

ORIGINAL ARTICLE

Refractive Error and Vision-Related Quality of Life in South Indian Children

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ABSTRACT

Purpose. To understand the vision-related quality of life (QoL) of schoolchildren with uncorrected refractive error (URE).

Methods. A snapshot qualitative research design and homogeneous sampling strategy was adopted. Thirty-one, 27, and 22 eye care practitioners, children, and teachers participated in four, three, and two focus group discussions, respectively. The participants were recruited from various parts of Chennai, India. The discussions were audio recorded, transcribed, coded, and analyzed.

Results. Eight themes emerged: complaints and symptoms of children with URE, vision-related activity limitation, coping strategies, psychological impact, social impact, the perceived difference after first time refractive correction, reasons for refractive error remaining uncorrected, and the significant amount of refractive error.

Conclusions. The study gives a holistic view of the vision-related QoL of children with URE by demonstrating the difficulties and problems that they face in their day-to-day life and also by describing the perceived difference in QoL after wearing refractive correction.

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Key Words: uncorrected refractive error, quality of life, qualitative research, children

Uncorrected refractive error (URE) is the leading cause of visual impairment in children, the prevalence of which in India ranges from 2.7 to 6.4%.^{1–4} The World Health Organization (WHO) has prioritized URE in its Vision 2020—Right to Sight Programme.⁵ Although many initiatives have been taken to improve the accessibility and affordability of eye care services to combat URE,^{6,7} the uptake and use of refractive correction by children are poor, even when spectacles were provided free of cost and “satisfaction with current vision” was identified as one of the reasons for poor spectacle compliance.⁸ Although eye care practitioners (ECPs) often assume that URE affects the development and maturity of children and impairs their learning abilities and academic performance,⁹ the impact of URE on the vision-related quality of life (VR-QoL) of children remains unexplored. To understand the problems posed by URE in reality and to explore the reasons for refractive error

remaining uncorrected, it is necessary to review its burden in the context of “quality of life.” Pediatric health care professionals have started realizing the importance of understanding how the child feels about self. Researchers emphasize that health-related QoL assessment provides valuable information about the different aspects of health of the child and could improve clinical management, by optimizing therapeutic strategies and identifying effective treatment.¹⁰ Thus, the aim of the study was to understand the VR-QoL of schoolchildren with URE, qualitatively.

METHODS

A snapshot qualitative study design, which helps in understanding the current perception, beliefs, and behavior of participants at the time of research, was adopted. A purposive, homogeneous sampling strategy was used to recruit participants—children, ECPs, and teachers. Focus group discussions (FGDs) were conducted to collect data.

FGD with Children

Three FGDs were conducted among 27 children. Out of which, two FGDs were conducted among children with URE (URE was defined as myopia < −0.25 diopters [D], hyperopia > +0.25 D, or

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astigmatism < -0.25 D) and one FGD with children wearing spectacles. The children were identified from the school screening program of Elite School of Optometry, Medical Research Foundation, Chennai. Both primary and high school children were included. Homogeneity of the groups was maintained based on grade (primary/high school) and medium of communication (English/Tamil).

FGD with ECPs

Three FGDs and one FGD were conducted among optometrists and ophthalmologists, respectively. The ECPs (optometrists and ophthalmologists) were from tertiary and independent practice eye care settings. Eye care practitioners with at least 1 year of experience and willingness to participate in the study were recruited for the discussion.

FGD with Teachers

Two FGDs were conducted among government and private school teachers. The teachers were identified from the schools in which the screening program was conducted. Primary and high school teachers were included in separate discussions to maintain homogeneity.

