A Contemporary Approach To Analyse The Impact Of Increased Screen Time On Individuals And Associated Issues

Deepti Sharma , Deepshikha Aggarwal and Archana B. Saxena

Department of Information Technology, Jagan Institute of Management Studies, Delhi, India.

Abstract

In recent year, digital device usage has increased significantly among people of all age groups. The screen time is enlarged by both social and professional group of people especially during this covid pandemic. The extensive use of computers/ laptop, smartphones as medium of teaching, learning and working professionals may lead to computer related health problems. The current research is conducted to demonstrate the usage pattern of digital devices. The interviews and questionnaire based surveys were conducted to collect the data. The results indicate the rising screen time for the people due to the usage of digital devices for various tasks. Researchers observed that the increasing screen time is leading to reduced concentration among the users. Among other major side effects of increased screen time such as tiredness, headaches, lack of physical activity, etc. loss of concentration is also an important factor that results due to increasing screen time and needs attention.

Keywords: Digital devices, screen time, health problems, data analysis, concentration

1. Introduction:

The time when the covid 19 pandemic started, there were numerous problems faced by people from different segments of the society. (Chahal, 2021) The pandemic not just brought uncountable medical emergencies but the overall lives of the people changed. The educational institutions and workplaces were locked down. People started to work online and education also became online. Due to these changes, the screen time has tremendously increased. We have conducted research on increasing screen time during the pandemic and the outcomes have enabled us to identify the factors leading to increased screen time and associated issues.

With the new normal during covid-19, usage of digital devices has increased a lot. (Arora, 2021) Across all age groups, there is a substantial increase in utility of various devices and thus increased screen time of users. In the data collected for this study, where age groups from 5 years and more have participated, we can observe people are using screens usually for more than 8 hours.

2. Literature Review

All constructive things comes with a baggage of limitations, same is true for this "Digital Era". Digital Era is characterized by the use of technology in various forms to perform the traditional

tasks. (Lowe, 2020) Digital technologies and devices play a conspicuous role in deciding standards, evaluating performances and analysing behaviours (What is Digital Era). Now a days person has to stay in Digital World consuming Digital devices to execute their daily tasks like Educational activities, social connect, performing official responsibilities, shopping, entertainment and information update (Digital World, 2021) (Aggarwal et al. 2021). The current pandemic situation is considered as one of the biggest push in this already scattering "Digital Era". Due to the pandemic some of the activities that were never executed through distance mode are running successfully in online mode with the help of digital devices (Coleman & Bennett,, 2020). During the pandemic days to maintain the social distancing most of the activities are executed through online mode then lot of survey base research practiced to find the technology impact on eyes, sleep pattern, satisfaction and other subjective aspects (Marina et al.,2019). Through the survey based research it is concluded that these digital practices are leaving a lot of impact on physical and mental health of the users (Saxena et al., 2020). Mental health includes behaviour, performance, motivation, anxiety related aspects and on the other hand physical impact includes the undesirable or harmful changes one can experience in the body due to excessive use of these digital devices (Sharma et al., 2021). Lot of researcher have done recommendable work to analyse the impact on various organs and body parts. In reference to the current paper and its scope authors are only discussing literature concerning the impact of digital devices on eye and its related problems & concerns (Gammoh, 2021). A new terminology used in this context is CVS (Computer Vision Syndrome) or DES (Digital Eye strain). When a user is experiencing eye related problems like watery eye, itching, redness, blinking issues, headache during the prolonged use of digital devices. Not only researcher but medical vertical has also contributed in this domain by listing the symptoms that can be experienced by the user if they are using the devices continuously for more than perishables limit (Computer Vision Syndrome – Most Popular Eye Problem Amongst Youngsters) (Computer Vision Syndrome, 2021) (Watson, 2019).

3. Research Methodology

This piece of research is executed through following stages:

1. **Personnel Interview** with sample population to understand the pros and cons of increased online presence
2. **Identification of issues** related to excessive screen time for questionnaire design
3. **Development of the questionnaire and collection of data**
4. **Analysis of data** collected through questionnaires to derive results.

The internal working of these stages and analytical facts derived from collected data can be well understood through subsequent sections:

3.1 Personnel Interview and Identification of Issues:

In order to analyse the issues associated with increased screen time, authors have adopted the most effective technique of qualitative research "Interview". The participants were selected by the authors from different age groups so as to understand the usage pattern of digital devices by them. 10 people were selected from each age group. The purpose of the interviews was to

understand the issues faced by the participants. Interviewer has asked open ended questions not choice based questions to get their original feedback that is not influenced by the factors specified in the questionnaire. We asked the respondents to list three most common problems that they faced due to the increased screen time. The following are the top 3 problems reported by the respondents.

