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Impact of Excessive Usage of Smartphone on Human being

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Abstract

The wireless technology is developing having rapid speed with advanced techniques. It is an emerging technology in various fields of communication like internet access, location-based services, mobile entertainment services, mobile financial services and video conferencing system etc. The users may use such applications at anytime and anywhere via mobile communication. The wireless communication technologystarted with the first generation of mobile phones,known as 1G also. Basically, this was an analog telecommunications technology. The first generation of mobile wirelesscommunicationsystem (1G) was launched in Japan in 1979 by NTT. In the year 1991, the second-generation of wireless communication technology (2G) was commercially launched on the Global System for mobile communication (GSM) standard in Finland by Radiolinja.

The word 3G denotes the third generation of mobile communication technology which was introduced in the year 2000. The fourth generation of wireless mobile communication system (4G) was introduced in the year 2010. This system is the IP-based mobile system which provides access through a collection of radio interfaces. The fifth generation of wireless mobile communication system (5G) was introduced in the year 2020. It is the wireless internet network. It is maintained through OFDM, MC-CDMA, LAS-CDMA, UWB, Network-LMDS and IPv6. The 5G is known as real world wireless because it does not require limitations. Now world is working for more advanced wireless communication technology system.

The effects of excessive use of computer screens and smartphones are putting serious concerns among health and educational authorities because of adverse effects in users. Recent studygave the various evidence supporting excessive smartphone use as an addictive behavior is scarce. Billieuxet al (2015) suggested that there is insufficient evidence for behavioral and neurobiological similarities because of excessive use of smartphone. Some workers (Panovaet al 2018) also suggested that there is insufficient evidence to support for the diagnosis of smartphone addiction. According to Montag et al (2019) and Wacks et al (2021),the excessive smartphone use is a type of Internet use disorder. Now-a-days smartphones are being used for different purposes like chatting, gaming, social network services, video calling, watching video clips and for so many other purposes. After COVID-2019, most of the things are

being done through smartphone. During COVID-2019, almost all the students used their smartphone for study purpose like online classes, sharing their study materials etc. Thus, the excessive use of smartphones may have different effect on various activity of human being according to the type of smartphone use. This present paper reportsimpact of use of smartphone on human beings.

Introduction:

A cellular phone, handphone, cell phone, cellphone, mobile phone, hand phone or pocket phone, sometimes calledas simply mobile or cell or just phone, which is a portable telephone set, can make and receive calls over a radio frequency link however the user is moving within a telephone service area(Rehman et al 2006 and Srivastava et al 2013).The word mobile is used because it is very easy to move it from place to place.

The radiations of smartphone utilize the frequency of the range from 3 kHz to 300 GHz. For example when a laptop is connected to the Wi-Fi network and it is kept on laps within the distance of 60 cm, it is very harmful for human beings (Ellis 2016, Kumar[a & b] et al 2022 and Oni et al 2011). Because of the rapid growth of usage of smartphone, this technology creates an alarming situation for the general functioning of the biological systems of the human beings. It leads to the serious impact such as brain diseases like alzheimer's disease, brain tumor, brain cancer, Parkinson and so on. Also,someshort-term effects (attention, behavior, effect on centration, hormone disruption, impairment of cognitive function andsleep disruption etc.) and some long-term effects (DNA damage, Male infertility) (Sage et al 2009 and Suhag et al 2016). Specially for children, the wireless electronic gadgets are more serious impact because of their thinner bony skulls and their neural systems are thin. The smartphone devices also communicate by utilizing the electronic radiations along with other types of radiations which are more hazardous and cannot save the physical structure of human being(Ahonen 2007). Presently, human beings are using the smartphones everywhere because these of wireless system which is in great demandfor the communication purposes. These mobile phone devices produced harmful radiations which effects the human health on both active and passive user of smartphone because these radiations are available everywhere and in general their existence cannot be observed. These radiations also penetrate in the human body and affect the cell structure as well as the DNA of the human being. Now-a-days we are using different types of radiations for connecting the smartphone devices with each other and each radiation having their own frequency and wavelength.In general, these frequencies mostly range from 3 kHz to 300 GHz. There are different types of smartphone related devices for exampleaudio player, Bluetooth device, cell phones, cell telephone tower, laptop connected to the wireless router (Wi-Fi), personal computer, wireless hand free, wireless router, tablet. All these devices produced harmful radiations that can contribute in generating and enhancing many harmful diseases such as Alzheimer's

disease, asthma, birth defects, Brain Tumor, Ear Hearing Impairment, Heart trouble, high blood pressure, Immune system, insomnia, leukemia, Male Infertility and effect on the foetus, Parkinson's disease and rheumatoid arthritis. Radiations are also cause of some symptoms that are headache, sleep disruption, tiredness and so on. DNA damage can also causedue to the wireless radiation which given off by the mobile phone devices during the sending and receiving process of the data which is broken down by this survey-based research (Suhag et al 2016). The present study is carried out with the assistance of doctors by using survey questionnaire.This survey contains some of the diseases like finger pain, neck pain, sleep disorder, vision defect and anger level or irritability which are induced by these radiations.