FGD Guide

The WHO definition of QoL was used as a framework to develop the FGD guide, and exclusive FGD guides were developed for each stakeholder. The WHO defines *quality of life* as an “Individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.”¹¹ It comprises a range of concepts including a person’s physical health, psychological state, level of independence, social relationships, personal beliefs, and their relationship to salient features of their environment.¹¹ Vision-related QoL can be defined similar to QoL but in the context of visual impairment. The FGD guides addressed the following domains: complaints of children with URE, their visual functions, vision-related activities, limitations, reasons for refractive error being unnoticed, psychological and social impact, academic performance, and factors affecting spectacle compliance. In addition, the ECPs were questioned about the amount of refractive error that they considered significant enough to impair the VR-QoL of children, and the children wearing spectacles were asked to articulate the difference they felt before and after refractive correction. The FGD guide was refined by expert opinions and was tested for efficiency with mock discussions.

The principal investigator (SEK) moderated the discussions and the note taker (DS) recorded the nonverbal cues of the participants. All discussions were audio recorded. The FGDs were conducted until redundancy of responses was obtained in every domain. Informed consent to participate in the study was obtained from the ECPs and teachers whereas oral assent was obtained from the children in addition to consent from their parents and school management.

Coding and Data Analysis

Verbatim transcription of FGDs in English was performed by SEK. Three FGDs that were conducted in Tamil were translated

into English by the principal investigator (SEK), keeping in mind the context in which it was stated. The transcribed verbatim was verified for conceptual equivalence by all the coinvestigators (DS, SMB, and KKR). The differences that arose were solved by re-translation and discussion until consensus was achieved. Data familiarization was done by repeated reading of the transcribed text. The familiarized data were then coded manually using both deductive and inductive approach. The themes were generated by grouping the similar codes after attaining mutual concurrence among the investigators.

The study was conducted with adherence to the Declaration of Helsinki, and it was approved by the institutional review board and ethics committee of Vision Research Foundation, Chennai.

RESULTS

Demographics

The mean ($\pm$ SD) age of the children who participated in the study was 10.1 ($\pm$ 2.3) years; 14 were male and 13 were female. The mean ($\pm$ SD) age and experience of the ECPs were 33 ($\pm$ 7.6) years and 9.9 ($\pm$ 8.3) years. The mean ($\pm$ SD) age and experience of the teachers who participated in the study were 41 ($\pm$ 8) years and 14 ($\pm$ 9) years. Forty-eight percent ($n = 13$) of the children had simple myopia, 22% ($n = 6$) had compound myopia, 11% ($n = 3$) had compound hyperopia, and 19% ($n = 5$) had astigmatism.

Themes of Analysis

Eight themes emerged out of the qualitative analysis. They are as follows:

1. Complaints and symptoms of URE
2. Vision-related activity limitation
3. Coping strategies
4. Psychological impact
5. Social impact
6. Perceived difference after first time refractive correction
7. Reasons for refractive error remaining uncorrected
8. Significant refractive error

Complaints and Symptoms of URE

Most children with URE complained of difficulty in distant vision, particularly difficulty in reading what the teacher writes on the blackboard at school and watching television at home. Headache, eyestrain, eye pain (toward the evening), watering of eyes, and difficulty in recognizing faces (especially in the dark) were also expressed by children with URE.

“I can’t see the board from where I sit. So I go to the front and sit on the floor, near the board. One of my teachers writes big. During her class I will sit in my usual place, on the bench.” (FGD 9: child with URE).

Children who were corrected ametropes recalled similar problems before spectacle correction.

“My eyes used to water very often, and I even used to shrink my eyes while seeing. It used to pain a lot while seeing computer or TV for long time. It used to pain a lot.” (FGD 4: child wearing refractive correction).

Eye care practitioners added glare, redness and swelling of eyelids attributed to frequent rubbing of eyes (in an attempt to see clearly), abnormal head posture, frequent blinking, and squeezing of eyes as complaints reported by parents of children with URE who visit their clinic or hospital.