- Tiredness
- Pain in neck & shoulders
- Headache

Some other common problems were also identified but the above stated were the responses for more than 80% respondents. Other common problems reported were:

- Boredom/ monotony
- No social life
- No physical movement

3.2 Identification of issues

Table1 shows the demographics of respondents and the summary of collected responses. Each age group had 10 respondents.

TABLE 1: DEMOGRAPHICS

Age Group	Responses for tiredness	Responses for neck & shoulder pain	Responses for headache
5 - 15 years	9	6	7
15 - 20 years	8	8	8
20 - 30 years	7	8	7
30 - 45 years	9	9	8
> 45 years	10	10	9
Total	43	41	39

3.3 Development of the questionnaire and collection of data: The questionnaire is developed to collect the information about screen time patterns of people from different age groups and to study the pros and cons of using online devices for various tasks. Questionnaires were sent to 210 people and 197 returned giving a response rate of 93.8% (197/210). Majority of respondents were in the age group of 20-30 accounting to a total of 69.5% [Figure 1]. Females were more as compared to males which is 57.9% [Figure 2].
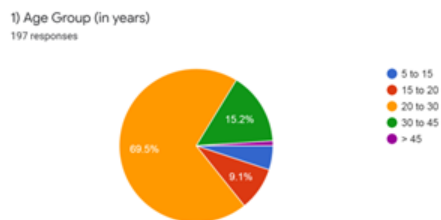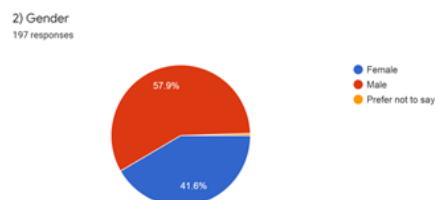
Fig 1: Age Group   Fig 2: Gender

3.4 Data Analysis:

A) Screen Time & Gadgets :[Figure 3] shows total screen time devoted during the day. 58.4% respondents were using the screen for more than 8 hours, followed by 25% who used the screen for 6 to 8 hours. It has been noticed around only 20% of people are using screens for less than 3 hours rest all are using screens for more than permissable hours. This could be a pandemic effect where all professional responsibilities, educational activities and social connect is done through online mode.
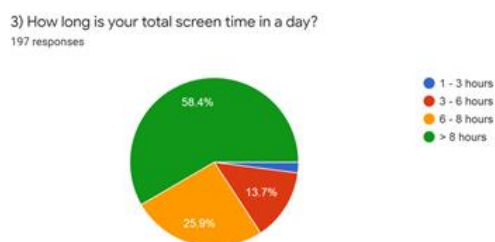
Fig 3: Total Screen Time

Survey has also concentrated on aspects of how these hours are bifurcated among various devices. [Figure 4] shows the usage time for various devices in a day. Computer/laptop is used generally for time ranging from 1 to 5 and 5 to 8 hours. Very few people used tablets for a maximum of 5 hours. As it's quite comfortable to work on a bigger screen for long hours. So people prefer laptops to tabs. Smaller screen leaves more strain on the eyes than a bigger screen. Smartphones were also used for 1 to 5 hours at maximum and television was used for 1-5 hours.
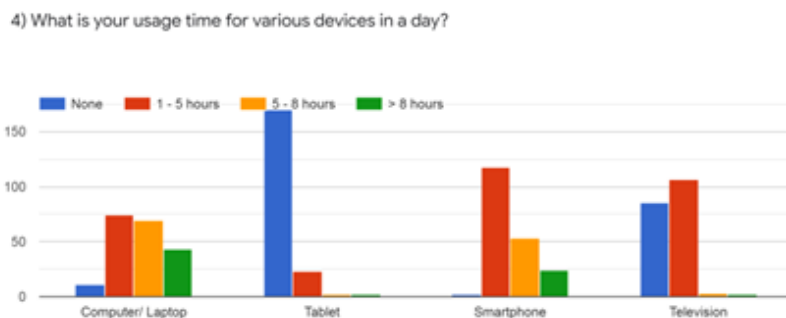

