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SMARTPHONE VISION PROBLEMS AND AWARENESS PROGRAM AMONG COLLEGE STUDENTS

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ABSTRACT

Many Peoples are using smartphone rather than landlines. Smartphone overuse has been identified as a potentially modifiable risk factor for visual impairment. Many of them use their phones with no knowledge of the ocular negative effects of smart phones. The purpose of this study was to assess the prevalence, pattern, and impact of smartphone use on ocular health and create awareness program among university students. Research design selected for this study was a cross sectional study. Non probability volunteer sampling methods was used to select 560 sample who met the inclusion criteria. To obtain data, a structured questionnaire with socio demographic and visual manifestations data was used. Data was analyzed using the SPSS program version 22. The overall utilization of smartphone was 98.84%. Furthermore, the average daily duration of smartphone use was 3-6 hours (30.2%) and females claimed that they used smartphone more frequently than males. Furthermore, smartphone users (46%) reported increased dryness after prolonged smartphone use. Finally, the majority of students (69%) experienced one or more ocular problems as a result of smartphone use. The number of hours spent using a digital screen, using a screen in a dark room, and having a blue light filter on a screen were all associated positively with the onset of ocular

symptoms. Smartphone use has been linked to the emergence of ocular symptoms. Health education campaigns on smartphone use and related ocular risks are strongly advised.

Keywords: Smartphone, Visual Impairment, College Students

INTRODUCTION:

The smartphone is seen as a crucial instrument for communication and is increasingly being included into our societies as it serves as both a social supplement and a means of communication **[1]**. Smart phones are currently used every day by people of all ages, but particularly by teenagers and young adults **[2]**. These gadgets can also carry out a growing variety of jobs and functions. As a result, their use is growing significantly worldwide in comparison to traditional fixed phones **[3]**. Even if using a smartphone continuously throughout the day can make life more easier, it can also result in neurological, retinal, musculoskeletal, and otological problems **[4]**.

In addition to musculoskeletal symptoms, excessive usage of smartphones can lead to physiological health issues such headaches, dry eyes, earaches, and weariness **[5]**. Furthermore, the primary contributor to traffic accidents is utilising a smartphone while driving. The link between excessive smartphone uses and cancer is also a topic of discussion **[6]**.

Addicts to smartphones can lead to severe psychiatric illnesses on a psychological level. They do not, however, appear to have any medical or psychological symptoms, and others are unaware of their illnesses **[7]**.

According to recent reports, using a smart phone has the greatest negative effects on the eye. However, there is a dearth of information in the medical literature **[8]** regarding the effects of smartphones on the eyes. Visual problems are a widespread issue that affect people of all ages and have a significant impact on the economy and finances of countries **[9]**. According to data, 285 million people worldwide had visual problems in 2010; of these, 246 million had decreased vision and 39 million were completely blind. Nearly 90% of them were immigrants from underdeveloped nations **[10]**.

The most frequent ocular problems associated with excessive use of computers and smartphones are dry eye and diplopia, especially in young individuals who are thought to use these devices the most frequently **[11]**. As a result, various organisations have suggested the maximum daily usage time for these gadgets.

However, there is a dearth of published information, particularly in the Gulf region of

the Middle East, on the causes and incidence of ocular illnesses related to smart phone use **[12]**. Planning and implementing a prevention programme to lessen the effects of smart phone use among university students and their families requires an understanding of the prevalence, pattern, and effects of smart phone use on ocular health among university students. Therefore, as a representative sample of young adults and adolescents in Sankalchand patel University students, Visnagar, Gujarat were chosen for this study to investigate the prevalence, pattern of usage, and effects of smart phone use on ocular health.

METHODOLOGY:

Cross sectional research design was chosen as the study's research method. 560 college students who met the inclusion requirements were collected using a non-probability volunteer sampling technique. After receiving verbal research information and their agreement, they were chosen at random. A set of pre-designed questionnaires were used to collect the data. Classrooms, common areas, cafeterias, and open sports areas of the nursing and physiotherapy institutions served as the location for the data collection, which was carried out by the various team members of the group. Students who had used smartphone for fun, communication, or academic purposes for at least a year were included in the study, while those who either refused to give their consent, had eye problems that had been diagnosed, or were females with gross anemia were not. “Statistical Package for the Social Sciences (SPSS) version 22” was applied to enter the data, analyze it, and draw conclusions. For categorical variables, frequency and percentages were determined in addition to mean and standard deviation for numerical variables. Using ANOVA with a post hoc Tuckey's test, the risk factors connected to smartphone visual issues were found. A binomial logistic regression model was created to determine the relationship between ocular symptoms and the risk variables for smartphone vision problems.

