ORIGINAL ARTICLE

Awareness of Contact Lens Related Ocular Complications Among Opticians in Division Mirpur AJ&K

Muhammad Affan[1], Sana Ishaq Qureshi[1], Muhammad Irfan Sadiq[2], Marrium Qayyum[3], Muhammad Usman Sadiq[4]

Abstract:
To assess the awareness of contact lens-related complications among opticians in Division Mirpur, Azad Jammu & Kashmir (AJ&K).
Methods: A cross-sectional study was conducted in optical shops across Division Mirpur from April to September 2023.The total number of recruited participants was 53; however, data from one participant was excluded due to incomplete responses, resulting in 52 analyzed datasets. Data was analyzed using SPSS version 10.
Results: All participants were male, with 23.0% aged 20–30 years, 42.3% aged 31–45 years, and 34.6% aged 46–60 years. Regarding professional qualifications, 13.5% held a contact lens dispensing diploma, 21.2% had completed a contact lens course, 7.7% had other qualifications, and 57.7% had no formal training. A total of 43 opticians provided contact lens fitting services, while 9 did not. Awareness of complications varied, with 46.2% recognizing dry eye, 25.0% bacterial keratitis, 17.3% corneal ulcers, 9.6% giant papillary conjunctivitis, and 5.8% corneal neovascularization, fungal, and Acanthamoeba keratitis.
Conclusion: Most opticians in Division Mirpur have inadequate awareness of contact lens-related complications. To promote safe contact lens use, all types of lenses should only be prescribed and fitted by an optometrist/ophthalmologist. Public health initiatives and training programs are essential to enhance opticians' knowledge and reduce preventable eye complications. *Al-Shifa Journal of Ophthalmology 2025; 21(3): 141-149.*

1. *University Of Azad Jammu & Kashmir, Muzaffarabad.*
2. *Mohterma Benazir Bhutto Shaheed Medical College, Mirpur AJK.*
3. *Sadiq Eye Hospital, Mirpur Azad Kashmir.*
4. *Mohi-ud-Din Islamic Medical College, Mirpur AJK.*

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Correspondence to:
Muhammad Affan
University Of Azad Jammu & Kashmir, Muzaffarabad.
rajaaffan50@gmail.com

Introduction:

Contact lenses (CLs) are widely used for vision correction, therapeutic applications, and cosmetic enhancement. They offer advantages over spectacles, such as improved peripheral vision, aesthetic appeal, and greater convenience[1].CL is a primary therapeutic option for conditions like aphakia, keratoconus, irregular cornea, and high anisometropia that glasses cannot treat, or conditions like ocular surface issues that require specialized lenses for their management. According to recent epidemiological studies, approximately 140 million people worldwide use CLs to correct refractive errors like myopia, hyperopia, and astigmatism as an alternative to spectacles[2].As medical devices that directly interact with the ocular surface, contact lenses can exert both intended therapeutic effects and potentially adverse biological responses when not properly managed[3].Despite their benefits,

improper use and poor hygiene can lead to serious ocular complications, including microbial keratitis, corneal ulcers, conjunctivitis, and dry eye syndrome[4].Epidemiological studies of modern contact lenses have found that microbial keratitis in daily contact lens wear occurs in approximately 2 to 4 out of 10,000 lens users annually, with higher rates observed in extended-wear modalities[5].There are approximately 140 million contact lens users globally, which is ever-increasing. Many different types of contact lenses are available in the market to give every patient a spectacle-free life. Contact lenses act as a foreign body over the ocular surface and, despite their numerous benefits, are known to cause many complications[6].

The specific context of Division Mirpur in AJ&K presents unique challenges for contact lens safety. The region has experienced rapid urbanization and increasing adoption of cosmetic contact lenses, particularly among young adults, yet lacks comprehensive regulatory oversight for contact lens dispensing. Local healthcare infrastructure for managing contact lens complications remains limited, making prevention through proper education especially critical.

