



# Ocular and Extraocular Symptoms among Medical Undergraduates with Cellphone Addiction, A Cross-sectional Study

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

**Aim:** To find out the frequency of ocular and extraocular symptoms due to cellphone use among the medical students.

**Study Design:** Cross-sectional study

**Place and Duration of Study:** Study was conducted in private and public sector medical and dental colleges of Karachi from January 2019 to September 2019.

**Methodology:** Self-designed, self-explanatory questionnaire was used to collect data. The setting for the collection of the data has been classrooms, common rooms, cafeteria and open sports areas of the medical and dental colleges which has been surveyed by the different team members

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of the group. The data was analyzed by using Statistical Package for the Social Sciences (SPSS) version 22.

**Results:** The mean age of the study participants was 21.2 ±1.82 years, among them majority was female i.e. 60.25%. Participants were having different degrees of blurred vision, eyestrain, dry eyes, eye redness and irritation, difficulty in refocusing the eyes and double vision with frequency of 17.25%, 24.25%, 9.5%, 10.75%, 9% and 5% respectively. Respondents during the survey stated that they were having different physical problems apart from disturbance in eyesight. About 39.75% respondents complained of varying degree of headache and or migraine. 36% were having pain in neck, shoulder or back while 25.25% were having variable degree of fatigue. About 21.5% complained pain in fingers and wrist, 9.5% complained of hand stiffness and their inability to grip or hold any other thing properly.

**Conclusion:** It has been concluded that cellphone usage has serious ocular and extraocular hazards so there is a need to limit its usage as it is affecting the physical and mental health of the students.

*Keywords: Cellphone addiction; ocular symptoms; extraocular effects.*

## 1. INTRODUCTION

Use of cellphone is a part of our daily routine. It is estimated that about 4.5 billion people are using cellphone worldwide and majority of them are youngsters. Cellphone is actually a need of society rather than luxury as is used for information, education, communication, and for entertainment. Multiple surveys have been done which shows that cellphone is an integral part of survival even some of the youngsters stated that they can survive without food for a day but cannot without their cellphones [1, 2].

Beside all the benefits of using cell phone, the youth is getting addicted to their phone leading to multiple ocular and extraocular problems [3, 4]. Use of smart screen for longer duration affect person's accommodating power and convergence because of decreased or incomplete blinking of eyes [5]. Literature reported that the light of these smart devices stresses the eye and cause refractory errors and deleterious effects over retina [6]. The blue light emitted from cellphone disturbs the circadian rhythm as it inhibits the melatonin release [7]. The international agency for research on cancer concluded that there are hazardous radiations which are emitted from cell phones, and these radiations are one of the possible cause of increasing presentations of brain cancer and damage to the nerves [8, 9].

Due to excessive use of cellphone the most common symptoms include eye strain, blurred vision, difficulty in refocusing, dry eyes, double vision, myopia, headache, neck and shoulder pain, fatigue, joint pain and inability to write or

hold object [10]. The aim of the current study is to find out the frequency of ocular and extraocular symptoms due to cellphone use among the medical students.

## 2. MATERIALS AND METHODS

A cross-sectional study was conducted in private and public sector medical and dental colleges of Karachi from January 2019 to September 2019. Calculated sample size was 400. Self-designed, self-explanatory questionnaire was used to collect data. The setting for the collection of the data has been classrooms, common rooms, cafeteria and open sports areas of the medical and dental colleges which has been surveyed by the different team members of the group. Those students were included who were using smartphones for pleasure, communication or study purpose for more than at least 1-year duration while those students who either did not give their consent for the study or with diagnosed eye problems or females with gross anemia were excluded from the study.

The data was analyzed by using Statistical Package for the Social Sciences (SPSS) version 22. For numerical variables mean with standard deviation were calculated and for categorical variables frequency and percentages were calculated.

## 3. RESULTS

The mean age of the study participants was 21.2 ±1.82 years, among them majority was female i.e. 60.25%. Students were equally selected (50%) from the both degree programs including

MBBS and BDS. Besides that, there was equal distribution of study participants in Government and Private medical colleges to avoid biasness. The demographic characteristics of study participants are mentioned in Table 1. During the survey multiple ocular symptoms were noted among the cellphone users. About 17.25% of the participants were having different degrees of blurred vision while 24.25% were having variable range of eyestrain during extensive use of cell phone. Constant focus and not blinking the eyelashes can cause dry eyes so about 9.5% were having eye dryness with cell phones while 10.75% were having eye redness and irritation. After prolong use of cell phone, 9% were having difficulty in refocusing the eye and 5% reported double vision as presented in Fig. 1.