From their experience, the ECPs articulated that children with uncorrected myopia usually squeeze eyes and express difficulties related to distant tasks like watching TV (reading cricket scores/flash news), whereas children with uncorrected hypermetropia complain of headache, eyestrain, and difficulties in performing near tasks like prolonged reading. Some ECPs mentioned that many younger children with hypermetropia are asymptomatic. In addition to eyestrain and headache, complaints of glare and irritation in eyes were said to be common in children with uncorrected astigmatism.

“The first symptom that the parents notice is that the child goes closer to the TV and watches it. At first they are not aware that the child unable to see the blackboard at school, but on seeing incomplete class work of their child, they feel that they should have an eye exam and brings them.” (FGD 3: optometrist/independent practitioner).

Teachers corroborated that they usually suspect refractive error in children if the child makes mistakes when copying from the board, holds book closer, misses words, or skips lines while reading. They also felt that these children are slow learners and have slower reading speeds. Most teachers claim to inform parents about their child’s problem and advise eye examination.

“We have steps... ladder in learning. These children are slow learners. They are not able to concentrate and read even for 10 minutes. They make lot of spelling mistakes.” (FGD 6: primary school teacher).

Vision-Related Activity Limitation

Children with URE expressed activity limitation at home and school, which was corroborated by ECPs and teachers. Issues related to sports and mobility were also identified.

Activity Limitation at Home

Children reported difficulty in doing homework, prolonged reading, using computer, drawing, and painting within borders of the picture. Eye care practitioners reasoned that children avoid reading and refuse to do homework owing to symptoms like eyestrain and headache.

“I am not able to see outlines properly while coloring. I color outside the borders.” (FGD 9: child with URE).

A small number of children reported difficulty in recognizing the time from a wall clock, reading books made of recycled paper (because of its dullness), and recognizing friends while playing in the dark (late evening).

“Once when I was in my grandfather’s place, my spectacle was broken. There I suffered a lot. We used to play on the roads at nights. We’ll play hide and seek and all those things. My friend would be standing just here (points hand nearby)

in the shadow, but I wouldn’t see him. I’ll think it is a shadow and I’ll just leave him.” (FGD 7: child wearing refractive correction).

Activity Limitation at School

The major activity limitation at school was difficulty in reading what was written on the blackboard and copying notes without mistakes. Some children expressed that they hesitate to take part in cocurricular activities and competitions. The teachers added that they are unable to concentrate for a long time or write in a straight line. However, a small number of children with URE contradicted that they write in a straight line and have a good handwriting. A small number of ECPs thought tasks like matching colors or forms and craft activities might be difficult, which was confirmed by teachers.

Many children with URE admitted that their academic performance was only average and related it to their vision-related problems. Children wearing refractive correction were able to recall their limitation to perform well in academics before spectacle wear.

“I copy wrongly from the board and because of the mistakes I will get less marks and fail.” (FGD 4: child with URE).

“Before wearing glasses, I used to copy all the numbers wrongly while doing Mathematics and I used to get less marks. But, after wearing glasses, I write all the sums correctly and now I am getting good marks.” (FGD 7: child wearing refractive correction).

Most ECPs hypothesized that URE has an effect on academic performance especially for children in middle and high school, owing to the increase in visual demand. Although many teachers agreed that there is an improvement in a child’s performance after refractive correction, some teachers felt that there was not much difference in performance but an improvement in their level of confidence.

Activity Limitation Related to Sports

Children with URE preferred to participate in athletics and play indoor games and video games. The children wearing spectacles stated that it was difficult to focus and track the ball while playing and few said that it was even difficult to aim while playing carom, before spectacle wear. The ECPs hypothesized “poor eye-hand co-ordination and fear of being hurt while playing” as the reasons for avoidance of outdoor games. Children articulated symptoms like headache and eye pain when playing without refractive correction. Teachers agreed that children with vision problems avoid playing in groups and mentioned that their performance is better in athletics.

(While playing cricket) “I will think ball is coming on this side and keep the bat there, but it will come somewhere and I will miss it.” (FGD 9: child with URE).