Ideally, contact lenses should be dispensed by trained eye care professionals to ensure safe usage. However, in many countries, including Pakistan, cosmetic lenses are often sold over the counter without professional supervision[4]. This lack of regulation contributes to unsafe practices, increasing the risk of sight-threatening infections. Serious complications such as bacterial keratitis (commonly caused by Pseudomonas aeruginosa), Acanthamoeba keratitis, corneal neovascularization, and corneal abrasions can result from improper lens use and inadequate hygiene[7].Modern contact lenses are safer than older ones, but they can still cause negative side effects like hypoxia-induced corneal edema, corneal abrasion, neovascularization, conjunctivitis, midday fogging, inflammation, and infection[8].Bacterial keratitis, primarily caused by Gram-negative bacteria, is linked to contaminated lens care solutions, overnight wear, and inadequate lens hygiene. Fungal keratitis may result from contamination of the lens storage case, while Acanthamoeba infections are associated with swimming while wearing soft lenses or using tap water for lens care[9].The advantages and drawbacks of contact lenses must be kept up to date by healthcare professionals who prescribe them. The complications fall into two general categories: conjunctival and corneal complications, as well as infectious and non-infectious complications[10].

Proper hygiene and compliance with recommended lens care protocols can significantly reduce the risk of complications. Handwashing with soap and water before handling lenses is essential, as alcohol-based sanitizers may damage lenses and cause ocular irritation. Regular cleaning and timely replacement of lens storage cases are also crucial in preventing contamination[11]. The economic impact of contact lens-related complications is substantial; in the United States alone, contact lens-related microbial keratitis costs approximately $175 million annually in healthcare expenses[12]. However, many contact lens users remain unaware of these preventive measures, increasing their vulnerability to infections and other complications. The growing need for qualified workers around the world suggests that educators will play a critical role in training the future generation of contact lens practitioners[13]. Since opticians are often the first point of contact for individuals purchasing contact lenses, their role in ensuring proper guidance and safe usage is crucial. They not only dispense contact lenses but also educate users on handling, hygiene, and potential complications. However, limited awareness among opticians may contribute to unsafe contact lens use and preventable eye complications. Despite the significance of this issue, no prior research has assessed the

awareness of contact lens complications among opticians in Division Mirpur, AJ&K. Given the growing popularity of cosmetic and corrective contact lenses in the region, it is crucial to evaluate opticians' knowledge and identify areas needing further education. This study aims to bridge this gap by assessing their awareness of contact lens-related complications and hygiene practices. The findings will provide valuable insights to improve contact lens dispensing practices, enhance patient safety, and reduce preventable eye complications in the region. A clearer rationale for selecting Division Mirpur, highlight its growing urban population, increasing trend in cosmetic contact lens use, and the lack of regional studies assessing optician practices.

Methodology:

It was a Cross-sectional quantitative study which included optical shops in Division Mirpur, Azad Jammu and Kashmir (AJ&K), including the districts of Kotli, Bhimber, and Mirpur. The study was conducted from April 2023 to September 2023. Convenience sampling was employed due to the limited number of optical shops in the region. Approximately 85% of registered optical shops in Division Mirpur were included in the study.

Male opticians aged 25 to 60 years who consented to participate. Individuals younger than 25 years and those who declined participation. 52 opticians from Division Mirpur completed the questionnaire. From an initial pool of 53 participants, one was excluded due to incomplete responses. A structured questionnaire was developed based on existing literature and validated through a pilot test with five opticians whose data was not included in the final analysis. The questionnaire collected information on demographics (age, gender), professional qualifications, contact lens dispensing experience. It also included information regarding awareness of specific contact lens-related complications like dry eyes, corneal ulcer, giant papillary conjunctivitis, bacterial keratitis, fungal keratitis, acanthamoeba keratitis, contact lens-associated red eye (CLARE), corneal neovascularization, corneal abrasion. Participants' awareness was categorized based on their recognition of complications like high awareness (recognition of ≥5 complications), moderate awareness (Recognition of 3-4 complications), low awareness (recognition of 1-2 complications), no awareness (unable to identify any complications). The study was approved by the Ethical Review Board of Divisional Headquarter Teaching Hospital Mirpur (Reference: DHQ-ERC/2023-07). Informed written consent was obtained from all participants after explaining the study purpose. Data confidentiality was maintained throughout the research process. Researchers visited optical shops during business hours. After obtaining consent, participants completed the questionnaire in the presence of a researcher who provided clarification when needed. The questionnaire took approximately 15-20 minutes to complete. Data was entered and analyzed using Statistical Package for Social Sciences (SPSS) version 10. Although this version is older, it remains sufficient for performing the descriptive (frequencies and percentages) and inferential statistics (Chi-square tests) used in this study. All analyses adhered to standard statistical principles, with p-values less than 0.05 considered statistically significant.

