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Eye glasses compliance among children undergoing school visual acuity screening in Nepal

Abstract

Purpose: The purpose of our study was to determine the compliance of spectacle wear among children undergoing school visual acuity testing with free distribution of eye glasses and explore the determinants for non compliance.

Methods: This was a population- based, cross –sectional study of 269 children of 12 schools in Chitwan district who received free eye glasses during school screening programs. A team of optometrists conducted unannounced visits to each school to assess spectacle compliance one year after screening. School records were used to confirm glass provision. Data were gathered on age, sex, school level, type of school (private/public), location of school (urban/rural) and parental education status. Interviews were performed using a questionnaire to determine the reason for non-compliance Spectacles were assessed for condition of lens and frame as well as fit.

Results: Of the 170 children 48(28%) were found to be wearing glass during the unannounced visit. Among the 48 children using glasses, only 30(17.7%) were wearing the same glass provided through school screening free of cost. Broken glasses was a major cause 47(38.5%) for non-compliance. Sixteen students (13.2%) reported that vision was not clear with the spectacles. Twelve (10%) of the students felt they did not require spectacles. Compliance was more among girls (32%) than boys (23%). Compliance was greater in private (31%) compared to public schools (26.8%) but was not statistically significant (p=0.56). Compliance was better with education status of the parents (P=0.016).

Conclusion: Better counseling, quality refraction, durable and cosmetically acceptable spectacles distribution is essential to ensure compliance of spectacle wear in school children. Therefore school screening programs should have appropriate modifications that create a mandatory system of follow -up of students with refractive error, so that provision of spectacle will have a real impact on these children.

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Introduction

The World Health Organization estimates that 13 million children aged 5-15 years worldwide are visually impaired from uncorrected refractive error.[1] Uncorrected refractive errors are the most common cause of visual impairment in school children in Nepal.[2,3] Correction of refractive error through provision of spectacles improves vision related quality of life and self reported visual function.[4–6] School visual acuity screening in Nepal is conducted by the Nepal Netra Jyoti Sangh through various eye hospitals[7] with support from many charitable and non- government organizations. However, in many areas, even when spectacles are provided for significant visual impairment, they are worn by fewer than 1 in 6 children and are available for use at school in less than half of the cases.[8] Unless compliance is high good, the efforts taken to provide corrective lenses are wasted. School vision screening programs in Nepal provide glasses following testing, but they do not include regular follow-up visits to deal with technical problems or to promote eye glass use. As a result, no one knows how many of those children provided free spectacles are actually wearing them and whether regular visits increase compliance. Our study determined spectacle –wear compliance among children in Nepal.

Methodology

This is a population-based, cross- sectional study of the Chitwan District of Nepal. A list of schools within Chitwan district, with school screening programs in 2014-15 was collected from the medical record department at Bharatpur Eye Hospital. Twelve of 18 schools were randomly selected, 8 were public and 4 were private. A team of optometrists conducted unannounced visits to each school to assess spectacle compliance one year after screening. School records were used to confirm glass provision. Data were gathered on age, sex, school level, type of school (private/public), location of school (urban/rural) and parental education status. Teachers were asked to gather students who had received glasses and direct inspection was done to see if child was wearing glasses. Children not wearing spectacles at the time of visit were termed non-compliant. Compliance was reported as percentage. Figure 1 shows the recruitment of school children and assessment for compliance.

Interviews were performed using a questionnaire to determine the reason for non-compliance Spectacles were assessed for condition of lens and frame as well as fit. Visual Acuity was noted for all students with or without spectacles with the help of externally illuminated paper chart placed at a distance of six meters. Students with presenting visual acuity less than 6/12 were advised to visit the hospital. The study was approved by the ethical committee of Nepal Netra Jyoti Sangh and verbal consent was obtained from the school authorities on behalf of the students, to take part in the study. Data were analyzed using SPSS.