Fig 4: Time Usage per device

35% respondents used screen time for 1-5 hours for attending online classes followed by 20% who were using devices for 5-8 hours. Most people use devices for 1 to 5 hours for online shopping, communication purposes, gaming, internet surfing and social media [Figure 5]. During the pandemic, online classes are going on for students of schools, universities, colleges and other educational institutions. Thus, the screen time is increased for students. Thus, they are using it for 1-5 hours. Also with the boom in Internet and advanced and friendly technology, people are using devices for doing online activities like shopping, gaming and social media. Because we are unable to meet our friends and family these days, communication through whatsapp, facebook is also very popular.
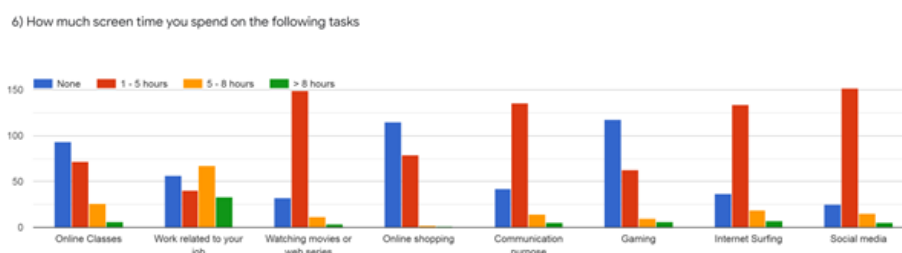

Fig 5: Screen time on different tasks

B) Use of anti glare device: Most of the respondents (52%) used an anti glare screen while using devices [figure 6]. The anti glare devices cut down the light from the source and reduce contrast so they act as a shield for your eyes and cause less stress. But only 50% of the people using it may be because they are unaware about the utility or not much concern about eye stress or cost could be one of the factors.
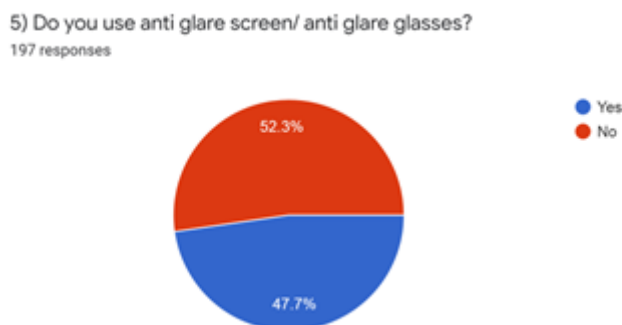

Fig 6: Use of anti glare devices during screen time

C) Use of devices for various activities: Computer/laptop were used by 82% for online classes, 97% used computer/laptop for work related tasks, 43% used it for watching movies. 74.5% used smartphones for online shopping, 91% used smartphones for communication purposes, 43% used it for gaming, 77% used it for internet surfing and 87% used it for social media [Figure 7]. The reason for using a laptop or desktop for education and work is because it provides a large screen, user friendly mouse and keyboard. These devices have better battery life for long usage, camera quality and audio performance. People can have better online collaboration with others. Providing curriculum support, sharing study material, assignments and connecting with friends and teachers is another reason. Few people watch movies or web

series also on laptop or desktop because if they want to take a break from their work, instead of switching to tv or mobiles, they prefer to switch between screens. Smartphone is another device which is very much popular online shopping, communication, gaming and for social media. There are many apps today which are very handy and easy to use. People select their products at convenience with offers, refund, discount, reviews and trust worthy payment services. It is very convenient to surf, communicate through social media.
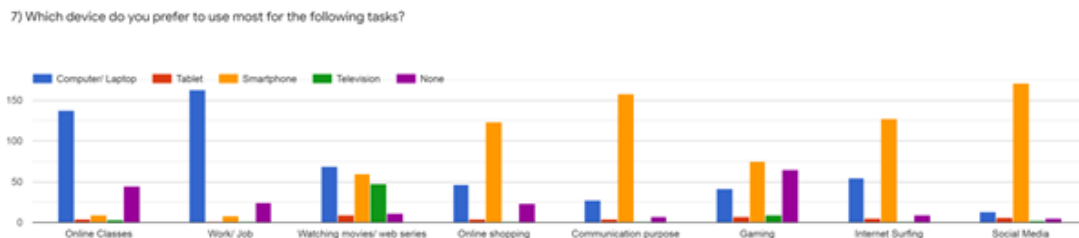

Fig7: Device Usage for Different Activities

4. Results and Discussions

4.1 Pattern of Screen Usage and Concentration

Concentration is your ability to devote your undivided attention to your task or objective. The more you are concentrated the better you can execute your responsibilities. In the current piece of research authors would like to explore the impact of longer screen hours on concentration.

