

# Contact Lens Wearer's Outlook Towards Recommended Replacement Schedule of Contact Lens in Mumbai

Mansi Mehta<sup>1\*</sup>, Kalika Bandamwar<sup>2</sup>

<sup>1</sup>Ph.D. Scholar, Department of Optometry, School of Allied Health Sciences, Chitkara University, Punjab, India

<sup>2</sup>Assistant Professor, Department of Optometry, School of Allied Health Sciences, Chitkara University, Punjab, India

\*Corresponding Author: Mansi Mehta

<sup>1</sup>Ph.D. Scholar, Department of Optometry, School of Allied Health Sciences, Chitkara University, Punjab, India

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## Abstract

**Background:** Non-compliance is one of the major reasons of CL related complications. Various research studies have been done over the past three decades to find reasons for patient non-compliance. Use of CLs over the recommended replacement schedule has been one of the major reasons leading to CLs complications. It is evident that the CLs user are often unaware of their non-compliance towards lens care and maintenance regimen. Even after introduction of daily disposable lenses and one-step multipurpose solution non-compliance towards CLs use is still a major problem in CLs patients. The complications due to patient non-compliance can be sometimes irreversible. This research will help us understand CL user reasons of intentionally or unintentionally being non-compliant to recommended replacement frequency.

**Method:** All CL users willing to share their experience participated in this questionnaire based online survey which was designed with the help of focused group discussion.

**Results:** Most of the CL wearer prefer buying pairs for at least 6 months at a time. Almost 80% of CL wearers do not replace their CL as per MRRF. 70% of those who participated wore CL for more than 10 hours per day. The male and female ratio is almost equal in the participants participated in the research.

**Conclusion:** Research done in the past suggest incomplete knowledge imparted to the wearer or CL forgetting the instructions given to them at dispensing. Research also suggest some CL wearer knowingly are non-compliant to MRRF. This study tries to find loopholes in a CL practice by finding reasons of non-compliance as per CL wearers prospective and probable suggestion from the user itself. An ECP is a paramedical person who has the right to prescribe them, whether according to MRRF or as per their knowledge of the patient's ocular status. For e.g., an antibiotic medicine is supposed to be prescribed for 3 days or 5 days, once or twice is decided by the medical practitioner prescribing. As this research shows over 50% of the CL wearer said that their 'ECP said its okay'.

## INTRODUCTION

Contact lenses (CL) are one of the common modes of refractive error correction, approximately 150 million people wear CL worldwide; of these about 80% wear soft CL.<sup>1</sup> Although safe in most of the cases CL can cause serious eye infections, affecting one out of 500 users per year.<sup>2</sup> Use of CL beyond recommended period by manufacturer has been repeatedly found to be one of the common factors of non-compliance with potential to cause adverse effects.<sup>3</sup> An area that needs attention is the CL user understanding of the instructions of care and maintenance.

Approximately 40-90% of CL users do not follow CL care instructions. Although CLs wear has higher chances of eye related complications compared to spectacles; the CL related complications are often related with patient non-compliance<sup>4</sup> or improper guidance from the practitioner.<sup>5-9</sup>

Non-compliance is one of the major problems in health care field.<sup>10,11</sup> In recent years, the connection between CL complication and patient non-compliance to lens care and maintenance have been heightened.<sup>5-7</sup> A survey was carried out by FDA in 1986 in USA on daily and extended wear CLs user which revealed that patients were confused of the instructions imparted to them by the practitioner or in some cases no instructions were imparted on lens care, lens case replacement, cleaning and disinfecting of lenses or replacement schedule to be followed for the prescribed CL.<sup>12</sup> As we have substantial research supporting that patient non-compliance leads to 90% of CL related complication.<sup>13-17</sup>

CL care compliance varies among patients and depend on guidance from their practitioners. While it is necessary that patients follow all instructions provided by the practitioners. Negligence towards patient education can directly lead to CL complication in the long run. Most of the patient follow the lens care, maintenance and replacement schedule as instructed however a few deliberately indulge in non-compliance for various reasons such as to save money, lazy to track replacement dates, or not convinced to throw the lenses that feel fine and provide clear vision. Current strategies to improve

compliance are limited. Patient education is paramount and has been the gold standard for decades. Recent findings, suggest that recommendations amongst eye care practitioners are highly variable necessitating more effective practitioner educational programs to eliminate this ambiguity. Our research will help us understand CL users prospective and suggestion for improving compliance in CLpractice.