Survey Based Methodology:

The present study is based on survey questionnaire. The primary data is obtained from numerous smartphone users of different age groups starting from 15 years of age with a class interval of ten years. The survey questionnaire is distributed among the users through online mode. The study was conducted at different regions between November 2022 to January 2023. The questionnaire consists of six questions which cover adequate information regarding smartphone devices which results consequence on human body and the diseases induced by them. Total500 questionnaire were distributed. In the outcome, each smartphone user has given their own response in relation to the effects of smartphone devices on the human body by their observations concerning the patients and other person of the family.

Data collection:

Data collection was started from November 2022 to January 2023 from different people of different age group and survey task was completed. The questionnaires were distributed only to the five hundred smartphone users and also interviewed for data collection around the effects ofsmartphone on the human health.

Results and Discussion:

Total 500 smartphone users were interviewed about the effects of smartphone devices on the human health. Good number of smartphone users complain about the adverse effects of smartphone devices on the human Health. The process of interpretation is essentially one of the stating facts what the results show. The significance level is studied by using chi square test. For this test contingency table were made and the Chi square values were calculated as follows:

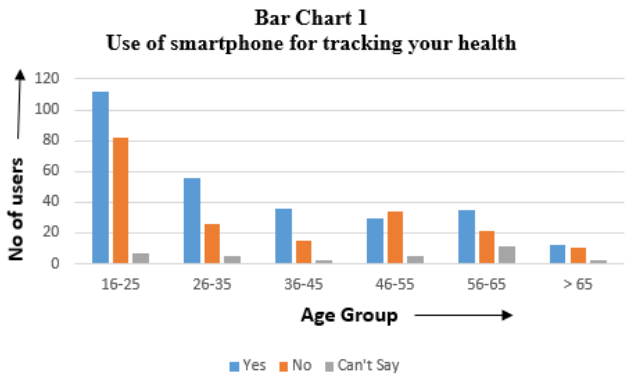
$$\chi^2 = \sum\left[\frac{(f_0 - f_e)^2}{f_e}\right]$$

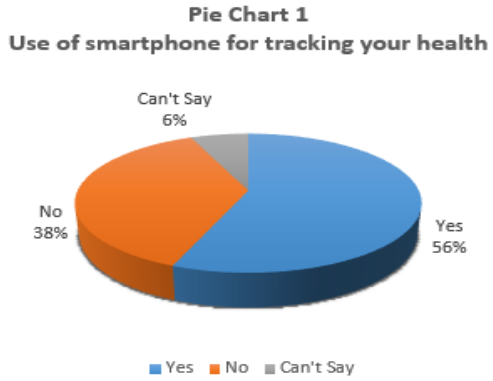
Where f_0 = Frequency of occurrence of observed or experimentally determined facts and f_e = Expected Frequency of occurrence

The results of different questions are explained as follows:

Table 1 : Use of smartphone for tracking your health

Options	16-25	26-35	36-45	46-55	56-65	> 65	Total	Chi square value
Yes	112	56	36	29	35	12	280	5.03
No	82	26	15	34	21	10	188	
Can't Say	7	5	2	5	11	2	32	
Total	201	87	53	68	67	24	500	

