

Original Research Article

Establishing a school-based vision screening program in Myanmar: a qualitative study on the perspectives of school children with refractive error, teachers, optometrists and ophthalmologists

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ABSTRACT

Background: Refractive error (RE) is one of the global leading causes of vision impairment among children. The World Health Organization outlined the school-based vision care program aided by school teachers as one solution. In Myanmar, although the prevalence of RE among school children is expected at about two million, a regular eye check-up program has not been established. This study aimed to explore the barriers, feasibility, and limitations of the children with RE and service providers to establish a program.

Methods: This qualitative study was conducted in eight public schools, that have been involved in the pilot school-based vision screening program, in Yangon. Focus group discussions with school children and teachers from these schools, key informant interviews with optometrists and ophthalmologists, involved in the program, and working at Yangon Eye Hospital and North Okala General Hospital, were carried out from January to August 2020. Qualitative data analysis was manually performed using the grounded theory according to the pre-defined themes.

Results: Almost all school children showed positive perspectives but they expressed their psychosocial barriers of the cost, time, and care given by their parents on the next vision examination. All teachers mentioned optimism to be volunteers. The optometrist and ophthalmologists revealed the feasibility to establish the program despite having limitations in human resources, logistic requirements, and low awareness level on visual impairment of the children by parents.

Conclusions: This study highlighted that a school-based vision care program can be initiated in Myanmar despite having some barriers and limitations.

Keywords: Uncorrected refractive error, School children, School-based vision care program

INTRODUCTION

Uncorrected refractive errors (URE) is one of the major global leading causes of vision impairment and is very common among children and adolescents. Myopia is one of the major causes of refractive error. Refractive error (RE) impacts educational achievement, social

development, and economic production.^{1,2} By 2050, half the world's population is estimated to be myopic and one billion people will be highly myopic. The majority of people with vision impairment are living in developing countries where human resources and infrastructure for vision care services are inadequate. Correction of RE not only affects students with visual impairment but also

impacts their families and teachers. The provision of spectacles to students in school may significantly improve both the general health and academic performance of children. Timing is crucial to the correction of RE. High myopia can be prevented with early correction and intervention only in the developing eyes of the child, typically up to the age of 12 or 13 years.³ For the school children, the school is a critical setting to access eye care, and an excellent location to deliver eye health education messages.^{4,5}

In the World Health Organization Vision 2020, school-based screening for RE and on-site spectacle provision has been outlined as one of the solutions to reduce ocular morbidity and developmental delays caused by childhood vision impairment and blindness.⁶ It can offer an excellent opportunity to affect the health of about 700 million children worldwide.⁷ Consequently, school-based spectacles provision programs to school children with URE have been rolled out as the model projects in some South-East Asian countries, for example, in Cambodia and Indonesia.^{8,9}

Teachers play a significant role in the school-based screening program. In some studies, the vision screening done by teachers had shown high validity and reliability. Thus, in countries of poor resources, “teachers training in vision screening” is regarded as an innovative, community-based approach that is reasonable and feasible for the effective utilization of the available human resources in the school-based vision screening program.^{10,11}

However, the programs have not been operated efficiently among school children in all situations. The compliances with the dispensing spectacles were not high, even when spectacles are provided free of charge depending on the setting and population. This was due to the beliefs and perceptions that; wearing spectacles will make their eyes worse, concerning lost or broken spectacles, being teased about an appearance by the peers keeping eyeglasses at home or wearing only for special occasions and feeling inconvenience, and lacking attractive style.¹²⁻¹⁷ Regarding parents’ the common reason for not buying glasses for the vision care of the children was observed as being “too busy with work,” whereas “too expensive” was the least common reason.¹⁷

In Myanmar, the prevalence of RE among school children is expected at about two million.¹⁸⁻²⁰ The general medical examination of school children in Myanmar is being carried out by the School Health Division of the Department of Public Health under the Ministry of Health and Sports. Regular eye check-up by an ophthalmologist is one component of the intermediate health package under Myanmar National Comprehensive School Health Strategic Plan 2017-2022, yet it needs to be established.²¹ To be established as a well sustainable program, a school-based program requires to satisfy the necessities of schoolchildren with vision impairments, to enable the

voluntary participation of teachers, and to facilitate the involvement of optometrists and ophthalmologists. This study aimed to identify the barriers and benefits of the pilot study on school-based vision screening program among school children and to explore the service providers’ perspectives on the feasibility to launch a school-based vision screening program in Myanmar.

