

## Original Research Article

# Spectacle adherence and barriers towards spectacle wear among primary school going children

Rakesh Kumar Yadav<sup>1\*</sup>, Anjali Rani<sup>1</sup>, Ashish Chander<sup>2</sup>

<sup>1</sup>Department of Optometry, <sup>2</sup>Department of Ophthalmology, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India

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### \*Correspondence:

Rakesh Kumar Yadav,

E-mail: [rakeshyadav.opt@gmail.com](mailto:rakeshyadav.opt@gmail.com)

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## ABSTRACT

**Background:** The aim of the study was to assess the spectacle adherence and barriers towards spectacle wear among primary school going children in the west UP.

**Methods:** A cross-sectional, descriptive questionnaire-based study was conducted among the primary school going children in rural area of west UP. Spectacle was provided after the comprehensive eye examination, free of cost to the children those who required. An uninformed visit was planned after 3 months of initial examination to assess the compliance of spectacle wear and non-compliant subjects were questioned about the reasons for not wearing spectacle.

**Results:** This study consists of total 158 children. In this study, majority of participants 88.61% were myopic having low degree of myopia being more common. Compliance rate towards the spectacle wear was high in males as compared to female children. Compliance rate was significantly varied with the age of participants. Myopic patients show more compliance than the hyperopic patients, it was insignificant while considering the severity of refractive error. The main cause for non-compliance towards spectacle was the cosmetic blemish.

**Conclusions:** It has been found that the compliance rate towards the spectacle wear was not good enough even after distributing the spectacle free of cost to the children. Various factors including cosmetic blemish, parents and children perception for wearing spectacle and difficulties experienced by the children while wearing glasses were responsible for the non-compliance. The compliance rate can be increased by providing the education and training and Counselling to school teachers, children and their parents regarding the eye health.

**Keywords:** Spectacle, Compliance rate, Spectacle adherence, Barriers

## INTRODUCTION

WHO estimated that moderate to severe distant visual impairment or blindness due to unaddressed refractive error was estimated (123.7 million, e.g. myopia or hypermetropia).<sup>1</sup> Refractive error, the most significant cause of visual impairment, can be completely compensated for with the use of glasses, contacts, or laser surgery.<sup>1,2</sup> Refractive error left unaddressed has a significant effect on both society and the individual.<sup>2</sup> Amblyopia can result from uncorrected refracted error if it

is not addressed promptly. Refractive error itself or its treatment may have a major impact on quality of life.<sup>4</sup> Early diagnosis of impaired vision development is crucial for children. Visual acuity and stereoacuity tests are helpful visual screening methods to find visual morbidity in preschoolers and school-aged children.<sup>5</sup> Spectacle remains unquestionably the most often utilised technique used worldwide to correct for refractive error.<sup>2</sup> The quality of life related to vision, productivity and self-reported visual function are improved by correcting refractive error using spectacle.<sup>6</sup> Undiagnosed and untreated vision problem

make it harder for people to develop to their full capacity and impose a heavier socioeconomic cost on society.

Various causes are thought to be responsible for refractive errors being untreated in developing countries, with the primary one being a lack of knowledge and identification of the problem at the personal, family, community, and public health levels. People with visual impairments may not be able to complete their school, may have trouble finding jobs, and may not be able to lead full lives. However, this is readily fixed by using glasses.<sup>7</sup> Numerous studies have shown that higher costs deter people from purchasing eyewear.<sup>8</sup> Cost, poor quality of eyewear, and lack of understanding regarding myopia and the advantages of its treatment are all obstacles to receiving refractive therapy.<sup>9</sup>

Ready-made eyewear is another strategy to increase access to spectacle in resource-constrained places. Compared to custom eyewear, ready-made eyewear can lower costs and improve service delivery logistics while attaining a similar level of wearer acceptance.<sup>8</sup> The acceptance of refractive services has been demonstrated to be significantly influenced by lack of knowledge, stigma, and irrational beliefs about refractive problems across many continents.<sup>10</sup> The study of knowledge and attitude in a population is crucial for reducing this impact through early diagnosis and the referral of schoolchildren to eye care services by school teachers.<sup>5</sup> The act of wearing the recommended eyewear correction on a regular basis is referred to as compliance with spectacles. The current study's goals are to evaluate the main factors that influence spectacle wear and the causes of non-compliance across various demographic groups, Age, gender and refractive error after providing free spectacles.

