Awareness and Prevalence of Contact Lens-Related Complications among Users at a Tertiary Eye Care Hospital in Uttar Pradesh, India

Razia Bano[1], Dr. Ashish Chander[2]
[1] Department of Optometry, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India
[2] Department of Ophthalmology, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India

Correspondence:
Ms. Razia Bano (Research Scholar)
Department: Optometry
Affiliations: Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India

ABSTRACT

Background: Contact lenses (CLs) are widely used for vision correction and cosmetic purposes; however, improper use is associated with various ocular complications. This study aimed to assess awareness, practices, and complications related to contact lens use among young adults.

Aim: To assess the knowledge, awareness, attitudes, and practices related to contact lens use, and to determine the prevalence and types of associated complications among young adults.

Methods: A descriptive cross-sectional study was conducted among 185 contact lens users aged 18–35 years at a tertiary eye care hospital in Uttar Pradesh. Data were collected using a structured questionnaire and confirmed by ophthalmic examination. Statistical analysis was performed using SPSS version 20.0, with $p < 0.05$ considered significant.

Results: Females constituted 64.3% of participants. Soft lenses were used by 88.6%, and most users had less than 2 years of experience. Although 58.4% perceived complications as rare, 31.9% reported actual complications, including infections (13.5%), allergies (10.8%), and abrasions (7.6%). Common side effects included irritation (21.1%) and redness (18.9%). Doctor-recommended users showed significantly better compliance ($p < 0.001$).

Conclusion: Despite reasonable awareness, contact lens–related complications remain prevalent, primarily due to poor hygiene practices and noncompliance. Enhanced patient education and regular professional guidance are essential to reduce preventable ocular morbidity.

.**Keywords** Contact lenses, Microbial keratitis, Ocular complications, Hygiene practices, Awareness, Compliance, Young adults

INTRODUCTION

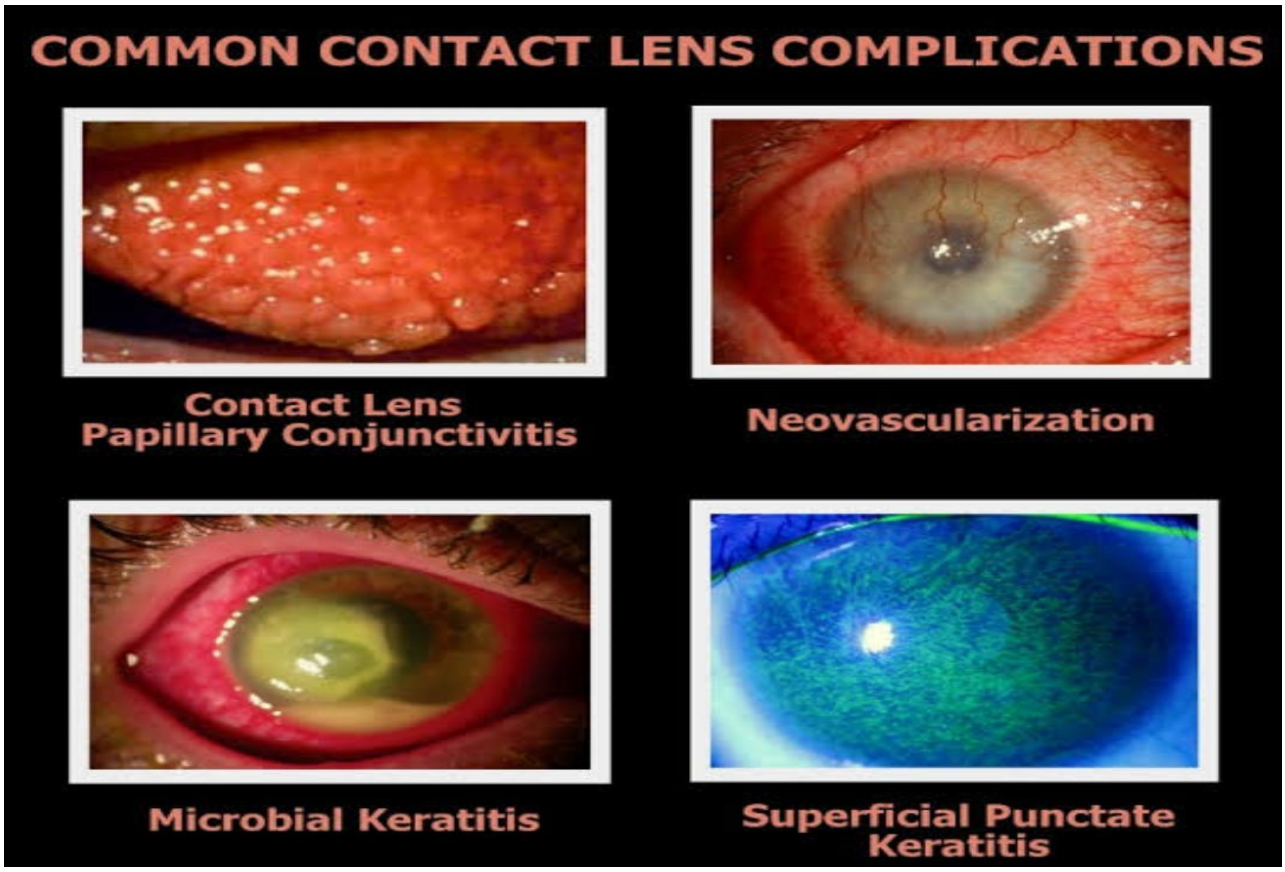
Contact lenses (CLs) have become an increasingly popular alternative to spectacles, offering both functional and cosmetic benefits. Their use has grown significantly worldwide, with millions of individuals relying on them for vision correction [1]. When used appropriately under professional guidance, contact lenses provide a safe and effective means of visual rehabilitation.