METHODS

This qualitative exploratory cross-sectional study was conducted from January to June 2020. It was a continuation study of the baseline cross-sectional study to investigate the prevalences and risk factors of RE among school children in the eight public schools from two townships, Mingalar Taungnyut and North Okala, in Yangon Region, Myanmar. A total of 2500 school children (1067 females and 1433 males) were involved in the baseline study.

The qualitative inquiry was carried out among participants who had involved in this program. The four groups of participants who participated in the study were (1) school children: well-communicated and coordinated, Grade 7,8,9,10 students who received both vision screening and the ready-made spectacles from the school-based vision screening study program (2) school teachers, who has volunteered in the vision screening of the study program, from these eight public schools (3) optometrists, who provided vision screening training to the volunteered school teachers, and rechecked the vision of participants screened by the teachers, and (4) ophthalmologist who provided vision care to referral cases from this study program.

A purposeful sampling method was used in the selection of participants in this qualitative study. Participants were explained about the purpose of the study, asked for their informed consent, and permission for the use of digital recorders to create a record. The consolidated criteria for reporting qualitative research (COREQ) checklist was used to report the methods and findings of the study.²² The FGDs were carried out by one experienced qualitative researcher and two note-takers at the most convenient date, time, and locations of the participants. All researchers had neither relationship with the participants nor a conflict of interest.

Four FGDs each for the school children's group and the school teacher's group were conducted. Since the group members of FGDs were homogenous, four FGDs sessions with interviewees (typical cases) in an articulate, expressive, and reflective manner were assumed to acquire saturation of knowledge. The quantity and characteristics of the study participants in the focus group discussions (FGDs) were shown in Table 1.²³

All ten KIIs were conducted with the service providers of the pilot project of the School-based vision care program. Five optometrists and five ophthalmologists who were

involved in the program were interviewed at their most convenient times at their workplaces, Yangon Eye Hospital and North Okala General Hospital in Yangon, and the office for “Trachoma and Prevention of Blindness

Project” at the Department of Public Health, Nay Pyi Daw. The quantity and characteristics of the study participants in the interviews can be seen in Table 2.

Table 1: Overview of study participants of the focus group discussion (FGD).

Category	# of FGD	Total no of participants	Characteristics
School children	4	32	Grade 7 to 10 students of both sexes who received both vision screening and the ready-made spectacles from the study program.
School teacher	4	32	The female teachers, with a minimum of five years of teaching experience, who volunteered in the vision screening program in the baseline cross-sectional study were included in the study.

Table 2: Overview of study participants of the key informant interview (KII).

Category	# of KII	Total no of participants	Characteristics
Optometrist	5	5	The optometrists, who provided training to the volunteered school teachers and involved in the baseline cross-sectional study, working at the tertiary level hospital, Yangon Eye Hospital. They have a minimum of 10 years of working experience as an optometrist in Yangon Eye Hospital.
Ophthalmologist	5	5	One senior pediatric ophthalmologist and one senior ophthalmologist working at tertiary hospitals, Yangon Eye Hospital, two senior ophthalmologists working at North Okala General Hospital in Yangon, and one ophthalmologist working for the “Trachoma and Prevention of Blindness Project” as a project manager at the Department of Public Health, Ministry of Health and Sports, Nay Pyi Daw. They all have a minimum of 7 years of working experiences as an ophthalmologist/ project manager in their respective hospitals/office. They all have their specialized knowledge and unique perspectives on the discussed topic.

The FGD and KII guides were developed from the literature and research objectives. All focus group discussions and interviews were audio-recorded and transcribed. All transcripts and notes were reviewed thoroughly for accuracy. A thematic content analysis was conducted as an interrelated process through discussions and refining of the major themes using a grounded theory approach and the Framework Method.^{24,25} Codes were also implied referring to the group dynamic established in the course of interaction.