[Figure 8] shows the difficulty in concentration after prolonged usage of the screen. 50.3% respondents agreed that they are unable to concentrate when they use the screen for a long period of time. 33.5% are not sure whether they are unable to concentrate. Only 16.2% say that they can still concentrate after long periods of time.
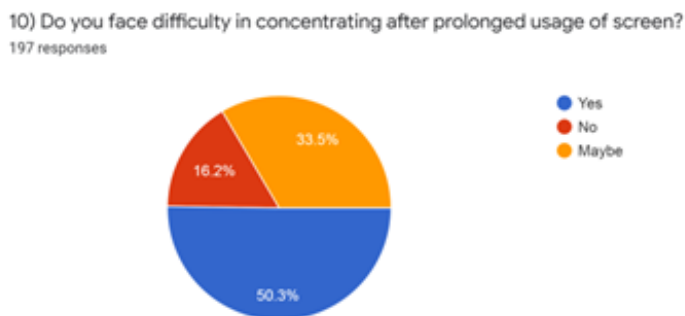

Fig: 8 Difficulty in concentrating after prolonged usage of screen

[Figure 9] shows the pattern of usage of screens for longer hours and its impact on concentration. The questions were divided to get the data for the number of hours people were using the screen. Most of the respondents said that they use the screen for more than 8 hours a day. The bar graph shown below interprets that there is a probability that the concentration is less when screen time increases for more than 8 hours. Concentration has a direct correlation with fatigue, when we are using the system for more than 5-6 hours our body organs(eyes) are giving fatigue symbols and we will start losing concentration. Concentration can also be linked with the type of gadget in hand. The smaller the screen, the more concentration u need and probability of getting fatigue symbol quite early.
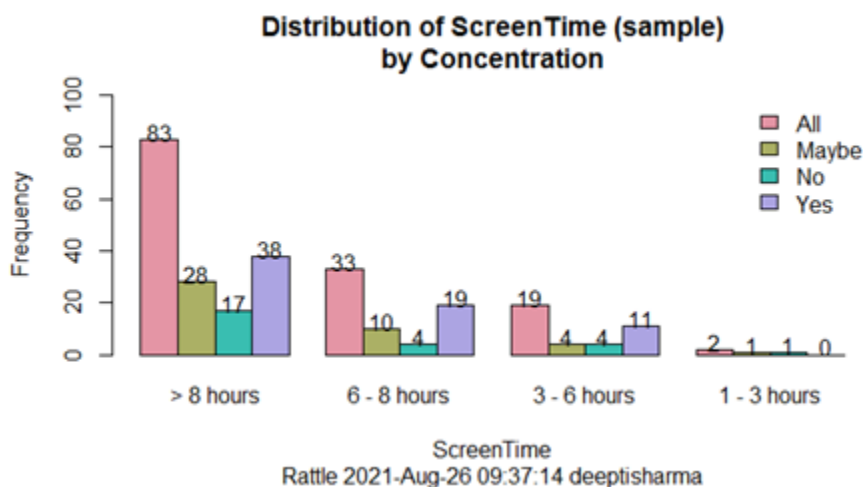
Fig 9 Effect of Screen Time on Concentration

4.2 Pattern of Device Usage and Concentration

These days, different digital devices like computers/laptop, smartphones, tablets and tv are used for different purposes, say for attending online classes, working purpose, communication, social media, online shopping and many more. Next few figures will tell the impact of various devices on the concentration":

[Figure 10] analyses that for doing work online, when the computer is being used for 5-8 hours, the probability of concentration is less. That means after 5 hours, users are less concentrated and need break time. The usage of tablets is very less and thus it doesn't have much impact on concentration.
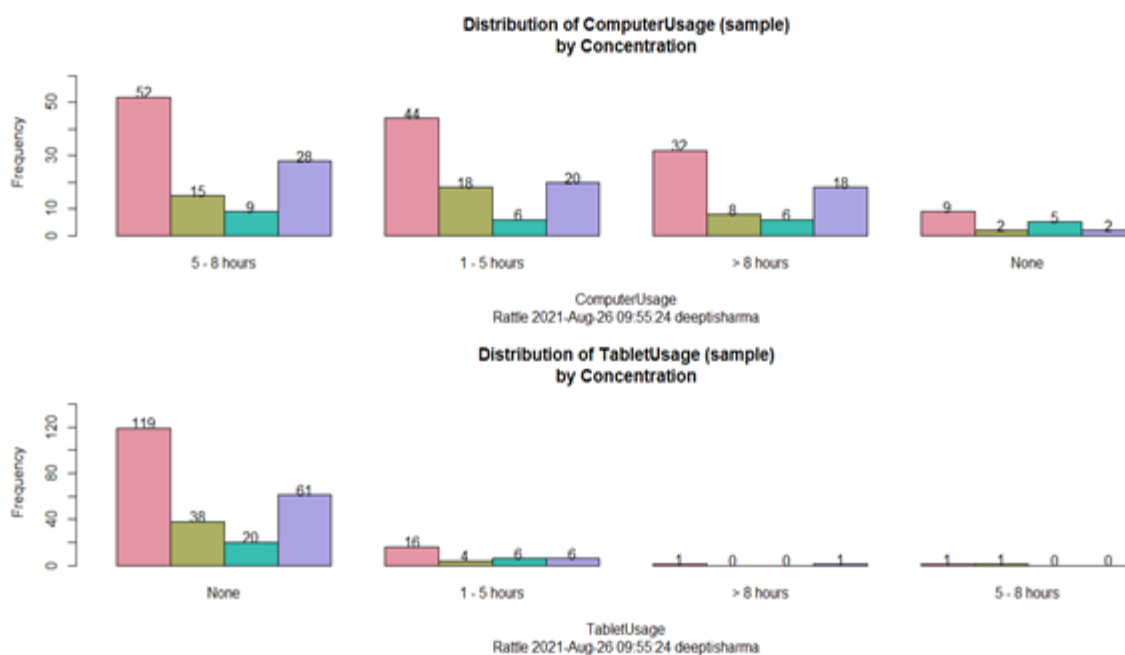