“Children (with vision problem) stumble. If they have to catch a ball it is difficult. They become nervous.” (FGD 6: primary school teacher).

Mobility-Related Issues

Most of the children did not have any concerns with mobility whereas very few stated that they slip and fall. The ECPs expressed that uncorrected high myopes may have difficulty in mobility and some felt that children with URE face difficulty to learn cycling, which was contradicted by children. Although teachers thought these children might have difficulty in moving around in the dark, it was not voiced by children.

Coping Strategies of Children with URE

When probed about how they manage their day-to-day activities, the children with URE reported that they sit closer to the blackboard or television. At school, they take help from friends and teachers by asking them to recite or dictate, and parents or siblings help them at home. Teachers also claimed to help these children by writing bigger on the board and helping them to read and write.

“I asked my friends to dictate and I write down.” (FGD 7: child wearing refractive correction).

Children showed a tendency to avoid vision-related activities that are difficult, if they had a choice or an option, which was rightly hypothesized by ECPs. According to few ECPs, uncorrected myopes manage by squeezing eyes to see clearly. Some also felt that auditory and tactual senses were used as alternatives.

“They tend to involve in activities which does not require much visual demand.” (FGD 1: optometrist in a tertiary care hospital).

Psychological Impact of Children with URE

According to some children, parents and teachers overlook their problems and do not believe them when they complain. Instead, they blame them for making mistakes and for their poor academic performance.

“I told I need glasses but my father said ‘No, your vision is good only.’” (FGD 4: child with URE).

“My mom used to scold me. No one in the family believed me when I said I have vision problem.” (FGD 7: child wearing refractive correction).

The children who were wearing spectacles expressed that they felt inferior when they identified that they had a problem in seeing. Few children claimed that parents related their complaints to activities like watching TV for a long time and not eating well. Eye care practitioners and teachers had similar opinions.

“My mom scolded me that it is all because you always watch TV and play computer, you are having these problems and then she told lets go for an eye checkup.” (FGD 7: child wearing refractive correction).

Other than these, there were no psychological issues reported directly by children. However, ECPs and teachers articulated that ignorance and disbelief of parents may have a negative impact on

the child leading to low confidence, low self-esteem, inferiority complex, and depression. They also expressed that these children have a fear of being embarrassed by peers for incompetence.

“When his parents came to collect report card, I told his parents to get his eyes checked but his parents did not accept that he had a vision problem. Whole 7th standard, he suffered a lot.” (FGD 8: high school teacher).

Social Impact of Children with URE

The children with URE did not express any issues in socializing or making friends. However, teachers and ECPs expressed that children with vision problems prefer to stay alone and avoid group activities because of fear of embarrassment. They added that these children make friends with those who do not embarrass and help them. A small number of ECPs considered myopes to be more close work related and of introvert personality.

“They don’t have many friends. They have relationship with those who don’t tease them and those who help them.” (FGD 6: primary school teacher).

The study identified that there still exists a social stigma for girls wearing spectacles. Some ECPs and teachers shared that parents of some female children consciously hinder their child wearing glass with a feeling that she may be looked down in society.

“We went for a camp 3 days back. A girl had $-3.5D$ in one eye and $-4.0D$ in the other eye, but the girl is not wearing any glasses. Her father said that he don’t want his daughter to wear spectacles. He don’t want people to see her wearing glasses as he fears that nobody will come forward to marry her in the future.” (FGD1: ECP/optometrist practicing in a tertiary eye care hospital).

A small number of ECPs felt that children face social and psychological issues only after wearing spectacles. This was corroborated by many children wearing spectacles. Being teased, being called by names, and being mocked by friends for wearing spectacles were stated as major issues. They also expressed that playing outdoor games with spectacles on was uncomfortable, which led to embarrassment by friends.

