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Dissatisfaction and Discontinuation of Contact Lens Use among University Students in Lahore Pakistan

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ABSTRACT

To assess the factors contributing to dissatisfaction and discontinuation of contact lens use among university students in Lahore Pakistan. This cross-sectional study was conducted at Superior University Lahore Pakistan. A total of 50 undergraduate students having a history of contact lens use followed by discontinuation, aged 18–25 years, studying in various disciplines, were enrolled using a non-probability consecutive sampling. Students who were actively using contact lenses were excluded. Informed consent was obtained prior to enrollment. Data were collected using a specially designed questionnaire consisting of three domains. The first domain included demographic information such as age and gender, along with details related to contact lens use. The second domain assessed factors related to dissatisfaction, while the third domain focused on contact lens discontinuation. Data were entered and analyzed using SPSS version 23. A total of 50 university students who had discontinued contact lens use were included (mean age 21.8 ± 1.7 years; 50% male). Soft extended-wear lenses were most commonly used (46%), and half of participants wore lenses on ≤2 days per month. Key complaints included discomfort (62%), handling difficulties (66%), dryness (66%), and ocular complications such as eye injuries (38%) and infections (32%). Most participants (72%) had discontinued lenses within the past few months, with 42% attributing their eye symptoms possibly to lens use. Despite discontinuation, over half (52%) indicated willingness to resume lens use in the future. In this dropout sample of university students, discomfort, handling difficulties, and ocular symptoms were frequently reported among previous contact lens users. These findings highlight factors associated with dissatisfaction and discontinuation. Future studies should employ multi-center designs, compare active users with dropouts, and use validated instruments to better understand patterns of contact lens use and discontinuation in Pakistan.

INTRODUCTION

Contact lenses are commonly used for both cosmetic enhancement and visual correction by serving as an effective alternative to spectacles (Chaudhary et al., 2023). Their widespread acceptance, particularly among young adults, is attributed to improved aesthetics, comfort and a wider field of vision (Rhee et al., 2022; Liu et al., 2024). Globally, the contact lens industry has expanded substantially, with millions of users relying on lenses to correct refractive errors such as myopia, hyperopia, astigmatism, presbyopia and keratoconus (Kumar et al., 2019; Jones et al., 2023). Advances in lens materials and designs including soft hydrogel, rigid gas permeable, extended wear, disposable and cosmetic lenses have further increased their accessibility and use (Kumar et al., 2019; Lakkis et al., 2022). Despite these advantages, contact lens wear is associated with several challenges. Improper handling, poor hygiene and non-compliance with recommended wearing schedules may result in discomfort, dryness, infections and other ocular complications, some of which can be sight-threatening (Cope et al., 2015; Alipour et al., 2017; AlSarhan et al., 2023). Reported complications include contact lens–induced dry eye, meibomian gland dysfunction, corneal abrasions, giant papillary conjunctivitis, corneal neovascularization and infectious keratitis (Ioniță et al., 2023; Lim et al., 2016). These adverse effects often lead to dissatisfaction and eventual discontinuation of contact lens use (Rueff, 2023).

Refractive errors remain the most common cause of visual impairment worldwide and the second leading cause of vision loss, as reported by the World Health Organization (WHO) (Alhibshi et al., 2021; Chalmers et al., 2010). Effective correction of refractive errors is essential for maintaining visual function and quality of life. Although contact lenses offer an efficient corrective option, long-term success depends on comfort, affordability, convenience and proper

lens care (Alhibshi et al., 2021; Chalmers et al., 2010). Successful contact lens wear is typically defined as comfortable use for at least 12 hours per day over most days of the week; however, a significant proportion of users discontinue use annually, a phenomenon commonly referred to as contact lens dropout (Pritchard et al., 1999; Pucker & Tichenor, 2020). Contact lens dropout continues to limit the sustained success of contact lens wear globally, despite improvements in lens technology (Pritchard et al., 1999; Pucker & Tichenor, 2020). Discomfort, handling difficulties, cost, visual dissatisfaction and hygiene-related concerns are consistently reported as key contributing factors (Pucker & Tichenor, 2020; Pucker et al., 2019; Chiang, Tajbakhsh, & Wolffsohn, 2025). Difficulty with insertion and removal, inadequate hand hygiene, and the financial burden of lenses and care products further increase the likelihood of discontinuation (Pucker et al., 2019). Additionally, physiological changes in the cornea and tear film associated with lens wear may contribute to irritation and intolerance over time (Chalmers et al., 2010; Pucker & Tichenor, 2020).

