one (25.0%) reported having children with squints in their classes and 77 (31.7%) reported to the contrary. Of those who reported having children with squints, 55 (93.2%) indicated that they had less than five children with the condition and four (6.8%) had more than 10 children with squints in their classes. One

hundred and fifty-five (63.8%) teachers indicated that eye health professionals have never visited their schools, 66 (27.2%) were unsure and 22 (9.0%) said that this had occurred. Among those who said that eye health professionals had visited their schools, 10 (45.5%) indicated that they last visited between two and four years ago, seven (31.8%) reported that they visited more than five years ago and five (22.7%) visited more than a year ago. Eleven (39.3%) teachers indicated that optometrists were present during the visits, seven (25.0%) reported that ophthalmic nurses were present, six (21.4%) noted that general nurses were present and four (14.3%) reported that ophthalmologists were present.

One hundred and fifty-three (63%) teachers reported that their schools were situated in an area where there was a clinic or health facility, 78 (32%) reported that there were no clinic or health facility and 12 (5%) were unsure if such facilities existed. Of those who indicated the presence of a health facility, 70 (45.2%) indicated that eye care services were offered, 45 (29%) reported that they were not offered and 40 (25.8%) were unsure. A cross tabulation between the presence of a clinic in an area where the school was located and teachers being well informed about eye health found that the association between these factors was insignificant ($p = 0.415$). From the teacher's experiences, 133 (54.7%) indicated that none of the children had to drop out of school because of visual problems and 70 (28.8%) reported that children dropped out of school, while 40 (16.5%) were unsure. One hundred and thirty-three (55.2%) teachers reported that they were not well informed about eye health problems and 73 (30.3%) indicated being well informed, while 35 (14.5%) were unsure.

One hundred and seven (44%) teachers indicated that REs were not serious among their school children, 75 (30.9%) indicated that it was somewhat serious and 61 (25.1%) reported that it was serious. One hundred and thirty-nine (57.2%) teachers were unsure if wearing spectacles had a significant impact on children's schoolwork and 63 (25.9%) thought that it had an impact on their schoolwork. Twenty-seven (11.1%) teachers believed that children get teased by their peers for wearing glasses and 14 (5.8%) indicated that it had an impact on their relationships with their peers.

Teachers' practices about eye care

One hundred and twenty-seven (52.3%) teachers advised parents to take their children for vision testing after complaining of persistent headaches when reading or looking at the board, 84 (34.6%) informed the principal about the problem and 32 (13.2%) preferred informing the school health services. One hundred and fifty-nine (65.4%) teachers considered eye problems as a potential cause of poor performance in school and 84 (34.6%) did not. One hundred and thirty-four (55.1%) teachers reported that they had children wearing spectacles in their classes and 109 (44.9%) did not. One hundred and seventeen (86%) of those who had children wearing spectacles in their classes had less than five children wearing spectacles, 12 (8.8%) had between 5 and 10 children wearing spectacles and seven (5.2%) had

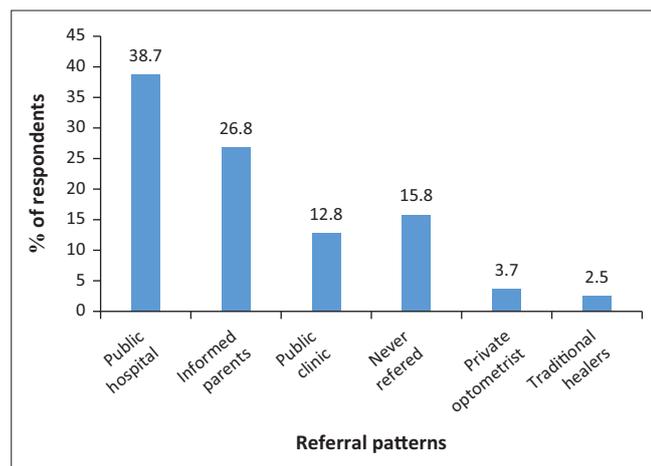


FIGURE 7: Teachers understanding of children's referral patterns.

more than 10 children wearing spectacles. One hundred and forty-nine (61.3%) teachers agreed that they did not monitor children wearing glasses and 94 (38.7%) monitored them. Monitoring children wearing spectacles was significantly associated with teachers who indicated being well informed about eye health ($p < 0.001$) and teachers who were more likely to advise parents to take their children for eye testing ($p = 0.003$). Ninety four (38.7%) teachers indicated that they referred children with vision problems to public hospitals and 65 (26.8%) preferred informing parents about the problem, with the other responses being shown in Figure 7.