“I was happy and enjoyed when I wore the specs for the first time. After reaching school, my entire mood was spoiled. My friends started teasing me. The whole day I was irritated.” (FGD 7: child wearing refractive correction).

Perceived Difference after First Time Refractive Correction

The children wearing spectacles recalled and contrasted the difference perceived before and after wearing spectacles. Most of what the children articulated was substantiated by the teachers, who, in their experience, have observed students’ behavior before and after refractive correction.

Perceived Benefits

Improved clarity in seeing, comfortable reading distance (for high myopes), less errors/spelling mistakes, writing in straight

lines, and improved academic performance were stated as advantages by most participants. Many children claimed enhanced confidence level after wearing spectacles.

“Before, I was not able to read properly from the power point presentations projected in my class. Now, when I wear this glass, I am able to see clearly and when my teacher questions me, I am able to answer correctly.” (FGD 7: child wearing refractive correction).

Perceived Drawbacks

The major drawbacks of wearing spectacles were hindrance to play and participate in certain extracurricular activities like dance, in addition to pains and scars on their nose and temples. Many children felt that spectacles are not cosmetically appealing. One child candidly said that he dislikes wearing spectacles and used to break them often.

“While playing volley ball, I will be afraid that the ball may hit my specs and break. So I will just go away from the ball and I will not be able to get it. Sometimes, my team loses because of that!” (FGD 7: child wearing refractive correction).

Although most ECPs believed that refractive correction improves the QoL of children, a few stated that it may just have a “placebo” effect, especially in cases of mild visual impairment (visual acuity better than 6/12).

Reasons for Refractive Error Remaining Uncorrected

The ECPs mentioned that the child would not face much difficulty if the child has mild visual impairment or unilateral refractive error. They also felt that it is often overlooked and is spotted either through school camps or by accidentally closing the normal eye in case of unilateral refractive errors. In addition, some stated that the coping strategies adopted by the children (elaborated in theme 3) help them to perform their day-to-day activities, thus masking visual impairment. Few ECPs believed that many children, who so far had not used refractive correction, have not “experienced clear vision” or “seen things clearly” and hence live in ignorance. These children might not know that their vision can be better than what it is at present and hence might not complain.

“Unless the child has seen something which is better (clear), how will he know that what he is seeing is not clear?” (FGD 3: optometrist/independent practitioner).

Ignorance, unbelief, lack of awareness of the problem, and anticipation of emmetropic parents that their child would also be emmetropic were the other reasons identified. One ECP pointed out that the parents often attribute the complaints of children such as headache and eyestrain to other reasons rather than eyes.

“When children complain of eyestrain and headaches, parents think about a lot of other things rather than refractive error. They go to a general physician thinking it may be sinusitis, migraine or something else.” (FGD 3: optometrist/independent practitioner).

Social stigma for female children wearing spectacles and myths like “wearing glass at young age is not good and that it leads to deterioration of eye sight and progression of refractive error” were spotted as other reasons.

Factors Influencing Spectacle Compliance

The factors affecting spectacle compliance were articulated by the ECPs and teachers. Optimum correction, clear vision, symptomatic relief, good cosmetic appearance of spectacles, lightweight lenses, and motivation from parents and friends were quoted as reasons for good compliance.

Poor spectacle compliance was believed to be because of heavy spectacles, poor cosmetic appearance with spectacles, peer pressure, and embarrassment of wearing spectacles. Eye care practitioners also felt that children with unilateral refractive error or mild visual impairment do not comply well with spectacles. Less visual demand and no significant/perceived improvement in visual ability to perform day-to-day activities after refractive correction were hypothesized as reasons for poor spectacle acceptance by ECPs.

“Children say that their glasses are heavy and cause itching. So they just keep in their bag.” (FGD 8: high school teacher)

Many children with URE claimed that they like to wear spectacles and expressed their belief that using spectacles is advantageous as it would help them see well.