## Objective

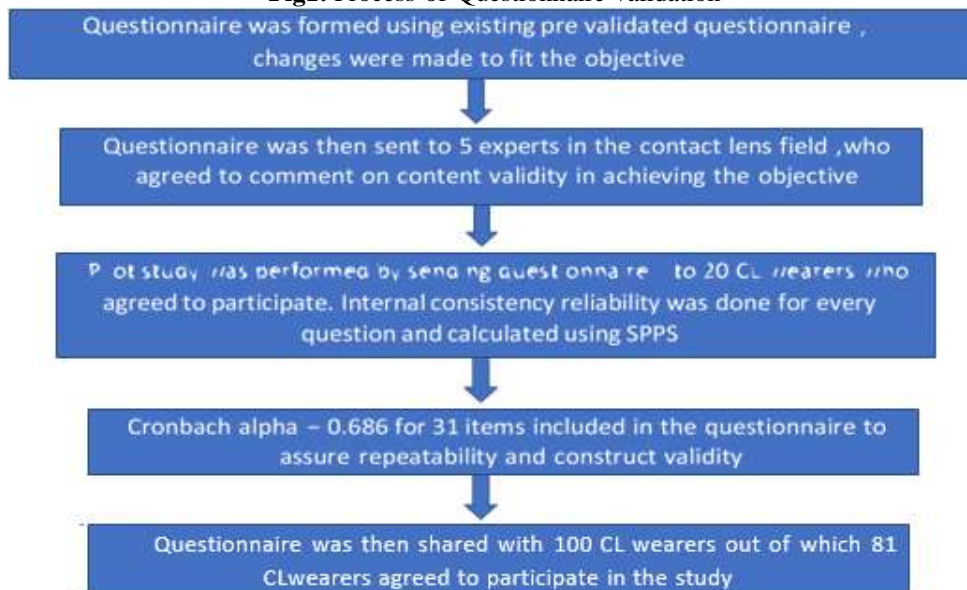
To evaluate CLs wearer's outlook towards recommended replacement schedule of CLs inMumbai.

## METHODOLOGY

### Pilot study

The questionnaire was designed using questions from the existing pre-validated questionnaire;however, a few changes were done to fit the objective to be achieved. This questionnaire was validated (Fig 1) using Cronbach alpha to assure repeatability and construct validity. This questionnaire was presented and approved by the Indian human ethics committee (IHEC).

**Fig1: Process of Questionnaire validation**



Questionnaire was sent to five experts in the contact lens field who agreed for commenting for content validity and voted for every question to be relevant in achieving the objective, relevant comments were considered, and changes were made. This questionnaire was then sent to 20 CL wearers who agreed to participate in the questionnaire study. Internal consistency reliability was done for every question and calculated using SPSS software which revealed: Hence the questionnaire was then shared via an online google form to 100 CL users out of which 81 CL users responded to participate in the research study.

### Study population

Study population were CL users at Hospital sector in Mumbai, India.

Inclusion criteria were CL users irrespective of the refractive error, with or without history of infection. Exclusion criteria were CL wearers with binocular vision anomalies, any corneal abnormalities, any trace of nuclear sclerosis or strabismus. CL users that meet the inclusion criteria were provided with an online survey questionnaire link via e-mail, a hard copy/printable version was also made available on request. All participants were CL users based in and around Mumbai, were contacted for inclusion in the study. Those who were willing to participate after signing an informed consent were included. In this cross-sectional study all CL users were contacted over two months and those who meet inclusion criteria were included. After initial invitation, those who have not responded were sent reminders after 1 week and 4 weeks. Data from all the participants were considered for the study.

### Study Procedures

A questionnaire tool is used to evaluate reason for non-compliance among CL users based in and around Mumbai with emphasis on non-compliance to recommended replacement schedule. The questionnaire is designed using a focussed group discussion. Study population would be existing CL users. CL users are given an anonymous self-reported questionnaire and asked to complete it for information on most preferred brand or used by wearers, common recommended replacement schedule used, years of CL use, duration of CL use in hours per day, preferred time to discard lenses, reasons of non-compliance to recommended replacement schedule, preferred replacement schedule, follow up at practitioner and pair of lenses bought at a time. Subjects found to be non-compliant to recommended replacement schedule in objective 2 will be considered for the objective 3.

## Statistical Analysis

To this research, compliance was defined as whether CL user was compliant to the manufacturer's recommended replacement frequency (MRRF) of contact lens according to the questionnaire designed.

