Original Article

Dealing with Complacency and Non-Compliance in Contact Lens Use and Care

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ABSTRACT

Background: Medical students often visited the Ophthalmology Department for contact lens-associated problems. Non-compliance in use and storage of contact lenses is known to cause ocular surface disorders and sight-threatening infections. **Objective:** The objective of this study is to know the procedures followed in the use and care of contact lenses and to institute corrective measures. **Material and Methods:** Participants were asked to fill a questionnaire along with comprehensive ocular examination and advice. **Results**: Forty-six females and 31 males participated. Twenty-six (33.76%) had their lenses on the eyes for more than 8 h, and 11 (14.28%) of these wore lenses for more than 12 h. Only 5 (6.49%) participants washed hands before inserting and removing the lenses. Seventy-five (97.40%) participants washed hands before inserting lenses, and 70 (90.90%) participants washed hands while removing. All participants stored lenses in the cases. Five (6.49%) participants washed cases with tap water, and one washed with warm water. Three (3.89%) topped off the solution. No one changed the case unless worn out or lost. Only 37 (48.05%) participants were willing to undergo refractive surgery. Conjunctival papillary hyperplasia in 50 subjects, giant papillary conjunctivitis in one subject, concretions in seven, and meibomian gland dysfunction in one were the ocular surface abnormalities observed. **Conclusion:** Medical students were casual and complacent in use and care of contact lenses. Proactive strategies by ophthalmologists and optometrists such as developing awareness about problems, good rapport with contact lens users, having regular feedback, and timely corrective measures are likely to improve compliance and prevent site-threatening problems.

Key words: Contact lens, feedback, non-compliance, proactive strategies

INTRODUCTION

Contact lenses stay as a feasible option for varied purposes. Extended wear contact lenses are being considered as an alternative to refractive surgery.[1,2] Other than refractive purpose, contact lenses can also be used to monitor illnesses.[3] Contact lens usage is often abandoned due to improper fit, allergic reactions, improper solutions, and sight-threatening infections.[4-7]

Even health-care personnel are complacent about proper handling, duration of use, cleaning, and storage of contact lenses.[8-11]

We hereby report the observations regarding contact lens care in medical students and proposed corrective measures.

Access this article online	
Website: www.mmj.net.in	Quick Response Code
DOI: 10.15713/ins.mmj.16	

MATERIAL AND METHODS

Medical students using contact lenses from MIMER Medical College, Talegaon Dabhade, Pune were included in the present study after the Ethics Committee

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approval. All students were using contact lenses to correct refractive errors. Medical students filled the questionnaire (Appendix 1) from 1st to 31st December 2011 to 1st to 31st December 2012 with the help of two internship trainees. The participants were examined on a slit lamp. Necessary treatment and advice were given, and the data were subjected to analysis.

RESULTS

A total of 77 students participated in the study, of which 31 were male and 46 were female. All students were between 18 and 25 years of age. Participants varied in the number of years of contact lens use as shown in Figure 1. The study also took into account the type of contact lens used, with 47 using yearly disposable lenses and 30 using monthly disposable ones.

Table 1 shows the number of hours in a day that each participant wore contact lenses.

Students were asked about their motivation behind using contact lenses, with the distribution shown in Figure 2. Maximum participants (47) used the lenses on self-motivation. Twenty-four were advised by friends. Only six were using lenses on the advice of ophthalmologists.

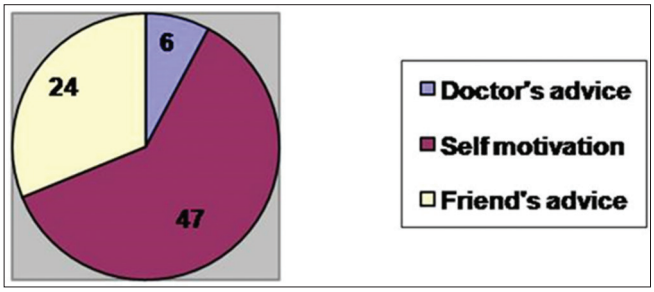

Figure 1: Chart depicting years of contact lens usage by the subjects under the study

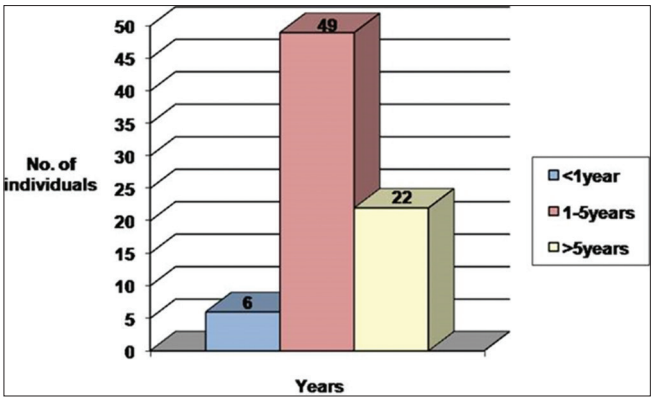

Figure 2: Chart illustrating reasons why participants chose to use contact lenses

Students were questioned about hygienic and safety practices in lens care.