“If we wear glass, we need not go closer to the black board or TV. From distance we can see well.” (FGD 4: children with URE).

Significant Amount of Refractive Error

Refractive error as a major cause of avoidable visual impairment was brought out by many ECPs. The importance of refractive error correction, particularly for the pediatric population, was emphasized, especially in the context of better functioning and QoL. When probed about the amount of refractive error significant enough to affect QoL of children, diversified opinions arose. The responses ranged from -0.25 to -3.0 D of myopia, $+1$ to $+3$ D of hyperopia, and -0.5 to 3.0 D of astigmatism. Few ECPs were not sure about the amount of URE that affects QoL but believed that refractive errors that are amblyogenic would affect QoL. According to some ECPs, the significant amount of refractive error cannot be generalized as it depends on other factors such as age of the child and their visual demand.

“Having a criteria or a cut off is very difficult because everything is subjective for a patient because a patient who is more into studying is frequent to find symptoms for very low powers.” (FGD 3: optometrist/independent practitioner).

DISCUSSION

The current study is an initiative to understand the VR-QoL of children and the functional loss of visual impairment, qualitatively. It attempts to elicit understanding in the form of thick descriptions of the problems faced by the child functionally and in relation to their environment. Complaints, activity limitation,

coping strategies, and psychological and social issues have been explored. In addition to the well-known symptoms of URE, the study identified symptoms in the context of activity limitations and functionality like inability to copy without mistakes from the board, a consequence of impaired distance vision.

Focus group discussions were used to gather qualitative data. The advantage of focus groups over other qualitative methods is that, large amount of information can be gathered efficiently in a short time frame. Focus group discussion triggers the thought processes of the participants to provide more facts.¹² One constraint of focus groups is that some participants may be less expressive and some may be dominant. To overcome this, the moderator tried to balance the discussion by probing those who were less expressive to share their views. From the author's experience, it was found that children were comfortable to express their views in groups and were less anxious.

Focus groups were conducted with ECPs, teachers, and children. Eye care practitioners are directly involved in diagnosing and treating children with URE. They provided valuable information about the child's visual functioning and impairment. Eye care practitioners practicing independently and in hospitals were included, to tap a range of perceptions and experiences. Teachers were included in the study as they are the direct observers of the child at school and hence can provide information about their functioning and performance at school. They described the problems faced by children who lost or forgot to wear spectacles and behaviors of children before and after refractive correction.

Some ECPs felt that children with URE may not articulate or express all the difficulties they face, as they might think what they see is normal or cope up with their problems. Therefore, in addition to children with URE, children wearing spectacles were included and they provided important information about their QoL before and after wearing spectacles.

Children with URE expressed that their parents do not believe them when they complain about problems in eyesight. A qualitative study that explored parental awareness of children's eye problems also reported similar issues.¹³ The current study identified children with URE through a school screening program. It was only then that the parents of these children were aware of their child's refractive error. An informal discussion with these parents revealed that they were either anxious about the child's vision problem or defensive for being ignorant about it. Hence, the current study did not include parents as one of the stakeholders. Further studies to understand the perspectives of parents of children with URE may give more insights on parental barriers to spectacle wear and compliance.

The vision-related activity limitations hypothesized by the ECPs and teachers were substantiated by most children with URE and children wearing spectacles. On the other hand, a small number of children with mild, moderate visual impairment and unilateral refractive errors expressed that they had no difficulty in performing certain tasks. Children with no difficulties may not find improvement in functionality after wearing refractive correction and hence might not comply or accept it. Also, some ECPs felt that most children with URE have not experienced better clarity in vision and hence may be satisfied with their current vision, ignorant that they can see better. These findings of the present study may explain the poor spectacle compliance and

acceptance among schoolchildren, demonstrated by Li et al.⁸ and Castanon Holguin et al.¹⁴

In addition, the current study identified the parent- and child-related issues that influence spectacle acceptance and compliance. The pains and scars attributed to spectacle wear, which was spotted as the main disadvantage, can be addressed by facilitating appropriate and lightweight frame and lens selection for children. Custom-made frame selection based on individual facial measurements may help.