University students are particularly vulnerable to contact lens dissatisfaction due to irregular lifestyles, prolonged screen exposure and inconsistent compliance with lens care practices (Zengin et al., 2021; Supiyaphun & Jongkhajornpong, 2021; Al-Otaibi et al., 2024). While international studies have explored these issues extensively (Unnikrishnan & Hussain, 2009; Khoza et al., 2020), data from Pakistan especially among university students, remain limited (Ibrahim et al., 2018). Previous research has highlighted gaps in knowledge and hygiene practices among contact lens users (Cope et al., 2015; Albasheer et al., 2024; Kahal et al., 2025), underscoring the need for further investigation. Additionally, cultural and socioeconomic factors unique to the Pakistani context such as affordability, access to professional eye care and awareness of proper lens hygiene may influence usage patterns and discontinuation rates. Therefore, this study aimed to assess the factors associated with dissatisfaction and discontinuation of contact lens use among university students in Lahore Pakistan. In this study, the conceptual framework guiding the investigation posits that contact lens wearing experience (type, duration, frequency) may be associated with ocular complaints or complications (discomfort, dryness, redness, handling difficulties, infections), which in turn influence dissatisfaction and ultimately discontinuation of lens use (contact lens dropout). This framework clarifies the relationships under investigation and provides a logical structure for interpreting reported factors, rather than treating them as an unconnected list.

Understanding these factors is essential for developing targeted educational strategies, improving compliance and reducing preventable contact lens dropout in this population. Identifying these factors will not only inform eye care professionals but also help design context-specific interventions to enhance comfort, safety and long-term adherence among young contact lens users in Pakistan. This study aimed to explore patterns of contact lens dissatisfaction and discontinuation among university students in Lahore who had previously discontinued lens use. Specifically, it addressed the research question: Which factors related to discomfort, handling difficulties, ocular symptoms, and other user experiences are most frequently reported among students who have discontinued contact lens use?

METHODS

This descriptive cross-sectional study was conducted at Superior University Lahore Pakistan with the aim to identify factors contributing to contact lens dissatisfaction and discontinuation among undergraduate students. The ethical principles of the Declaration of Helsinki (1964), as revised in 2000 were adhered to in this study. All participants provided informed consent after being fully briefed on the study′s purpose, procedures, benefits and potential risks. Confidentiality and the protection of participants′ life, health, privacy and dignity were strictly maintained throughout the study. A total of 50 undergraduate students, aged 18–25 years and enrolled in various disciplines at Superior University, were recruited using a non-probability consecutive sampling technique. Inclusion criteria required participants to have a prior history of contact lens use but not be actively using lenses at the time of data collection. Current contact lens users, individuals with ocular disease or those unwilling to provide informed consent were excluded. This approach was chosen to specifically investigate factors contributing to contact lens discontinuation while avoiding confounding from ongoing lens use. The recruitment flow involved inviting eligible students in public areas of the university during regular academic hours, screening for eligibility, obtaining consent and then administering the questionnaire.

Data for this study were collected using a structured, self-administered questionnaire developed specifically for this research, based on a review of the literature on contact lens dissatisfaction and dropout and consultation with optometry and ophthalmology experts to ensure content validity and cultural relevance. The questionnaire comprised three domains with a total of 18 items. The first domain, demographics and contact lens use (7 items), collected information on age, gender, duration and frequency of lens use, type of lens, method of cleaning and average daily wearing hours. The second domain, dissatisfaction (7 items), assessed participants′ experiences of discomfort, difficulty handling lenses, dryness, redness, eye injuries and infections. Items included questions such as "Were you uncomfortable while using contact lenses?" and "How often did your eyes feel discomfort while wearing lenses?" Responses were binary (Yes/No) or ordinal (Never / Sometimes / Constantly). The third domain, discontinuation (4 items), explored the timing of stopping lens use, perceived association of symptoms with lens use, financial impact, and willingness to resume, with items such as "When did you stop using contact lenses?" and "Would you consider resuming contact lens use in the future?" Conceptually, the questionnaire was guided by a framework in which contact lens wearing experience (type, duration, frequency) is associated with ocular complaints or complications, which in turn are linked to dissatisfaction and discontinuation of lens use**.** Items in the dissatisfaction domain were designed to capture self-reported negative experiences, while items in the discontinuation domain captured reported factors associated with dropout