Soft contact lenses are the most commonly used type due to their comfort and ease of adaptation [1]. However, despite their advantages, the prevalence of contact lens–related complications remains high, particularly in developing countries where awareness and compliance are often inadequate [2,5]. The image above highlights common complications such as contact lens papillary

conjunctivitis, neovascularization, microbial keratitis, and superficial punctate keratitis, which are frequently encountered among users with poor lens care practices.

Microbial keratitis (MK) is one of the most severe complications associated with contact lens use and can result in permanent visual impairment if not treated promptly [3,6]. Globally, the incidence of contact lens–related infections has been increasing, with lens wear identified as a significant risk factor [7,20]. As illustrated, such infections can present with severe redness, corneal opacity, and vision-threatening changes.

Figure 1.a: - Common Contact Lens–Related Ocular Complications



Poor hygiene practices—including inadequate cleaning, improper storage, and exposure to contaminated water—play a critical role in the development of these complications [4,12]. Behavioral factors such as overnight wear, prolonged usage, and failure to adhere to professional instructions further increase the risk [8,11]. Additionally, contamination of storage cases and water exposure predispose users to serious infections such as fungal and Acanthamoeba keratitis [14].

Previous studies have emphasized that lack of awareness and poor compliance are major contributors to contact lens–related complications [5,13]. Young adults and females represent the largest group of contact lens users and are also more prone to associated complications [20]. Therefore, evaluating awareness, prevalence, and user practices—particularly in tertiary eye care settings in Uttar Pradesh—is essential to reduce preventable ocular morbidity and improve safe contact lens usage.

OBJECTIVES

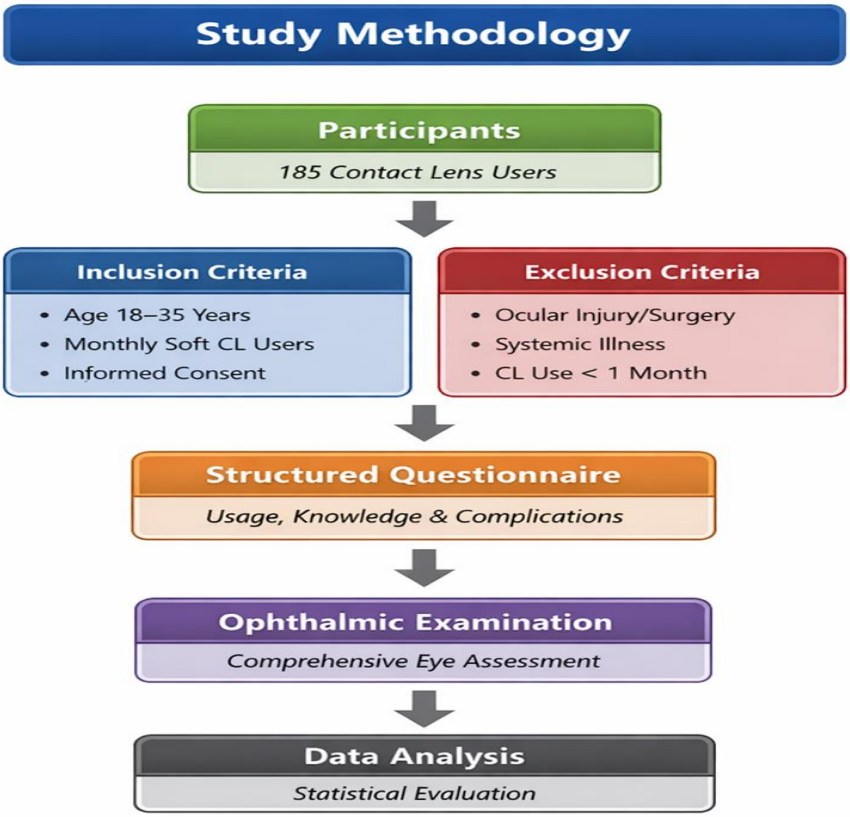
1. To assess knowledge and awareness regarding contact lens use
2. To evaluate attitudes and practices among users
3. To determine the prevalence and types of contact lens-related complications