Seventy-five participants (97.40%) washed their hands before inserting lenses, and 70 (90.90%) washed their hands before removing the lenses from their eyes. Only five (6.49%) participants washed their hands before both inserting and removing lenses. All participants stored the lenses in a lens case. Five people in the group washed the case with tap water before filling solution, three topped fresh solution on the existing one in the case, and one person washed the case with warm water before filling solution. Others washed the case with multipurpose solution before storing the lenses. No participant reported changing the case unless it was worn out or lost. No participant had any knowledge about contents of the solution in use. Fourteen participants were aware about enzyme cleaning. All the participants were driving two wheeler, but eighteen individuals did not use any protective glasses while driving.

Comfort level was assessed during various activities. To facilitate comparison among contact lens users, those who scored four or more of five were termed as high scorers and those who scored <4 were termed as low scorers. Table 2 shows the percentage of high scorers in various activities.

Participants showed a refractive error range of −0.50 D–−5.00 D.

Figure 3 illustrates the willingness of students to undergo refractive surgery.

The study also revealed a few ocular findings such as giant papillary conjunctivitis and concretions in participants, as highlighted in Table 3.

DISCUSSION

Similar studies involving health-care professionals and others have been performed in India and other parts of the world in the past.[8-15] Non-compliance in lens care at some level is a common factor reported in all these studies. It was observed in our study that students were not complaint about the duration of lenses on

Table 1: Duration of contact lens usage by individuals on a daily basis

Number of hours of lens use	Number of individuals
<8	40
8-12	26
>12	11

Table 2: Percentage of high scorers in different activities

Activity/score	5	4	3	2	1	0
Day-to-day (%)	16 (20.8)	27 (35.1)	16 (20.8)	18 (23.4)	0 (0)	0 (0)
Reading (%)	12 (15.6)	18 (23.4)	19 (24.7)	23 (29.9)	3 (3.9)	2 (2.6)
Insertion (%)	12 (15.6)	25 (32.5)	27 (35.1)	13 (16.9)	0 (0)	0 (0)
Removal (%)	15 (19.5)	32 (41.6)	13 (16.9)	16 (20.8)	0 (0)	1 (1.3)
After removal (%)	50 (64.9)	15 (19.5)	10 (13.0)	1 (1.3)	1 (1.3)	0 (0)

Table 3: Various ocular signs seen in participants

Ocular signs	No. of individuals
No abnormality	12
Conjunctival papillary hyperplasia	50
Giant papillary conjunctivitis	01
Concretions	07
Meibomian gland dysfunction	01

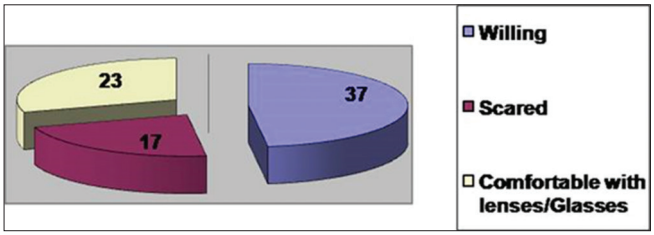

Figure 3: Chart depicting willingness of participants to undergo refractive surgery

their eyes. Twenty-six participants (33.76%) had their lenses on their eyes for more than 8 h, and of these, 11 (14.28%) had their lenses for more than 12 h even during short sleep in this period [Table 1].

The participants were questioned about the motivation to use contact lenses. Forty-seven (61.03%) students decided to use lenses on their own and 24 (31.16%) on the advice of their friends to improve looks and comfort. Only six (7.79%) were directed to use lenses by their treating ophthalmologist [Figure 2]. All the participants acquired the lenses from ophthalmologists or opticians. Wu *et al.* in their study stated that contact lens users who purchased the lenses directly from internet were 3.8 times less likely to adhere to their aftercare schedule than those who purchased contact lenses from the optometrists (95% confidence intervals = 1.2–12.2, $P = 0.024$).[11] No participant in our group purchased the lenses directly from the internet.

Students were quite complacent regarding the use and care of lenses. Only five (6.49%) students washed hands before inserting and removing lenses. Seventy-five of 77 (97.40%) in our small study group washed hands before inserting the lenses, but only 70 (90.90%) participants washed hands while removing the lenses. Khan *et al*. in their study of contact lens use and care found that 412 (82%) of 500 washed hands before inserting the lenses.[10] Wu *et al.* in their study have identified poor hand hygiene (11%), inadequate cleaning of lenses (13%), and lens storage cases (61%), and wearers not remembering how often they were advised to return for an aftercare (50%) as major issues about compliance.[11] Our study also reports similar issues with compliance.

All our participants stored the lenses in the cases that were provided, five (6.49%) students washed cases with tap water and one washed with warm water before filling with multipurpose solution; three (3.89%) topped off the solution. No one changed the case unless it was worn out or lost. Only 14 (18.18%) participants were aware about enzyme cleaning. Not a single participant had knowledge about the content of the solution.

