



Expanded Utilization of Personal Electronic Devices during the Pandemic and its Effect on Overall Health and Wellness of People in Bangalore

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ABSTRACT: Over the last few years, smart phones have been replaced by landlines, cellular phones and other older versions of mobile phones. Smartphones and other personal electronic devices like laptop, tab, iPad etc. has made our lives easier by providing access to almost everything making our lives more comfortable and easier. In spite of these several benefits associated with smartphones and personal electronic devices yet excessive usage results in affecting the mental and physical health of the people. The recent pandemic of covid-19 has bought our lives to a standstill and made us confine within our homes since the lockdown was being enforced in Bangalore and other states of India respectively. Thus, most of the activities including our occupation is being done through the means of smartphones and personal electronic devices which includes laptops, iPod, iPad etc. and the internet. This increased usage of has made a greater impact on the people in affecting their mental and physical health. This study aims to analyze how the people of the city Bangalore have been affected both mentally and physically due to the extended utilization of personal electronic devices during the pandemic and also provide ways to resolve this. A semi-structured questionnaire containing the basic details of the respondents, number of hours spent on personal electronic devices for work purpose and other purposes, number of physical and mental health effects suffered by each individual were being collected from the total number of fifty-four individuals out of which a sample of forty-seven people were being considered for this study.

KEYWORDS: Personal electronic devices, physical and mental well-being, people, Bangalore city, pandemic, lockdown, online network, cyberspace.

I. INTRODUCTION

Smartphones and other personal electronic devices have become a vital part of our everyday life. The first cell phone was being introduced in the year 1973 by Motorola organization. Cell phones were concocted to replace the customary landlines and empower us to associate with individuals from whichever place we are. Over since the last few years cell phones are accessible in various adaptations taking into account the various needs of the individuals. Aside from cell phones these days there are different personal electronic devices such as - iPad, iPod, tablet, smart watches etc. making our lives a lot simpler and more advantageous. Smartphones and other personal electronic devices help us to perform several functions such as setting up a timer, watching movies through amazon prime and Netflix, making digital payment from whichever place we are and so on. In spite of several advantages there are other issues also involved due to increased usage of smartphones and other personal electronic devices affecting our physical and mental health such as:

Back pain	Wrist pain
Eye Strain	Anxiety
Sleep Disturbances	Depression and experiencing loneliness etc.

The recent pandemic of COVID-19 has made us depend more on personal electronic devices for our day-to-day activities thus causing serious physical and mental health effects as described above. In this study we analyze the reasons regarding the physical and mental health effects caused due expanded utilization of information appliances during the on-going pandemic of covid-19 among the people in one of the metropolitan cities of India i.e., Bangalore.

II. MEANING OF PHYSICAL HEALTH, MENTAL HEALTH AND PERSONAL ELECTRONIC DEVICES

1) Physical Health:

Physical health refers to the state of physical well-being in which an individual is able to perform daily activities without much problems. Some of the ways to achieve good physical health included maintaining fitness and health through exercise and proper nourishment. Having a good physical health enhances the overall health of an individual and lowers the chances of becoming sick.



2) Mental Health:

Mental health refers to the condition of a person with regard to their psychological and emotional well-being. As per definition given by WHO “good mental health is related to mental and psychological well-being. Mental health includes our emotional, social and psychological well-being. It affects the way we think, feel and act.”

3) Personal electronic devices:

Personal electronic devices are a combined name given to electronic devices used by people for their personal use including smartphones, laptop, iPad, iPod and so on.

III. REVIEW OF LITREATURE

(Trond Harman LCSW, 2018) have reported that people who spend a lot of time on electronic devices, social media and video games end up living a more isolated life. The normal social interaction among their friends and family has been affected to a larger extent. The children end up spending a lot of time on playing video games with unknown people at different time zones therefore lack proper sleep and are unable to wake up the next day and go to school. Also, excessive usage of phones and other devices resulted in increasing anxiety and low self-esteem. The more people are isolated the more they end up getting depressed. They end up spending huge amount of time at home in isolation and as a result experience low confidence levels when they are being exposed to the outside world. Also, there is greater chances of people having weight issues due to lack of exercise.

(Johnson, 2020) has stated in this article explains the harmful effects on both psychological and physical health of a person caused due to increased usage of technology. The psychological effects include isolation, the more the usage of the technology and social media the more people become isolated socially. Depression is another major psychological effect caused due to excessive usage of technology. The major physical effects include eye strain which is a result of various technological factor including screen time, screen glare, screen brightness, poor sitting posture, underlying vision issues etc. Dry eyes and blurred vision are the symptoms of eye strain. Eye strain will also lead to pain in other parts of the body such as neck, back and shoulders. Further excessive usage of technology would also result in problems associated with proper sleep. Absence of proper sleep is caused due to usage on devices during bedtime which displays the blue light thereby making the person harder to fall asleep. Other problems include reduced physical activity which further results in negative health effects such as obesity, cardiovascular diseases, premature death and type two diabetes.

