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Understanding Contact Lens Usage Among Non-Ophthalmological Residents – A Study on Awareness, Knowledge and Practices

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ABSTRACT:

Introduction: The prevalence of refractive eye diseases globally has led to increased use of contact lenses (CLs) for corrective, cosmetic, and therapeutic purposes. The rising use of CLs necessitates a comprehensive understanding of awareness levels among non-ophthalmological residents.
Objective: This study aimed to assess awareness among non-ophthalmological residents regarding CL use, including indications, types, risks, and hygiene practices. The objective was to identify gaps in knowledge and recommend educational enhancements.
Methodology: A cross-sectional study was conducted at a tertiary healthcare center in Tamil Nadu, focusing on residents outside the ophthalmology department. A structured questionnaire covering demographics, CL knowledge, risks, and attitudes was used. Ethical approval was obtained, and confidentiality was ensured.
Results: Among 200 participants, 43.5% demonstrated awareness of CL usage. Factors influencing awareness included gender (females more aware, $p < 0.001$), current users (more aware, $p = 0.016$), frequency of use (daily users more aware, $p = 0.018$), and duration of use (> 3 years more aware, $p = 0.002$). Binomial logistic regression confirmed associations ($p < 0.05$) with male gender, past CL use, and shorter daily usage periods linked to lower awareness levels.
Conclusion: Non-ophthalmological residents exhibit varying levels of awareness regarding CL usage, influenced by gender, usage history, frequency, and duration. Education programs tailored to these factors are crucial for promoting safe and effective CL practices.

Keywords: Contact lenses, awareness, non-ophthalmological residents, education, safety.

1. Introduction:

There is a growing worldwide prevalence of refractive eye diseases. [1]Contact lenses (CLs) have been prescribed for over a century to correct refractive defects, for cosmetic purposes, as well as a therapeutic intervention for corneal conditions.[2] The utilization of CLs has increased drastically, and more progress is to be anticipated.[3]
Contact lenses provide the ability to improve the quality of life for people, mostly by correcting refractive problems, but also for a variety of additional uses, like specific kinds of eye protection or therapeutic indications. The choice to prescribe contact lenses as a form of optical correction, or for individuals to decide whether to wear them, is influenced by various lifestyle factors. These factors include the individual's ocular and systemic health, the types of activities they will be involved in while wearing the lenses, the regularity of lens wear as well as the conditions in which they should be used.[4]

Furthermore, medical practitioners have the choice to recommend contact lenses for a range of therapeutic purposes. When used appropriately, contact lenses are generally safe. Providing education on ocular health, particularly about the proper and cautious use of contact lenses, may help avoid issues caused by the wearer's improper behaviour. An avenue for investigation is examining an individual's subjective understanding of their own familiarity with wearing contact lenses.[5]

Objectives

1. To assess the level of awareness among non-ophthalmological residents regarding contact lens use, including understanding of indications for contact lens wear, common types of contact lenses, and potential risks associated with contact lens use.
2. To evaluate the knowledge of non-ophthalmological residents regarding proper contact lens hygiene practices, and lens care techniques
3. To provide recommendations for enhancing contact lens education within non-ophthalmological residency training programs based on the findings of the study, with the aim of improving and promoting safe and effective contact lens use among healthcare providers alike.

2. Material and Methods:

Study Design

This study entailed a descriptive cross-sectional design involving residents at a tertiary health care centre in Tamil Nadu. The study focused on residents not affiliated with the ophthalmology department.

Sample size:

The sample size was calculated according to the mean (SD) knowledge score of 30.1 ± 7.74 obtained from a similar study,[6] with an absolute error of 1.1%, non-response rate of 10%, and 95% as confidence interval, resulting in a required sample size of 200.