RESULTS:

According to **Table 1**, there were 56% (312) men and 44% (248) women. According to the type of screen being used, 88% (493) of the people had android phones, 12% (67) had apple phones. The findings make it quite evident that android smartphone was the screen that nursing and physiotherapy college students utilised the most. The majority of our research participants have cell phone addictions. Greater than 3-4 hours of screen time per day were reported by 57%.

The findings showed that 59% (328) of the students were accustomed to maintaining a

constant look and concentrate on the screen while using a mobile phone, while 41% (232) either took breaks or experienced interruptions while doing so. Only 6% of participants in our survey reported using their cell phones for less than an hour in a dark environment, despite the fact that nursing and physiotherapy students had various levels of understanding about the health risks of using screens in darker surroundings. In the study, it was discovered that 70% of the participants adjusted the brightness of their cell phone screens when using them for extended periods of time, since they were aware of the risk to their eyes. Despite knowing how to do it, 30% of the participants had never adjusted their phone's brightness for ambient light.

In order to protect their customers' eyesight when using their phones at night, smart phone firms have developed blue light filters and night shields out of regard for their customers' safety. Night shields were used by about 31% of students to protect their vision. 68% of respondents admitted that they used their cell phones more at night than during the day.

Results also reported that about 69 % students were having symptoms of smartphone vision problem as presented in **Figure 1**.

During the survey, respondents admitted that they were experiencing a variety of physical issues in addition to ocular discomfort. According to **Figure 2**, 67% of respondents reported headaches of varied severity, which were closely related to the amount of time spent in front of screens. Approximately 42% of participants reported neck and shoulder pain, which was again strongly related to their postures and the amount of time they spent using their phones, while 69% reported varying degrees of weariness. Only 23% of respondents acknowledged experiencing varying degrees of vision blurriness, while 72% of participants reported experiencing varying degrees of eyestrain after prolonged smartphone use at any time of day or night. Only 46% of participants reported experiencing dry eyes while using a cell phone, whereas 39% reported experiencing eye redness and discomfort. Constant attention and failing to blink the eyelashes can also induce dry eyes. Five percent (20) of those surveyed who reported having trouble refocusing their eyes after using their smartphones for an extended period of time reported experiencing double vision.

Table 2 lists some of the risk factors that may contribute to the development of ocular symptoms that result in smartphone vision problems, including the number of hours spent using digital screens, the length of time spent focusing on them, using screens in dimly lit environments, adjusting screen brightness,

and the use of blue light filters in screens. The number of hours spent using a digital screen, using a screen in a dark room, and having a blue light filter on a screen were all associated positively with the onset of ocular symptoms, according to the results (p-value 0.05).

Table 1: Characteristics of study participants

S. No.	Demographic variable		Frequency N_1	Percentage %
1.	Sex	a)Male	312	56%
		b)Female	248	44%
2.	Screen type used	a) Android mobile	493	88%
		b) Apple mobile	67	12%
3.	Hours spend in front of digital screen	a) ≤1 hour	32	6%
		b) 1-2 hour	98	18%
		c) 3-4 hour	322	57%
		d) ≥ 6 hour	108	19%
4.	Focus on screen	a) Continuous	328	59%
		b) Interrupted	232	41%
5.	Hours spend in dark room	a) ≤1 hour	35	6%
		b) 1-2 hour	173	31%
		c) 3-4 hour	289	52%
		d) ≥ 6 hour	63	11%
6.	Adjust brightness	a) Yes	392	70%
		b) No	168	30%
7.	Blue light filter in screen	a) Yes	175	31%
		b) No	385	69%
8.	Major time spent with smartphone	a)Day	177	32%
		b)Night	383	68%