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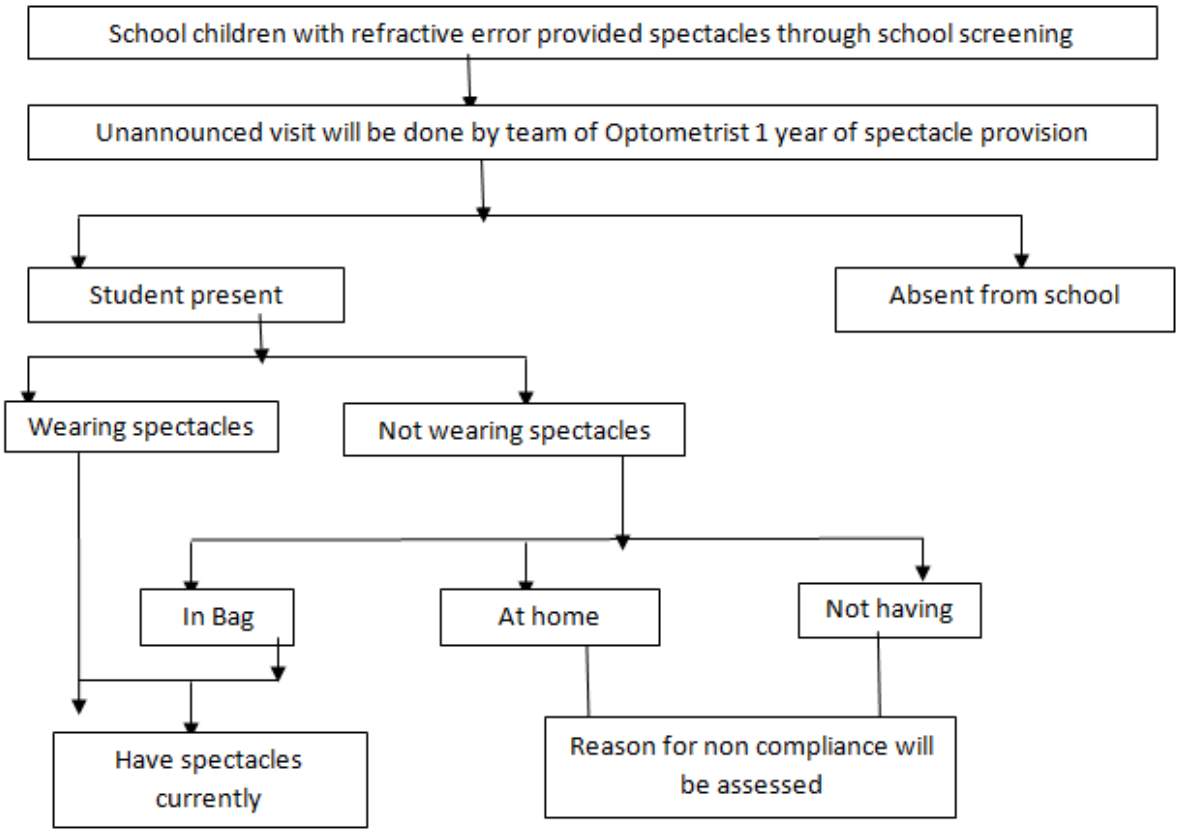

Figure 1 Flow chart showing recruitment of students in study.

Results

Out of 269 children that received glasses in 12 schools (8public and 4 private) only 170(63%) students were available at the time of school visit 1 year after the provision of free spectacles. Ninety nine (37%) of students were either absent, dropped out or left school for higher studies. Among the 170 students available 99(58%) were females. Mean age 13±2.08 years (range 7-16 years. There were no students below 5 years of age. The majority of students were between 11-16 years (Figure 2). One hundred and twelve (66%) enrolled in private schools.108 (63.5%) and urban areas (61.5%). Majority of the children were Aryan (86%) and only 14% were Mongolian in origin Table 1.