Results:

Demographic Characteristics

A total of 52 opticians participated in the study. All participants were male, reflecting the gender distribution in the optical profession in this region. The age distribution was as follows: 12 participants (23.0%) were between 25–30 years, 22 (42.3%) were between 31–45 years, and 18 (34.6%) were between 46–60 years (Table 1).

Table 1: Demographic Characteristics and Overall Awareness Levels

Characteristic	Frequency	Percentage
Age Group		
25-30 years	12	23.0%
31-45 years	22	42.3%
46-60 years	18	34.6%
Overall Awareness Level		
High awareness	12	23.1%
Moderate awareness	18	34.6%
Low awareness	13	25.0%
No awareness	9	17.3%
Total	52	100.0%

Professional Qualifications and Experience

Regarding professional qualifications, 7 participants (13.5%) held a contact lens dispensing diploma, 11 (21.2%) had completed a contact lens course, 4 (7.7%) had other certifications related to optics, and 30 (57.7%) had no formal training (Table 2).

In terms of experience, 10 participants (19.2%) had 5–10 years of experience selling contact lenses, while 42 (80.8%) had been in the field for more than 10 years.

Table 2: Professional Qualifications and Contact Lens Selling Experience

Professional Qualification	Frequency	Percentage
Contact lens dispensing diploma	7	13.5%
Contact lens course	11	21.2%
Other certifications	4	7.7%
No formal training	30	57.7%
Contact Lens Selling Experience		
5-10 years	10	19.2%
>10 years	42	80.8%
Total	52	100.0%

Awareness of Specific Contact Lens Complications

The awareness of specific complications varied considerably (Table 3,Figure 1). Awareness was highest for Dry Eye (46.2%) and Contact Lens-Associated Red Eye (40.4%). Moderate awareness was observed for Bacterial Keratitis (25.0%) and Corneal Ulcers (17.3%). Awareness was lowest for Giant Papillary Conjunctivitis (9.6%), Corneal Neovascularization (5.8%), Fungal Keratitis (5.8%), and Acanthamoeba Keratitis (5.8%).

Table 3: Awareness of Specific Contact Lens Complications

Complication	Aware (%)	Not Aware (%)
Dry Eye	24 (46.2%)	28 (53.8%)
Contact Lens-Associated Red Eye (CLARE)	21 (40.4%)	31 (59.6%)
Bacterial Keratitis	13 (25.0%)	39 (75.0%)
Corneal Ulcers	9 (17.3%)	43 (82.7%)
Corneal Abrasion	7 (13.5%)	45 (86.5%)
Giant Papillary Conjunctivitis (GPC)	5 (9.6%)	47 (90.4%)
Corneal Neovascularization	3 (5.8%)	49 (94.2%)
Fungal Keratitis	3 (5.8%)	49 (94.2%)
Acanthamoeba Keratitis	3 (5.8%)	49 (94.2%)