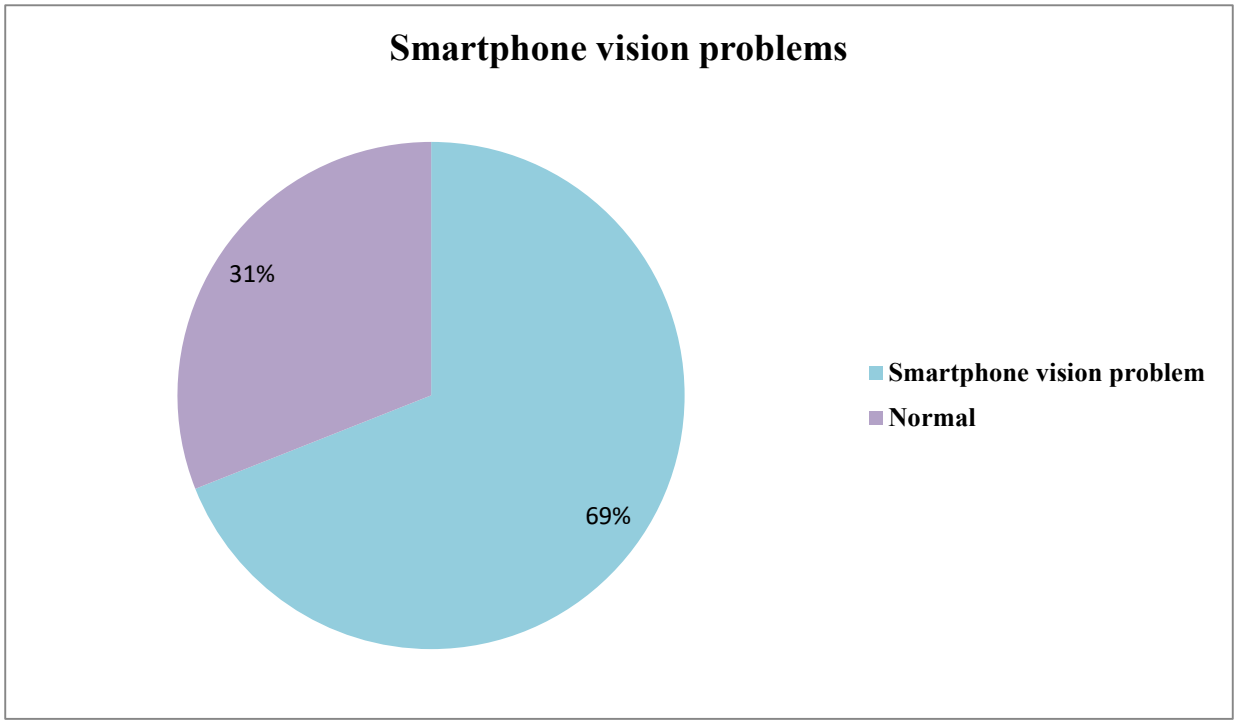

Figure 1: Smartphone vision problems

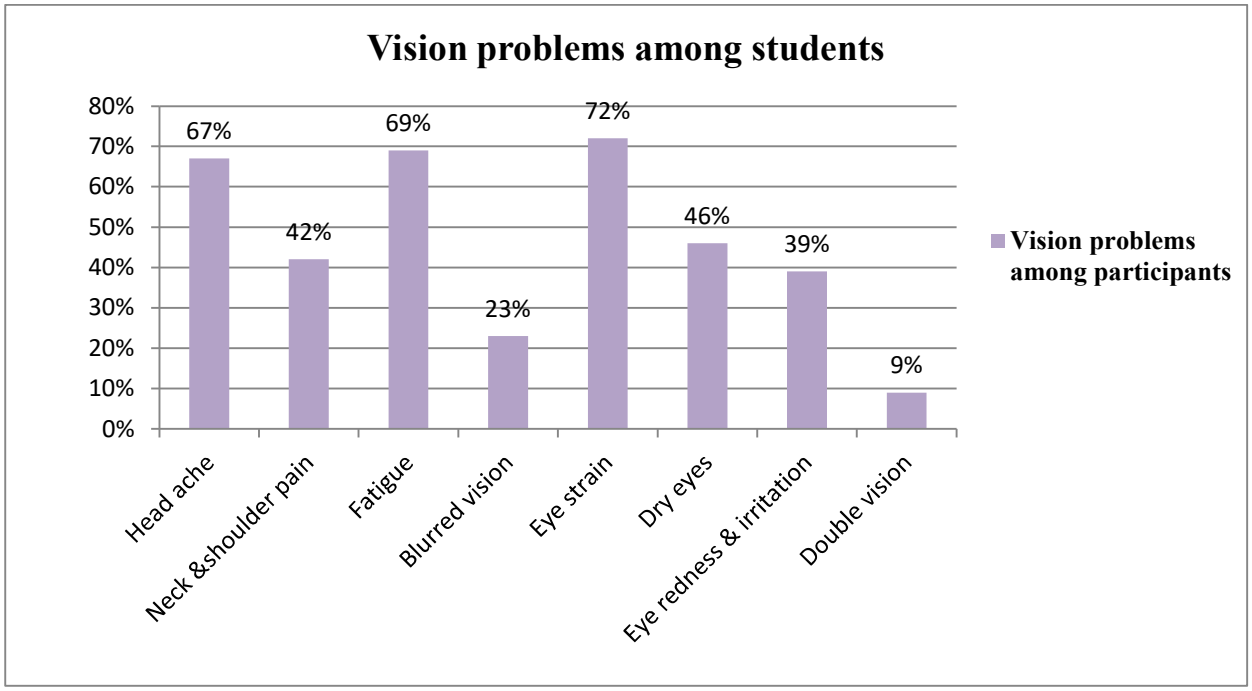

Figure 2: Smartphone vision problems among students

Table 2: Association of smartphone vision symptoms with risk factors

S. No	Risk factors	Chi square	P Value
1	Hours spend	61.602	12.592
2	Focus on screen	14.012	3.841
3	Using screen in dark room	83.195	12.592
4	Adjust brightness	8.082	3.841
5	Blue light filter on screen	19.141	3.841

DISCUSSION:

The drawback of society's expanding usage of smartphones and other smart devices with smaller screens is that people's eyes are paying the price. When using display screens, many people find that their eyes hurt and that they have visual issues. Everyone agrees that the amount and severity of their discomfort are strongly correlated with the amount of time they spend each day staring at devices **[13]**.

According to Perera *et al*., prolonged use of a small screen can cause headaches in some people **[14]**. This indicates that cell phone vision syndrome affects more than just a person's eyes and vision. It can also have negative consequences on their nervous system. According to Gustafsson *et al*., those who have cell phone syndrome also have neck and shoulder pain from using their neck too often in a downward position **[15]**. Lee and Low discovered that headaches constantly put students under stress; in fact, these symptoms

can have an impact on sleeping pattern and quality. Sleeping is uncomfortable for someone with neck and shoulder pain **[16]**.