In this study, "dissatisfaction" was operationally defined as the self-reported experience of discomfort, difficulty handling lenses, dryness, redness or other adverse ocular sensations while using contact lenses. "Discontinuation" refers to the participant having stopped wearing contact lenses for any duration prior to the study. These definitions allow differentiation between symptoms/complications and the broader constructs of dissatisfaction or discontinuation. The questionnaire was administered in a self-administered

format to all eligible participants in designated areas of the university during regular academic hours. Participants were provided with instructions and clarification as needed to ensure accurate completion. Completed questionnaires were checked for completeness at the time of collection. Missing data were minimal and any incomplete responses were excluded from the corresponding analysis; no imputation procedures were performed. All responses were coded and entered into the Statistical Package for Social Sciences (SPSS) version 23. As this study was designed as a descriptive mapping of contact lens dissatisfaction and discontinuation, only frequencies, percentages, means and standard deviations were calculated; no inferential statistical analyses were performed. Efforts to minimize bias included consistent administration of the questionnaire, anonymization of responses and inclusion of all eligible participants during the recruitment period to reduce selection bias.

RESULTS OF STUDY

Participant Profile and Contact Lens Use

A total of 50 participants were included in the study, with a mean age of 21.8 ± 1.7 years. Most participants were aged 22–25 years (33, 66.0%), and the gender distribution was equal, with males and females each comprising 50.0% of the sample. Half of the participants (25, 50.0%) had been using contact lenses for 2–4 years, and 12 (24.0%) reported constant use as shown in Table 1. Soft extended-wear lenses were the most commonly used type (46.0%), and the majority of participants cleaned their lenses using contact lens solution (88.0%) as depicted in Table 1.

Table 1. Demographic variables and contact lens usage of the participants (N=50)

Participant variables		Frequency (%)
Age	18 to 21 years	17 (34.0%)
	22 to 25 years	33 (66.0%)
Gender	Male	25 (50.0%)
	Female	25 (50.0%)
When did you first start using contact lens?	<2 years	19 (38.0%)
	2-4 years	25 (50.0%)
	5-10 years	04 (8.0%)
	>10 years	02 (4.0%)
How often did you use contact lens?	≤2 days per month	25 (50.0%)
	≥2 days per month	08 (16.0%)
	Weekly	05 (10.0%)
	Constantly	12 (24.0%)
Type of contact lens used	Daily disposable	04 (8.0%)
	Soft daily wear	09 (18.0%)
	Soft extended wear	23 (46.0%)
	Cosmetic lens	14 (28.0%)
How did you clean your contact lens?	With water	04 (8.0%)
	With soap	02 (4.0%)
	With contact lens solution	44 (88.0%)
Average duration of wearing contact lens	<6 hours	18 (36.0%)
	6 to <8 hours	13 (26.0%)
	8 to <10 hours	12 (24.0%)
	>10 hours	07 (14.0%)

Complaints and Complications

Table 2 presents participants' responses regarding dissatisfaction with contact lens use. A majority of participants reported discomfort while wearing lenses, with 31 (62%) indicating they were uncomfortable and 33 (66%) experiencing difficulties in handling them. Eye discomfort was common, with 43 participants (86%) reporting that their eyes sometimes felt discomfort and 3 (6%) reporting constant discomfort, while only 4 (8%) reported no discomfort. Regarding ocular complications, 19 participants (38%) had experienced eye injuries, 16 (32%) reported eye infections, and 33 (66%) experienced dryness while using contact lenses. Eye redness was reported rarely by 22 participants (44%) and sometimes by 14 (28%), while 14 participants (28%) never experienced redness. Overall, Table 2 highlights the high prevalence of discomfort, handling challenges, and ocular symptoms among participants who had discontinued contact lens use.

Table 2. Responses to questions about Dissatisfaction (N=50)

Questions about Dissatisfaction	Response	Frequency
Were you uncomfortable with using contact lens?	Yes	31 (62.0%)
	No	19 (38.0%)
Did you face difficulties in handling the contact lens?	Yes	33 (66.0%)
	No	17 (34.0%)
How often did your eyes feel discomfort while wearing contact lens	Never	04 (8.0%)
	Sometimes	43 (86.0%)
	Constantly	03 (6.0%)
Did you ever injure your eye while wearing contact lens?	Yes	19 (38.0%)
	No	31 (62.0%)
Have you experienced redness after using contact lens?	Rarely	22 (44.0%)
	Sometimes	14 (28.0%)
	Never	14 (28.0%)
Have you gotten eye infection from using contact lens?	Yes	16 (32.0%)
	No	34 (68.0%)
Have you experienced dryness from using contact lens?	Yes	33 (66.0%)
	No	17 (34.0%)