(World, 2018) has been reported that modern technology would result in creating a big impact on physical and mental health of users. When a person is excessively attached or is highly dependent on electronic devices it would result in psychological issues like distraction, expecting instant gratification, narcissism and depression. Hence it is very crucial to ensure a balance between online and real-world social relationship, manage screen time and move forward through this one can keep their mental health under control. Also increased usage of electronic devices would result in negative effects on physical health causing vision issues, neck strain and hearing loss. Further, one's sleep pattern gets affected due to usage of electronic devices up to midnight. Young adults suffer to a larger extent as they suffer from psychological problems and social isolation and spending more time on social media result in depression among young adults.

(Pietrangelo, 2019) has been reported that technology provides several opportunities to improve lives but at the same time it can result in causing negative effects on both physical and emotional health of a person's life. The negative effects of technology listed by the author in this article includes digital eye strain whose symptoms include blurred vision, dry eyes, headaches, neck and shoulder pain. These symptoms are a result of screen glare, bad lighting and improper viewing distance. Another major effect includes musculoskeletal problems which is caused due to holding one's head in an unnatural forward leaning position. This puts a lot of stress on one's neck, spine and shoulders. Also, excessive usage of technology often results in repetitive strain injuries of fingers, thumbs and wrists. People often keep their devices in bedroom which tempts their fingertips to operate it and thus makes it to switch off highly difficult. People are more socially isolated by spending more time on their phones and also causes anxiety and depression among them.

(Devi et al., 2019) have reported in their study which was being conducted on 200 volunteers in various locations of Hyderabad consisting of 123 females and 77 females respectively. Purposive sampling method was being used for this study. A structured



questionnaire was being prepared consisting of declaration and demographic profile of the participants in the first page followed by four sections of the study containing closed ended questions regarding the use of technological gadgets and present health status of the participants. Most of the participants possessed two or more gadgets and were using them for more than 6 hours as a result of which they are suffering with several problems associated with logical thinking, headaches, depression, anxiety, hearing, afraid of public speaking, low consciousness and worrying excessively and sleep problems. Further addiction to tech-gadgets also impacts on the life style of the respondents. The respondents end up spending less time on physical activity as compared with others who use gadgets for lesser time. They also spend lesser time with their friends and family also the frequency of visiting their home and spending time with them is very less. They prefer indirect communication i.e., through social media than direct interaction with others. The authors also state that in this article that use of technological gadgets should be only need based and not be used for luxury sake also it should not compromise with other necessary activities for daily living. Controlling and regulating the use of technology in a constructive way is highly crucial especially among the youth of a nation as they are the foundation of any society to grow or develop. The unlimited use of the technology leads in making people become more self-centered this is a threat to our cultural belief of togetherness and the values of sharing and caring. Thus, usage of technological gadgets should be limited to have a healthy and a happy life.

IV. RESEARCH METHODOLOGY

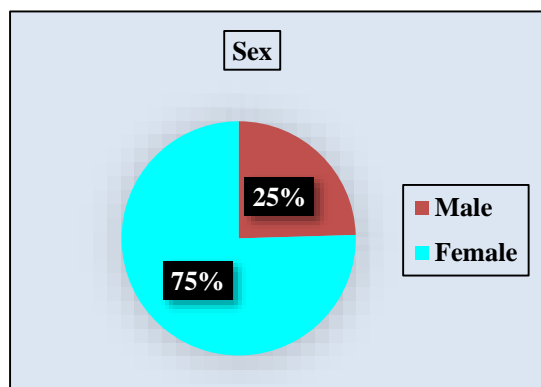
A semi-structured questionnaire containing questions related to average number of hours spent by the individuals on personal electronic devices for the purpose of work, average number of hours spent for other purposes apart from work, physical and mental health effects suffered by the individuals due to excessive usage of personal electronic devices were being asked. We received a sum of 54 responses of which 47 were being considered as a sample. Method of research applied is Analytical research. The data is being displayed in the form of tables and graphs.