Fig 10: Impact of Computer/laptop and tablet on concentration

[Figure 11] shows the usage of smartphone and television is maximum between 1-5 hours and concentration level is lost during this period.
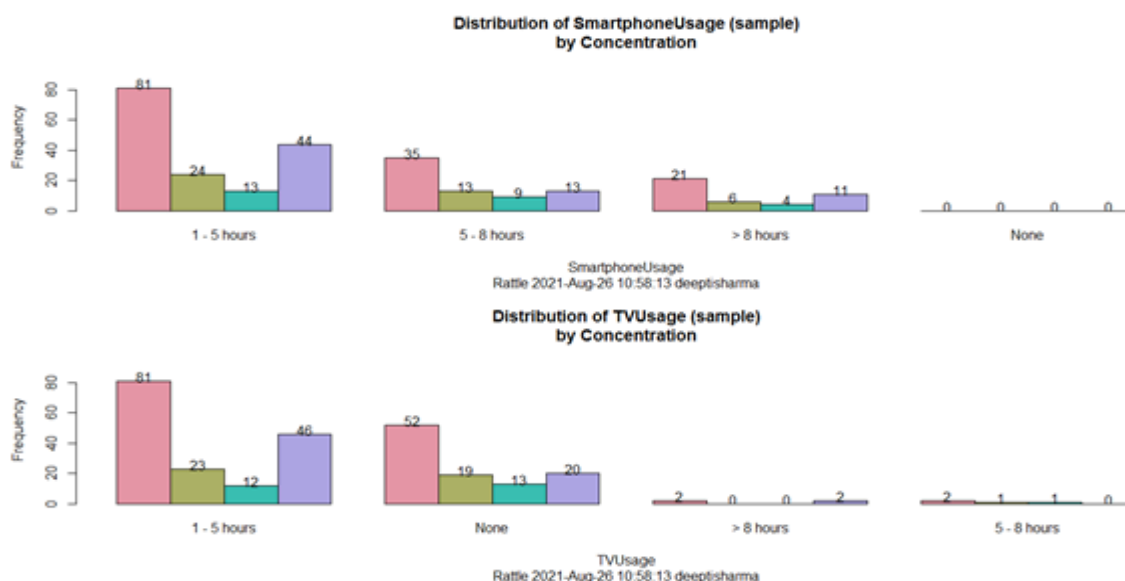