Discussion

Demographic profiles

Most teachers were women, which is likely to be because of having more women in the teaching profession in Swaziland.¹¹ Although many teachers were aware of their immediate family members who wore spectacles, nearly half (44.2%) reported that they were not aware of any family members who wore spectacles. Spectacle wear within immediate family does not translate to being well informed about eye healthcare, which suggests the need for eye health education in schools.

The variations in the times reported by the teachers to get to the nearest healthcare facility could be because of the fact that Lubombo region is a rural area, consisting mainly of scattered rural homesteads that are accessed by dusty gravel roads, whereas Hhohho is a more affluent urban region with a decent road infrastructure. It is therefore expected that they will take different times to reach these facilities, which may also be influenced by their socio-economic status and their access to and use of public or private transport. As most teachers had devices to access social and mainstream media, this can be useful in promoting healthcare and eye care messages for them to be well informed about children eye health.

Compared to other health disciplines, eye health programmes are not given a high priority according to the respondents. This agrees with the reports by Apple et al.¹⁷ and Abdullah

et al.⁵ that in low-income countries, such as Swaziland, there is scarcity of eye healthcare workers, facilities, equipment and outreach programmes consequently leading to non-prioritisation of health programmes. If these services were available, they were mostly likely to be found in urban areas and offered curative services only. Ali et al.¹⁸ and Borrel et al.¹⁹ suggested introducing new programmes in impoverished areas to address the limited human resource and financial capacity. A similar approach to that used by Ali et al.¹⁸ and Borrel et al.¹⁹ could be adopted in Swaziland for child eye healthcare. Teachers indicated that health outreach activities, such as public health nursing, environmental and oral health, were almost non-existent. However, our study found that teachers who reported that they were well informed about eye health indicated having health activities such as vision screening and oral health in their schools at some point, suggesting that these activities were offered together. These activities were endorsed under the school health system and should be successfully implemented if the Swaziland children healthcare system is to improve. In addition, there is a need for vision screening programmes to be accompanied by eye health education and campaigns for effective spread of information and ensuring that teachers and children are well informed as all three activities cannot be separated. It is therefore suggested that the Swaziland government looks at creative methods of re-enacting and successfully implementing the school health programme to ensure that all relevant health services, including eye care, are provided. Re-defining the roles of the Education and Health Ministries will eliminate the belief of the school health programme as the responsibility of the Health Ministry's only, and needs to include relevant stake holders and have access to adequate national budget allocations.

Children with visual impairment such as children with albinism are afforded the opportunity to attend mainstream schools in Swaziland. This could be because of lack of spaces for enrolling children in 'special' schools, as there is only one school for the blind and visually impaired. Children with visual impairment need to be enrolled in schools that are designed to cater to their unique needs. Enrolling disabled children in the so-called 'mainstream schools' may be detrimental and can further add to the stigma as some 'abled-bodied' children may tease them leading to social isolation and negative psychological effects. Gooding²⁰ suggested that children with disabilities who were placed in 'mainstream schools' without the necessary support were more likely to drop out of school, including those who are visually impaired. It is therefore important to identify children with visual problems as early as possible so that parents can make appropriate choices for them, such as enrolling them in 'suitable' schools. It is therefore important to promote positive attitudes and beliefs in schools and communities towards interacting with visually impaired and blind children.

Teachers' knowledge about eye care

A few teachers indicated knowing about ophthalmic nurses and opticians, while several teachers knew about optometrists.

This is an unexpected finding, as ophthalmic nurses are often the point of contact in many developing countries (such as Swaziland), with few having optometrists and ophthalmologists.^{21,22,23} In a country with a weak eye health system, there is a need for teachers to be informed about the different eye health professionals, their lack of knowledge possibly being because of no instruction being provided during their teachers training, as well as the ineffectiveness of the school health programme. Awareness programmes about child eye health and available services, specifying the roles of the different eye care practitioners, could be conducted using the media and school health activities.