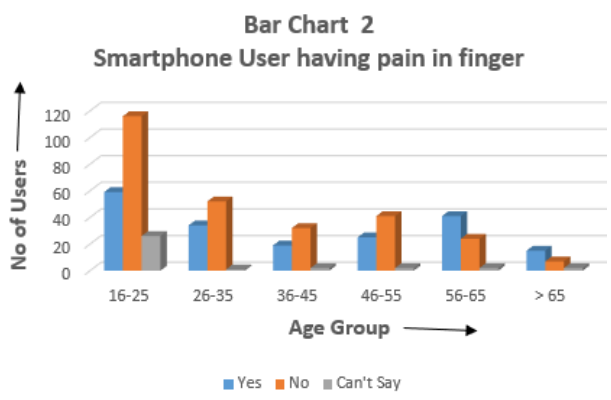


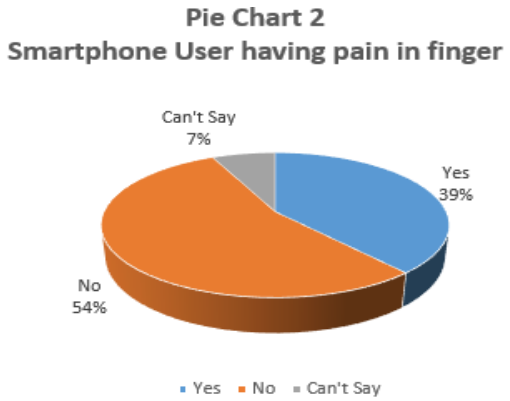


As given in Table 1, the chi square values is 5.03 for tracking health by smartphone user for a sample size of 500. This value is very much significant at 0.05 level of probability. It means the smartphone users are not tracking their health through smartphone. It is also shown in Bar Graph 1 and %age wise is shown in Pie Chart 1. Pie chart also shows the significant result. These data finds support from the literature value (Meo et al 2005, Braune et al 1998 and Szyjkowska et al 2014).

Table 2: Smartphone User Having Pain in Finger

Options	16-25	26-35	36-45	46-55	56-65	> 65	Total	Chi square value
Yes	59	34	19	25	41	15	193	8.82
No	116	52	32	41	24	7	272	
Can't Say	26	1	2	2	2	2	35	
Total	201	87	53	68	67	24	500	

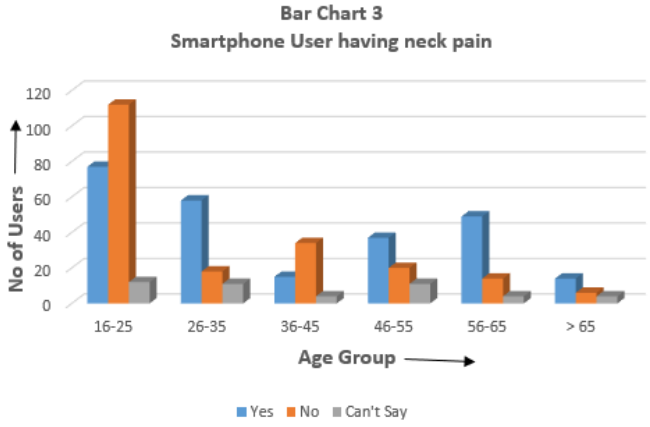


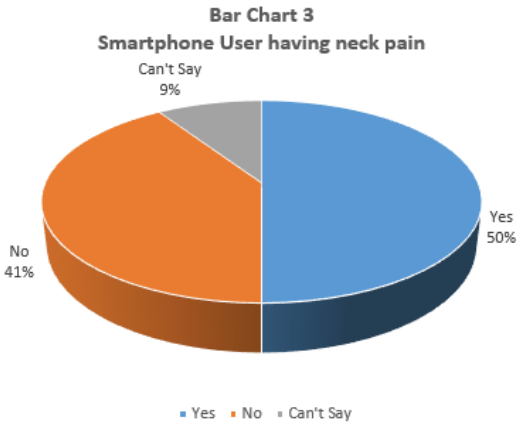


As given in Table 2, the chi square values is 8.82 for smartphone user having pain in their finger for a sample size of 500. This value is highly significant at 0.05 level of probability. It means good number of smartphone users are having pain in their finger. It is also shown in Bar Graph 2 and %age wise is shown in Pie Chart 2. The pie chart shows that 39% of people are suffering from this problem which is a good percentage of users. These data are in agreement with the literature value already reported (Eichenberg et al 2019, Kellenyi et al 1999 and Khudnitskii et al 1998).