## METHODS

A cross-sectional, descriptive questionnaire-based study from May 2022 to October 2022 was conducted among 158 primary school going children of age group 4-15 years in rural area of West UP by department of Optometry, Teerthanker Mahaveer Hospital and Research Centre. Data was collected using convenience sampling. Patient having any history of ocular inflammation, ocular trauma and ocular or refractive surgery were excluded from the study. A classroom with ambient lightening was chosen in the school for the assessment of visual acuity using Snellen's acuity chart separately for each eye from the 6meter distance.

The participants were refracted with the help of retinoscopy. The participants who didn't get 6/9 vision with correction were referred to base hospital for further examination. Those who had best corrected visual acuity equal to or more than 6/9 were prescribed the required correction and were included in the study. The prescribed spectacles were sent to the school authority to distribute among the respective students free of cost. The pros and Cons regarding the spectacle usage were explained to the

students, teachers and parents. An uninformed visit was planned after 3 months of initial examination to assess the compliance of spectacle wear and non-compliant subjects were questioned about the reasons for not wearing spectacle. Informed written consent of the principal or class teacher of all the schools and assent of the children were obtained.

## Statistical methods

Data was recorded in Microsoft excel. Descriptive analysis of data was performed including mean, standard deviation, frequency and percentages by MS excel and Chi square test was used for inferential statistics using IBM SPSS statistics version 22.0.

## RESULTS

The study comprised of total 158 participants with 35 (22%) male and 123 (78%) female with their mean age of 10±2 years as shown in Figure 1.

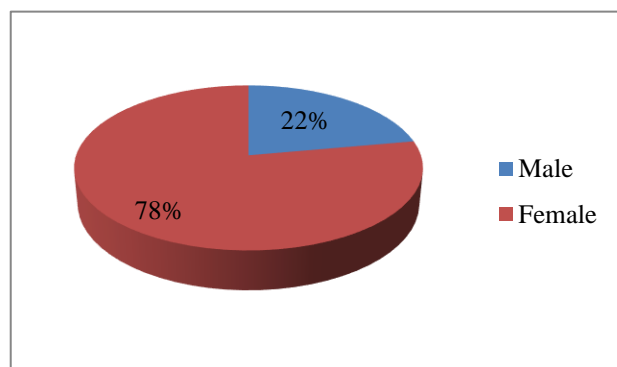


Figure 1: Gender of participants.

Table 1 showed that the majority of participants 124 (78.48%) were in the age group of 12-15 year followed by 23 (14.55%) in the age group of 8-11 years and 11 (6.96%) in the age group of 4-7 years.

Table 1: Age distribution of participants.

Age group (years)	n	%
4-7	11	6.96
8-11	23	14.55
12-15	124	78.48

According to American Optometric Association (AOA), on the basis of severity, refractive error was broadly divided into low, moderate and severe grade. It has been found that out of total 158 participants, 140 (88.61%) were myopic and 18 (11.39%) were hyperopic. Among myopic patients, majority 110 (78.57%) had low degree of myopia followed by moderate myopia 27 (19.28) and high myopia 03 (2.14%). Among hyperopic patients, 08 (44.44%) had low degree of hyperopia, 06 (33.33%) have high degree of hyperopia followed by 04 (22.22%) had moderate degree of hyperopia as shown in Table 1.

**Table 1: Distribution of refractive error.**

Type of myopia	n	%
<b>Myopia</b>	140	88.61
Low (<-3.00D)	110	78.57
Moderate (-3.00D to -6.00D)	27	19.28
High (>-6.00D)	03	2.14
<b>Hypermetropia</b>	18	11.39
Low (<+2.00D)	08	44.44
Moderate (+2.00D to +5.00D)	04	22.22
High (>+5.00D)	06	33.33

Table 3 showed that compliance rate was quite more among males (57%) than females (55%) which was

