International Journal of Community Medicine and Public Health
Marskole P et al. Int J Community Med Public Health. 2022 Jan;9(1):124-129
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20214812

Original Research Article

A study on assessment of effects of electronic gadgets on mental and physical health among medical students in Central India

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Received: 14 November 2021
Revised: 29 November 2021
Accepted: 30 November 2021

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ABSTRACT

Background: Human race has witnessed enormous technological advancements especially in last few decades. Electronic gadgets are part of everyday lives of all individuals in all age groups. On one side they make our lives easier and convenient and on the other side their excessive usage is harmful. These gadgets effect physical as well as mental health. Present study was conducted to see the effects of electronic gadgets on physical and mental health of medical students.
Methods: A cross-sectional study was conducted among MBBS students of Central India. Students who were present on the time of data collection were included in the study. For the study, data collection tool was a pre-designed, semi structured questionnaire, collected data was compiled in excel sheet and relevant analysis was done.
Results: About 70% have habit of waking up between 6 to 8 AM. 95.5% of subjects were using smartphones, 61.5% of subjects using laptop/computer. 58% were spending time with gadgets less than 4 hours while 6.5% were spending more than 10 hours. We found out that 54% had ophthalmic health effects and 46.5% participants accepted feeling anxious, irritated or restless without their gadgets. The study revealed health problems of participants as headache (30%), migraine (1%), depression (7%) and other problems like backache, weakness, joint pain and others.
Conclusions: The current and exiting data so far suggest that gadget have definite risk and adverse effects on the health of the general population.

Keywords: Electronic gadgets, Physical health, Mental health

INTRODUCTION

Technology is a two-edged sword. Term technology comes from Greek word 'techne' which is defined as the art or skill used in order to solve a problem, improve a pre-existing solution to a problem, achieve a goal, handle an applied input/output relation or perform a specific function, technology is the making, modification, usage and knowledge of tools, machines, techniques and method of organisation.[1] After industrial revolution the term became popular more so.

Human race has witnessed enormous technological advancements especially in last few decades. Electronic gadgets are part of everyday lives of all individuals in all age groups. These days business, education, billing and various other activities are being undertaken through electronic gadgets. Data as per the report by Indo-Asian news service, gadgets 360 dated 30 January 2020 said that over 500 million Indians were using smartphones and out of them 77% remained online.[2] But like every other scientific advancement electronic gadget also have both advantages and disadvantages. On one side they make our

lives easier and convenient and on the other side their excessive usage is harmful. Severity depends according to the type of device, duration of usage, rays transmitted, posture.

Extended duration of harmful radiations has deleterious effects on health especially, vision, mind and other vital organs. To regulate the duration and posture during usage, it is important for all of us to understand its harmful effects and implications on health so that the severity of health hazards can be minimized to the lowest possible level. Studies reveal that all citizens especially youngsters devote a lot of time and energy using gadgets.

Addiction is sometimes defined as continued repetition of a behaviour or an activity independent upon the adverse or negative consequences of the same or it can be a neurological impairment which is causing such behaviours.[3,4] Psychological control over substance and behaviour, preoccupation with the subject and the continuity of some activities in spite of consequences are the symptoms of addiction.[5] As per Kimberly Young, addiction to technology is said to be a habitual compulsion to engage in using technology instead of using it to solve problems.[6] They use technology as a coping mechanism to avoid conflict. Long term compulsions can lead to psychological problems such as insomnia, irritability and depression. For example, compulsion to use technology in favour of rare and exciting life events such as parties or vacations might signify addiction. Attitude changes in teens, sudden depression, loss of self-esteem and problems in paying attention to study are often symptoms of internet addiction.[6]

The recovery from addiction mostly need professional help, may be in the counselling or psychotherapy, drug treatment or life style changes.[7]

Objective

The objective was to assess the effects of electronic gadgets on physical and mental health of medical students.

METHODS

A cross-sectional study was conducted among MBBS students at a medical college of Central India. Study was conducted between June 2019 to August 2019, for 2 months. For the study universal sample of the non-exam going batch was planned. Only two batch were free at the time of the study, so we planned our study on students of these batches using convenient sampling. Those students who were willing and present at the time of data collection were included in the study. Those students who were not using any kind of gadgets were excluded from the study. For the study, data collection tool was a pre-designed, semi structured questionnaire which contained questions regarding electronic gadgets, type of gadgets, use of gadgets, their effects on sleep and other activities of daily living, duration of usage, knowledge about the hazards of their use and some preventive measures. The study was done through the filling of questionnaire after explaining the procedure of how to fill the questionnaire. Informed verbal consent was obtained from the student and then they were asked to fill the questionnaire.

Data analysis

Collected data was compiled in excel sheet. Descriptive analysis was done in terms of percentages. Chi square test was used to see the association between categorical variables. P value less than 0.05 was considered statistically significant.

