

Original Article

Investigating the Causes of Spectacle Non-Tolerance in Patients at a Tertiary Eye Hospital in Nepal

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Abstract

Purpose: To find out the causes of the non-tolerance of spectacles used among the patients visiting Biratnagar Eye Hospital, Nepal.

Patients and Methods: This prospective cross-sectional study was conducted among patients visiting the optical department of Biratnagar Eye Hospital, Biratnagar, Nepal. Patients of age more than 20 years who fall under the definition of spectacle non-tolerance were included. Patients' spectacle intolerance was verified based on the tolerance limit criteria by the American National Standards Institute (ANSI Z80.1-2015).

Results: A total of 8,000 spectacles were prescribed during the 3 months of study period between April to June 2022. Among these prescriptions non-tolerance cases accounted for 104 patients. The mean age of patients was 41.63 ± 13.30 year, ranging between 20 and 70 years. From the total population, 61.55 % were male. The prevalence of spectacle non-tolerance was 1.3 %. The majority of non-tolerance occurred in the 41-50 age group (31.0 %). A major cause of non-tolerance to spectacles was dispensing error accounting for 48 % of cases, particularly notable among bifocal lens users.

Conclusion: It is crucial to exercise careful consideration when prescribing and providing glasses to patients. Practitioners should eliminate transcription errors completely, as they are unacceptable from a professional standpoint. Opticians should diligently verify all essential parameters for glasses and ensure proper alignment both on and off the face. This meticulous approach serves to reduce intolerance and elevate patient satisfaction with their spectacles.

Keywords: Spectacle; Patient Dissatisfaction; Intolerance.

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Introduction

Spectacles are the most effective means of correcting refractive error ¹. Precision in prescribing and fitting spectacles requires expertise. However, some patients face difficulty adjusting to their glasses, a condition known as 'non-tolerance' ². Addressing this issue is critical, as it may lead patients to discontinue their prescribed eyewear. Little attention has been given to understanding why some patients have difficulty tolerating their spectacles ³. From the available literatures, it is suggested that 1.6 % to 2.8 % of the patients which are prescribed spectacles at hospitals, community eye health settings, and private practice clinics need spectacle reassessment ³⁻⁹. This study aims to identify the reasons for spectacles intolerance in a tertiary eye care center. This research emphasizes the importance of understanding and addressing non-tolerance to ensure patients receive the full benefits of their prescribed eyewear.

Patients and Methods

A prospective cross-sectional study was conducted among the patients visiting the optical department of the Biratnagar Eye Hospital (BEH), Biratnagar, Nepal from April to June 2022.

The BEH is a super-specialty eye hospital (tertiary care center) in the eastern region of Nepal, providing comprehensive eye care services to patients from different parts of Nepal, India, and Bangladesh. This study was approved by the institutional review board of the BEH (Reference no. 57/A) and the study adhered to the Tenets of the Declaration of Helsinki.

The patients with age above 20 years, who came to the optical department with a complaint and fall under the criteria of non-

tolerance, were included in this study. Patient having any ocular disease condition affecting their vision and those who acquired glasses from outside optical shops but experienced non-tolerance with spectacles were excluded from the study. However, the issue of non-tolerance was addressed and resolved. The BEH has its own optical store, which provides quality services as per the optical needs of the patients. The optical department has its own quality protocol where spectacles are first verified based on the tolerance limit criteria as defined by the American National Standards Institute (ANSI, Z80.1-2015) ^{1,10}.

The data were collected from the recording book from patients who returned to the optical department due to dissatisfaction with their new pair of spectacles during the study period from April to June 2022. If the dispensing error was verified as primary reason, the spectacles were reassessed and an appropriate process was followed to fix the dispensing-related issues and the spectacles were re-dispensed. Otherwise, patients were referred to a senior optometrist for additional evaluation. If discrepancies in values were detected, the glasses were replaced. Alternatively, if deemed necessary, specific counseling regarding the lens design was provided. Details of the patient such as demographic data, power of the spectacle lenses, and the reason for reassessment and final management were obtained from the spectacle's reassessment record recorded during the study duration.

Operational Definition of Spectacle Non-Tolerance

Spectacle non-tolerance refers to a situation where a patient receives spectacles from practice, agrees to wear them in their usual environment, but subsequently returns

because they encounter difficulties or find it challenging to wear their new glasses³. In the criteria set for data extraction, the reasons for spectacle reassessment were classified into two categories^{3,11-13}:

- 1- Prescription errors in measuring refractive error (spherical and cylindrical errors $\geq \pm 0.50D$ and axis error $\geq \pm 10^\circ$), transcription error or documentation error while writing the prescription form.
- 2- Dispensing errors due to the dispatched frame or lenses, dispensing measurements taken, incorrect frame fitting, optical centration problems, or difference in prescribed power (spherical and cylindrical errors $\geq \pm 0.25D$, axis error $\geq \pm 5^\circ$).