Teachers were aware of the existence of facilities for the blind, which will enable them to advise parents to send their children to the relevant school if they are either visually impaired or blind. Less than half (48.2%) of the teachers were aware of the special needs for albino children, with few reporting that they advised albino children to sit in front of the class and give them extra time to complete tasks. In addition, teachers felt that protection from the sunlight was more important than being visually corrected with spectacles. All these suggest that teachers do not have adequate knowledge about the needs of albino children. Furthermore, teachers who reported that they attended workshops were found to be less informed about eye health, suggesting a possible limited scope in these workshops or possibly not being conducted periodically to ensure that the teachers are kept well abreast of new information. These results were similar to that of teachers in Port Harcourt, Nigeria, which reported poor knowledge about childhood vision disorders, such as albinism, citing lack of training in their teaching curriculum.²⁴ Therefore, teachers need to have adequate knowledge about holistic management of a child with albinism, including vision, environmental protection and classroom settings, which needs to be incorporated in their scope of undergraduate training. Providing continued support from eye health professionals for teachers and investing in eye health education in schools will ensure that more children with visual special needs are reached by eye health services to eliminate the barriers to learning.

A high number (79%) of teachers were knowledgeable about correcting REs, which may be because of the prioritisation of refractive services by government eye clinics. This could also indicate that spectacle correction is still the most common and preferred way of RE correction. Teachers who indicated being well informed and those who indicated not to be well informed about eye health reported that eye drops can be used to correct RE. This highlights that regardless of the RE being prioritised, many teachers remain uninformed compared to the high number who indicated being knowledgeable, suggesting the need to ensure that teachers are trained about eye health and the school health programme.

Unlike the situation in developing countries,^{24,25} vision screening before commencing schooling is not a requirement in Swaziland, possibly because of the ineffective school health programme and the lack of public sector eye clinics.

Therefore, recommendations need be made to formulate eye health guidelines that include RE, as it has been shown that it is easily correctable with a pair of spectacles. This will also advocate for improving the teacher's knowledge and identifying children with visual disorders in a classroom setting. Many teachers generally agreed that there was a lack of vision screening in schools, which results in children with visual problems being unidentified for timely referrals to appropriate care facilities. Gilbert and Foster²⁶ further reiterated the importance of ongoing monitoring for those who have been given correction in the form of glasses or contact lenses. Very few schools had eye health professionals visiting them during the study period, indicating that vision screening was not prioritised, possibly because of the lack of human resources or relevant eye care policies. The lack of vision screening services results in a significant number of children without appropriate refractive correction and/or referrals to other eye care services. Partnerships between public-private involving non-governmental organisations (NGOs) and or mission faith-based services are necessary to strengthen intervention efforts as well as the referral system in school health programmes.

The teachers were also aware of the importance of adequate lighting in a classroom setting to enhance performance, with a significant number (21%) not being aware of difficulties encountered by visually impaired children. This points to the need for more emphasis to be placed on providing further education and training on rehabilitation services, with RE and vitamin A deficiency (VAD) reported to be among the most common causes of visual impairment in children particularly, in Africans.^{21,27,28,29} It is therefore encouraging to note that a significant number of teachers were aware of these serious sight-threatening conditions. These results could be because of the fact that REs usually present with symptoms that affect studying, and teachers are able to see their manifestations in class. As conditions such as onchocerciasis and trachoma have been completely eradicated in Swaziland, it is assumed that children who present with these conditions are less likely to be identified by the teachers and referred for further appropriate care and management. For example, those with RE can be referred to eye care professionals for spectacles and those with VAD can be referred to the local clinic for vaccinations or other vitamin A supplementation, as children usually receive vaccination against VAD at early age to prevent blindness.

Although the teachers' curriculum in Swaziland emphasises general health issues of children, particularly in the psychology module, the majority (90.1%) were aware of the general signs and symptoms of eye conditions. However, the curriculum does not adequately address eye conditions and there needs to be teacher training and workshops to address these. Teacher training and knowledge of eye conditions showed that 17.5% of teachers have never heard of any of the eye conditions affecting children. Although the exact reasons for this observation are not immediately clear, it could be because of the fact that teacher training differs across the country. Those who indicated that they were well

informed about eye health identified RE, congenital cataract and VAD as known conditions. These are priority conditions that cause visual impairment and blindness. Ideally, the curriculum for training should be expanded to cover all aspects of eye care affecting children.