smartphone vision problem has a number of symptoms, including eye pain, migraine, vision problem, dryness in eyes, and neck pain **[17] [18]**. In the current study, the most prevalent symptoms included migraine discomfort in the neck, shoulder, or back, fatigue, varying degrees of visual blurring, variable levels of eyestrain, dry eyes, red, itchy eyes, difficulty refocusing eyes, and double vision. The most frequent symptom of many physical and psychological complaints, according to Bogdanici *et al*., is blurred vision. When a person shares at a screen for an long period of time, their vision becomes blurry. This blurring is not temporary; it becomes permanent if it is not treated quickly **[19]**.

According to Coles-Brennan *et al*., improper lighting in the spaces where digital devices are used, improper eye distance from screens, the intensity of screen glare, uncorrected vision issues, incorrect posture of seating in front of display devices, or a combination of all these factors, are the main causes seen behind these symptoms **[20]**. The current study also concentrated on a few factors, such as the number of hours spent using a digital screen, the length of time spent focusing on it, using a screen in a dark room, adjusting the brightness of the screen, and using a blue light filter. It found a positive correlation between the number of hours spent using a digital screen, using a screen in a dark room, and using a blue light filter. Additionally, according to Aman *et al*.'s research, smart phone usage time directly correlates with the onset of smartphone vision problem **[21] [22]**.

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