Study Procedure

Participants were residents recruited from various departments within the healthcare facility, excluding the ophthalmology department. After the extant literature was reviewed, an organized questionnaire was put together and validated survey tools related to contact lens usage awareness. The questionnaire included sections to assess participants' demographic information, knowledge about contact lens usage, its risk factors, symptoms, and attitudes towards eye care. Every participant gave their informed consent, and their anonymity and privacy were scrupulously upheld over the course of the study. Part-B consisted of questions related to awareness about contact lens usage. Based on the results of the pilot study, each of the 11 items with categorical answers received a weighted score. The designed questionnaire had a good Cronbach's alpha of 0.81. The highest score that could be earned was 15, and the lowest possible score was 0. The median score was calculated to analyse awareness on contact lens usage. The achieved median score was 12. Individuals with a score of 12 or higher were classified as possessing adequate awareness of contact lens usage, and those who scored ≤ 12 as having inadequate awareness. Data for the current study were gathered using the developed and evaluated questionnaire.

Study participants:

Inclusion Criteria

- Participants currently enrolled in a residency program in a medical specialty other than ophthalmology (e.g., internal medicine, surgery, pediatrics, obstetrics and gynecology, etc.).
- Participants aged 20 years or older.
- Participants either current contact lens users or had used contact lenses in the past.

Exclusion Criteria

- Individuals who were currently enrolled in a residency program specifically in ophthalmology.
- Individuals who had never used contact lenses.

Study Outcome

This study's outcomes provided valuable insights into the present state of understanding and behaviors in contact lens use among non-ophthalmological residents. It mainly aimed to assess the awareness level, knowledge, practice patterns, attitudes, perceptions, and educational needs for contact lens usage among them.

Ethical Considerations

The Institutional Review Board (IRB) or Research Ethics Committee (REC) granted ethical approval prior to the commencement of the study. All participants' confidentiality and anonymity were ensured, and data were handled in accordance with relevant data protection regulations.

3. Results:

Table 1: Socio-demographic variables, contact lens usage characteristics of the study participants

S.No	Variable	Frequency (n=200)	Percentage %
1.	**Gender**		
	Male	53	26.5
	Female	147	73.5
2.	**Age**		
	21 – 30 years	159	79.5
	31 – 40 years	41	20.5
3.	**PG resident**		
	Clinical	166	83
	Non - clinical	34	17
4.	**Contact lens user**		
	Current user	91	45.5
	Past user	109	54.5
5.	**Frequency of lens usage**		
	Daily	100	50
	Once a week	23	11.5
	Once a month	21	10.5
	Rarely	56	28
6.	**Hours of contact lens use**		
	< 8 hours	90	45
	8 – 12 hours	78	39
	> 12 hours	32	16
7.	**Years of contact lens use**		
	< 1 year	64	32
	1- 2 years	22	11
	2 – 3 years	26	13
	> 3 years	89	44

Table.1 shows the demographic and contact lens usage characteristics of the study participants (N=200). Among them, 26.5% were male and 73.5% were female. The age distribution showed a majority (79.5%) in the 21 to 30 years range, with the remaining 20.5% falling in the 31 to 40 years range. In terms of PG resident status, 83% were clinical residents, while 17% were non-clinical. Regarding contact lens use, 45.5% were currently using contact lenses, while 54.5% had used them in the past. In terms of frequency of contact lens usage, daily usage was the most common (50%), followed by rarely (28%), once a week (11.5%), and once a month (10.5%). The hours of contact lens use varied, with 45% using lenses for less than 8 hours, 39% for 8 to 12 hours, and 16% for more than 12 hours. Lastly, the duration of contact lens use revealed that 32% had used them for less than a year, 11% for 1 to 2 years, 13% for 2 to 3 years, and 44% for more than 3 years. Overall, the data provides insights into the gender distribution, age demographics, PG resident status, and patterns of contact lens usage among the study participants.