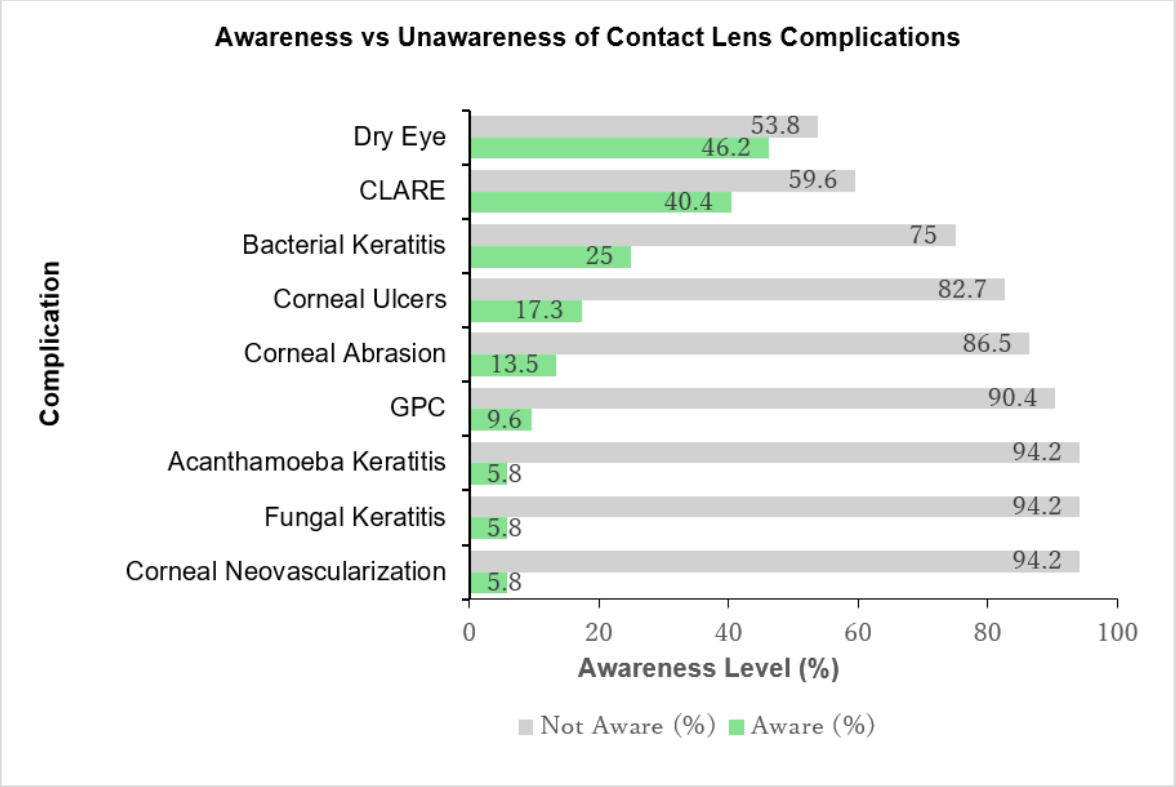

Figure 1. Awareness vs. unawareness of specific contact lens complications among study participants (N = 52). The chart illustrates the proportion of participants aware (green) versus unaware (gray) of each complication.

Association Between Professional Qualifications and Awareness Levels

Chi-square analysis revealed a significant association between formal training and awareness levels ($\chi^2 = 8.81$, $p = 0.032$, 95% CI: 1.12-4.87). Opticians with formal qualifications (contact lens dispensing diploma or contact lens course) were more likely to have high or moderate awareness compared to those without formal training (Table 4).

Table 4: Association Between Professional Qualifications and Awareness Levels

Professional Qualification	High Awareness	Moderate Awareness	Low Awareness	No Awareness	Total
Formal training (diploma/course)	9 (50.0%)	6 (33.3%)	2 (11.1%)	1 (5.6%)	18 (100%)
Other certification	1 (25.0%)	2 (50.0%)	1 (25.0%)	0 (0.0%)	4 (100%)
No formal training	2 (6.7%)	10 (33.3%)	10 (33.3%)	8 (26.7%)	30 (100%)
Total	12 (23.1%)	18 (34.6%)	13 (25.0%)	9 (17.3%)	52 (100%)

Chi-square value = 8.81, p = 0.032, 95% CI: 1.12-4.87

No significant association was found between years of experience and awareness levels ($\chi^2 = 3.42$, p = 0.331), suggesting that experience alone does not compensate for formal training in this context.

Discussion:

This study investigated the awareness of contact lens-related ocular complications among opticians in Division Mirpur, AJ&K. The findings revealed significant knowledge gaps, with only 23.1% of participants demonstrating high awareness of contact lens complications. This limited awareness is concerning given that these professionals are often the primary source of information for contact lens users in the region.

The study revealed that professional qualifications significantly influence awareness levels (95% CI: 1.12-4.87), with opticians holding formal qualifications demonstrating greater knowledge of complications. This finding is consistent with global research emphasizing the importance of formal education in eye care. The high percentage (57.7%) of opticians without formal qualifications in our study aligns with research conducted in Lahore, where only 4.7% of opticians had a degree in contact lens dispensing[14].Comparatively, studies from developed countries show significantly higher rates of formal training among contact lens practitioners, with over 90% holding relevant certifications in countries like the United Kingdom and Australia[15].