The current study also revealed that psychological issues like being embarrassed or teased by peers are experienced mostly by children after refractive correction. Similar reason has been quoted by 16.6% out of 86.1% of children who did not comply with spectacles in a study by Castanon Holguin et al.¹⁴ This suggests that peer pressure should be addressed while planning remedial measures to improve spectacle compliance among schoolchildren.

The barriers to refractive correction that have been identified and elaborated by the study can be used to formulate target-specific and problem-specific remedial measures; for example, awareness campaigns for parents may concentrate specifically on the issues that the parents are unaware.

The current study also explored the amount of URE that was considered to be significant by the ECPs. Different ECPs hypothesized different amounts of refractive errors to be significant, but in clinical practice, any amount of refractive error is usually prescribed. However, all the children wearing spectacles, irrespective of the amount and type of refractive error, perceived that their QoL improved after wearing spectacles. This is in agreement with a previous study by Estes et al.¹⁵ while contradicting the findings of Wong et al.¹⁶ It should be noted that both these studies used questionnaires that were not primarily developed for children with URE, which may be the reason for the difference. Therefore, it remains unclear whether the QoL of children is affected irrespective of the type and amount of refractive error they have and whether the prescribed spectacles make a meaningful difference in their QoL. Obtaining this information may help us in refining our prescribing guidelines from the QoL perspective and can help us target susceptible children while planning outreach programs.

Although the current study provides us an in-depth understanding of the VR-QoL of children qualitatively, the results cannot be generalized to the population and require quantitative measurement using a valid QoL instrument. Although certain refractive error-specific instruments are available, they were primarily developed for adults to measure the QoL after refractive correction and to compare the QoL of those with different types of refractive correction (spectacles, contact lens, and refractive surgery).^{17–20} To the best of our knowledge, SREEQ (Student Refractive Error and Eyeglass Questionnaire) is the only child-specific VR-QoL instrument developed by modification of PREP (Pediatric Refractive Error Profile) to measure the benefit of spectacle correction on VR-QoL of school-aged children who have previously worn glasses and who are currently wearing glasses. However, most of the items in the instrument targeted only the QoL issues related to visual functions. In addition, the instrument appears to have less-than-optimal reliability and the authors recommend addition of statements to enhance the instrument's performance.²¹ The current study may be useful in identifying items to re-engineer the existing questionnaires

and to develop a more reliable and elaborate instrument to comprehensively evaluate the VR-QoL of children.

In conclusion, the study gives a holistic view of the VR-QoL of children with URE by demonstrating the difficulties and problems that they face in their day-to-day life and also by describing the perceived difference in VR-QoL after wearing refractive correction. The similarities and differences in perceptions and opinions between the stakeholders have been displayed. The current perceptions, beliefs, and behavior exhibited in the study can be used to formulate target-specific awareness programs and strategies to combat URE, apart from facilitating improved understanding and clinical management by eye care professionals.