Chi square tests were used to examine if there were significant differences in continuous variables between two groups (such as years of contact lens use between knowledge imparted by ECP on dispensing, purchase of CL at a time, to place of CL purchase co-related to reasons of non-compliance). Statistical significance was set at  $P < 0.05$ . Stepwise logistic regression analysis was conducted to identify significant behaviors associated with age of user, years of CL use and purchase preference.

## RESULTS

### Contact lens user demographics.

The study population consisted of 54.3% female and 45.7% male. 84% of participants included in the study used CL for more than 5 years. P-test of significance was calculated with  $P < 0.05$  was set. There was a significant association between age of CL user and hours of CL use, as age increases the more hours/day increase in CL usage was found. However, there is no significant association found in age of user to attitude of sleeping with CL or visiting ECP, complication to CL or non-compliance to MRRF. There was no correlation found between the years of CL use to the reasons of non-compliance as per patient education imparted. However, 46.9% of the CL user according to the practitioner fall in the age group of 30-39 years. (Table 1). Disposable CL bought at a time for six months was reported to be 45.3%, for more than six months was 31.2% and for three months was reported by 17.2% (Fig 2). CL users prefer 65.4% monthly disposable, 11.1% daily disposable and 11.1% two-week disposable modality to their CL users (Fig 3). CL users use both Bausch & Lomb and Acuvue (J&J) almost equal at 44% and 38% respectively, whereas 11.1% use Alcon and 14.9% other available brands in the market. (Fig 4).

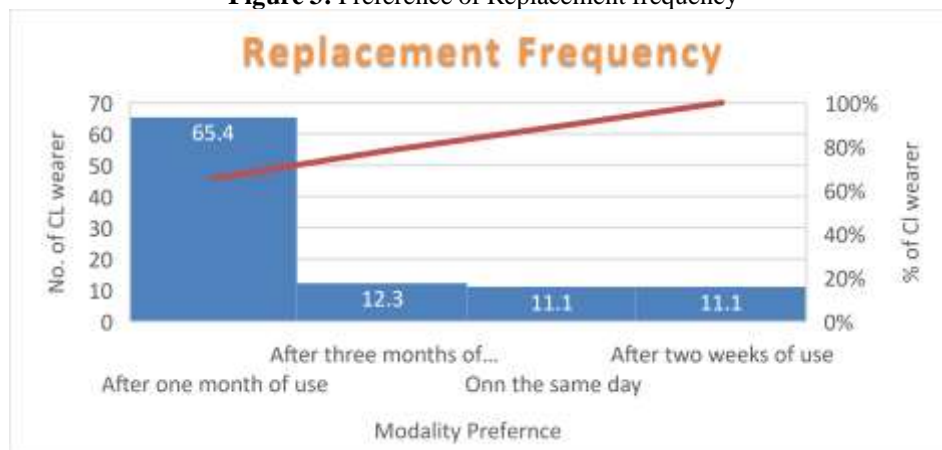
**Table 1:** Age group prevalence of CL user

Age group of CL user	Percentage
<20yrs	2.60%
20-29yrs	27.20%
30-39	46.90%
>40yrs	23.50%

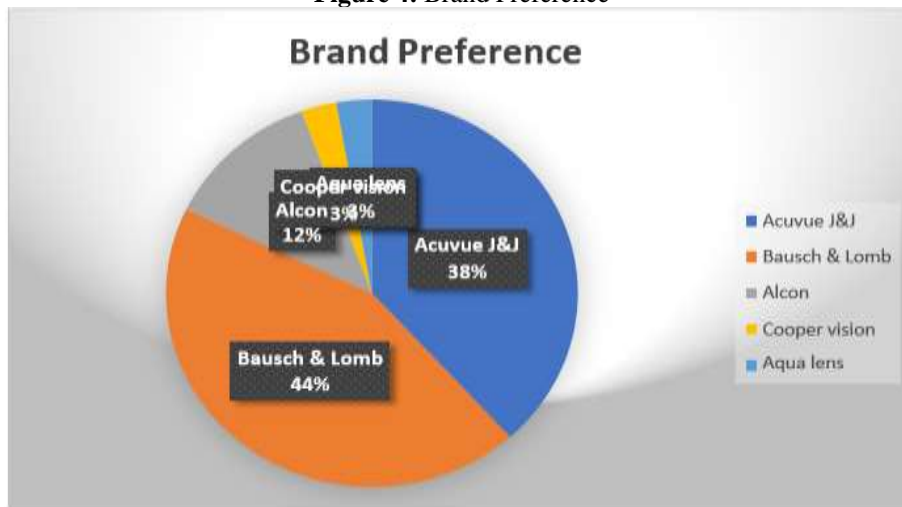
**Figure 2:** Number of CL pairs bought at a time.