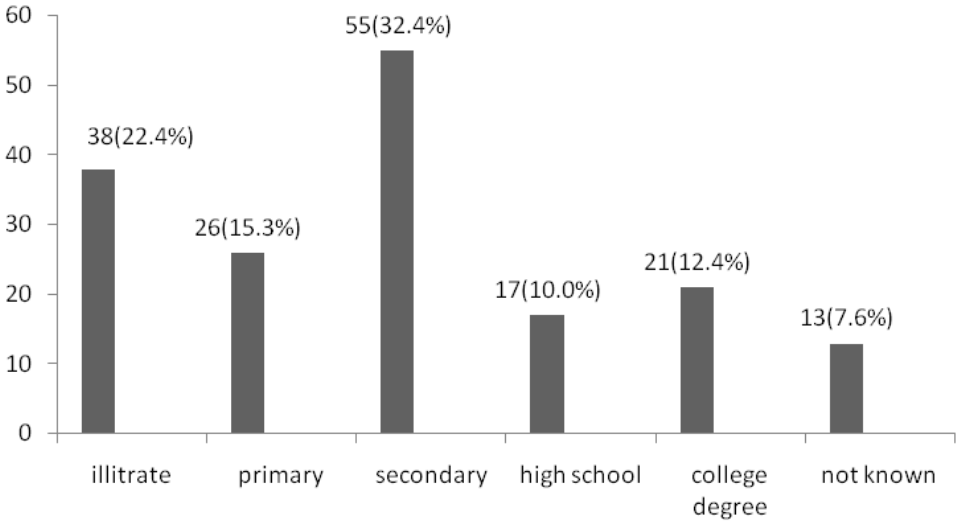

Figure 2 Parental educational status.

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Table 1 Age range of students

Age range	No of students	Percentage
0-4 years	0	0%
5-10 years	18	10.60%
11-16 years	152	89.40%

Of the 170 children 48(28%) were found to be wearing glass during the unannounced visit Figure 3. Among the 48 children using glasses, only 30(17.7%) were wearing the same glass provided through school screening free of cost. Eighteen (10.6%) were wearing glass which they purchased latter by themselves. Broken glasses was a major cause 47(38.5%) for non-compliance. Sixteen students (13.2%) reported that vision was not clear with the spectacles. Twelve (10%) of the students felt they did not require spectacles (Table 2).

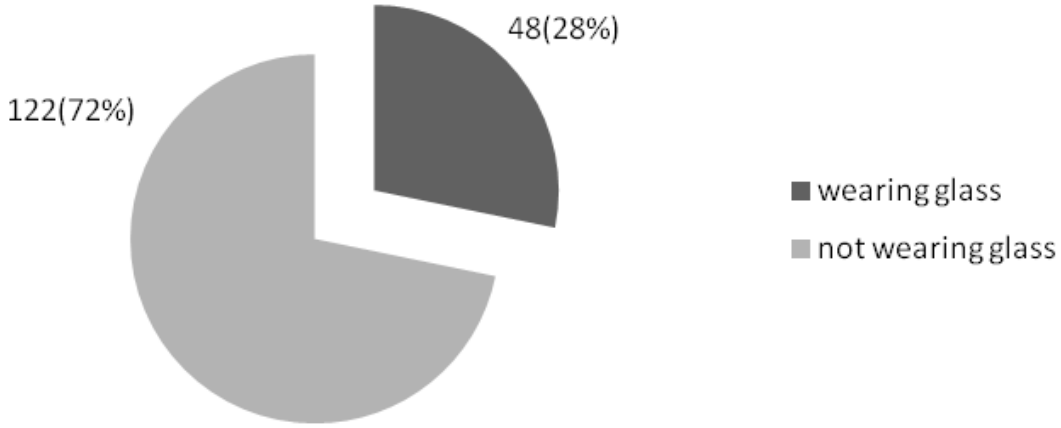

Figure 3 Spectacle wear and non wear among students.