MATERIAL AND METHOD

Study Design

This descriptive cross-sectional study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and the International Code of Medical Ethics [22}. Prior to the initiation of the study, ethical approval was obtained from the Institutional Review Board of Era University. Written informed consent was secured from the parents or legal guardians of all participants, ensuring voluntary participation, confidentiality, and adherence to ethical research standards.

Figure 1.b: - Study Design (Flowchart)



Study Population

A descriptive cross-sectional study design was employed. The study included 185 contact lens users who attended a tertiary eye care hospital in Uttar Pradesh. Participants were selected based on their use of contact lenses during the study period, and relevant demographic and clinical data were collected for analysis.

Inclusion Criteria

- Age 18–35 years
- Monthly soft contact lens users
- Provided informed consent

Exclusion Criteria

- History of ocular injury or surgery
- Systemic illness
- Contact lens use <1 month

Data were collected using a structured questionnaire assessing demographic details, usage patterns, awareness, and complications. A comprehensive ophthalmic examination was performed.

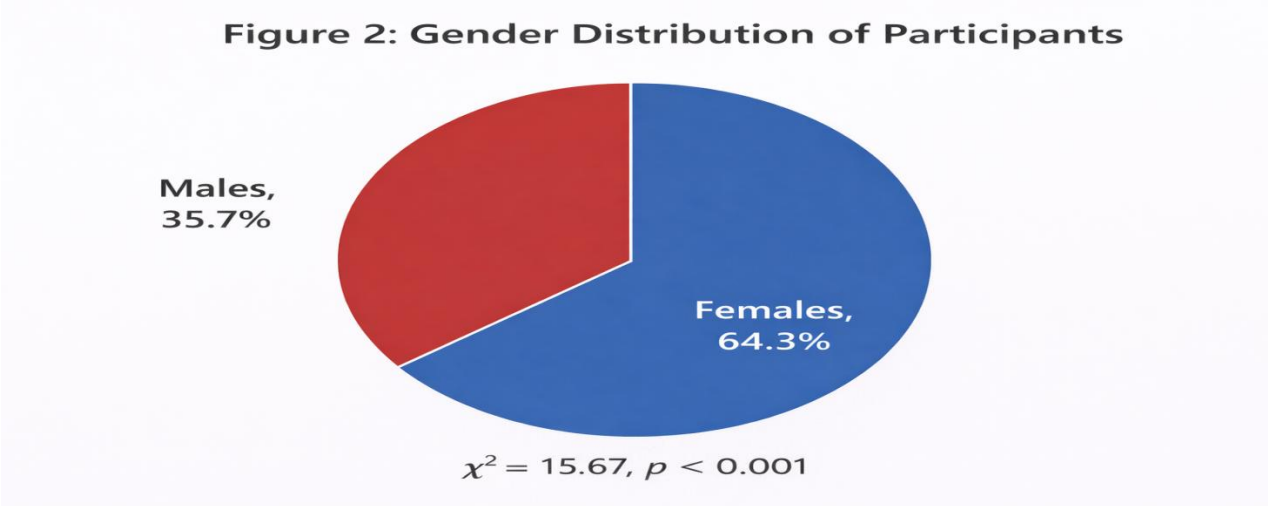
Statistical Analysis

Data were analyzed using **SPSS version 20.0**. Descriptive statistics were expressed as frequency and percentage. Chi-square test and ANOVA were applied, with **$p < 0.05$ considered significant**.