Fig 11 Impact of Smartphone and tv on concentration

4.3 Screen time Divergence for distinct objectives:

[Figure 12] shows work related jobs are at highest priority. Most of the people have screen time during working hours in between 5-8 hours. During a pandemic, when most of the tasks like school, jobs, shopping etc are online; people are spending more time on screen. Thus instead of going to school, colleges, offices or even shopping, they are performing these activities online. That is why the respondents' working hours are between 5-8 hours
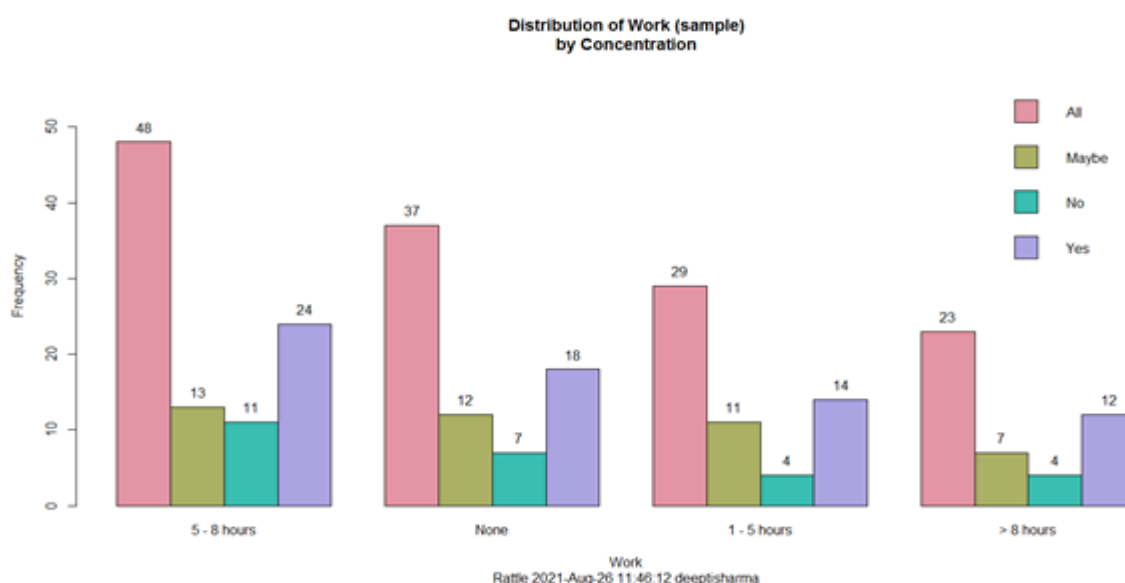

Fig 12:

[Figure 13] when people watch movies, do net surfing, social media and use screens for communication, they use it for 1-5 hours. While working online, when respondents take a break from work, they do surfing, social networking and whatsapp. Depending on their time, they use it for 1-5 hours.
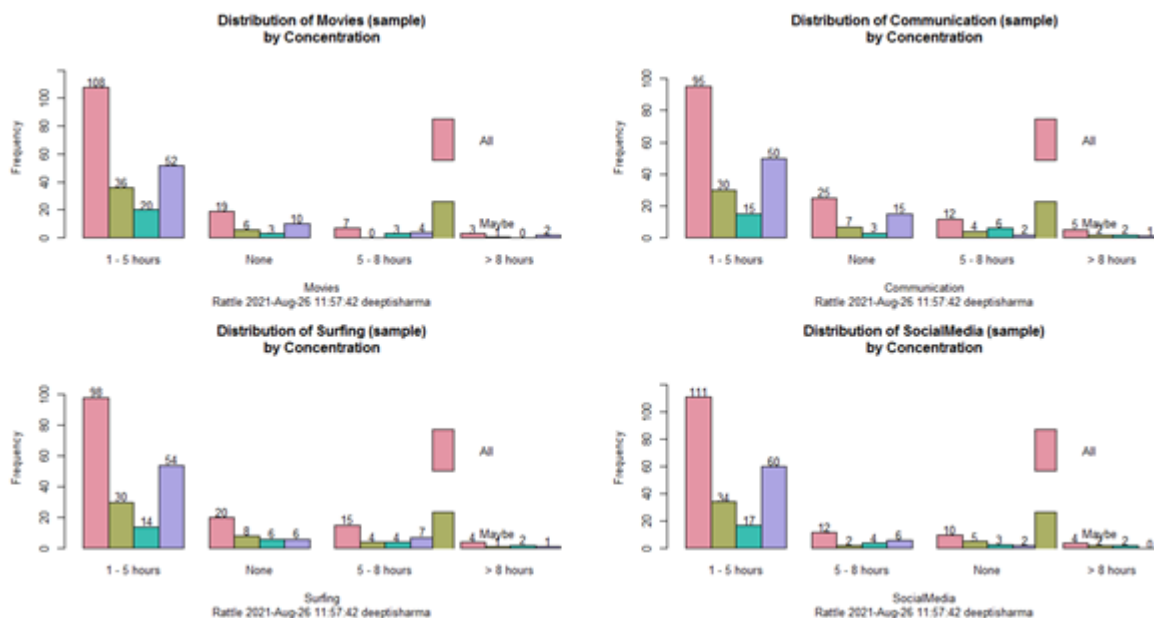