Fig.1.Awareness about contact lens usage among postgraduate residents of various disciplines (N=200)

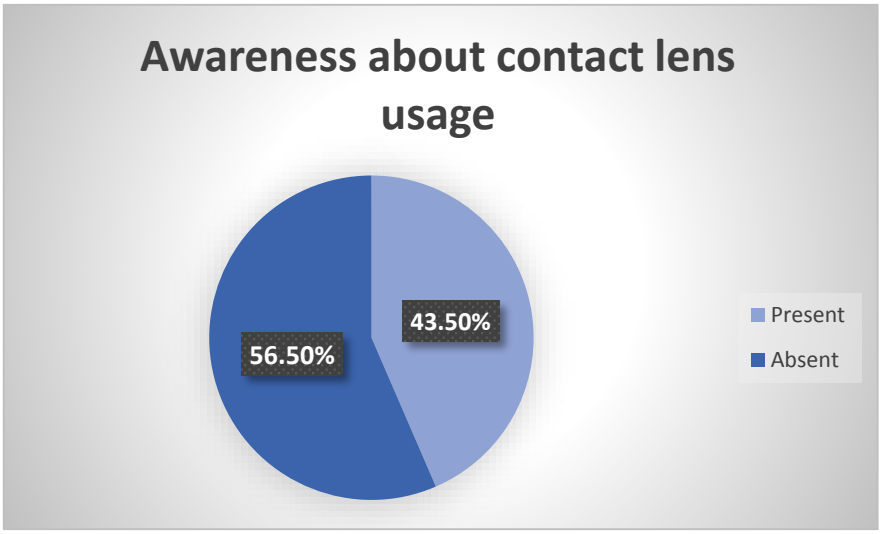


Fig 1 shows that among the study participants around 43.5 % were aware about contact lens usage.

Table 2. Association between demographic variables, contact lens usage characteristics and awareness about contact lens usage.

Variable	**Awareness**		**Total (N = 200)**	**Chi-square**	**Unadjusted odd's ratio (95% CI)**	**P Value**
	No n (%) n = 113 (56.5%)	**Yes n (%) n = 87 (43.5%)**				
Age						
21 – 30 years	88	71	159	0.420	0.793 (0.393 – 1.599)	0.517
31 – 40 years	25	16	41		1	
Gender						
Male	40	13	53	10.560	**3.119 (1.542 –**	**< 0.001***

					6.308)	
Female	73	74	147		1	
PG resident						
Non - clinical	17	17	34	0.704	0.729 (0.348 – 1.527)	0.401
Clinical	96	70	166		1	
Contact lens user						
Past user	70	39	109	5.809	**2.004 (1.135 – 2.536)**	**0.016***
Current user	43	48	91		1	
Frequency of lens usage						
Rarely	38	18	56	7.958	**2.287 (1.154 – 4.534)**	**0.018***
Once a month	15	6	21		2.708 (0.972 – 7.547)	0.057
Once a week	12	11	23		1.182 (0.477 – 2.928)	0.718
Daily	48	52	100		1	1
Hours of contact lens use per day						
< 8 hours	59	31	90	7.927	**3.172 (1.373 – 7.328)**	**0.007***
8 – 12 hours	42	36	78		1.944 (0.837 – 4.517)	0.122
> 12 hours	12	20	32		1	1
Years of contact lens use						
< 1 year	46	18	64	11.032	**2.930 (1.473 – 5.825)**	**0.002***
1- 2 years	10	12	22		0.955 (0.374 – 2.440)	0.924
2 – 3 years	16	10	26		1.834 (0.750 – 4.485)	0.184
> 3 years	41	47	88		1	1

*** P Value < 0.05 - Statistically significant at 95% Confidence Interval, OR – Odd's Ratio, χ^2 – Chi-square**

Table.2 presents the association between awareness levels across various demographic variables among the 200 study participants. Gender had a notable association with awareness, with females being more aware than males ($p < 0.001$, odds ratio 3.119, 95% CI: 1.542 - 6.308). Current users of contact lenses were more aware compared to past users ($p = 0.016$, odds ratio 2.004, 95% CI: 1.135 - 2.536). Individuals who rarely used lenses showed less awareness compared to those who use them on a daily basis ($p = 0.018$, odds ratio 2.287, 95% CI: 1.154 - 4.534). Usage duration also showed associations with awareness; users of less than one year were less aware than those using lenses for longer periods ($p = 0.002$, odds ratio 2.930, 95% CI: 1.473 - 5.825). Participants with <8 hours of lens usage per day had lesser awareness compared to those who use it more than 12 hours per day. These findings suggest that factors such as gender, current usage status, frequency, and duration of contact lens use may influence awareness levels.