Discontinuation Patterns and Intent to Resume

Table 3. Responses to questions about Discontinuation (N=50)

Questions about Discontinuation	Response	Frequency
When did you stop using contact lens?	A few months ago	36 (72.0%)
	A year ago	09 (18.0%)
	A few years ago	05 (10.0%)
Do you think your eye symptoms were related to your contact lens use?	Yes	15 (30.0%)
	No	14 (28.0%)
	Maybe	21 (42.0%)
Did contact lens use take a toll on your finances?	Yes	16 (32.0%)
	No	34 (68.0%)
Would you resume contact lens use in the future?	Yes	26 (52.0%)
	No	08 (16.0%)
	Maybe	16 (32.0%)

Table 3 summarizes participants' reported factors associated with discontinuation of contact lens use. Most students (36, 72%) had stopped using contact lenses a few months prior to the study, while 9 (18%) had discontinued a

year ago and 5 (10%) a few years ago. When asked whether their eye symptoms were related to contact lens use, 15 participants (30%) responded "Yes," 14 (28%) responded "No," and 21 (42%) were unsure ("Maybe"). Regarding financial impact, 16 participants (32%) reported that contact lens use had taken a toll on their finances, whereas 34 (68%) indicated it had not. Despite previous discontinuation, more than half of the participants (26, 52%) expressed willingness to resume contact lens use in the future, 16 (32%) were uncertain, and 8 (16%) reported they would not resume. These findings highlight the range of reported factors associated with discontinuation and the potential for future lens use if underlying issues are addressed.

DISCUSSION

The present study demonstrates a high level of dissatisfaction and discontinuation of contact lens use among university students, with discomfort, dryness, handling difficulties and ocular complications emerging as the primary contributing factors. In this dropout sample of university students, discomfort, dryness, and handling difficulties were frequently reported. Dryness, reported by 66% of participants, may be related to prolonged screen exposure and associated tear film instability, though this remains a plausible mechanism rather than a direct observation. Handling difficulties, reported by 66%, could reflect challenges with lens insertion or removal, potentially influenced by limited training or adaptation to lens fit. Eye infections and injuries, reported by 32% and 38% of participants respectively, may be associated with risk behaviors such as noncompliance with recommended hygiene or overwear, though causality cannot be established. These findings highlight patterns observed in this specific sample rather than the broader population of contact lens users. By distinguishing observed data from hypothesized mechanisms, the study provides insight into factors that may contribute to discontinuation among young adult contact lens dropouts.

The age range and equal gender distribution observed are consistent with previously reported patterns among young adult contact lens users (Pucker & Tichenor, 2020; Jacobs et al., 2021). These findings reinforce the vulnerability of this age group to contact lens–related problems. Ocular discomfort and dryness were among the most frequently reported complaints. Similar symptoms have been widely documented and are considered leading causes of contact lens intolerance (Gurnani & Kaur, 2025; Jacobs et al., 2021). Prolonged screen exposure, visual fatigue and extended wearing hours, common among university students, may contribute to tear film instability and increased ocular surface irritation, thereby reducing overall lens comfort (Gurnani & Kaur, 2025; Ilechie et al., 2021; Rhee et al., 2022). Cost emerged as a relevant consideration in this dropout sample, with 32% of participants reporting that contact lens use had a financial impact in our study. While not the primary factor, financial burden may influence decisions to discontinue, particularly in the context of limited access to affordable lenses, solutions, and professional follow-up in Pakistan. The cost factor may interact with other challenges, such as discomfort or handling difficulties, amplifying the likelihood of discontinuation. Addressing cost concerns through affordable lens options, campus-based optical services, or guidance on cost-effective lens care could help mitigate this barrier for students.

Handling difficulties were reported by a substantial proportion of participants, suggesting inadequate user training or difficulty adapting to lens insertion and removal. This finding aligns with earlier studies identifying poor dexterity, anxiety and insufficient counseling as significant contributors to contact lens dropout, particularly among new users (Jacobs et al., 2021; Pucker et al., 2019; Jones et al., 2023; Pucker & Tichenor, 2020). Proper instruction at the time of prescription remains essential for improving long-term compliance (Naaman et al., 2022; Beshtawi et al., 2022). Although most participants reported cleaning lenses with recommended solutions, a notable number experienced eye injuries and infections. Previous research has shown that microbial keratitis, though relatively uncommon, remains one of the most serious sight-threatening complications associated with contact lens wear (Stapleton et al., 2017; Teo et al., 2011; Maier et al., 2022). Poor hygiene, overnight lens wear and non-compliance with replacement schedules are well-established risk factors for such infections (Ilechie et al., 2021; Teo et al., 2011; Waghmare & Jeria, 2022). These findings suggest that appropriate cleaning alone is insufficient without strict adherence to overall lens care guidelines.