RESULTS

The baseline cross-sectional study interviewed 2500 participants (1067 females and 1433 males) of both sexes from eight public schools in two townships in Yangon. The demographic characteristics were shown in Table 3. The mean age was 12.5±1.9 (range 8 - 18 years). The majority of participants (93%) were from high schools. The major ethnic group was Bamar (87%), followed by Karen (1.9%), Rakhine (1.3%), and the rest belonged to the other minor ethnic groups. The major religion was Buddhism (78%), followed by Islam (15%), Hindu

(3.7%), Christian (3.2%), and others (0.4%). About 90% of the participants lived with their parents.

School children’s perceptions on before and after spectacles wearing and barriers encountered.

All 32 school children involved in the focus group discussions had RE with power between -0.50 D to -3.0 D with the same power in both eyes. They received free of charge ready-made spectacles from the study program. The main themes that evolved during discussions were “unsatisfactory experiences of URE”, “controversial experiences after wearing spectacles”, and “barriers to spectacles compliance”. Before receiving spectacles, all schoolchildren endorsed that they had difficulties seeing things at distance and found difficulties doing classwork and homework. They also had problems in their daily life because of poor vision.

“Until I received spectacles, I found many difficulties to see what teacher written on the whiteboard in class. It was worse while the light was reflecting on it. (Grade 8 schoolgirl with the myopia of -1.0 D, recently diagnosed on vision screening).

Table 3: The sociodemographic characteristics of the participants in the baseline cross-sectional study.

Sociodemographic characteristics	Female		Male		Total		
	n=1067 (42.7)		n=1433 (57.3)		n=2500		
Age (year)	12.5		12.4		12.5		
Range (year)	(8-18)		(8-18)		(8-18)		
	No	%	No	%	No	%	
Grade	3 to 4	47	8.7	124	4.2	171	6.8
	5 to 8	589	53.1	762	55.2	1351	54
	9 to 11	431	38.2	547	40.6	978	39.2
School	Middle School	78	7.3	96	6.7	174	7
	High School	989	92.7	933	93.3	2326	93
Father's occupation	Self-employed	385	36.1	433	30.2	818	32.7
	Government staff	241	22.6	403	28.1	644	25.8
	Manual worker	194	18.2	271	18.9	465	18.6
	Company Staff	132	12.4	192	13.4	324	13
	Farmer	26	2.4	31	2.2	57	2.3
	Don't know	89	8.3	103	7.2	192	7.7
Mother's occupation	Dependent	542	50.8	694	48.4	1236	49.4
	Self-employed	297	27.8	313	21.8	610	24.4
	Manual worker	116	10.9	253	17.7	369	14.8
	Company staff	33	3.1	65	4.5	98	3.9
	Government staff	43	4	46	3.2	89	3.6
	Farmer	12	1.1	17	1.2	29	1.2
	Don't know	24	2.2	45	3.1	69	2.8

“Sometimes, I had to request my friends to borrow his notebook to copy as I couldn't catch up on all the lectures.... And they helped me”. (Grade 7 schoolboys from one High School).

School children expressed various perspectives after wearing spectacles. They emphasized that the spectacles improved visual acuity. Clearer eyesight made them have more confidence. They also enjoyed to be tested by an experienced optometrist and received spectacles that fit perfectly for free. Some physical barriers were identified during discussions regarding spectacles wearing compliance. Some schoolgirls mentioned cosmetic reasons. However, some schoolboys explored spectacles wearing as a hindrance to their physical activities. Only one participant intensely stated that he had a problem protecting his spectacles from friends as they were constantly teasing him. He explained as follows.

“They are always teasing me to break down my glasses whenever there's a chance...I don't mind but it annoys me”. (A Grade 8 student from a High School).

Some school children expressed social and psychological barriers during discussions. They had concerns about the cost of purchasing spectacles and accessing quality services on their next check-up. Some had feared to be the life-long spectacle-wearers. Some also stated that their parents were not supportive to wear spectacles. One schoolgirl mentioned as follows.

“My eyesight became better with glasses but Amay (mother in Myanmar language) told me not to wear it all the time because I am so young to wear glasses”. (Grade 7 school girl).