The overall spectacle reassessment rate was calculated by comparing the number of recorded spectacle returns between April and June 2022 to the total number of spectacles dispensed during that timeframe⁹.

Statistical Analysis

The collected data was entered in Excel and imported to SPSS version 23 (Armonk, NY: IBM Corp). Data were presented in terms of percentages, pie- charts, and bar diagrams.

Results

A total of 8000 spectacles were dispensed, during the 3 months of the study period from April to June 2022, of which 104 patients came back with complaints of spectacles non-tolerance. The patients' with spectacles non-tolerance aged from 20 to 70 years with a mean age of 41.63 ± 13.30 years. From 104 patients with spectacles non-tolerance, 64 (61.55 %) were male and 40 (38.45 %) were female (Table 1). The prevalence of spectacles non-tolerance was 1.3 %.

The major causes of spectacles non-tolerance among patients entering the study

Table 1: Demographic characteristics of patients with spectacles non-tolerance

Gender	No.(n)	Percentages (%)
Male	64	61
Female	40	39
Age		
20-29	34	34
30-39	18	17
40-49	25	24
50-59	14	13
> 60	13	12
Total	104	100 %

were dispensing errors, prescription errors, counseling related errors, pathological causes, and binocular vision related errors (Table 2).

The spectacles non-tolerance due to pathology-related error was seen in 4 patients (cataract in one patient, keratoconus in one patient and retinal problems accounting for the other two cases), and binocular vision related errors (convergence insufficiency and binocular balancing) were observed in 3 patients (Table 2).

Dispensing related errors including alignment issues, fitting issues, frame issues, lens decentration and lens defect were observed in 50 patients (Figure 1).

Prescription related errors including transcription errors, incorrect add/working distance, variation in axis, cross compound power, overcorrection, and undercorrection

were observed in 24 patients (Figure 2).

Finally spectacles non-tolerance due to adaptation issues including bifocal adaptation issues, progressive addition lens (PAL) adaptation issues and single vision adaptation issues was observed in 23 patients (Table 3).

Discussion

The current study showed the prevalence of spectacles non-tolerance to be 1.3 % among our patients. Similar studies have reported rates of spectacles non-tolerance of 2.0 % to 3.3 %^{3-5,14}. The primary factor leading to intolerance in our study was identified as dispensing-related problems (48 %), followed closely by issues related to the prescription (23 %). This aligns with the findings of a study performed in Gurgaon, India¹⁵. When

Table 2: Major causes of spectacles non-tolerance among patients entering the study

Causes for non-tolerances	Number of non-tolerance	% of non-tolerance
Dispensing Error	50	48
Prescription Error	24	23
Counseling related Error	23	22
Pathological Error	4	4
Binocular vision related Error	3	3
Total	104	100 %

Table 3: Spectacles non-tolerance due to adaptation issues (n = 23)

Types of lens design	Number of subjects (n = 23)	Percentages (%)
Bifocal Adaptation Issue	12	52 %
PAL Adaptation Issue	08	35 %
Single vision Adaptation Issue	03	13 %

PAL: Progressive Addition Lens

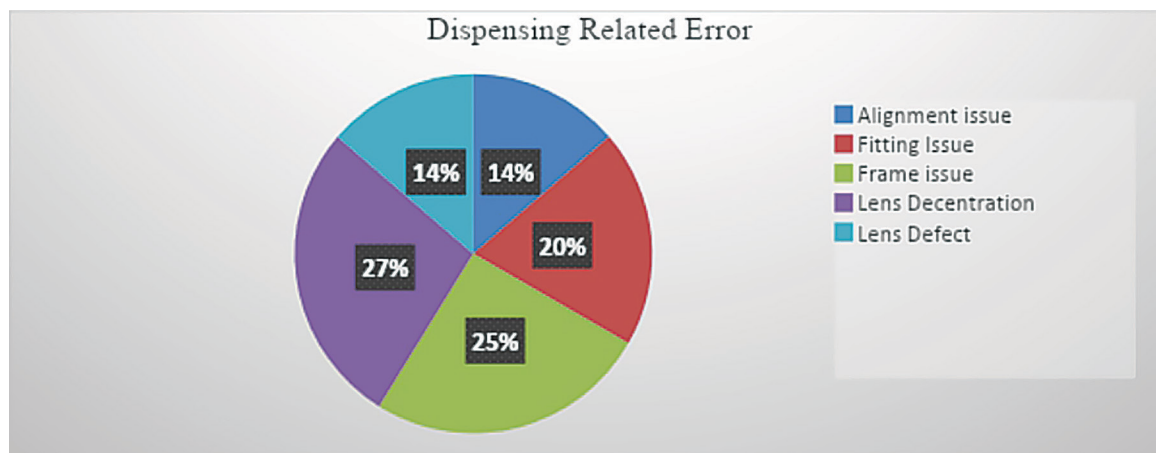


Figure 1: Distribution of spectacles non-tolerance due to dispensing-related errors (n = 50)