The willingness of more than half of the participants to resume contact lens use despite previous discontinuation is noteworthy. Similar studies report that a significant proportion of contact lens dropouts can successfully return to lens wear when underlying issues, particularly discomfort, are adequately addressed (Lakkis et al., 2022; Pucker & Tichenor, 2020). Advances in lens materials, better management of dry eye and meibomian gland dysfunction and regular follow-up may help reduce dropout rates and improve user satisfaction (Jones et al., 2023; Lakkis et al., 2022; Fogt, Roth, & Gardner, 2024). The findings of our study suggest several practical implications for reducing dissatisfaction and discontinuation among young contact lens users. Educational interventions should primarily target new student users, who may be most vulnerable to handling difficulties and discomfort. Core content should include proper lens hygiene, recommended daily wear time and adherence to replacement schedules to prevent ocular complications and enhance comfort. Delivery channels could include university health or eye clinics, campus optical shops and digital reminders or workshops, ensuring repeated reinforcement and easy access to guidance. Tailoring interventions to this population may improve safe lens practices and potentially reduce dropout rates.

The findings of this study should be interpreted in light of certain limitations related to generalizability. First, participants were recruited using a non-probability consecutive sampling method at a single university, which may not represent all university students in Lahore or the broader population of contact lens users in Pakistan. Second, the study specifically included students who had discontinued contact lens use (dropouts) and excluded current users, meaning the results reflect the experiences and reported factors associated with discontinuation rather than the full spectrum of contact lens users. The purpose of lens use (refractive vs. cosmetic) was not assessed, so the findings reflect general discontinuation patterns among dropout students regardless of lens indication. Data were self-reported, introducing the possibility of reporting bias, as participants may under- or overestimate discomfort, complications or handling difficulties. Additionally, recall bias is likely, given the variable time since participants discontinued contact lens use, which may have affected the accuracy of reported experiences. Because the study employed a purely descriptive cross-sectional design, it does not allow for testing associations or causal relationships between dissatisfaction factors and contact lens discontinuation. As such, the findings cannot be generalized

to all contact lens wearers, particularly those who continue to use lenses without problems. Future studies employing larger, multi-institutional samples and including both current users and dropouts would be needed to improve generalizability. Future studies should also consider prospective designs and objective assessments to complement self-reported data.

CONCLUSIONS AND RECOMMENDATION

In this dropout sample of university students in Lahore, discomfort, dryness, handling difficulties and ocular symptoms were commonly reported among previous contact lens users. These findings highlight factors associated with dissatisfaction and discontinuation in this specific group by emphasizing the importance of comprehensive patient education regarding proper lens handling, hygiene and wearing schedules. Regular follow-up and counseling may improve comfort, reduce complications and encourage sustained contact lens use among young adults. Moreover, tailored educational programs addressing common misconceptions and promoting adherence to recommended care practices could further enhance user satisfaction. Eye care professionals should also consider implementing periodic workshops or digital reminders to reinforce safe lens habits and early recognition of complications. Future research should include multi-center studies with larger samples, direct comparisons between active users and dropouts, and the use of validated instruments to better characterize patterns of contact lens use, satisfaction, and discontinuation in the Pakistani context.

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DECLARATION

Ethics approval and consent to participate

The present study was conducted in accordance to the ethical standards laid down in the 1964 Declaration of Helsinki, revised in the year 2000. All the participants were explained the purpose, benefits and process of the study after which informed consent was obtained prior to data collection, with assurance to maintain anonymity and confidentiality.

Consent for publication

All authors have given permission to be listed on the submitted manuscript, have read and approved the final version, and consent to its publication. The manuscript has not been previously published and is not under consideration by any other journal.

Availability of data and materials

Not applicable.

Conflicts of Interest Statement

The authors declare that they have no competing interests.

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Statement on the Use of Artificial Intelligence (AI)

Data generated or analysed during this study are available from the corresponding author upon reasonable request.

Authors' contributions

1. **HZN:** Conception and design; literature review; participant assembly, assessment and acquisition of data; analysis and interpretation of data; manuscript writing, review and revisions.
2. **MMU:** Conception and design; literature review; participant assembly, assessment and acquisition of data; manuscript writing.
3. **NA:** Conception and design; analysis and interpretation of data; manuscript writing, review and revisions.
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