V. ANALYSIS AND INTERPRETATION

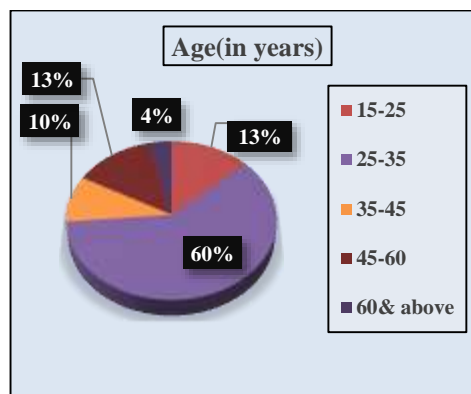
1) Demographic Characteristics:

Table 1.1: Table showing Demographic Characteristics of the respondents:

Age (in years)	Males	Females	Total	Percentage (%)
15-25	2	5	7	12.96%
25-35	7	26	33	61.11%
35-45	4	1	5	9.26%
45-60	4	3	7	12.96%
60&above	1	1	2	3.70%



Graph 1.1: Pie-Graph showing the Percentage of male and female Respondents.



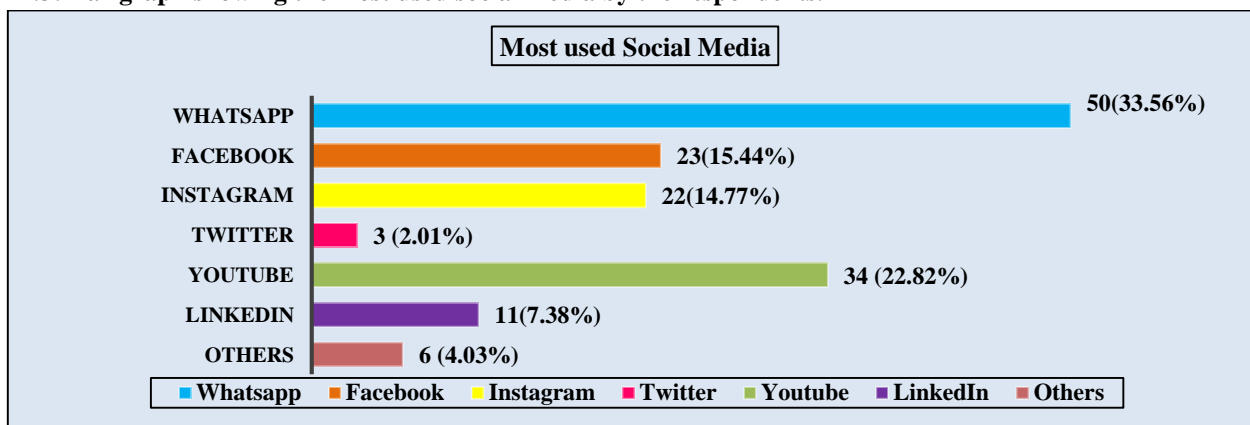
Graph 1.2: Pie-Graph showing the Percentage of respondents in different Age groups.

2) Most used Social Media by the respondents:

Table 1.2: Table showing the most used social media by the respondents.

Most used social media	No of responses	Percentage (%)
WhatsApp	50	33.56%
Facebook	23	15.44%
Instagram	22	14.77%
Twitter	03	2.01%
You Tube	34	22.8%
LinkedIn	11	7.38%
Others	6	4.03%

Graph 1.3: Bar graph showing the most used social media by the respondents.



Interpretation:

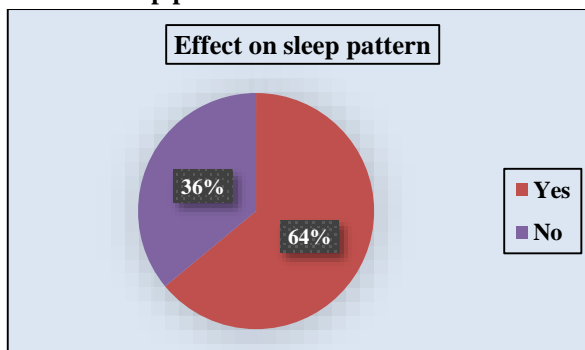
From the above graph we can see that WhatsApp is the most widely used social media among the people followed by YouTube, Facebook, Instagram, Linked In.

3) **Does increased usage of personal electronic devices have an effect on sleep pattern?**

Table 1.3: Table showing the effect on sleep pattern caused due to increased usage of personal electronic devices.

Effect on sleep pattern	Percentage (%)
Yes	64%
No	36%

Graph 1.4: Pie-Graph showing the effect on sleep pattern caused due to increased use of personal electronic devices.