RESULTS

In this study we could study on 200 students, out of which 97 (48.5%) were male. In our study 41% of participants were from upper middle class and 75% were from nuclear family. We found that 72.5% were having normal BMI and 54% were doing regular exercise. 70.5% have habit of waking up between 6 to 8 AM. 95.5% of subjects were using smartphones, 61.5% of subjects using laptop/computer and 57.5% of subjects using television. 58% were spending time with gadgets less than 4 hours while 6.5% were spending more than 10 hours.

Table 1: Socio-economic status and type of family of participants.

Characteristics	Male (n=97)	Female (n=103)	Total (n=200)	Chi square, p value
Socio-economic status				
Upper	23	56	79	22.25, 0.00
Upper middle	46	36	82	
Lower middle	28	11	39	
Type of family				
Nuclear family	77	73	150	2.11, 0.34
Joint family	18	23	41	
Three generation family	2	5	9	

Table 2: BMI, habit of exercise, time of waking up and sleeping of participants.

Characteristics	Male (n=97)	Female (n=103)	Total (n=200)	Chi square, p value
BMI				
Underweight	10	20	30	5.18, 0.07
Normal weight	71	74	145	
Over weight	16	9	25	
Habit of doing regular exercise				
Yes	65	43	108	12.83, 0.00
No	32	60	92	
Time of wake up in morning (in AM)				
4-6	9	11	20	1.30, 0.72
6-8	66	75	141	
8-10	16	13	29	
After 10	6	4	10	
Time of sleep-in night				
10-11 PM	25	24	49	4.68, 0.19
11-12 PM	40	32	72	
12-1 AM	18	32	50	
After 1 AM	14	15	29	

Table 3: Time spent with gadgets by participants.

Characteristics	Male (n=97)	Female (n=103)	Total (n=200)	Chi square, p value
Time spent with gadgets (in hours)				
<4	49	67	116	9.53, 0.04
4-6	19	20	39	
6-8	17	8	25	
8-10	6	1	7	
>10	6	7	13	
Time spent on internet (in hours)				
<2	36	39	75	1.17, 0.88
2-4	36	43	79	
4-6	15	11	26	
6-8	6	6	12	
>8	4	4	8	
Time spent on social media (in hours)				
<1	28	28	56	
1-2	36	37	73	
2-4	21	29	50	
4-6	8	7	15	
>6	4	2	6	
Time spent with laptop (in hours)				
<2	62	40	102	3.37, 0.33
2-4	22	23	43	
4-6	7	2	9	
6-8	6	1	7	

Table 4: Psychological and ophthalmic effects of gadgets use.

Characteristics	Male (n=97)	Female (n=103)	Total (n=200)	Chi square, p value
Stay without a mobile for a day				
Yes	64	68	132	0, 1
No	33	35	68	
Behaviour when not in touch with mobile				
No reaction	51	56	107	1.92, 0.58

Continued.

Characteristics	Male (n=97)	Female (n=103)	Total (n=200)	Chi square, p value
Anxiety	23	21	44	
Restlessness	10	16	26	
Irritated	13	10	23	
Feeling of irritation in daily life				
Yes	38	43	81	0.13, 0.71
No	59	60	119	
Use of any electronic gadgets in				
While driving	30	4	34	
Just before sleep	81	81	162	
In midnight	47	40	87	
Difficulty in sleeping				
Yes	27	19	46	2.48, 0.11
No	70	84	154	
Wears spectacles				
Yes	45	63	108	4.38, 0.03
No	52	40	92	

Table 5: Health problems faced by participants.

Health problems	Male (n=97)	Female (n=103)	Total (n=200)
Headache	25	35	60
Backache	9	10	19
Weakness	9	9	18
Joint Pain	0	2	2
Depression	11	3	14
High blood pressure	1	0	1
Diabetes	1	0	1
Heart attack	0	0	0
Stroke	0	0	0
Asthma	0	1	1
Migraine	0	2	2
No problem	83	97	180