RESULT

1. Demographic Distribution

A total of 185 participants were included in the study, with a higher proportion of females compared to males. Females constituted 119 (64.3%) of the study population, while males accounted for 66 (35.7%). This difference in gender distribution was found to be statistically significant ($\chi^2 = 15.67$, $p < 0.001$), indicating that contact lens usage was significantly more prevalent among females in this study population.



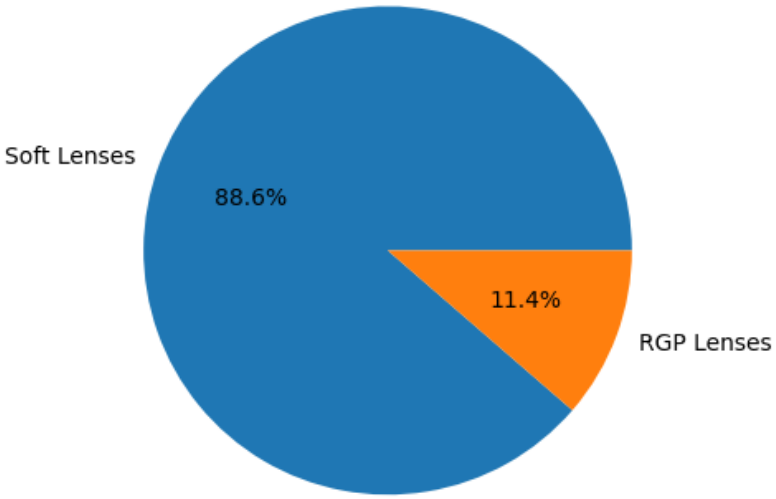
The predominance of female users suggests a possible influence of cosmetic preference, lifestyle factors, and greater acceptance of contact lenses among women compared to men.

2. Lens Type and Experience

The majority of participants (164, 88.6%) reported using soft (hydrogel) contact lenses, while only 21 participants (11.4%) used rigid gas permeable (RGP) lenses. This difference was highly

statistically significant ($\chi^2 = 107.72$, $p < 0.001$), reflecting the global trend of higher preference for soft lenses due to their superior comfort and ease of adaptation.

Figure 3: Type of Contact Lenses Used



Regarding duration of use, most participants (173, 93.5%) had less than 2 years of experience with contact lenses, whereas only 12 participants (6.5%) reported more than 5 years of usage. This indicates that the majority of users were relatively new adopters, which may influence their level of awareness and compliance with proper lens care practices.

3. Source of Recommendation

A significant proportion of participants (136, 73.5%) reported that their contact lenses were prescribed or recommended by an eye care professional, while 49 (26.5%) obtained recommendations from non-professional sources such as friends or peers.

A strong association was observed between professional recommendation and better compliance with lens care practices ($\chi^2 = 62.56$, $p < 0.001$).

Furthermore, 158 participants (85.4%) reported receiving proper instructions regarding contact lens use and maintenance, while 159 (85.9%) were aware of potential side effects. These findings highlight the critical role of healthcare professionals in improving awareness and promoting safe practices among contact lens users.