Seven (9.09%) students using monthly disposable lenses continued to use the same pair for 3 months, as they were occasional users. de Oliveira *et al.* have observed similar complacent behavior in their study where 79.1% of participants admitted that they did not take proper care during use and storing of contact lens.[9]

Similar problems of topping off the disinfecting solution, not rubbing and rinsing lenses with solution before storage, and improper cleaning as well as not replacing the storage cases on time have also been mentioned by Bhandari and Hung.[13] He has reported swimming with contact lenses without swimming goggles. Robertson and Cavanagh have stressed the need to educate contact lens users regarding topping off solution, water exposure, and hygiene.[14] Our questionnaire did not cover the aspect of swimming, but 18/77 (23–37%) participants did not use protective glasses while riding on a two wheeler when wearing contact lenses. Bui *et al*., Dumbleton and Jones, and Lyndon Jones have dealt with the issue of perceived and actual non-compliance.[15,16] According to Bui *et al*., swimming with lenses is not perceived as a risk factor for infection by contact lens users in their study.[15]

Carnt *et al.* have stated that compliance does not depend on age, gender, or years of contact lens wear and the only significant factor predicting non-

compliance is a risk-taking personality.[17] It therefore becomes necessary to identify risk-taking personalities in contact lens users and be more vigilant in such cases.

Redness, discomfort, watering, and photophobia are reported due to having lenses on the eyes for more than the prescribed time, poor lens care, and toxic solutions.[5,15,18] In our study, comfort level was scored during various activities with lenses on the eyes and after removal of lenses. It was observed that 64.9% of participants were comfortable after removal of lenses, indicating issues of lens fit and care [Table 2].

In our group, we did not find any sight-threatening problems such as keratitis; however, ocular surface abnormalities such as papillary hyperplasia, meibomian gland dysfuntion, and giant papillary conjunctivitis [Table 3] were responsible for discomfort and abandoning the use of lenses. It is reported that with the use of contact lenses there is a persistent risk of keratitis. Although Pseudomonas is responsible for the majority of sight-threatening infections, other bacterial keratitis, fungal keratitis, and Acanthamoeba keratitis have been associated with contact lens wear.[7,19] There was a worldwide outbreak of Fusarium keratitis associated with a particular brand of contact lens solution (ReNu with MoistureLoc®), which was then withdrawn.[20]

With a visible increase in a number of subjects opting for refractive surgical procedures, our participants were also questioned about their willingness for refractive surgery and reason for the choice. Only 37 students of 77 (48.05%) were willing to undergo refractive surgery as they thought it to be a permanent solution to correct their refractive error. All others were unwilling, either because they were scared of surgical complications (17 individuals) or they were comfortable with glasses or contact lenses (23 candidates). Xu and Jhanji in their study of choice of option for refractive correction have mentioned the role of cost, benefits, risks or complications, and long-term stability as factors in deciding what to choose.[21]

It is observed that good compliance is mandatory for t use and care of contact lenses. From the available literature, it is clear that compliance has not improved over the decades. Development of new educational strategies that will successfully alter the behavior of contact lens users is the need of the hour.[15] Wohlhagen has suggested assessment of patient's expectations and feasibility before prescribing contact lenses, educating the patient about lens care, encouraging proper hygiene in lens usage and storage, and explaining the consequences of non-compliance to the patient as positive steps toward improving compliance in addition to updating knowledge about lens care products and imparting it to the users.[22]

The American Academy of Ophthalmology has a campaign to warn consumers about the health risks associated with cosmetic contact lenses acquired from illegal resources.[23] A similar strategy is essential to educate the public in developing countries for cosmetic contact lenses and even for contact lenses prescribed for other purposes.

CONCLUSION

Despite being aware of serious problems such as sight-threatening infections associated with improper contact lens care, medical students who are budding future health promoters were quite casual and complacent. They ignored instructions given by the ophthalmologists or the opticians. This problem needs to be addressed at the individual as well as community level. Ophthalmologists and optometrists must proactively inculcate the habit of good lens care in their patients by making them aware of the devastating problems that may arise when the lens care instructions are not adhered to at the time of first visit as well as during subsequent visits. The follow-up visits must be planned and scheduled according to individual needs. Practitioners must ensure that the subjects turn up for follow-up and also provide a feedback of what is practised. The practitioners must give relevant written and oral instructions to make necessary changes in care practices whenever necessary. Special attention must be paid to patients who have a high risk-taking complacent attitude. Ophthalmologist having experience and knowledge about appropriate indications and fitting technique, hygiene, maintenance, and risks and benefits associated with contact lenses must be consulted before contact lens use.

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How to cite: Sambarey P, Raje S, Gupta A, Dikshit R. Dealing with Complacency and Non-Compliance in Contact Lens Use and Care. MIMER Med J 2017;1(2):13-17.

Source of support: Nil. **Conflict of Interest:** None