Fig 13 Distribution of activities and concentration

[Figure 14] interprets usage of computer\laptop for working online, classes and movies.
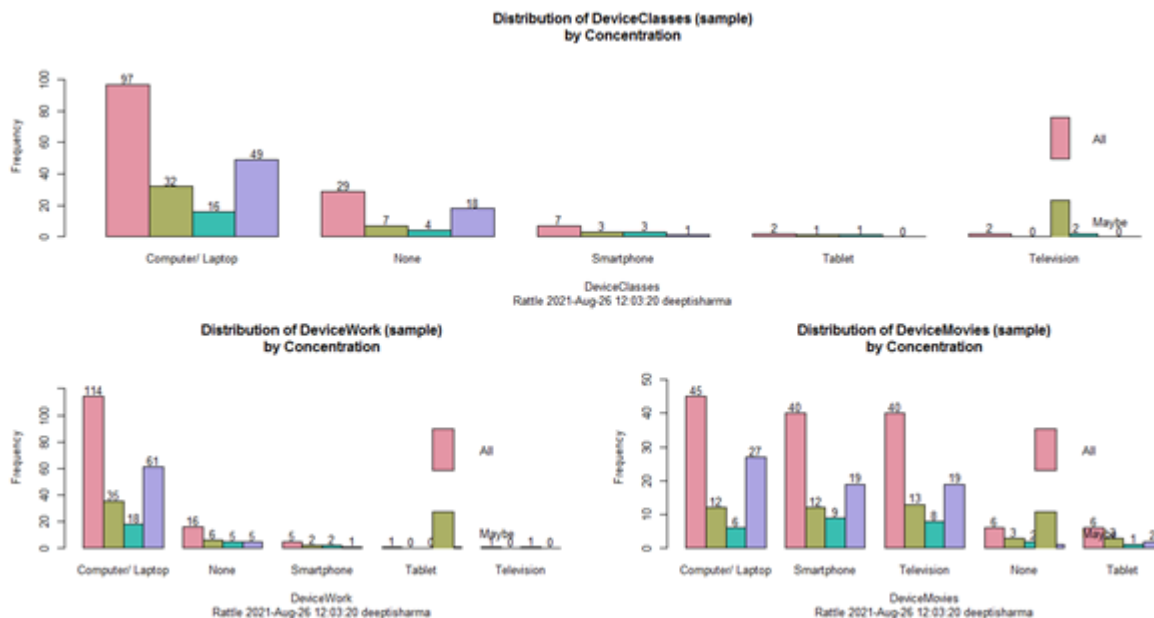

Fig 14 Use of computer/laptop for various activities

[Figure 15] shows more usage of smartphone for gaming, communication, surfing and social media.
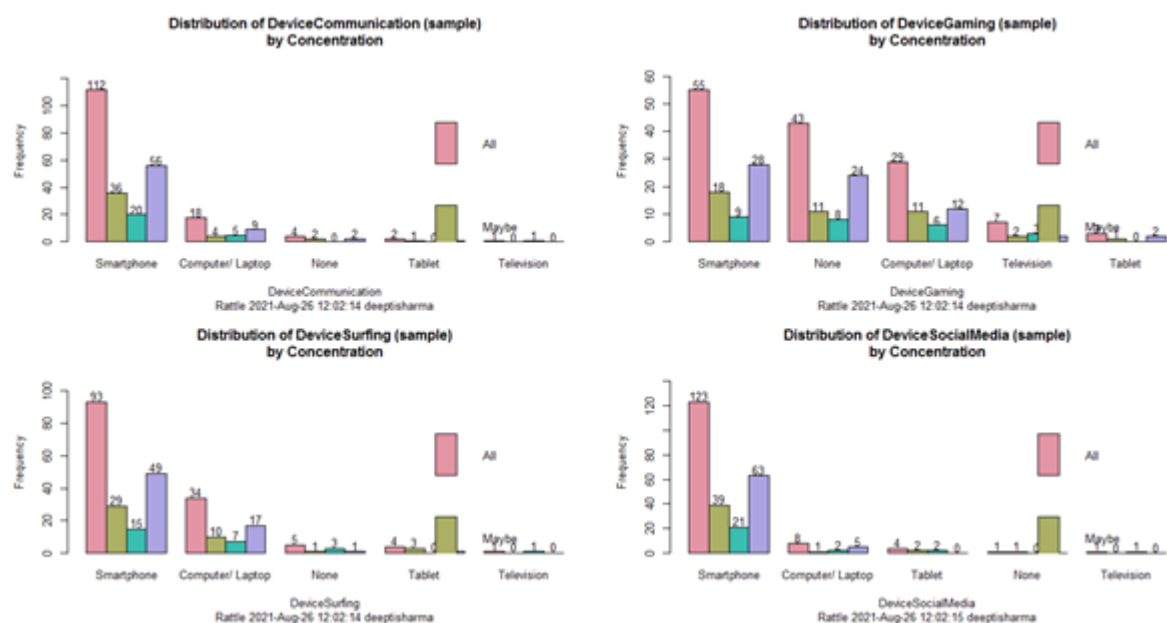
Fig 15 Use of computer/laptop for various activities

The usage of electronic devices for different activities has been summarized in the previous sections. The people from different age groups are using the devices for different purposes and for different time duration. These observations have also been depicted in the above sections.