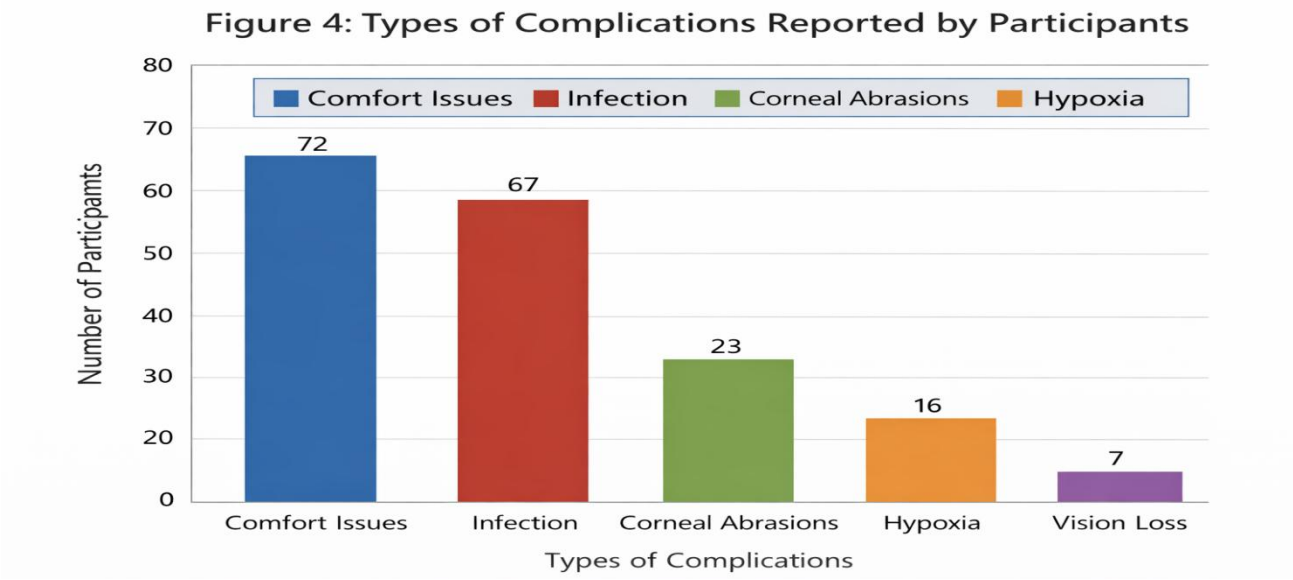
4. Perceived Frequency of Complications

Participants' perception of contact lens-related complications varied considerably. A majority of users (108, 58.4%) perceived complications as "very less common" or "not at all common," while 65 participants (35.1%) considered them "common," and 12 (6.5%) perceived them as "very common."

A statistically significant association was found between duration of lens use and perception of complications ($\chi^2 = 11.34$, $p = 0.010$), suggesting that more experienced users may have greater awareness or personal exposure to complications.

5. Types of Complications (Perceived)

Participants identified multiple types of complications associated with contact lens use. The most frequently reported issue was comfort and handling difficulties (n = 72), followed closely by infections (n = 67). Other reported complications included corneal abrasions (n = 23), hypoxia-related problems (n = 16), and vision loss (n = 7).



These findings indicate that while discomfort-related issues are most commonly perceived, awareness of serious complications such as infections is also relatively high among users.

6. Actual Complications Experienced

Among the study participants, the majority (126, 68.1%) reported no history of complications related to contact lens use. However, among those who experienced complications, infections were the most common (25, 13.5%), followed by allergic reactions (20, 10.8%) and corneal abrasions (14, 7.6%).

Table 1: Actual Complications Experienced

Complication	Number	Percentage
None	126	68.1%
Infection	25	13.5%
Allergy	20	10.8%
Abrasion	14	7.6%

The observed distribution of complications was statistically significant ($\chi^2 = 184.7$, $p < 0.001$), indicating that the occurrence of complications was not random and that certain conditions, particularly infections, were more prevalent.

These findings emphasize that although a large proportion of users remain asymptomatic, a considerable number still experience clinically relevant complications.

7. Side Effects Experienced

A variety of side effects were reported by participants. While 83 (44.9%) reported no side effects, a significant proportion experienced symptoms such as irritation (39, 21.1%), redness (35, 18.9%), dryness (21, 11.4%), and blurred vision (7, 3.8%).

Table 2: Side Effects Experienced

Side Effect	Number	Percentage
None	83	44.9%
Irritation	39	21.1%
Redness	35	18.9%
Dryness	21	11.4%
Blurred vision	7	3.8%

The difference in distribution of side effects was statistically significant ($\chi^2 = 95.6$, $p < 0.001$).

These results suggest that minor but bothersome symptoms such as irritation and redness are relatively common among contact lens users, potentially reflecting poor hygiene practices, prolonged wear, or environmental factors.

8. User Response to Complications

Participants demonstrated varied responses upon experiencing complications. The largest group (85, 45.9%) continued using contact lenses despite experiencing symptoms, while 76 participants (41.1%) sought medical consultation. A smaller proportion (24, 13%) discontinued lens use altogether.

Table 3: User Response to Complications

Action	Percentage
Continued use	45.9%
Consulted doctor	41.1%
Discontinued	13%

A statistically significant association was observed between the type/severity of symptoms and the action taken ($\chi^2 = 166.09$, $p < 0.001$).

The finding that nearly half of the users continued lens use despite complications is clinically important, as it may increase the risk of more severe outcomes such as microbial keratitis.