Some expressed their concerns about the time availability of parents to accompany to optical store and taking good care of parents on their vision care. A few adolescents felt that their parents did not fully understand their vision problems. “I'm afraid it will be difficult for me to make a new one when it (current glasses) was broken. I supposed [Aphay father in Myanmar language] will be busy to accompany me to the optical store” (A schoolgirl aged 14 years).

Teachers' perception and their role as volunteers

Four focus group discussions were conducted with 32 teachers from four public schools. All teachers had over 5 years of teaching experience. The main themes that evolved during discussions were “prior misconceptions about the student with RE”, “positive perspectives on the school-based vision screening program”, and “willingness to involve as volunteers in the program”.

During FGDs, the majority of teachers stated their previous misunderstanding on the children with RE that these students had no willingness to learn well. They had noticed some behaviors among students with RE.

“While I (teacher) was explaining the lessons, two of my students repeatedly rubbed their eyes and gazed at the books of their friends. I previously thought that they (students with RE) didn’t wish to learn or write. (one 48 years old teacher in FGD in one High School). Apart from one teacher who emphasized that some brilliant students had no motive to share notes with them, almost all teachers stated that the students with RE were seen positively by most of their peers in the class.

“If they couldn’t see the board clearly, they copied the lessons from their nearby friends who helped them as they fond of each other” (FGD in one Middle School).

Nevertheless, teachers expressed an encouraging and optimistic view regarding the barriers and difficulties encountered by the students with vision impairment. *“We have neither difficulties nor annoyances due to the presence of students with poor vision in class”.* (A 45-years old teacher from one High School).

All teachers stated positive perspectives on students’ behavior in class after wearing spectacles. The students showed better concentration, attention, and became more engaged in class. They seemed delighted on receiving spectacles. They preferred to choose spectacles of different frame, color, and size rather than felt shyness to wear spectacles. One teacher said that,

“I didn’t notice any students who didn’t want to wear glasses. They were happy as they got a frame of their favorite color and shape”. (A 55 years-old teacher from a High School). Another teacher added. *“In my experience, some students with spectacles were used to be teased by calling nickname, for example, “Four-eyes”. But it changes. There are many students with spectacles and they were not in the minority. I assume this is an era of wearing spectacles”.* (A 45 years-old teacher). Regarding their role as volunteers to take part in a school-based vision care program, almost all teachers showed their willingness. Though they had many chores to do, they showed optimism and enthusiasm to be a volunteer.

“It was like a one-stop service. No need to go to the optical shop or hospital. It was also very convenient for some students with poor visions who need referral services and we are happy to be a part of this program.” (42 years old teacher who has volunteered in the study program in her school). Conversely, one teacher claimed that this task took time. *“I can, but, hmm hmm. I have many duties to do in school. Many...many.in all means and ways to do in all-inclusive works. I will be. But, I’m busy”.* (A 50 years old teacher from High School located in Yangon downtown).

The service providers’ perspectives on the school-based vision screening program

“The human resources factor”, “technology and logistics”, and “awareness of eye health among the community” were three themes that emerged in the in-

depth interview with an ophthalmologist and three optometrists regarding establishing a school-based vision screening program.

One senior pediatric ophthalmologist mentioned the limitations of human resources as follows; *“We have many limitations of human resources to establish the program...less than 400 ophthalmologists are working mainly at the tertiary level hospitals to take care of the referral cases from the whole country. No one at the community level”.* (49 years old ophthalmologist working at the tertiary level hospital).

Likewise, other senior ophthalmologists showed the same view highlighting that more optometrists need to be trained to cover human resource requirements. However, a training program for optometrists requires a minimum of two-years. The other limitation explored at the KIIs of the optometrists was the career ladder of the optometrist cadre. The maximum potential of a gazette officer makes the applicants less interested to choose this career. In interviews with senior optometrists, they expressed their perspectives on limited human resources for vision screening.

“During this school-based vision screening program like a campaign, we all can all involved. But, I think, it will not be an easy job to launch this activity countrywide as a community service. We have our routine duty in the hospital”. (A 52 years old, senior optometrist). Two out of five ophthalmologists showed different views regarding the solution for human resource limitations. One mentioned as follows: *“We have no optometrists in School Eye Health Program to cover the school-based eye care program nationwide. However, we can provide “Primary Eye Care training” to School Health Doctors and BHS to screen the vision of school children on their school health examination visit. We can tell them to refer if necessary”.*

The other ophthalmologist added that “the Trachoma and Prevention of Blindness Program” conducted by the Ministry of Health had about 20 ophthalmologists. They were sanctioned mainly focused on the most prevalent areas of trachoma in Myanmar in the past. They could be re-allocated to provide community service like a school-based eye care program.