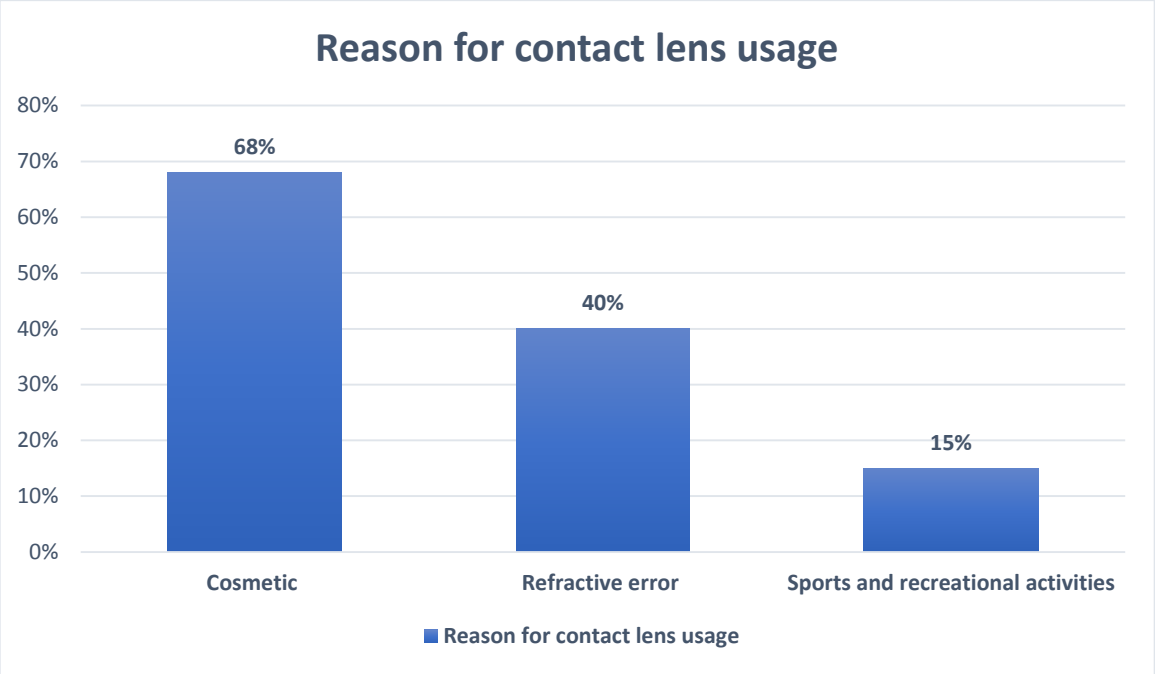
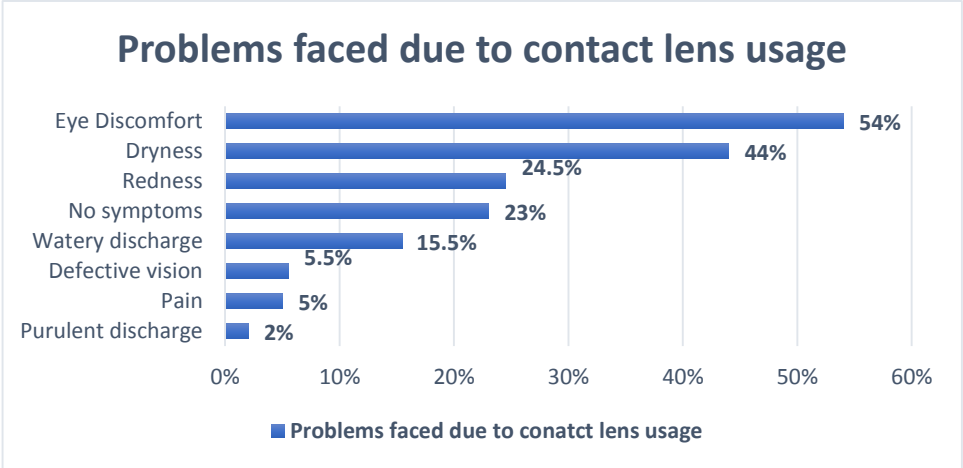