**Table 1. Demographic characteristics of study participants**

Variables	n=400	%
Gender		
Male	159	39.75
Female	241	60.25
Degree program		
MBBS	200	50
BDS	200	50
Educational sector		
Government	200	50
Private	200	50

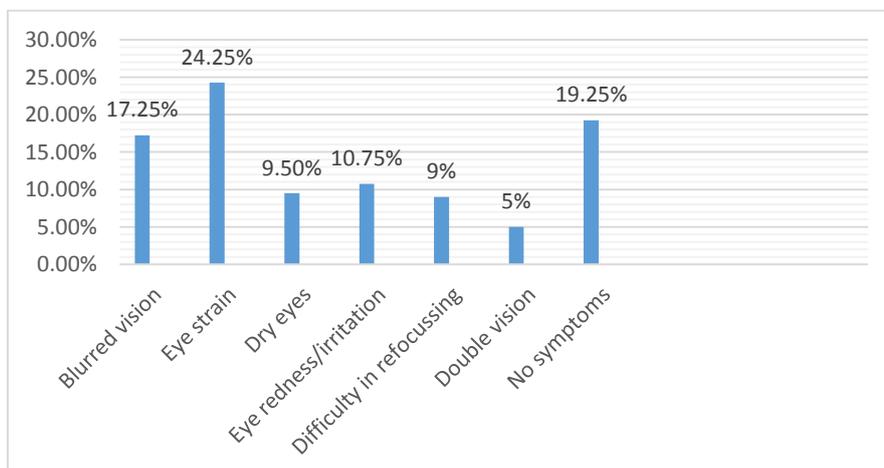
Out of 400 participants in the study, 20.75% of participants were already suffering from dry eyes and had visited an eye consultants or general practitioners for this problem while only 13.5% of participants were using artificial tears or other tropical eye drops for the treatment of dry eye

disease. About 46% of participants of the study were having eye sight issues of variable degrees. In our study it was observed that out of 46% participants only 33.75% were using glasses or contact lenses to improve their eyesight as mentioned in Table 2.

**Table 2. Diagnosed eye diseases and their correction**

Diagnosed diseases	n= 400	%
Dry eye disease	83	20.75
Use of tropical drops	54	13.5
Refractive errors	184	46.0
Use of glasses or contact lenses	135	33.75

Respondents during the survey stated that they were having different physical problems apart from disturbance in eyesight. About 39.75% (159) respondents complained of varying degree of headache and or migraine. About 36% (144) of participants were having complaint of pain in neck, shoulder or back while 25.25% (101) were having variable degree of fatigue. Holding the cell phone in a specific position for hours and hours was expected to cause damage and pain specially those of fingers and wrist, but our younger generation who was participating in the study, only 21.5% (86) participants complained of such problems while 9.5% (38) of the participants complained of hand stiffness and their inability to grip or hold any other thing properly. About 7.25% (29) students agreed that they were having difficulty holding their pens for writing and 19.25% (77) of the participants complained of shoulder pain while using cell phones as presented in Fig. 2.



**Fig. 1. Percentage of ocular symptoms among cellphone adductors**



**Fig. 2. Percentage of extraocular symptoms among cellphone adductors**

#### 4. DISCUSSION

It has become an alarming situation where every user of cell phone has become addicted to its use and because of which are suffering from distress and becoming victims of poor eyesight and other ocular and extraocular symptoms [11]. Literature is full of researches reporting higher prevalence of ocular and other symptoms and their association with cellphone addiction [12].

Bogdănici, Săndulache and Nechita, identified along with many other complaints of physical and psychological nature that, blurred vision is an important outcome of this addiction, when a person keeps on watching display screen for longer period of time his vision gets blurred, this blurring to vision is not temporary but get permanent if not corrected in short period of time [13]. Küçer N also reported blurring of vision, conjunctivitis and watering of eye among the cellphone users [14]. Current study found that 17.25% of the participants were having different degrees of blurring of vision. Baudouin et al. has shown that people also encounter dry eyes when they continuously use cellphone. Dry eye is a condition in which eyes get fatigued along with redness, unusual discharge and irritation, dry eyes do not produce tears or tears may evaporate too quickly [15]. Dry Eyes are a common complaint among people of Karachi which may be due to excess pollution, dry dusty winds and chronic sinusitis. Current study found 20.75% of participants were already suffering from dry eyes and had visited an eye consultants

or general practitioners for this problem out of which 13.5% are using tropical eye drops.

Perera et al. elaborated that after consistent watching on smaller screen for hours, individual may start feeling headache, this shows that cellphone addiction is not only limited to eyes and vision related problems but it also has harmful effects on nervous system of a person due which individual feels headache [16]. Current study is also reported headache in about 39.75% study participants.

Literature reported variable degrees of neck, shoulder and back pain with different postures and positions while using cell phones. Gustafsson et al. in their publication discussed their findings of musculo-skeletal discomfort and pain. They indented that, victims of cell phone addiction also encounter neck and shoulder pain, this pain is due to excessive use of neck in downwards position [17]. About 36% of participants from current study agreed of having any such complaint in neck, shoulder or back which was again directly related to their postures, positions and length of cell phone use duration but majority of 64% of respondents denied of any complain. This may be related to their young age and possible better posture during phone use. While aggregating the number of participants having different complains of variable levels of musculo-skeletal or eye problems, it was observed that 80.75% participants had one or other problem.

Early fatigue is a common problem during any task on routine basis, but the desire to continue the assignment or psychological dependence reduces the chances of early fatigue [18]. During current study, most of the medical students about 74.75% denied fatigue syndrome. Literature also reported that continuous use of cellphone for texting, gaming or scrolling the social media cause tendinitis, numbness and pain in wrist or hand [19,20], same is favored by the current study.

## 5. CONCLUSION

It has been concluded that cellphone usage has serious ocular and extraocular hazards so there is a need to limit its usage as it is affecting the physical and mental health of the students.

## ETHICAL APPROVAL

The project had been conducted after the approval by the Departmental Research Committee of Community Health Sciences and finally by Ethical Review Board of Hamdard University.

## CONSENT

Participants were randomly selected after informed consent.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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