Interpretation:

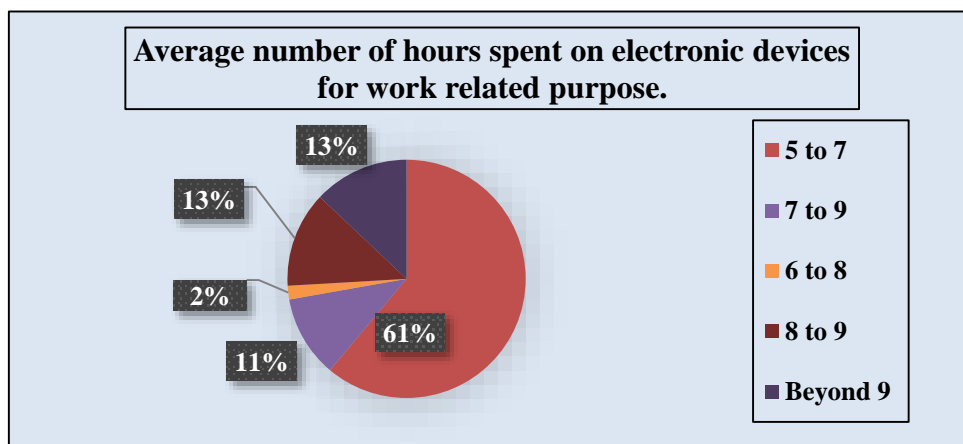
From the above pie-graph we can see than around 64% of the respondents are facing effects on their regular sleep patterns which is caused due to increased usage of personal this one can electronic devices and 34% of the respondents are not facing the issues associated with sleep pattern.

4) Average Number of hours spent on personal electronic devices for work related purposes by the respondents:

Table 1.4: Table showing average number of hours spent on personal electronic devices for work related purpose by the respondents.

Average number of hours spent on personal electronic devices for work related purpose	Number of responses	Percentage (%)
5-7 hours	33	61.11%
7-9 hours	6	11.11%
6-8 hours	1	1.86%
8-9 hours	7	12.96%
Beyond 9 hours	7	12.96%

Graph 1.5: Pie-Graph showing the average number of hours spent on personal electronic devices for work related purposes.



Interpretation:

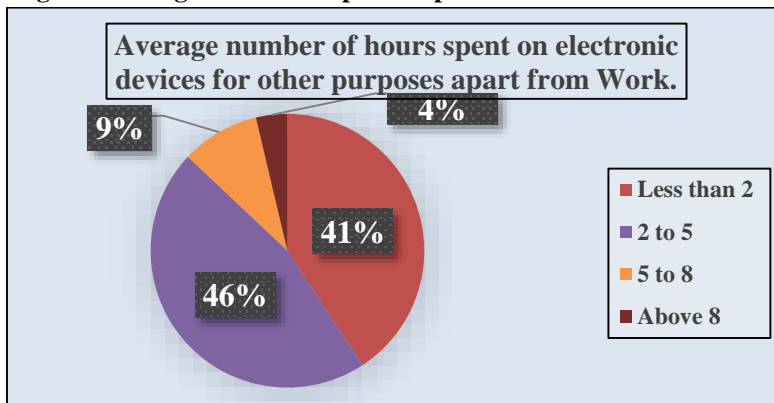
Around 62% of the respondents spend an average of 5 to 7 hours on personal electronic devices for work related purpose followed by 13%, 12%, 11% and 2% of the respondents who spend an average of 8-9 hours, 7-9 hours, beyond 9 hours and 6 to 8 hours respectively.

5) Average number of hours spent on electronic devices for other purposes apart from work:

Table 1.5: Table showing the average number of hours spent on electronic devices for other purposes apart from work.

Average number of hours spent on personal electronic devices for other purposes	Number of responses	Percentage (%)
Less than 2 hours	22	40.7%
2-5 hours	25	46%
5-8 hours	5	9%
Above 8 hours	2	3.77%

Graph 1.6: Pie-Graph showing the average number of spent on personal electronic devices for purposes other than work.



Interpretation:

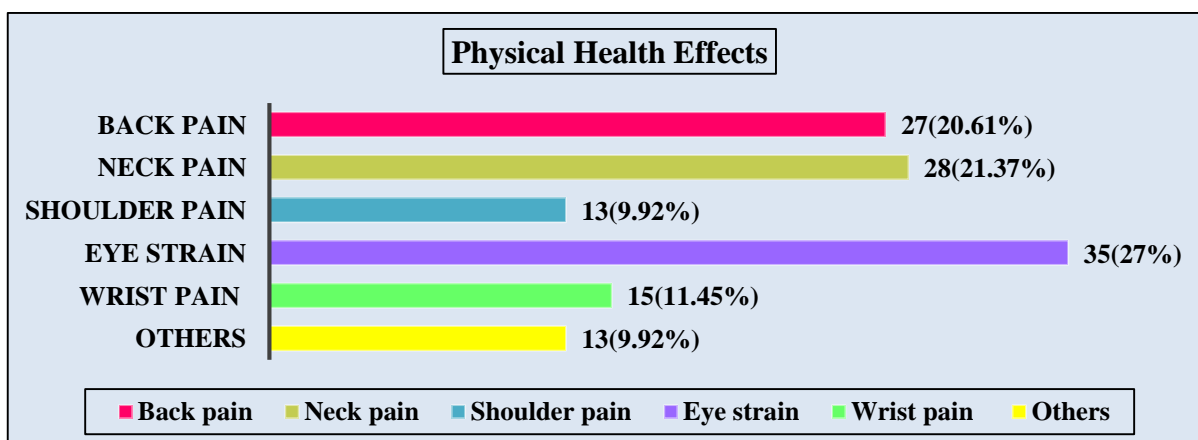
From the above graph we can observe that around 47% of the people spend around less than 2 hours on personal electronic devices for other uses apart from work followed by 40%,9% and 4% of the people spending time for other purposes for 2 to 5 hours, 5 to 8 hours and above 8 hours.