The mainstream media, such as newspaper, radio and television, were the main sources from where teachers received information about children's eye health. As suggested by Muller et al.,³⁰ these media platforms play important roles in spreading information about health. Only 27% of the teachers indicated that they received information about child eye health from their training. There is therefore a need for continued workshops to keep them abreast of visual problems that children may experience in the classroom setting. Sudhan et al.³¹ highlighted ways in which workshops can be conducted for teachers and included: short-course sessions, distance learning utilising newsletters, recorded video lectures and manuals. Friends who are knowledgeable about eye conditions were also reported by some teachers to be a source of information about children's eye conditions. It is noteworthy that health professionals were not reported as the main source of eye conditions by many teachers. These results highlight the lack of school screening conducted by health professionals in schools probably because of lack of human resources and not prioritising time to explain eye health conditions to parents. Therefore, teachers can be trained to conduct these important screenings in schools to identify children with visual problems. Korani et al.¹⁵ in India recommended that teachers be trained by eye health professionals about the visual conditions that children experience and the consequences of not managing them appropriately. Realistic involvement of the local public health or eye health facilities in planning for effective school eye health programme as an intervention strategy that is sustainable with referral protocols is warranted to achieve the desired results of teachers being eye health literate and accessible to children.

Eye health is not only about detecting signs and symptoms of eye conditions but also about engaging in best practices by offering proper advice and referral. Although referring children is not an economic burden to the teacher but to the parent, none of the teachers who indicated being well informed about eye health referred children to private optometrists' but to public facilities to receive eye healthcare. This may suggest that many rely on public health facilities for general and eye health. Few teachers referred children to traditional healers, which is a positive finding, as it reduces the risk of children using traditional remedies, which can, and do, lead to blindness.³² Although many teachers indicated being informed about eye health, a significant percentage indicated inadequate knowledge about certain eye health conditions and their possible consequences. This statement is supported by the fact that they recommended sleeping or washing of the face to 'get rid' of an eye condition. A high proportion of teachers were unsure if children in their classes had squints or not. Squints are usually noticeable with a naked eye, and this finding could

suggest that teachers were not aware of what a squint is and many children with this condition may be left undetected, resulting in amblyopia. Cooperation between the Ministries of Education and Health in curriculum development on the epidemiology of local eye conditions in children, adults and common condition in different age group need to be embedded in the school curriculum and school eye health programme, while referral system is essential.

The long period (over five years) taken by eye health professionals to visit schools means that those in need of urgent eye care or any other health-related issues may not receive appropriate healthcare or eye care timeously, particularly those in rural areas. The delayed visits by eye health professionals can be ameliorated by training of teachers as 'vision screeners'. This training has been adopted in developing countries such as India and has proven to be helpful in reducing the workload of eye health professionals.¹⁵ A significant percentage of teachers indicated that there was an absence, or they were unsure of ophthalmic services in their areas. This could be because of the fact that qualified eye care personnel in the clinics where ophthalmic services are reported to be offered are not available or are occupied by community health workers. Teachers in schools without a clinic in the surrounding area reported to be well informed compared to those who had clinics. This highlights a lack of outreach programmes and spread of eye health information outside the clinic walls because of inadequate eye health personnel. Teachers reported that they had not encountered children dropping out of school because of visual problems, while others said that they did. This could indicate that they were not aware of the reasons for children dropping out, and that the school did not follow up on those who did not return.

Global initiatives on the prevention of visual impairment and blindness list REs as one of their priority conditions.³³ However, our study showed that most teachers reported REs as not being a serious condition among children. This result confirms that although REs have been reported to be significant causes of vision impairment in children, global messages have not reached everyone in Africa.³⁴

Many teachers were unsure of whether children should wear glasses or not, which implies that they may not reinforce wearing of glasses in children who need to wear them all the time. Perceptions about wearing glasses varied, with teachers differing in the opinions, believing that it will both negatively and positively impact on the children's education, these results being similar to those reported by Wedner et al.³⁴ Proper induction for teachers is important to change their perception about wearing glasses to enable them to teach children about the benefits of using them. Moreover, eye health education focused on parents or guardians and teachers' communication on the use of spectacles by children is essential.