Table 2 Reasons for non compliance with spectacle wear

Reasons for non compliance	Number of students	Percentage
Spectacle Broken	47	38.50%
Spectacle lost	10	8.20%
Forget spectacles at home	11	9.00%
Don't feel spectacles are needed	12	10%
Spectacles caused headache	10	8.20%
Vision not clear with spectacles	16	13.20%
Use spectacles only some time	4	3.20%
Concerned about teasing and looks	8	6.50%
Worried spectacles will make eye weak		0.00%
Parents disapproved of spectacles	4	3.20%

Compliance was greater in private (31%) compared to public schools (26.8%) but was not statistically significant (p=0.56). Compliance was more among girls (32%) than boys (23%). Compliance was found to better with the parental education level (P=0.016).Presenting VA was better than 6/18 in the majority 147 (86.5%) of children. 79(46.5%) of the children had presenting VA better than 6/9. Only 23(13.5%) of children had VA less than 6/24. More than 74% of students with presenting VA better than 6/18 were found not wearing spectacles.

Discussion

Compliance in our study was low (28%), but only 17.7% were found wearing the glass provided through school screening .Among the students wearing spectacles only 75% had the spectacles in good condition. Yabumoto et al[9] in their study in southern Brazil found that after 10 months of providing free spectacles 73.3% were reported to be wearing spectacles. Study in Oman[10] compliance was 71.6% among school children at a 1 year follow up visitwhich was much greater than in our study. Gogate et al[11] found the rate of compliance with wearing spectacles in rural secondary school children of Pune district to be 29.5% after one year from the provision of free spectacles which is almost similar to our finding. Study done in South India among school children of 7-15 years found compliance to be 57.8% when unannounced visit was done after 3 months of providing spectacles free of cost.[12]

Reported spectacle wear was significantly higher at 6 months compared with 12 months (p=0.001) in study conducted by Vincent et al[13] among the adult population. These findings show that longer the duration for follow up the lower the compliance with spectacles wear. So the compliance of spectacle wear among students in our study

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may have been low because of the longer duration of follow up after spectacle provision and only those actually wearing spectacles at the time of visit were termed compliant.

Studies from Oman[10] South Africa[14] and Mexico[8] found that girls were more compliant with spectacles wear than boys, which is similar to our study where compliance was 23% in boys and 32% in girls. But there are other studies, which have not found gender to be significantly associated with spectacle wear.

Our study found that spectacle broken (38.5%) was a major cause for non compliance. Students reported, blurred vision with spectacles, spectacles caused headache, parents' disapproval of spectacles, concerned about teasing and looks as other causes for not wearing spectacles. Similar to our findings the most common reasons for non wear was lost (44.9%) and broken (35.5%) of spectacles in study done by Messer et al[15] among primary Native American children who were provided spectacles free of charge through a school based vision program In a study[16] conducted among rural Chinese secondary school children, belief that spectacles weaken the eyes was the most common reason for no wear; this is in contrast to the findings in our study where none of the students reported this to be the cause for non compliance. Study conducted by Aldebasi[17] among children of primary schools at Qassim Province, Saudi Arabia found that disapproving spectacle wear by parents was among the main reasons for non- compliance.

Finding from studies indicate that lack of awareness and knowledge regarding the need and importance of using spectacles can be major barrier to spectacle wear among children. In our study we found that compliance increase with the education level of the parents (p=0.016) and also children in private schools were found to be more compliant compared to children in public schools (p=0.56). Compliance with spectacle wear was also found to be related to the status of visual acuity of the children. In our study compliance was more among students with poorer VA (P=0.012) compared to those with better VA. In several other studies[18–20] poorer visual acuity and higher amount of myopia have been found to be associated with compliance of spectacle wear.

Although school screening programs and provision of free spectacles have been conducted since long in Nepal, only limited or no information is available on the magnitude of the compliance of spectacle wear and their reasons. The compliance of spectacle has been very poor after one year of the provision of spectacles. Better counseling, quality refraction, durable and cosmetically acceptable spectacles distribution is essential to ensure compliance of spectacle wear in school children. Therefore school screening programs should have appropriate modifications that create a mandatory system of follow up of students with refractive error, so that provision of spectacle will have a real impact on these children.

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Conflicts of interest

The authors declare that there was no conflict of interest.

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