**Figure 3:** Preference of Replacement frequency

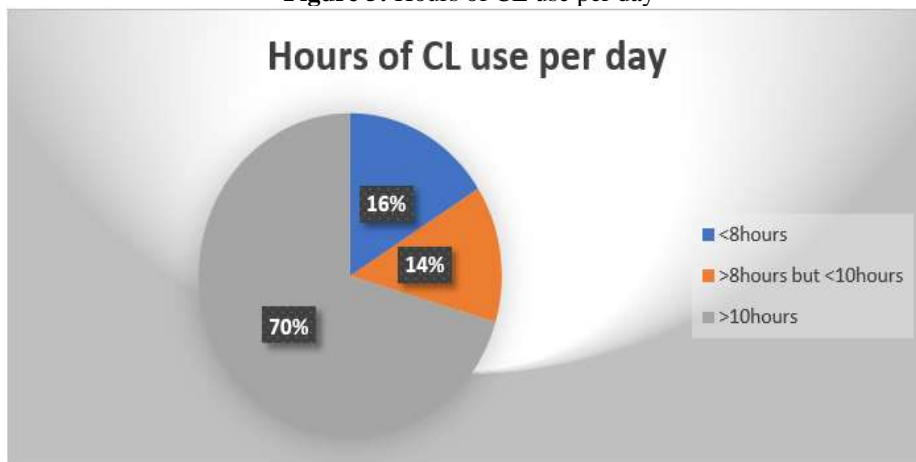


**Figure 4: Brand Preference**



Most of the CL user included in the research use CL for over 10 hours per day. (Fig 5) There was a significant association found between more years of CL use to more hours of CL usage. 37% of CL user purchase CL for 3 to 6 months at a time, however 46% of CL user buy their CL online or elsewhere than their ECP. (Fig 6) There was a significant association found between online purchase of CL and non-compliance to MRRF.