Teachers' practices about eye care

Many teachers indicated that they advised parents to take their children for vision testing when they complained of

headaches while looking at the board or when reading. This is good advice, as it will afford the children the opportunity to have comprehensive eye examinations. In ideal situations, referring children to school health services could be a better option. However, because of the current poor state of the school health programme, there are no successful school health services in Swaziland. School health programmes used successfully by many countries, such as South Africa, need to be adopted in Swaziland to ensure that they respond to the needs of the children. The limited number of optometrists in the country might attribute to this low number of spectacles wearers. The majority of teachers referred children to public facilities, which were accessed by the majority of the people in the study area. Therefore, it is important to improve coordination of the school health programme between partnerships and stakeholders both at national and regional levels. These partnerships can be extended to international partners to eliminate visual problems among children in the public education system.

The study has several limitations that must be acknowledged. Firstly, the study relied on responses from teacher's knowledge and practices, while factors such as satisfaction with the services provided and preference for private or public eye services were not included. Secondly, the study focused on issues relating to service delivery from within the public health system without investigation beliefs and attitudes on access to eye health services. Thirdly, the sample of teachers may not be a representative of all Swaziland teachers' views regarding children's eye health knowledge and practices.

Conclusion

Lack of adequate knowledge about child eye health reported by some teachers is a cause for concern, while others demonstrated being informed, although it appears to be insufficient to address the broader issues of child eye health. Teachers need adequate training and understanding about eye health, including visual disability of children, to ensure that information is shared in a way that does not discriminate the child with disabilities during learning and in order to remove barriers in the teaching system.

Acknowledgements

Ms Karen Martin was responsible as an editor on this article.

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

This article forms part of the PhD thesis undertaken by V.N.S. at the University of KwaZulu-Natal, South Africa, supervised by V.R.M. and K.P.M.

Ethical considerations

The study proposal was approved by the Biomedical Research Committee of University of KwaZulu-Natal (UKZN) (BE338/13), the Swaziland Health Ethics Committee (MH/599C) and the Ministry of Education. Participation in the study was voluntary as stipulated in the UKZN consent form and only those who completed the consent forms (after the nature and purpose of the study were explained to them) were allowed to participate in the study. All data captured were kept confidentially and no subject was identified by name.

Funding information

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

Data availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

References

- Njepuome N, Onyebuchi U, Onwusoro M, Igbe M. Visual impairment among public servants in Abuja, Nigeria. *J Ophthalmol Vis Sci.* 2012;9(1):14–18. <https://doi.org/10.5580/2a9a>
- WHO. The FRESH Monitoring and Evaluation Framework. A generic framework for monitoring and evaluation of school health interventions. 2010.
- Nutbeam D. Health promotion glossary. *Health Prom Int.* 1998;13(4):349–364. <https://doi.org/10.1093/heapro/13.4.349>
- Davies M, Macdowell W, editors. *Health Promotion Theory.* England: London School of Hygiene & Tropical Medicine; 2006.
- Abdullah KN, Al-Sharqi OZ, Abdullah MT. Barriers to the uptake of eye care services in developing countries: A systematic review of interventions. *Health Educ J.* 2012;72(6):742–754. <https://doi.org/10.1177/0017896912461193>
- Central Statistical Office (CSO) & Macro International Inc. *Swaziland Demographic and Health Survey 2006-2007.* Mbabane, Swaziland: Central Statistical Office and Macro International Inc. Government of the Kingdom of Swaziland; 2008.
- World Bank. *Swaziland - Public expenditure review: Strengthening public expenditure policy and management for service delivery and poverty reduction.* Washington, D.C.: World Bank; 2009.
- Pons J, Mapham W, Newsome B, et al. The potential impact of a cataract surgery programme on the care of orphans and vulnerable children in Swaziland. *S Afr Med J.* 2012;102(3):140–141. <https://doi.org/10.7196/SAMJ.5568>
- World Health Organization. *Report for Swaziland, Mbabane.* Geneva: WHO; 2005.
- Liese B, Dussault G. *The state of the health workforce in sub-Saharan Africa: Evidence of crisis and analysis of contributing factors.* Washington, D.C.: World Bank; 2004.
- Ministry of Education & Training. *Annual Education Census (AEC) Report.* Mbabane; 2012.
- Integrated School Health Policy. Republic of South Africa: Department of Health and Basic Education; 2010.
- Ministry of Education & Training. *Mbabane: National Education and Training Sector Policy (EDSEC);* 2011.
- Powell C, Wedner S, Hatt SR. Vision screening for correctable visual acuity deficits in school-age children and adolescents. *Cochrane Database of Systematic Review.* 2009;4.
- Korani J, Williams JD, Rose A, Khanna R. A prospective study to assess the quality of preliminary eye screening done on school children by teachers in Andhra Pradesh. *J Comm Med Health Educ.* 2015;5(2):1–5. <https://doi.org/10.4172/2161-0711.1000342>
- Seethal C, Karim AS. An evaluation of a Teacher Vision Awareness Programme (TVAP), implemented by preschool teachers to detect vision problems in pre-school children in Kwa Zulu-Natal, South Africa. In: *Evidence for action: Challenges for The Cochrane Collaboration in the 21st century.* Abstracts of the 8th Cochrane Colloquium. 2000 Oct 25–29; Cape Town, South Africa.