Regarding technology and equipment, one ophthalmologist mentioned that the discrepancy between objective refraction and subjective refraction makes it less reliable to do eye examination among children of young age. He highlighted that patient’s cooperation is required in subjective refraction to provide the best-corrected visual acuity. *“The reliability of subjective refraction usually depends on the age of the child. The younger the child, the less accurate the result will be...sometimes we require cycloplegic refraction. But, it is a challenge for us to do cycloplegic refraction in the community”.* (An ophthalmologist working at the tertiary level hospital).

The majority of ophthalmologists mentioned using portable auto-refractometer in a school-based vision screening program. One said, *“It is fundamental to have a retinoscope costed about 700,000 MMK (≈US\$ 500), but it is time-consuming and labor-intensive. I think it is better to have a portable auto-refractometer to use on mobile trips. It costs about 5,000,000 kyats (≈US\$ 35,500)”*.

To increase awareness about vision impairment in the community, one ophthalmologist emphasized that some eye health problems, for example, amblyopia and strabismus were less awareness among the general public as follows; *“Amblyopia or “lazy eye” is another reason why detecting and treating vision problems in childhood is critical ...let’s say... if it is detected later in life, it is often too late to recover normal eyesight”*.

Others claimed that counseling parents to prescribe spectacles to their children was a big problem for them. The majority of parents had misbelief that wearing spectacles at a young age makes their children’s eye problems worse. They mentioned more awareness-raising programs on limiting screen time will be required. One senior ophthalmologist pointed out as follow. *“The role of parents is critical to reducing screen time. Some parents allow using of screens without time limitation rather than going outside. This brings serious consequences on the eyeball of the growing child ... you see... this is the result of frequent accommodation while using near devices like smartphones causing simple myopia in children”*.

DISCUSSION

School-based vision screening and the provision of spectacles are key global strategies to reduce avoidable blindness and visual impairment.²⁶ In our study, school children revealed vision problems as a barrier that hindering their academic performance, whereas after wearing spectacles, they achieved confidence in visual acuity. This was very similar to the finding in one US study, where improvement of school function and psychosocial well-being observed after receiving dispensing spectacles.⁴ However, cosmetic reasons in some schoolgirls, the reason of reduced ability to take part in games in some schoolboys, and concerns about the cost for new spectacles were found as negative perceptions in FGDs as in the Tanzania study.¹⁴

Our study also found the willingness of the teachers to be involved in the program although they had many routine duties. This finding was similar to a study in Thailand where willingness shown by teachers that the program was reasonable, feasible, and affordable.¹¹ Likewise, this finding was comparable to that conducted in the UK where the role of schools as facilitators to promote spectacle wear in young children.⁵

The perspectives on human resources for vision screening disclosed a huge gap to launch the school-based screening by the ophthalmologist and optometrists. These findings

were similar to those found in many other studies conducted in low- and middle-income countries, for instance, China, India, and Peru.²⁷⁻²⁹ The study also explored the logistics requirements of portable auto-refractometers and hand-held ophthalmoscopes on mobile school health visits and the necessity to raise awareness of the parents on vision impairment encountered by schoolchildren amid the alarming progression of screen time. One promising opportunity to establish a school-based vision care program in Myanmar was that, though it took times, human resources, and logistic requirement, the program could be launched by extension of providing primary eye care training to all School Health Doctors and Basic Health Staff who are performing routine school health examination nationwide.

CONCLUSION

Despite having many resource limitations, a school-based vision care program in Myanmar can be initiated as a pilot project before the extension to the nationwide program for three main reasons; students received both academic and psychosocial benefits with fewer barriers from the program, teachers could be volunteers for the school-based screening program, and primary eye care training could be provided to School Health Doctors and Basic Health Staff, who are performing routine school health examination accompanied by volunteered teachers.

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