**Figure 5: Hours of CL use per day**



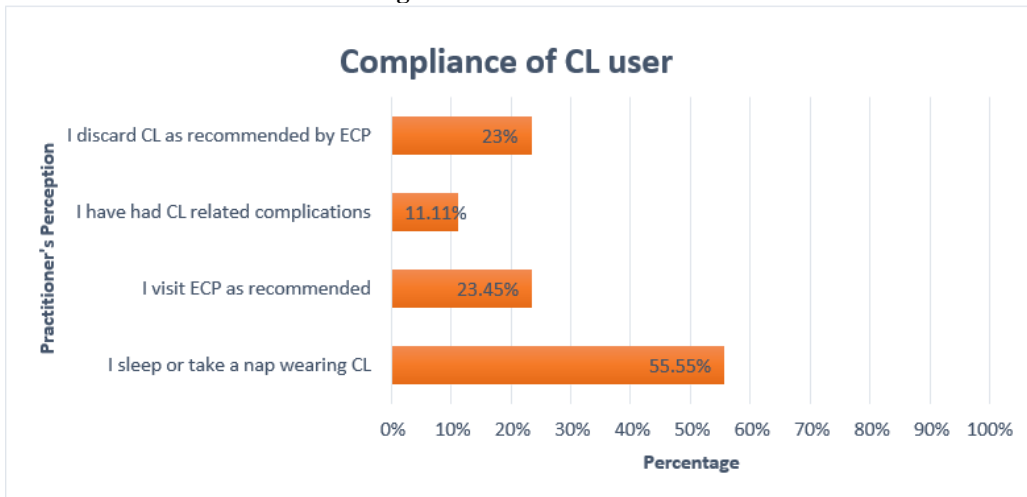
**Figure 6: CL buying preference**



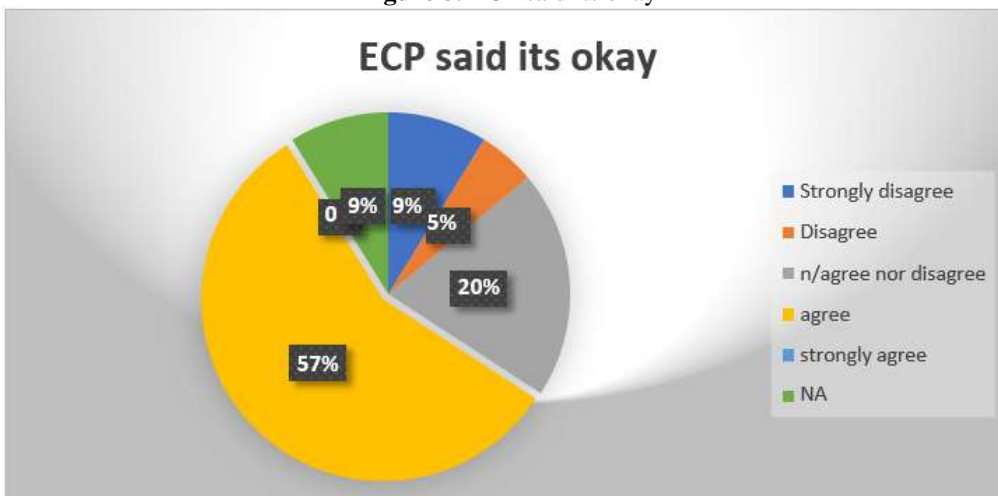
**Contact lens wearers compliance.**

According to this research 55.55% of CL user have a tendency of napping with contact lenses. (Fig 7) There are 57% of the CL wearer agree that ECP said its okay to wear CL over the MRRF (Fig 8). There was a significant association found between age of CL user and ECP said itsokay. Only 19.75% of CL wearers replace their contact lenses as per the MRRF. There was a significant association between years of CL use to finally discarding lens on red eye or discomfort. Most common reason of non-compliance to contact lens was forgot to order lenses & lack of time which was 38.27%, closely followed by 32% to save money (Fig 9). However, there was significant association found between age of CL user and reason of continuing the lens as no harm. CL wearers feel best way to improve CL compliance to MRRF is via SMS or reminder. (Fig10). There was a significant association found between years of CL use and suggestion of improving compliance via SMS.