17. Apple DJ, Ram J, Foster A. Blindness in the world. *Surv Ophthalmol.* 2014;45(1):150–160.
18. Ali A, Ahmad I, Ayub S. Prevalence of undetected refractive errors among school children. *Biomedica.* 2007;23(21):97–101.
19. Borrel A, Dabideen R, Mekonen Y, Overland L. Child eye health in Africa. The status and way forward. The African Child Policy Forum. Cape Town: ORBIS Africa, 2013; p. 1–37.
20. Gooding K. Poverty and blindness: A survey of the literature Haywards Heath. International Programme Development Unit: Sight Savers; 2006.
21. Lewallen S, Courtright P. Blindness in Africa: Present situation and future needs. *Br J Ophthalmol.* 2001;85(8):897–903. <https://doi.org/10.1136/bjo.85.8.897>
22. Gilbert CE, Shah SP, Jadoon MZ, et al. Poverty and blindness in Pakistan: Results from the Pakistan National Blindness and Visual Impairment Survey. *BMJ.* 2008;336(7):29–32. <https://doi.org/10.1136/bmj.39395.500046.AE>
23. Jadoon Z, Shah SP, Bourne R, et al. Cataract prevalence, cataract surgical coverage and barriers to uptake of cataract surgical services in Pakistan: The Pakistan National Blindness and Visual Impairment Survey on behalf of the. *Br J Ophthalmol.* 2007;91(10):1269–1273. <https://doi.org/10.1136/bjo.2006.106914>
24. Tabansi PN, Anochie IC, Pedro-Egbe CN, Nkanginieme KEO. teachers knowledge of vision disorders of primary school children in Port Harcourt. *Niger J Paediatr.* 2009;36(18):33–41. <https://doi.org/10.4314/phmedj.v3i3.45268>
25. Misra S, Baxi RK. Knowledge about eye diseases and eye care needs in school going children among teachers and children of a city located in Western India. *Healthline.* 2012;3(2):64–66.
26. Gilbert CE, Foster A. Childhood blindness in the context of VISION 2020; The right to sight. *Bull World Health Org.* 2001;79:227–232.
27. Alene GD, Abebe S. Prevalence of the risk factors for trachoma in rural locality of North-western Ethiopia. *East Afr Med J.* 2000;77(6):308–312. <https://doi.org/10.4314/eamj.v77i6.46638>
28. Policy brief. Eye health in children: Sight Savers. Geneva: WHO; 2011.
29. Guidelines for School Eye Health for the Eastern Mediterranean Region Eastern Mediterranean Regional office of the International Agency for the Prevention of Blindness in collaboration with the World Health Organization; 2009.
30. Muller A, Keeffe JE, Taylor HR. Changes in eye care utilization following an eye health promotion campaign. *Clin Exp Ophthalmol.* 2007;35(4):305–309. <https://doi.org/10.1111/j.1442-9071.2007.01450.x>
31. Sudhan A, Pandey A, Pandey S. Effectiveness of using teachers to screen eyes of school-going children in Satna district of Madhya Pradesh, India. *Indian J Ophthalmol.* 2009;57(6):455–458. <https://doi.org/10.4103/0301-4738.57157>
32. Oduntan AO, Raliavhenga M. An evaluation of the impact of the eye care services delivered to the rural communities in the Mankweng Health sub-district of the Northern Province of South Africa. *S Afr Optom.* 2001;60(3):71–76.
33. Dandona L, Dandona R. What is the global burden of visual impairment? *BMC Med.* 2006;4(6):1–10. <https://doi.org/10.1186/1741-7015-4-6>
34. Wedner S, Masanja H, Bowman J, Gilbert C. The association between refractive cutoffs for spectacle provision and visual improvement among school-aged children in South Africa. *Br J Ophthalmol.* 2008;92(1):19–24. <https://doi.org/10.1136/bjo.2007.119198>