Fig.2.Reasons cited out by participants for contact lens usage. (N=200)

It was found that 68% of the users used contact lenses for cosmetic reasons followed by refractive error 40% (Figure.2)

Fig.3.Problems faced due to contact lens usage. (N=200)



Participants reported the following issues while wearing contact lenses. 54% had eye discomfort, 44% had dryness, 24.5 % had redness, 15.5% had watering, 5.5% had defective vision, 5% had pain, 2% had purulent discharge and those who had no symptoms accounted for about 23% (Figure 3).

Table.3 Binomial logistic regression between demographic variables, contact lens usage characteristics and awareness about contact lens usage.

S.NO				Variable	P Value	Adjusted Odds Ratio	95% CI
	Male	0.007*	2.851	1.32 – 6.13			
	Past user	0.004*	4.022	1.4 - 8.2			
	<8 hours of lens usage per day	0.030*	2.628	1.03 – 6.4			

"Enter method" was utilised to determine the binomial logistic regression.
*** Statistically significant at 95% Confidence Interval, OR – Odd's Ratio, AOR – Adjusted Odd's Ratio**

In order to exclude confounders, binary logistic regression analysis was used to examine variables that showed a statistically significant correlation with ignorance of contact lens usage during bivariate analysis. It turned out that the male gender with an AOR of 2.851 (95% CI – 1.32 – 6.13) , past contact lens users with AOR of 4.02 (95% CI – 1.4-8.2), and less than 8 hours of lens usage per day with AOR of 2.62 (95% CI – 1.03 – 6.4) had a statistically significant association with lack of awareness about contact lens usage. **(p value <0.05)** (table.3)

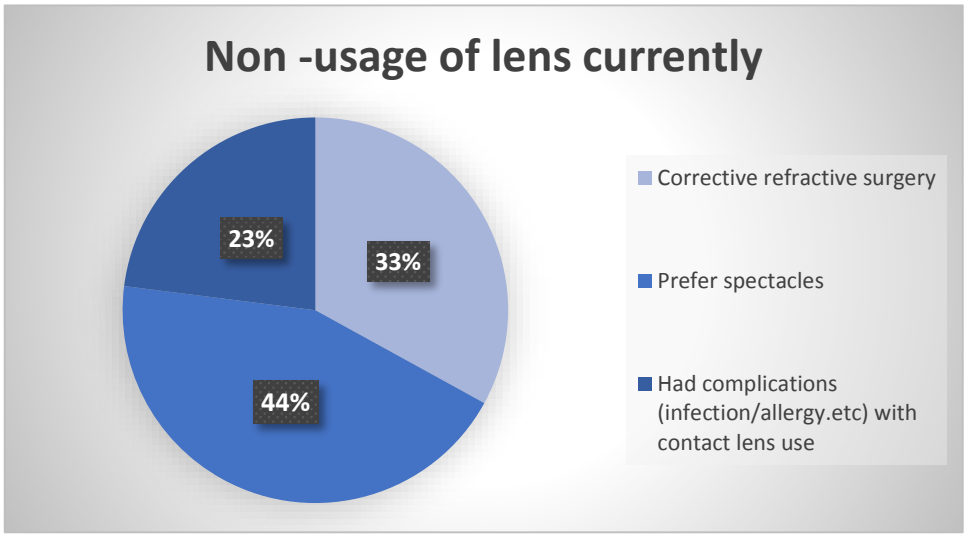
Table 4: Practice of lens usage among the study participants