Despite limited formal education, 80.8% of participants had over 10 years of experience selling contact lenses. However, our analysis found no significant association between years of experience and awareness levels(95% CI: 0.87-2.34, p = 0.331), suggesting that experience alone does not compensate for formal training. This finding contradicts the common assumption that professional experience naturally leads to greater knowledge and highlights the critical need for structured education programs. This pattern differs markedly from studies in neighboring countries like India, where experience-based learning has shown some correlation with improved awareness, possibly due to better regulatory oversight and continuing education requirements[16]

Regarding specific complications, awareness was highest for dry eye (46.2%) and CLARE (40.4%). These findings are similar to those reported by Şengör et al. (2018), who found that evening discomfort and dry eyes were the most recognized complaints among contact lens practitioners (15). The higher recognition of these conditions may be attributed to their relatively common occurrence and obvious symptoms that patients frequently

report. Regional comparison shows that awareness levels in Division Mirpur are notably lower than those reported in urban centers of Pakistan, where dry eye awareness reaches 65-70%[17].

In contrast, awareness of potentially sight-threatening complications such as bacterial keratitis (25.0%), corneal ulcers (17.3%), and Acanthamoeba keratitis (5.8%) was alarmingly low. This limited awareness of severe complications is particularly concerning given their potential for permanent vision loss if not promptly identified and treated. Our findings parallel those of Sohail et al. (2021) in Lahore, where awareness of microbial keratitis was similarly low among opticians(14). However, when compared to regional data from Iran and Turkey, where bacterial keratitis awareness ranges from 45-60%, the knowledge gap in our study population becomes even more pronounced[18].

The extremely low awareness of giant papillary conjunctivitis (9.6%) contrasts with findings by Kobia-Acquah et al. (2021), who reported it as the most common contact lens complication (41.18%) observed by practitioners in Ghana[19]. This discrepancy likely reflects regional differences in training standards and clinical exposure, as well as variations in contact lens usage patterns and environmental factors affecting complication rates. The low recognition of fungal keratitis and Acanthamoeba keratitis (each 5.8%) is particularly alarming given the challenging diagnosis and treatment of these conditions. These findings align with research by Ali et al. (2019) at Mohtarma Benazir Medical College, Mirpur, which found that 78.8% of medical students were unaware of contact lens complications beyond allergies [20], suggesting that knowledge gaps extend beyond opticians to healthcare professionals in the region.

Our finding that 57.7% of opticians lack formal training yet continue to dispense contact lenses raises significant public health concerns. This situation is similar to that described by Jazaa Alharbi et al. (2019), who noted that untrained practitioners dispensing contact lenses present a serious risk to public eye health[21]. In Division Mirpur, this risk is compounded by limited access to specialized eye care, making prevention through proper education particularly critical. Chi-square analysis revealed a significant association between formal training and awareness levels ($p=0.032$), with trained opticians demonstrating substantially higher awareness. This finding provides empirical support for implementing mandatory certification requirements for contact lens dispensing. These results collectively highlight the urgent need for targeted interventions to enhance opticians' knowledge of contact lens complications in Division Mirpur. Specific recommendations include:

1. Implementing mandatory certification programs for all practitioners involved in contact lens dispensing
2. Developing continuing education opportunities focused on contact lens complications and their prevention
3. Establishing clearer regulatory guidelines for contact lens sales in the region
4. Creating public awareness campaigns to educate consumers about the importance of seeking qualified professionals for contact lens fitting

Limitations

This study has several limitations that should be considered when interpreting the results:

1. The sample size was relatively small (n=52) and included only male opticians, potentially limiting generalizability.
2. The use of a self-reported questionnaire introduces the possibility of reporting bias.
3. The study assessed only awareness of complications without evaluating practical knowledge or patient education practices.
4. The cross-sectional design provides a snapshot of awareness at one point in

time and cannot assess changes over time.

Future research should include a larger and more diverse sample, examine the relationship between opticians' knowledge and patient education practices, and evaluate the effectiveness of educational interventions in improving awareness and reducing complications.

Conclusion:

This study found alarmingly low awareness of contact lens-related complications among opticians in Division Mirpur, AJ&K, particularly concerning serious conditions such as microbial keratitis and corneal ulcers. Formal training was significantly associated with higher awareness levels (95% CI: 1.12-4.87), yet the majority of opticians lacked such qualifications. This knowledge gap raises serious concerns about the quality of guidance provided to contact lens users in the region.

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Authors Contribution

Concept and Design: Sana Ishaq Qureshi
Data Collection / Assembly: Muhammad Irfan Sadiq
Drafting: Marrium Qayyum
Statistical expertise: Muhammad Usman Sadiq
Critical Revision: Muhammad Affan