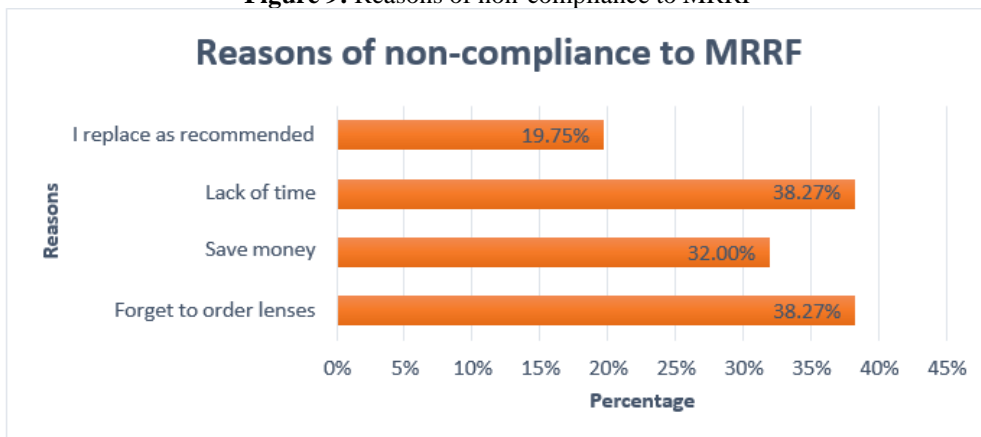
**Figure 7: Discard of CL use**



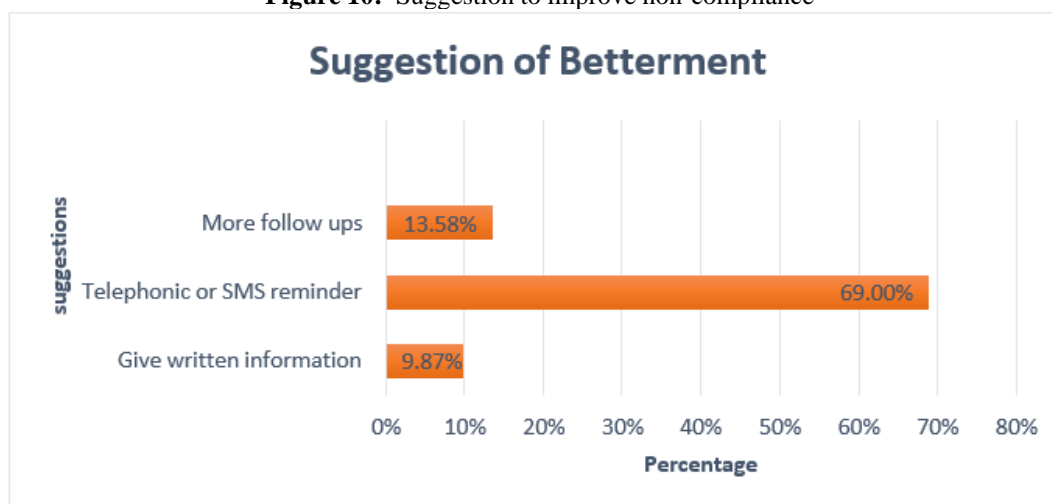
**Figure 8: ECP said its okay**



**Figure 9: Reasons of non-compliance to MRRF**



**Figure 10:** Suggestion to improve non-compliance



### 4.2.3 DISCUSSION

Research done in the past suggest incomplete knowledge imparted to the wearer or CL wearer forgetting the instructions given to them at dispensing leading to non-compliance to CL wear.<sup>18</sup> Research also suggests that ECP prescribe certain CL over the MRRF according to their understanding and experience of CL practice.<sup>19</sup> Research also suggest some CL wearer knowingly are non-compliant to MRRF.<sup>20,21</sup>

This study firstly tries to understand the CL wearers included by taking in to account their sex, age, type of CL they use, their knowledge of when to discard their lenses and its correlation to the brand and CL that they use. This will help us understand their knowledge of CL modality they are using and whether they follow the MRRF.

Next section is dedicated to history of CL use by including the years and hours of CL use. Then a section was dedicated to CL compliance by asking questions like whether user naps with CL, visit to ECP as per follow up schedule, any CL related complications in the past and discard lenses as per ECP recommendation. Another section was dedicated to understanding CL wearers preference of at a time purchase of number of CL pairs helping us understand CL wearer preference of follow up to their ECP.

Next section was dedicated to the reasons given by CL wearer for non-compliance to MRRF giving options of the most common reasons listed according to previous research and understanding ultimately when they remember to replace their lenses giving options of the most common symptoms observed due to over wear of CL as per old research.<sup>19</sup>

This study investigates CL wearers understanding of the knowledge imparted to them by the ECP. It also tries to find loopholes in a CL practice by finding reasons of non-compliance as per CL wearers prospective and probable suggestion from the user itself that might help them in improving their CL wear.<sup>22,23</sup>

As in the medical field manufacturers can suggest certain dosage or usage of medicine as per their research but following or not following is completely on the practitioners. For e.g., an antibiotic medicine is supposed to be prescribed for 3 days or 5 days, once or twice but sometimes if a patient has infection worse than the doctor would ask him to take for seven days also according to his knowledge. Similarly, CL is also called a medical device, an ECP is a paramedical person who has the right to prescribe them as per their knowledge of the patient's ocular status. It doesn't mean they would prescribe for over-wear only, but they can also prescribe for reduced wear than the manufacturer recommended, like a monthly disposable CL can be prescribed for bi-weekly or a quarterly wear can be prescribed for monthly. As this research shows over 50% of the CL wearer said that their 'ECP said its okay'. It also helps to understand CL wearers thinking on follow up as according to the questionnaire maximum of the CL wearers agree for telephonic or SMS reminder to reduce non-compliance to MRRF over follow ups & written information, as we live in the digital world amidst the pandemic that people over the world have experienced, following up for a routine checkup has reduced and been avoided on a large scale.

### 4.2.4 CONCLUSION

Maximum of the CL user participated in the research fall in the age group of 30-39 years. The male and female ratio is almost equal in the participants participated in the research. Most of the CL wearer prefer buying pairs for at least 6 months at a time. Out of total number of CL wearer participating in this research over 60% were monthly disposable wearer. Maximum of the CL wearer were divided between Acuvue and Bausch & Lomb brand. 70% of the CL wearer participated wore CL for more than 10 hours per day. CL wearer 46% of them preferred buy CL online or elsewhere rather than their ECP. Just over 50% of the CL wearer nap or sleep with CL. 57% of CL wearer said their ECP said its okay to over wear CL. Almost 80% of CL wearers do not replace their CL as per MRRF because they forget the actual day or replacement or forget to order closely followed by to save money. CL wearers suggest a reminder via a telephone or SMS would help to overcome their non-compliance to MRRF.

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