6) Physical health effects caused due to excessive usage of electronic devices:

Table 1.6: Table showing the various physical health effects caused due to increased usage of personal electronic devices.

Physical Health Effects	Number of responses	Percentage (%)
Back Pain	27	20.61%
Neck Pain	28	21.37%
Shoulder Pain	13	9.92%
Eye Strain	35	26.72%
Wrist Pain	15	11.45%
Others	13	9.92%

Graph 1.7: Pie-graph showing the various physical health effects caused due to increased usage of personal electronic devices.



Interpretation:

From the above bar-graph we can infer that around 26.72% of the respondents are facing the major physical effect of eye strain which is caused due to continuously seeing the personal electronic devices. Also neck pain, shoulder pain, wrist pain and back pain



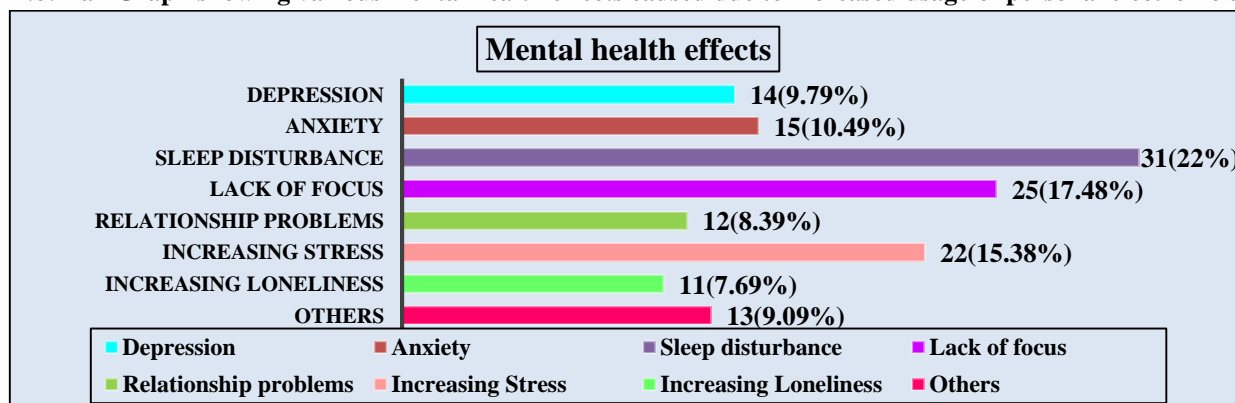
are other serious physical effects affecting the people due to excessive usage of personal electronic devices. From the above bar-graph we can observe that around 21.37%, 9.92%, 11.45% and 20.61% of the respondents are facing physical health effects caused due to neck pain, shoulder pain, wrist pain and back pain respectively.

7) Mental health effects caused due to increased usage of electronic devices:

Table 1.7: Table showing the various mental health effects caused due to increased usage of personal electronic device.

Mental health effects caused due to increased usage of personal electronic devices	Number of Respondents	Percentage (%)
Depression	14	9.79%
Anxiety	15	10.49%
Sleep Disturbance	31	22%
Lack of focus	25	17.48%
Relationship Problems	12	8.39%
Increasing stress	22	15.38%
Increasing Loneliness	11	7.69%
Others	13	9.09%

Graph 1.8: Bar-Graph showing various mental health effects caused due to increased usage of personal electronic devices.



Interpretation:

From the above bar graph, we can infer that majority of the respondents i.e., around 21.68% face difficulty in getting proper sleep, followed by lack of focus on their work, increasing stress, anxiety and depression, relationship problems and increasing loneliness which accounts to 17.48%, 15.38%, 10.49%, 9.79%, 8.39% and 7.69% of the respondents respectively.