5. Conclusion & Future Scope

The current research is conducted to demonstrate the usage pattern of digital devices. The interviews and questionnaire based surveys were conducted to collect the data. The results indicate the rising screen time for the people due to the usage of digital devices for various tasks. The people from different age groups are using digital devices for tasks specific to their needs. The usage of digital devices is though not limited to performing needful tasks only but the digitization has changed the way in which people communicate with each other, how they shop and how they entertain themselves. The increasing screen time is an impact of the current pandemic also. Though digital devices were being used extensively before the pandemic, it has changed the lifestyle of most people. Since the time the lock down of offices, educational institutions and markets happened and people were confined to their houses, the dependability on the internet has increased for everything right from work to study to shopping and communication and social interaction.

The above sections extensively depict the screen time patterns of people through various graphs that have been generated by the researchers using the collected data. We have observed that the increasing screen time is leading to reduced concentration among the users. Among other major side effects of increased screen time such as tiredness, headaches, lack of physical activity, etc. loss of concentration is also an important factor that results due to increasing screen time and needs attention.

Our research in the area of impact of increasing screen time on users will continue and we are working towards identifying the impact of screen time and relevant measures that need to be taken in order to minimize the negative effects of screen time increase.

6. References:

Aggarwal, D., Sharma, D., & Saxena, A. B. (2021). A Pragmatic Approach to the Usage of Digital Devices in Education in Developing Countries. Turkish Journal of Computer and Mathematics Education, 6918-6930.

Arora, D. P. (2021). Virtual workplace- A new normal for the organisations. Elimentary education online, ISSN: 1305-3515.

Coleman, & Bennett,. (2020, May 19). We're all living in the digital world, thanks to the Coronavirus pandemic. Retrieved from https://economictimes.indiatimes.com: https://economictimes.indiatimes.com/tech/internet/were-all-living-in-the-digital-world-thanks-to-the-coronavirus-pandemic/new-age-network/slideshow/75822771.cms?from=mdr

Computer Vision Syndrome – Most Popular Eye Problem Amongst Youngsters. (n.d.). Retrieved from https://www.eye7.in: https://www.eye7.in/computer-vision-syndrome/

Computer Vision Syndrome. (2021). Retrieved from https://www.aoa.org: https://www.aoa.org/healthy-eyes/eye-and-vision-conditions/computer-vision-syndrome?sso=y

Digital World. (2021, August 21). Retrieved from https://en.wikipedia.org: https://en.wikipedia.org/wiki/Digital_world

Deepak Chahal, D. L. (2021). Exploratory data analysis on the eidemiology of Coronavirus (Covid-19). International Journal of current research and review, ISSN: 2231-2196.

Devesh Lowe, M. B. (2020). Leveraging Digital Learning Platforms for Competitive Advantage in Higher Education. International Journal of Information Communication Technology & Digital Convergence, Volume 5 Issue 1] [ISSN 2466-0094].

Gammoh, Y. (2021). Digital Eye Strain and Its Risk Factors Among a University Student Population in Jordan: A Cross-Sectional Study. Cureus.

Marina, VARGA, V., & JELOVČIĆ, S. (2019). Digital technology use uring the covid-19 pandemic and its relations to sleep quality and life satisfaction in children and parents. Croation Science Foundation Project no: 2019-04-7547, 249-269.

Saxena, A. B., Sharma, D., & Aggarwal, D. (2020). Covid 19 Impressions: Health Aspects of New Educational Model – Stakeholders' Perspective. Bioscience Biotechnology Research Communication, 250-261.

Sharma, D., Aggarwal, D., & Saxena, A. B. (2021). Stakeholders' Perspective Towards the Contingency Education Model During Covid 19 Pandemic. International Journal of Current Research and Review, 150-154.

Watson, S. (2019, Aug 17th). Eye Health. Retrieved from https://www.webmd.com: https://www.webmd.com/eye-health/computer-vision-syndrome

What is Digital Era. (n.d.). Retrieved from https://www.igi-global.com: https://www.igi-global.com/dictionary/ethical-values-and-responsibilities-of-directors-in-the-digital-era/7612