**Table 3: Compliance rate of spectacle wear.**

Parameters	Compliance		Non-compliance		P value
	N	%	N	%	
<b>Gender</b>	Male=35	20	57	15	0.99
	Female=123	68	55	55	
<b>Age group (years)</b>	4-7=11	06	45.45	05	0.03
	8-11=23	15	56.52	09	
	12-15=124	67	53.22	56	
<b>Refractive error</b>	<b>Myopia=140</b>	80	57.14	60	0.307
	Low=110	63	57.27	47	
	Moderate=27	15	55.56	12	
	High=03	02	66.67	01	
	<b>Hyperopia=18</b>	08	44.44	10	0.93
	Low=08	02	25	06	
	Moderate=04	02	50	02	
	High=06	04	66.67	02	

Out of total 70 participants who were non-compliant to spectacle wear, 35 (50%) responded that they do not wear spectacle because of the cosmetic reasons followed by the 14 (20%) participants answered that they do not feel the need to wear spectacle as shown in Table 4.

**Table 4: Reasons for non-compliance of spectacle wear.**

Type of myopia	n	%
<b>Broken glasses</b>	03	4.28
<b>disapproved by Parents</b>	06	8.57
<b>Cosmetically unappealing</b>	35	50
<b>Causes headache/eye strain</b>	06	8.57
<b>Not comfortable with glasses</b>	06	8.57
<b>Not needed</b>	14	20

**DISCUSSION**

Some studies reported the high cost of spectacle as the barrier of spectacle utilization.<sup>12</sup> In this study, spectacle was distributed free of cost to the participants, even though the compliance rate was 55.70% after 3 month of initial examination while previous study conducted by McCormick et al found that 60.1% of participants were compliance to spectacle wear.<sup>13</sup> This study showed that the

insignificant (p=0.99). Participants in the age group 8-11 year were more compliance to spectacle wear followed by 12-15 years (53.22%) and 4-7 years (45.45%) which was a significant difference (p=0.03).

Myopic subjects (57.18%) showed more compliance towards spectacle wear as compared to hyperopic patients (44.44%). The compliance rate was more among patient with high degree of myopia (66.67%) followed by low degree of myopia (55.56%) and moderate degree of myopia (55.56%). Similarly, patients with high degree of hyperopia showed more compliance rate for spectacle wear but the difference was insignificant.

compliance rate was not associated with the gender of participants as the difference was statistically insignificant which was similar to the study conducted by McCormick et al, Gajiwala et al and von-Bischhoffshausen et al.<sup>13-15</sup> Present study showed that participants in the age group 8-11 year were more compliant towards spectacle wear followed by 12-15 years and 4-7 years which was significant.

Similarly, McCormick et al and Bischhoffshausen et al found that the use of spectacle was significantly related to the age of children and compliance rate decreased with increased age.<sup>13,15</sup> Our study reported that the myopic patients showed more compliance towards spectacle wear and it was significantly related to the severity of refractive error while the previous studies showed that the compliance rate was similar in different types of refractive error but significantly depend on severity of refractive error. The study conducted by Narayan et al subdivided barriers to spectacle wear as physical, psychological and societal which includes scars on the face, unattractive frames contributing to poor appeal, adolescents feeling discriminated and set apart, fears of injury to eyes, difficulties in participation in sports to lack of parental involvement and negative attitudes of society toward spectacle wearers.<sup>12</sup> It has been found that the main reason

for not wearing spectacle was cosmetic blemish while another study reported that the broken spectacle and loss of spectacle was the main cause of non-compliance of spectacle wear.<sup>14,15</sup>

### Limitation

The limitations of the study were (a) less sample size; (b) multiple follow-up can be done; and (c) study can be conducted in urban area as well.

### CONCLUSION

Present study concluded that after comprehensive examination, spectacles were distributed as refractive correction to the participants who had refractive error. But, even after providing the spectacles free of cost to the participants, compliance rate towards the spectacle wear was not up to the mark. Several reasons were found for non-compliance of spectacle wear and cosmetic blemish was the main barrier for non-usage of spectacle. There is a need to educate the children regarding the refractive error and its corrections. Teachers and parents should be educated and trained about the consequences of not using the refractive correction adequately. Education towards eye care can be incorporated in curriculum of children so that the compliance rate or spectacle utilization can be enhanced and visual impairment and its burden on individual and society can be reduced.

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