S.No	Variable	Frequency (n=200)	Percentage %
1.	**Type of contact lens used**		
	Soft	144	72
	Rigid	4	2
	Unaware	52	26
2.	**Ever slept with contact lens on**		
	Never	114	57
	Rarely	32	16
	Occasionally (once a month	32	16
	Often	9	4.5
3.	**Contact lens used beyond expiry date**		
	No	173	86.5
	Yes	27	13.5
4.	**Contact lens used while swimming / bathing**		
	Never	157	78.5
	Sometimes	34	17
	Always	9	4.5

5.	**Use of eye makeup while wearing contact lens**		
	Never	72	36
	Sometimes	80	40
	Always	48	24
6.	**Used contact lenses beyond the times its supposed to be used in a day**		
	Never	53	26.5
	Occasionally (once a month	64	32
	Sometimes (once a week)	68	34
	Always	15	7.5
7.	**Wash hands before handling contact lens**		
	Always	161	80.5
	Didn’t wash occasionally	31	15.5
	Never	8	4
8.	**Type of lens used based on duration**		
	Daily disposable	44	22
	Biweekly disposable	8	4
	Monthly disposable	122	61
	Extended wear	26	13
9.	**Contact lens advised by**		
	Qualified ophthalmologist	145	72.5
	Optometrist	10	5
	Optical shop without any prior consultation	45	22.5

Table.4 shows the practice of contact lens usage among the study participants (N=200). Most respondents (72%) use soft contact lenses, followed by rigid lenses (2%). However, a notable proportion (26%) is unaware of the type they use. Concerning hygiene practices, a majority (57%) reported never sleeping with their contact lenses on, while others did so rarely, occasionally, or often. A significant number (86.5%) reported not using lenses beyond their expiry date, indicating adherence to safety guidelines. When it comes to activities like swimming or bathing, most respondents (78.5%) never use their lenses, while some do so sometimes (17%) or always (4.5%). Eye makeup usage while wearing lenses varied, with 40% doing so sometimes and 24% always. Interestingly, a substantial portion of respondents (34%) reported occasionally using lenses beyond the recommended daily usage, which could pose risks. Regarding hygiene, a majority (80.5%) always wash their hands before handling lenses, while a smaller percentage do so occasionally or never. In terms of lens duration, monthly disposable lenses were most common (61%), followed by daily disposable (22%) and extended wear (13%). A large percentage (72.5%) received contact lens advice from qualified ophthalmologists, while others consulted optometrists (5%) or obtained lenses from stores without prior consultation (22.5%). Among the participants wearing extended wear lenses (n=26), the majority of them (85%) had sought advice from a qualified ophthalmologist. Overall, while many follow good practices, there are areas where awareness and adherence to safety guidelines could be improved, particularly concerning lens usage duration and hygiene habits.

Fig.4.Reason for not using contact lens currently (Among past users) (N=109)



Reasons for non – usage of lens currently included preference for spectacles (23.5%), corrective surgery (17%), and past complications with lenses (11.5%).

4. Discussion:

The study on contact lens awareness among postgraduate residents provides valuable insights into the demographic factors, awareness levels, practices, and reasons for non-usage among past users. The demographic analysis revealed that among the 200 study participants, 73.5% were female, and the majority (79.5%) belonged to the 21 to 30 years age group. Clinical PG residents accounted for 83% of the participants. In terms of contact lens usage, 45.5% were current users, with daily usage being the most common frequency (50%). The duration of contact lens use varied, with 44% using lenses for more than 3 years.