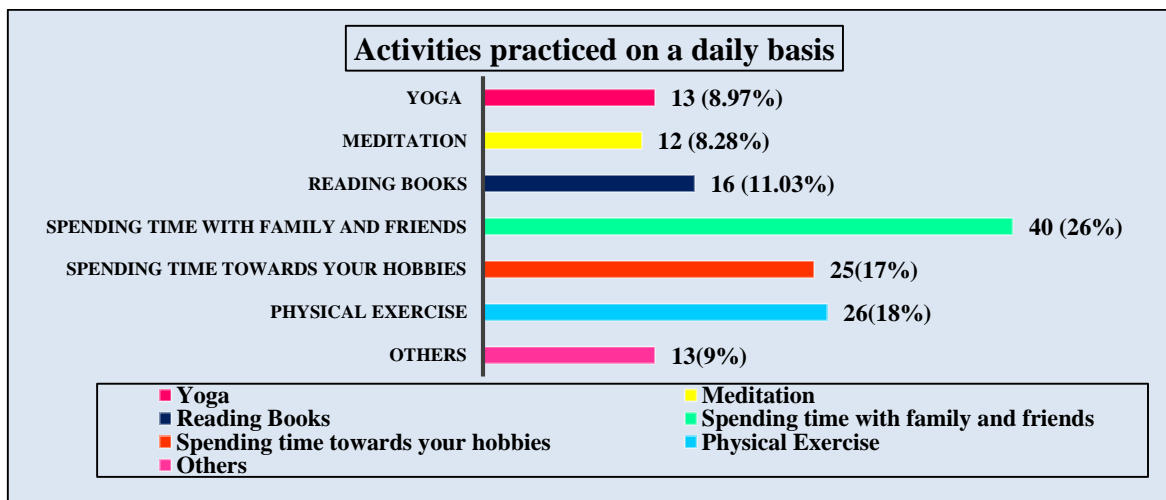
8) Activities practiced on a daily basis by the respondents to lead a happy and healthy life

Table 1.8: Table showing the various activities practiced on a daily basis in leading a happy and healthy life.

Activities practiced on a daily basis	Number of respondents	Percentage (%)
Yoga	13	8.97%
Meditation	12	8.28%
Reading books	16	11.03%
Spending time with family and friends	40	27.59%
Physical Exercise	26	18%
Others	13	9%
Spending time towards your hobbies	25	17%



Graph 1.9: Bar-Graph showing various activities practiced by respondents on a daily basis for leading a happy and healthy life.



Interpretation:

Spending time with friends and family is mostly preferred among majority of the respondents i.e., 26% followed by physical exercise, spending time towards one’s hobbies, reading books, yoga and meditation is 18%, 17%, 11.03%, 8.97% and 8.28% respectively. Percentage of respondents involved in those activities other than the above is 9%.

VI. HYPOTHESIS TESTING: Z -TEST FOR SINGLE MEAN

Hypothesis Testing 1: To test if the average number of hours spent on personal electronic devices for purpose of work by individuals per day is 7.09 hours i.e. $\mu=7.09$ hours

Ho: Average number of hours spent on personal electronic devices for the purpose of work by individuals per day is 7.19 hours i.e. $\mu=7.19$ hours.

Vs H₁: Average number of hours spent on personal electronic devices for the purpose of work by individuals per day is not 7.19 hours i.e. $\mu \neq 7.19$ hours.

Note:

The population consists of 54 people out of which a sample of 47 individuals were being considered for this study. The population mean (μ) hours spent on electronic devices for the purpose of work per day by the individuals is 7.19 hours. The sample mean (\bar{X}) hours spent on electronic devices for the purpose of work per day by the individuals is 7.212 hours. The standard deviation (σ) of the population is 1.569 and the size of the sample (n) is 47.

Under Ho test statistics is given as follows:

$$Z = \frac{\bar{x} - \mu_0}{\sigma / \sqrt{n}}$$

Applying this formula, $Z = \frac{7.212-7.19}{1.569/\sqrt{47}} = 0.022/0.2289=0.0960$.

Therefore Z=0.096. At 5 % level of significance the critical value is 1.96 for two tailed tests.

Decision: Since $Z=0.0960 < 1.96$ at 5 %level of significance we accept Ho and conclude that average number of hours spent by individuals per day is 7.19 hours.



Hypothesis Testing 2: To test is the average number of hours spent on personal electronic devices for other purposes apart from work per day by the individuals is 3.22 hours.

Ho: Average number of hours spent on personal electronic devices for other purposes apart from work per day by the individuals is 3.22 hours i.e., $\mu=3.22$ hours

Vs H_1 : Average number of hours spent on personal electronic devices for other purposes apart from work per day by the individuals is not 3.22 hours i.e., $\mu \neq 3.22$ hours.