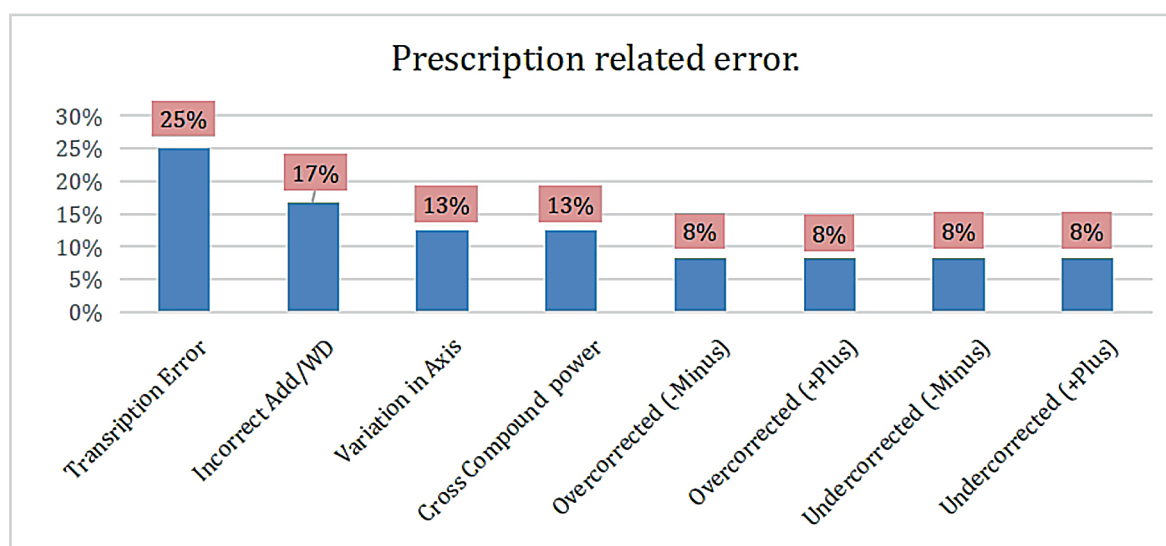


Figure 2: Distribution of spectacles non-tolerance due to prescription-related errors (n = 24)

we examined the dispensing-related errors in greater detail, it became evident that a substantial portion was attributed to lens decentration problems (27%), followed by frame-related issues (25%) which is in line with the results of previous studies^{3,16,17}. Additionally, we observed that a majority of complaints regarding spectacles non-tolerance originated from users of bifocal lens designs (45%), in contrast to those using progressive (14%) and single vision lenses (40%).

Next in line, prescription inaccuracies constituted 23% of the identified causes of

spectacles non-tolerance among our patients. Specifically, transcription errors (25%) were the most prevalent, followed by incorrect addition power (17%) in accordance with the habitual working distance. Additionally, variation in the axis (13%) was noted as another significant contributor to prescription-related intolerance. This pattern of findings resonates with the conclusions drawn in a similar study by Beesley et al.,¹⁷.

Various factors, including the initial use of bifocals, the duration required to adjust to a different lens design, transitioning from

bifocals to progressive lenses, and adapting to a new addition power based on customary working distance, can greatly influence an individual's ability to become accustomed to a new pair of glasses ². Alongside these considerations, counseling plays a crucial role in explaining the optical attributes of a particular lens design and the necessary period for becoming accustomed to its distinctive characteristics ².

The present study had some limitations. It is possible that all our patients may not be aware that they can seek assistance for issues related to spectacles non-tolerance. We relied on the assumption that patients who did not report any complaints were entirely satisfied with their new spectacles. Conducting this study on a larger scale and over an extended period could yield more comprehensive results. It is worth noting that the findings from a tertiary eye care setting may not directly apply to low-resource settings where the availability of trained refractionists and opticians may be limited. Lastly, minor issues that were resolved by the dispensing optician may not have been documented in reassessment records, potentially leading to missed data.

Conclusion

It is crucial to exercise careful consideration when prescribing and providing glasses to patients. Practitioners should eliminate transcription errors completely, as they are unacceptable from a professional standpoint. Opticians should diligently verify all essential parameters for glasses and ensure proper alignment both on and off the face. This meticulous approach serves to reduce intolerance and elevate patient satisfaction with their spectacles.

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Footnotes and Financial Disclosures

Conflict of interest:

The authors have no conflict of interest with the subject matter of the present manuscript.