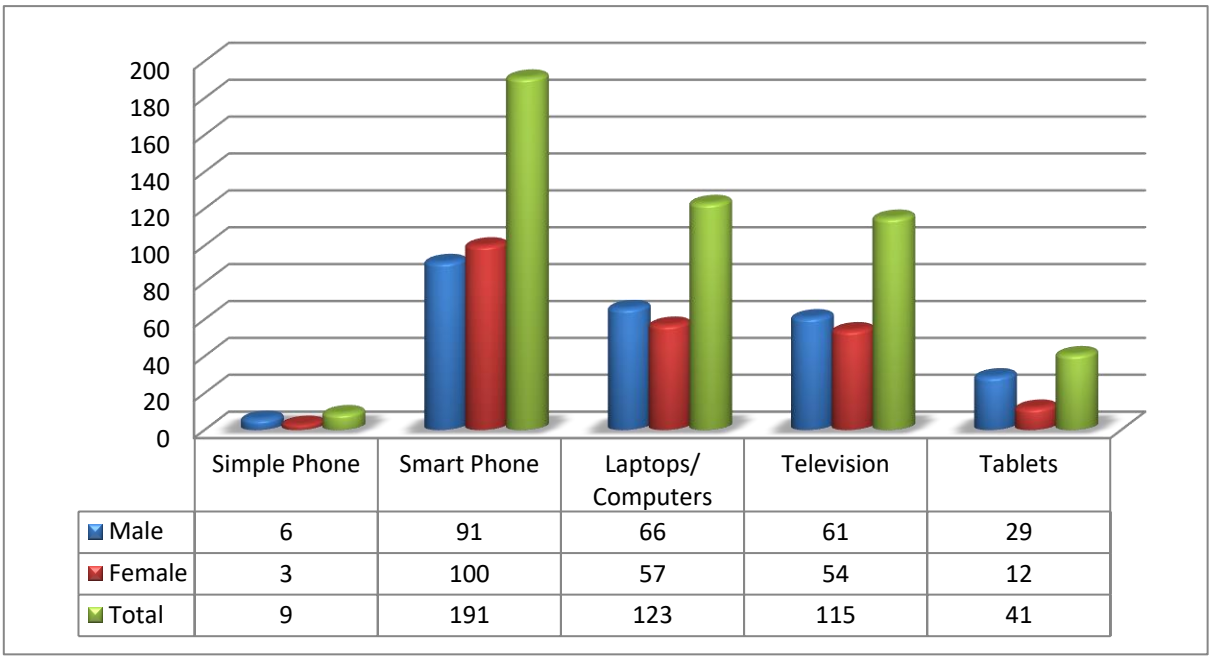

Figure 1: Distribution of subjects according to type of gadgets they have.

We found out that 54% have ophthalmic health effects and are wearing spectacles. Similarly, 46.5% participants accepted feeling anxious, irritated or restless without their gadgets. The study revealed health problems of participants as headache (30%), migraine (1%), depression (7%) and other problems like backache, weakness, joint pain and others.

DISCUSSION

The present study included 200 participants out of which 103 were male and 97 were female. All the participants (100%) were using any form of gadgets as compared to other study by Mahbubur et al in which 89.25% males and 85.52% females were using one or the other form of gadgets.[8]

As for as the BMI was concerned in our study 73.1% males and 71.8% female were in the normal BMI range as compared to other study by Mahbubur et al in which 89.42% males and only 10.57% females were in normal BMI range.[8]

In the present study the maximum number of participants according to duration of usage of gadgets in a day was 49% males and 67% females who were using gadgets for >4 hours in a day as compared to study by Wahyuni et al in which 43.6% participants were using gadgets for >5 hours a day.[9]

As far as the psychological effect of electronic gadgets was concerned the present study found abnormal mental reactions in the form of anxiety, irritation and restlessness among 46% participants as compared to 28.2% found out in study by Wahyuni et al.[9] According to Sundus 2015 about the effect of using gadgets on children that using too many gadgets causes depression in children at certain ages.[12] This also caused mental health problems in children in childhood and adolescence. They may act depressed or we can see the worst of these symptoms of depression within a few days

To talk about the adverse ophthalmic effects of gadgets 54% of the participants were having refraction error and were wearing spectacles. In a similar study by Pachiyappan et al pain in eyes was identified in 16% participants and blurring vision in 8.6%.[10] Another related study by Maniraju et al found out effects of gadgets in the form of dryness and redness of eye.[11]

In the long list of health problems faced by gadgets user headache ranked first with 30% users facing it similar to study by Pachiyappan et al with 34.8% participants complaining of headache.[10]

This study tried to bring out the factors and characteristics associated with electronic gadget addiction and its effects on human body. In other study titled Liddell et al findings showed an increasing proportion of people saying they were losing control due to a lack of time, concentration or creativity.[1] The present study had tried to bring out the relationship with physical and psychological health problems and the types and pattern of use of electronic devices. In a study by a project targeted at girls and underway at North Eastern University in Seattle has a self-explanatory acronym: GAMES: girls advancing in maths, engineering and science. There was already something of a track record for this approach, with some hugely successful girl-oriented games. For example, Seattle based Her Interactive has sold more than 9 million copies of one such game. With the advent of new devices and technology the present research work can lead to further such studies and observations.

Limitations

In this study we used convenient sampling leading to limited number of study participants. Further detailed study with usage details of different apps would have been more beneficial.

CONCLUSION

The evidence available by research done so far does not provide a clear pattern to prove an association between exposure microwave and other radiations from mobile phones and direct effects on health. whereas the quality of the research done so far do not allow ruling out adverse effects on health. The studies so far have supported that gadgets have adverse effects on the health of the general population. The current evidence as well suggest that there is a definite risk. It becomes, a major precautionary approach to the use of this communication technology and gadgets, so that the health of users especially youngsters can be restored and maintained.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Marskole P, Yadav R, Sethia S, Parmar S, Bhagora R, Parihar L. A study on assessment of effects of electronic gadgets on mental and physical health among medical students in Central India. Int J Community Med Public Health 2022;9:124-9.