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REFERENCES

- Dandona R, Dandona L. Refractive error blindness. *Bull World Health Organ* 2001;79:237–43.
- Murthy GV, Gupta SK, Ellwein LB, Munoz SR, Pokharel GP, Sanga L, Bachani D. Refractive error in children in an urban population in New Delhi. *Invest Ophthalmol Vis Sci* 2002;43:623–31.
- Dandona R, Dandona L, Srinivas M, Sahare P, Narsaiah S, Munoz SR, Pokharel GP, Ellwein LB. Refractive error in children in a rural population in India. *Invest Ophthalmol Vis Sci* 2002;43:615–22.
- Padhye AS, Khandekar R, Dharmadhikari S, Dole K, Gogate P, Deshpande M. Prevalence of uncorrected refractive error and other eye problems among urban and rural school children. *Middle East Afr J Ophthalmol* 2009;16:69–74.
- Thylefors B. A global initiative for the elimination of avoidable blindness. *Community Eye Health* 1998;11:1–3.
- Qureshi MB. Training to meet the need for refractive error services. *Community Eye Health* 2007;20:48–51.
- Kyndt M. Importance of affordable eye care. *Community Eye Health* 2001;14:1–3.
- Li LP, Song Y, Liu XJ, Lu B, Choi K, Lam DSC, Zhang MZ, Zheng MW, Wang YF, Sharma A, Congdon N. Spectacle acceptance among secondary school students in rural China: the Xichang Pediatric Refractive Error Study (X-PRES)—Report 5. *Invest Ophthalmol Vis Sci* 2008;49:2895–902.
- Jose R, Sachdeva S. School eye screening and the National Program for Control of Blindness. *Indian Pediatr* 2009;46:205–8.
- De Civita M, Regier D, Alamgir AH, Anis AH, Fitzgerald MJ, Marra CA. Evaluating health-related quality-of-life studies in paediatric populations: some conceptual, methodological and developmental considerations and recent applications. *Pharmacoeconomics* 2005;23:659–85.
- WHOQOL: Measuring Quality of Life. WHO/MSA/MNH/PSF/97.4. Geneva: World Health Organization Programme on Mental Health, 1997:1–15. Available at: http://www.who.int/mental_health/media/68.pdf. Accessed July 23, 2014.
- Nassar-McMillan SC, Borders LD. Use of focus groups in survey item development. *The Qualitative Report* 2002;7(1). Available at: <http://www.nova.edu/ssss/QR/QR7-1/nassar.html>. Accessed July 22, 2014.
- Senthilkumar D, Balasubramaniam SM, Kumaran SE, Ramani KK. Parents' awareness and perception of children's eye diseases in Chennai, India. *Optom Vis Sci* 2013;90:1462–6.
- Castanon Holguin AM, Congdon N, Patel N, Ratcliffe A, Estes P, Toledo Flores S, Gilbert D, Pereyra Rito MA, Munoz B. Factors associated with spectacle-wear compliance in school-aged Mexican children. *Invest Ophthalmol Vis Sci* 2006;47:925–8.
- Estes P, Castanon A, Toledo S, Rito MAP, Ervin A, Wojciechowski R, Congdon NG. Correction of moderate myopia is associated with improvement in self-reported visual functioning among Mexican school-aged children. *Invest Ophthalmol Vis Sci* 2007;48:4949–54.
- Wong HB, Machin D, Tan SB, Wong TY, Saw SM. Visual impairment and its impact on health-related quality of life in adolescents. *Am J Ophthalmol* 2009;147:505–11.
- Vitale S, Schein OD, Meinert CL, Steinberg EP. The Refractive Status and Vision Profile: a questionnaire to measure vision-related quality of life in persons with refractive error. *Ophthalmology* 2000;107:1529–39.
- Berry S, Mangione CM, Lindblad AS, McDonnell PJ. Development of the National Eye Institute refractive error correction quality of life questionnaire: focus groups. *Ophthalmology* 2003;110:2285–91.
- Hays RD, Mangione CM, Ellwein L, Lindblad AS, Spritzer KL, McDonnell PJ. Psychometric properties of the National Eye Institute-Refractive Error Quality of Life instrument. *Ophthalmology* 2003;110:2292–301.
- Pesudovs K, Garamendi E, Elliott DB. The Quality of Life Impact of Refractive Correction (QIRC) Questionnaire: development and validation. *Optom Vis Sci* 2004;81:769–77.
- Crescioni M, Messer DH, Warholak TL, Miller JM, Twelker JD, Harvey EM. Rasch analysis of the Student Refractive Error and Eyeglass Questionnaire. *Optom Vis Sci* 2014;91:624–33.

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