This observation is consistent with studies by Ibrahim NK et al[7] and Faruqui S et al[8], which also highlighted a female predominance in contact lens use. The age distribution showed a significant majority (79.5%) in the 21 to 30 years range, indicating that this age group is the primary user of contact lenses among postgraduate residents. This finding corresponds with studies like Janti S et al[9], where younger age groups were more likely to use contact lenses.
Regarding awareness about contact lens usage, approximately 43.5% of the participants were aware. The association analysis highlighted several significant factors. Females were more aware than males ($p < 0.001$), current users were more aware than past users ($p = 0.016$), and daily users showed higher awareness compared to rare users ($p = 0.018$). The duration of lens usage also influenced awareness levels, with longer-term users showing higher awareness ($p = 0.002$). The logistic regression analysis further confirmed these associations. Male gender, past usage of lenses, and shorter daily usage durations were significantly associated with lower awareness levels ($p < 0.05$). For instance, males had an adjusted odds ratio of 2.851 for lack of awareness, past users had an adjusted odds ratio of 4.022, and those using lenses for less than 8 hours a day had an adjusted odds ratio AOR of 2.628.

This awareness level aligns with findings from similar studies, such as Boqursain SK et al,[6] which also reported a relatively moderate level of awareness among participants. However, the study identified factors associated with higher awareness, including being a female, a current contact lens user, and having longer durations of lens usage. These associations

highlight the importance of targeted education and awareness campaigns, especially among male participants, past users, and those with shorter durations of lens usage.

The practice of lens usage among participants showed that most of them used soft contact lenses (72%) and adhered to safety guidelines regarding expiry dates (86.5%) but had varied practices concerning sleeping with lenses on, using lenses while swimming/bathing, and following hygiene protocols. Interestingly, while 72.5% received advice from qualified ophthalmologists, a significant percentage obtained lenses without prior consultation.

These findings are consistent with studies by Khoza N et al[10] and Thiraviam M et al[11], which also highlighted lapses in hygiene practices and non-adherence to usage guidelines among contact lens users. Complications such as eye discomfort, dryness, redness, and other symptoms were reported by a notable proportion of participants, emphasizing the need for regular check-ups and adherence to recommended practices to prevent complications.

The reasons for non-usage among past users included a preference for spectacles (23.5%), corrective surgery (17%), and past complications with lenses (11.5%). Comparing the results of the present study with those of previous literature reveals both similarities and differences. While the prevalence of contact lens usage, especially among females and younger age groups, is consistent across studies, there are variations in awareness levels, hygiene practices, and adherence to usage guidelines. These differences underscore the need for targeted interventions and educational efforts tailored to specific demographic groups and addressing common misconceptions and hygiene lapses identified in various studies.

Overall, the study highlights the importance of gender, current usage status, frequency, duration of use, and professional advice in influencing awareness levels and practices regarding contact lens usage among postgraduate residents. It underscores the need for targeted education and awareness campaigns to improve safe and informed contact lens practices among this population. Healthcare providers, particularly ophthalmologists and optometrists, play a crucial role in educating patients about safe contact lens practices and monitoring their usage habits. Additionally, public health initiatives can leverage the insights from this study to design interventions aimed at improving contact lens awareness and promoting safe usage practices among postgraduate residents and other demographic groups.

5. Conclusion:

In summary, this study on contact lens awareness among non-ophthalmological residents highlights a moderate level of awareness (43.5%) regarding contact lens usage, with gender, current usage status, frequency, and duration of use influencing awareness levels. Cosmetic reasons were the primary motivation for lens use, although participants reported various discomforts like dryness and redness. While many demonstrated good hygiene practices and adherence to safety guidelines, occasional misuse of lenses was noted. These findings stress the need for targeted educational efforts focusing on safe lens practices, regular eye check-ups, and addressing common issues to enhance the overall experience and safety of contact lens wearers among non-ophthalmological residents.

Conflict of Interest: Nil
Acknowledgements: Nil

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