DISCUSSION

The present study highlights a significant gap between perceived and actual risks associated with contact lens (CL) use. Although the majority of participants considered complications to be rare, clinical findings demonstrated a noteworthy prevalence of infections, allergic reactions, and corneal abrasions. This discrepancy indicates inadequate awareness and underestimation of risks among users, which has also been reported in previous studies [5,11]. Such findings emphasize the need for improved patient education regarding potential complications.

A key observation of this study is the predominance of complications among soft contact lens users and females. Soft lenses, due to their high water content and prolonged wear habits, are more prone to microbial contamination and hypoxic stress, thereby increasing the likelihood of complications [1,5]. Furthermore, the higher proportion of female users aligns with global trends and may be associated with increased cosmetic use and longer wearing hours, contributing to higher complication rates [11,20].

The role of professional guidance emerged as a critical factor influencing safe contact lens practices. Participants who received recommendations and instructions from eye care professionals

demonstrated significantly better compliance compared to those advised by non-professional sources. This finding is consistent with studies showing that proper counseling improves adherence to hygiene practices and reduces complications [8]. Despite this, a substantial proportion of users continued unsafe behaviors, including extended wear and inadequate lens care, indicating that awareness alone may not always translate into compliance.

Poor hygiene practices remain the most significant contributors to contact lens–related complications. Inadequate cleaning, improper storage, and exposure to contaminated water were commonly reported risk factors in this study. These findings are in agreement with global evidence highlighting the role of lens case contamination and water exposure in increasing the risk of microbial infections, including fungal and Acanthamoeba keratitis [12,14]. The omission of essential steps such as rubbing and rinsing lenses further exacerbates the risk of infection [4].

Microbial keratitis (MK) continues to be one of the most serious complications associated with contact lens use due to its potential to cause permanent visual impairment. Although trauma remains the leading cause of MK in developing countries like India, contact lens–associated keratitis is steadily increasing and represents a preventable cause of ocular morbidity [6,7]. The occurrence of infections observed in this study supports previous reports indicating a rising trend in CL-related keratitis globally [16,20].

In addition to infections, non-infectious complications such as dryness, irritation, and redness were frequently reported. These symptoms are characteristic of contact lens–related dry eye, which has been documented in approximately 30–50% of users [13]. Chronic discomfort may lead to discontinuation of lens use and reduced quality of life, highlighting the importance of proper lens selection and adherence to wearing schedules.

Another important finding is the variability in user response to complications. While a significant proportion of participants sought medical advice, many continued using lenses despite experiencing symptoms. This behavior reflects a lack of risk perception and underscores the importance of reinforcing patient education regarding early warning signs and timely consultation [9].

Overall, the findings of this study are consistent with existing literature and reinforce the multifactorial nature of contact lens–related complications, involving behavioral, environmental, and clinical factors.

Limitations

- The study relied partially on self-reported data, which may introduce recall and reporting bias
- Being hospital-based, the sample may overrepresent symptomatic individuals and limit generalizability

Strengths

- Inclusion of ophthalmic examination for objective validation of complications
- Adequate sample size with robust statistical analysis
- Focus on awareness, behavior, and clinical outcomes simultaneously

CONCLUSION

This study demonstrates that contact lens–related complications remain a significant public health concern despite relatively good levels of awareness among users. Infections, allergic reactions, and irritation were among the most common complications, with poor hygiene practices and noncompliance identified as major contributing factors.

Professional guidance plays a crucial role in promoting safe contact lens use, as users who received proper instructions exhibited better compliance and fewer complications. However, the persistence of unsafe practices highlights the need for continuous reinforcement of education and behavioral change strategies.

Targeted interventions focusing on proper lens hygiene, avoidance of water exposure, adherence to recommended wearing schedules, and early recognition of symptoms are essential to reduce preventable complications. Special attention should be given to young adults and female users, who represent the majority of contact lens wearers and are at higher risk.

Strengthening awareness programs at both clinical and community levels, along with regular follow-up and patient counseling, can significantly reduce the burden of contact lens–related ocular morbidity and improve overall eye health outcomes.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

ETHICAL APPROVAL

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Institutional Ethics Committee of the concerned tertiary care hospital in Uttar Pradesh prior to the commencement of the study.

Informed consent was obtained from all participants before enrolment. Confidentiality and anonymity of the participants were strictly maintained throughout the study.

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