Table 3: Smartphone User having neck pain

Options	16-25	26-35	36-45	46-55	56-65	> 65	Total	Chi square value
Yes	77	58	15	37	49	14	250	**13.85**
No	112	18	34	20	14	6	204	
Can't Say	12	11	4	11	4	4	46	
Total	201	87	53	68	67	24	500	





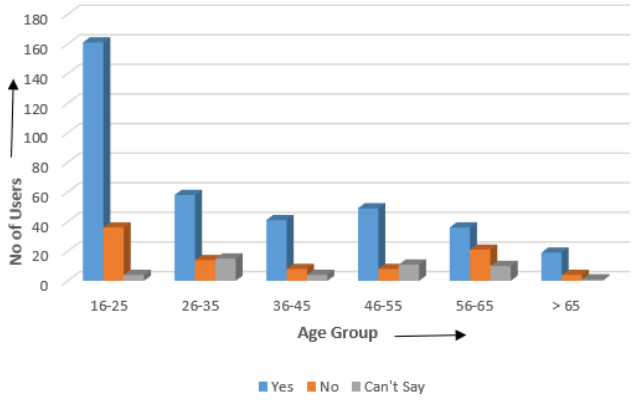
As given in Table 3, the chi square values is 13.85 for smartphone user having neck pain in for a sample size of 500. This value is highly significant at 0.05 level of probability. It means good number of smartphone users are having neck pain. It is also shown in Bar Graph 3 and %age wise is shown in Pie Chart 3. The pie chart shows that 50% of people are suffering from this problem which is a good

percentage of users. These data are also in agreement with the literature value already reported (Inal et al 2015 and Zhuang et al 2020).

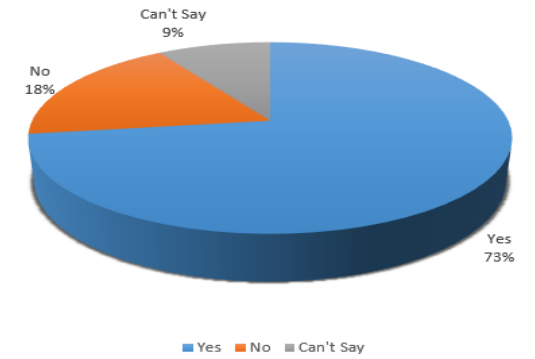
Table 4: Smartphone User having vision problem

Options	16-25	26-35	36-45	46-55	56-65	> 65	Total	Chi square value
Yes	161	58	41	49	36	19	364	7.76
No	36	14	8	8	21	4	91	
Can't Say	4	15	4	11	10	1	45	
Total	201	87	53	68	67	24	500	

Bar Chart 4
Smartphone User having vision problem



Pie Chart 4
Smartphone User having vision problem



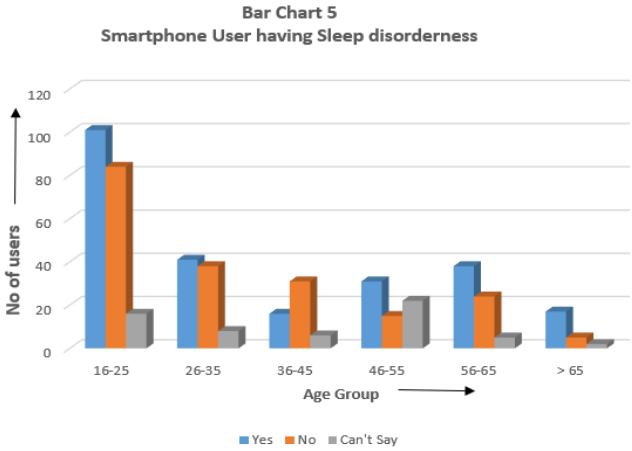
As given in Table 4, the chi square values is 7.76 for smartphone user having vision problem for a sample size of 500. This value is highly significant at 0.05 level of probability. It means good number of users are suffering from vision problem. It is also shown in Bar Graph 4 and %age wise is shown in Pie Chart 4. The pie chart shows that 73% of people are suffering from vision problem which is a good percentage of users. These information find support from the literature value (Lee et al 2016 and Wacks et al 2021).

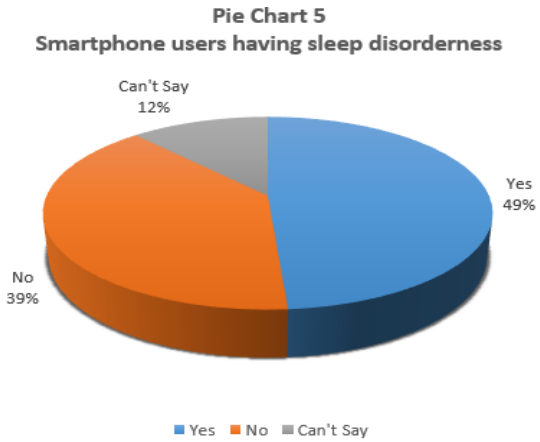
Table 5: Smartphone User having Sleep disorderness