Appendix 1

Questionnaire for teachers.

General and demographic questions		Please mark with an (X)		
1.	Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female	
2.	Race	<input type="checkbox"/> African <input type="checkbox"/> Mixed race	<input type="checkbox"/> White <input type="checkbox"/> Other: specify _____	
3.	Are there any children in your immediate family (mother, father, brothers and sisters) who wear spectacles?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
4.	Are there any children in your immediate family who were born blind or gone blind?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
5.	How long does it take you to get to your nearest health facility that offers eye health services with eye doctor or optometrist?	<input type="checkbox"/> 0–15 min <input type="checkbox"/> 31–60 min	<input type="checkbox"/> 16–30 min <input type="checkbox"/> more than 60 min	
6.	From question 5 above, what mode of transport do you use?	<input type="checkbox"/> Bus <input type="checkbox"/> Private transport	<input type="checkbox"/> Mini Bus/Taxi <input type="checkbox"/> Other, specify _____	<input type="checkbox"/> Walking
7.	Do you have access to the following social media?	<input type="checkbox"/> Face book <input type="checkbox"/> mix-it <input type="checkbox"/> other: specify _____	<input type="checkbox"/> Twitter <input type="checkbox"/> Black Berry Messenger	<input type="checkbox"/> Whatsapp
8.	Do you have access to the following mainstream media?	<input type="checkbox"/> Television <input type="checkbox"/> other, specify _____	<input type="checkbox"/> Radio	<input type="checkbox"/> Newspaper
9.	Has any of the following ever taken place at your school? Please tick all applicable answers	<input type="checkbox"/> Eye screening <input type="checkbox"/> Eye health material distribution <input type="checkbox"/> Audio (hearing) services <input type="checkbox"/> Social workers <input type="checkbox"/> Public health nursing	<input type="checkbox"/> Eye health education <input type="checkbox"/> Oral health services <input type="checkbox"/> Psychologists <input type="checkbox"/> Environmental health services <input type="checkbox"/> Mental health nursing	
10.	Do you admit children with visual problems in your school?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
11.	Is eye screening one of the requirements before children can be admitted?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure

Knowledge about eye care

12. Which of the following eye care professionals do you know?

- Ophthalmic nurse
- Optometrist
- Optician
- Ophthalmologist
- All of the above
- None of the above

13. In your training as a teacher, were you ever taught how to detect children with visual problems?

- Yes
- No
- Unsure

14. Do you know any school for the blind and visual impairment in the country?

- Yes
- No

15. Do you know about facilities for children with special needs, for example, albino child?

- Yes
- No
- Unsure

16. If Yes, what do you do to assist these children?

- Always wearing glasses
- Well protected from sunlight
- Give them extra time to complete class work
- Sit in front of class