Note:

The population consists of 54 individuals out of which 47 individuals were being considered for this study. The population mean (μ) hours spent on personal electronic devices for purposes other than work is 3.22 hours and the sample mean (X) hours spent on personal electronic devices for purposes other than work is 3.36 hours. The standard deviation (σ) of the population is 2.271 and the size of the sample (n) is 47.

Under Ho the test statistics is given as follows:

$$Z = \frac{\bar{x} - \mu_0}{\sigma / \sqrt{n}}$$

Applying this formula: $Z = \frac{3.36 - 3.22}{2.271 / \sqrt{47}} = \frac{0.14}{0.3312} = 0.4227$

Therefore $Z=0.4227$. At 5% level of significance the critical value for two tailed tests is 1.96.

Decision: Since $Z=0.4227 <$ Critical value of 1.96 at 5 % level of significance we accept the null hypothesis (Ho) and conclude that the average number of hours spent on personal electronic devices for other purposes apart from work is 3.22 hours.

Hypothesis Testing 3: To test whether each individual suffers on an average 5 health effects or more (both mental and physical health effects) which is caused due to excessive usage of personal electronic devices.

Ho: Each Individual suffers on an average 5 health effects which is caused due to excessive usage of personal electronic devices i.e. ($\mu=5$)

Vs H_1 : Each Individual on an average suffer more than 5 health effects which is caused due to excessive usage of personal electronic devices i.e. ($\mu > 5$)

Note:

The population consists of 54 individuals out of which 47 individuals were being considered for this study. Average health effects suffered by the individuals in the population is 5 effects ($\mu=5$) and average health effects suffered by the individuals in the sample accounted for is 6 effects ($\bar{X}=6$). The standard deviation of the population is 3.89. The size of the sample (n) is 47.

Under Ho the test statistic is given as follows:

$$Z = \frac{\bar{x} - \mu_0}{\sigma / \sqrt{n}}$$

Applying this formula; $Z = \frac{6 - 5}{3.89 / \sqrt{47}} = \frac{1}{3.89 / 6.856} = 1 / 0.5674 = 1.762$

At 5% level of significance for one tailed test the critical value is 1.645.



Decision: Since $Z=1.762 >$ Critical value of 1.645 at 5% level of significance we reject H_0 and conclude that each individual on an average suffer more than 5 health effects which is caused due to excessive usage of personal electronic devices.

VII. FINDINGS

- 1) Majority of the respondents who responded to the questionnaire were females (75%) followed by males (25%).
- 2) Around 61% of the respondents were in the age group of 25-35 years.
- 3) WhatsApp is the most used social media followed by YouTube, Facebook, Instagram and LinkedIn.
- 4) As a result of excessive usage of personal electronic devices 64% of the respondents are experiencing disturbances in their regular sleep pattern.
- 5) 61% of the respondents spend on an average 5-7 hours using personal electronic devices for the purpose of their work followed by 13% of the respondents who spend 8-9 hours and beyond 9 hours every day on electronic devices for work purpose respectively.
- 6) 46% of the respondents spent 2-5 hours every day on personal electronic devices other purpose apart from work and 41% of the respondents spent less than 2 hours on personal electronic devices every day for other purposes apart from work.
- 7) Major physical effects suffered by the respondents as a result of excessive usage of personal electronic devices during the pandemic include eye strain, neck pain, back pain and wrist pain.
- 8) Major mental health effects suffered by the respondents as a result of excessive usage of personal electronic devices include sleep disturbances (22%), lack of focus (17.48%) increasing stress (15.38%), anxiety (10.49%) and depression (9.79%) respectively.
- 9) Around 83% of the respondents failed to make use of any addiction controller apps which are available in the App store or Play store to reduce and control the excessive usage of personal electronic devices.
- 10) Activities practiced on a regular basis by the respondents for leading a healthy and happy life along with the percentage of respondents included spending time with friends and family (26%), physical exercise (18%), spending time towards their hobbies (17%), reading books (11%) and yoga and meditation respectively.