Options	16-25	26-35	36-45	46-55	56-65	> 65	Total	Chi square value
Yes	101	41	16	31	38	17	244	9.81
No	84	38	31	15	24	5	197	
Can't Say	16	8	6	22	5	2	59	
Total	201	87	53	68	67	24	500	

Excessive smartphone use was associated with vision problem (Ghekiere et al 2019, Liu et al 2019, Tamura et al 2017 and Twenge et al 2019). From Table 5, the chi square values is 9.81 for smartphone

user having vision problem for a sample size of 500. This value is highly significant at 0.05 level of probability. It means good number of users are suffering from vision problem. It is also shown in Bar Graph 5 and %age wise is shown in Pie Chart 5. The pie chart shows that 49% of people are suffering from vision problem which is a good percentage of users.

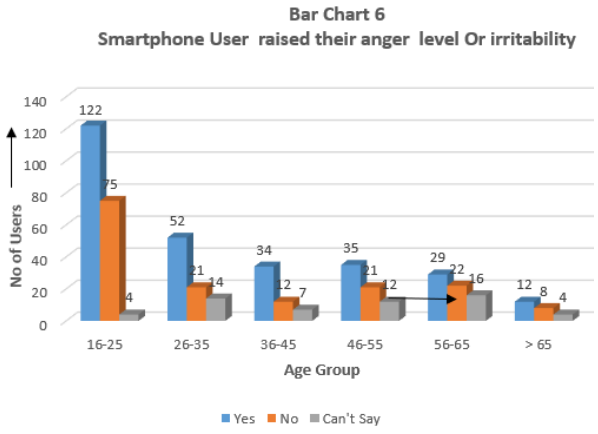


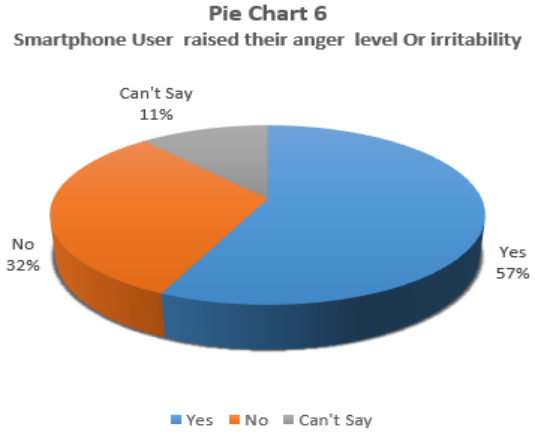


These findings also find support from the literature value (Ali et al 2019, Dharmadhikari et al 2020, Huang et al 2020, Kim et al 2015 and Lee et al 2016).

Table 6:Smartphone User raised their anger level or irritability

Options	16-25	26-35	36-45	46-55	56-65	> 65	Total	Chi square value
Yes	122	52	34	35	29	12	284	**7.67**
No	75	21	12	21	22	8	159	
Can't Say	4	14	7	12	16	4	57	
Total	201	87	53	68	67	24	500	





Excessive use of smartphone was associated with increase of level of anger or irriatability (Kim et al 2016, Dimirci et al 2016 and Wacks et al 2021). From Table 6, the chi square values is 7.67 for smartphone user having vision problem for a sample size of 500. This value is highly significant at 0.05 level of probability. It means good number of users are suffering from vision problem. It is also shown in Bar Graph 6 and %age wise is shown in Pie Chart 6. The pie chart shows that 57 % of people are suffering from vision problem which is a good percentage of users. These findings also find support from the literature value (Demir et al 2019 and Montagni et al 2016).

Conclusion:

It is concluded that by the excessive usage of smartphones five diseases such as finger pain, neck pain, problem in eye vision, level of anger or irritability and sleep disorders can be affected on human health. Agreeing to our survey, we found that the smartphone usage is more dangerous on human health, as doctors believed that all wireless devices like cellular phones, laptop, wireless router, wireless earphone, cell telephone tower, Bluetooth devices and personal computer are accountable for the development of diseases of finger pain, neck pain, problem in eye vision, level of anger or irritability and sleep disorders. It is suggested that one should keep away from the use of smartphone or have minimal usage as low as possible as it may affect the human life in number of ways.

Recommendations:

- Keep the smartphone away from user if it is not needed.
- Do not use smartphone for a very long time as it results the neck pain and finger pain.
- Do not use smartphone late night as it affects the sleep.
- Do not use the smartphone in dark because it’s light affects our vision.

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