17. Are you aware of visual problems that an albino child presents with?
- Yes
 - No
18. Do you think healthy eyes are important for performance in school?
- Strongly disagree
 - Disagree
 - Unsure
 - Agree
 - Strongly agree
19. The most common management or treatment of refractive error (short sighted, far sightedness or astigmatism) is:
- Spectacles
 - Eye drops
 - Surgery
 - Other (please specify): _____
20. Are you aware that lighting in the class room play an important part in visual performance of children?
- Yes
 - No
21. Are you aware that children with vision problems cannot cope with academic work?
- Yes
 - No
22. Do you attend workshops where you are taught how to teach children with vision problems?
- Yes
 - No
23. Is eye screening lacking in your school?
- Strongly disagree
 - Disagree
 - Unsure
 - Agree
 - Strongly agree
24. Which of the following eye diseases and conditions do you know?
- Congenital cataract
 - Trachoma
 - Onchocerciasis
 - Vitamin A deficiency
 - Refractive error (short sighted and far sightedness)
 - All of the above
 - None of the above-mentioned diseases
25. Which is the condition that affects school children the most?
- Congenital cataract
 - Trachoma
 - Onchocerciasis
 - Vitamin A deficiency
- Refractive error (short sighted and far sightedness)
 - None of the mentioned diseases
26. Where did you learn about these conditions?
- Nurse
 - Doctor
 - Neighbours
 - Friends
 - Radio
 - Newspaper
 - TV
 - Other (please explain): _____
27. Are there signs and symptoms that you as a teacher can pick up that indicates to you that the child may have visual problem?
- Yes
 - No
28. If Yes, what are these signs and symptoms? (can mark more than one option)
- Copying from friends notes
 - Red eyes
 - Persistent headache
 - Continuous eye rubbing
 - Squinting eyes
 - Making mistakes when taking down information
 - Closing or covering one eye
 - Holding a book close to the face
 - Losing his or her place while reading
 - All of the above
29. In your teaching experience have you ever seen children or child with vision problems?
- Yes
 - No
30. If Yes, state what these problems were.
- 5 Squinting
 - 5 Closing or covering one eye
 - 5 Holding a book close to the face
 - 5 Losing his or her place while reading
 - 5 Other, specify _____
31. What did you advice the child or parent to do?
- Go to the hospital
 - Go to the clinic
 - Wash face and go back to class
 - Sleeping
 - Use traditional medicine
32. Are there any children in your class who have a squint?
- Yes
 - No
 - Unsure
33. If Yes, how many?
- less than 5

- b. 5 to 10
c. Greater than 10
34. Have eye health professionals ever visited your school?
a. Yes
b. No
c. Unsure
35. If Yes, when was the last time they visited?
a. Greater than 1 year
b. 2–4 years
c. More than 5 years
36. Which of the following eye health practitioners were present during the visit?
a. Optometrist
b. Ophthalmic nurse
c. Ophthalmologist
d. General nurse
e. Other, specify _____
37. Does the area where the school is located have a clinic or health care facility?
a. Yes
b. No
c. Unsure
38. If Yes, does it offer eye care services?
a. Yes
b. No
c. Unsure
39. In your teaching experience do you know of any children who have had to drop out of school because of visual problems?
a. Yes
b. No
c. Unsure
40. Do you feel that you are well informed about eye health problems?
a. Yes
b. No
c. Unsure
41. In your opinion, how serious is the refractive error (short sighted and far sightedness) problem in school children?
a. Very serious
b. Somewhat serious
c. Not very serious
42. As a teacher, what is your view on children wearing glasses at school?
a. Children get teased by their peers
b. It has an impact on their school performance
c. It has an impact on having good relationship with peers
d. Unsure
- Practices about eye care**
43. If a child complains of persistent headaches reading or looking at the board while in class as a teacher what do you do?
a. Advice parents to have the child's vision tested
b. Inform the principal
c. Inform the school health services
44. If a child is not performing to his or her potential in school, do you consider vision as one of the contributing factors to child's poor performance or achievements?
a. Yes
b. No
45. Are there any children in your class wearing glasses?
a. Yes
b. No
46. If Yes, how many?
a. Less than 5
b. 5 to 10
c. Greater than 10
47. Do you monitor children prescribed with glasses to ensure that they wear their glasses at all times while at school?
a. Yes
b. No
48. Where do you refer a child if you find out that he or she has visual problems?
a. Public hospital
b. Public clinic
c. Traditional healer
d. Private optometrist
e. Inform parent and leave it up to them to find a service provider
f. Never done that

Thank you for filling in the questionnaire