VIII. SUGGESTIONS

- 1) People should compulsorily make some time out of their busy schedule to spend quality time with their friends and family by engaging in indoor games, having a walk after dinner, having at least one meal together, spending quality time with their children, cooking their favorite dish, exercising and working out together, cleaning the house together and so on.
- 2) Self- Counselling can be defined as the practice of examining one's own behavior using psychoanalytical methods of free-thinking and free association. People should talk to themselves by sitting in a calm place and find out the ways through which they can prepare a schedule and track the time spent on using electronic devices and also follow the schedule. The schedule should include the time spent on having a good sleep, exercising and performing other activities which can make them feel happy, spending time towards one's hobbies and overcome work pressure each day which does not involve usage of electronic devices.
- 3) People are supposed to prepare a diet chart for each day in a week for four times a day i.e., Breakfast, lunch, evening snacks and dinner along with the total calories of the food which is consumed each day. Since the pandemic the people are working for longer hours sitting in front of the devices thus the physical activity is reduced hence there is need for having a healthy and a balanced diet to stay fit and prevent obesity.
- 4) People who are working with the devices for longer hours should mandatorily take breaks between their work. There will be breaks which will be given as per the policy by the company during the working hours. People should leave their devices aside during the breaks get up from their desk and relax for some time by spending time with nature, do some exercises, meditate and involve themselves in other activities which will make them feel fresh and energetic and less stressed to continue doing their work.
- 5) Most of the times people who work with their devices for longer hours tend to skip their meals and consume a lot of coffee to keep themselves alert to do their work. Skipping the meals has several side effects like lower metabolism, leads to weight gain and results in reduced energy to do other activities. Also, necessary changes in lifestyle needs to be made.



- 6) Sit in the right posture while working on with devices for longer hours. It is highly advisable to sit in the right chair and desk while working for long hours and make sure to give adequate support for your back by using pillows.
- 7) Good blood circulation can be achieved by doing frequent exercises for hands and legs. Also, allot minimum one hour to perform workouts on a daily basis.
- 8) Avoid foods which are very high in carbohydrates and not good for health like sugar, pancakes, bread products, potato chips etc. while sitting in devices for longer hours.
- 9) Avoiding using multiple devices for other purposes during working hours. Also, take one or two naps in a day to remain productive in their work.
- 10) Providing the same contact number for both clients and colleagues should be avoided especially for people who are being employed in the information technology sector. At times the colleagues may call and clients will be waiting thus the communication between the colleagues and clients will be hampered.
- 11) Constant motivation from team leaders from time to time is highly crucial for employees to perform their work effectively.

IX. CONCLUSION

From this study we can conclude that since the time the recent pandemic of covid-19 has been evolved the life of people of various age groups has been affected greatly as there is a huge transformation of people shifting from their conventional lifestyle to the virtual world for all walks of life like education, work, purchasing groceries and other items and so on. This increased usage of personal electronic devices by the people since the pandemic has affected both their physical and mental health to a larger extent. People are suffering from several physical health effects as discussed in this study such as back pain, neck pain, head pain, shoulder pain, eyes strain, wrist pain etc. and also mental health effects like, anxiety, depression, problems in their relationship, increasing stress and loneliness, lack of focus and so on. Thus, it is necessary for people to adapt to a balanced lifestyle which will make them feel better while working with devices for longer hours. Daily exercises and workouts, good and healthy foods which are high in nutrients and avoiding foods which have high carbohydrates, sleeping early at the night, switching off the devices at least one hour before sleep etc. are crucial for leading a healthy life in this pandemic situation.

REFERENCES

1. Harman, L.C.S.W. (2018, May 16). The effect of electronics on mental health. *Keystone health*. <https://keystonehealth.org/blog/effect-electronics-mental-health/>
2. Jon Johnson. (2020, February 25). Negative effects of technology: What to know. *Medical News Today*. <https://www.medicalnewstoday.com/articles/negative-effects-of-technology>
3. The Scientific World. (2018, November 24). How modern lifestyle affects our physical and mental health. *The Scientific World*. <https://www.scientificworldinfo.com/2018/11/how-modern-lifestyle-affects-our-physical-and-mental-health.html>
4. Ann Pietrangelo. (2019, May 23). How does technology affect your health? The good, the bad, and tips for use. *Health line*. <https://www.healthline.com/health/negative-effects-of-technology>
5. Praveena Devi, C.H.B., Samreen, S., Vaishnavi, B., Navitha, D., Kusuma Kumari, N., Sharma, JVC., & Sirisha, P. (2019). A study on impact of electronic devices on youngsters. *The Pharma Innovation Journal*, 8(5), 283-292. <https://www.thepharmajournal.com/archives/2019/vol8issue5/PartE/8-4-150-688.pdf>
6. Jesus, A. (2018, December 5). *Keeping children away from the bad effects of gadget overuse*. World Vision Philippines. <https://www.worldvision.org.ph/stories/keeping-children-away-bad-effects-gadget-overuse/>
7. *What is electronic media doing to our health?* (2019, December 11). Two Sides North America. <https://twosidesna.org/US/what-is-electronic-media-doing-to-our-health/>
8. *Health effects of using portable electronic devices studied*. (2013, September 5). Science Daily. <https://www.sciencedaily.com/releases/2013/09/130905160452.htm>

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