Technology Addiction and Associated Health Problems among Medical Students in Kalaburagi District

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ABSTRACT

Introduction: Over the past decade, society has witnessed massive changes with media and technology playing a major role in the ways we work and live. Advancements in digital technologies have resulted in various positive applications. However, research has shown a number of negative consequences as well; such as depression, anxiety, or damage to relationships etc. Thus this study was designed to estimate; 1) Prevalence of technology addiction & dependency on them and 2) To find the associated health problems among those addicted.

Methodology: A cross-sectional study was conducted among 102 under-graduate medical students of Gulbarga Institute of medical sciences, Kalaburagi. A structured e-questionnaire designed with Google forms was deployed to collect data. Study was undertaken for two months from Dec 2017 to Jan 2018.

Results: Over 60 % of the study subjects spent more than 7 hour/day with some technological devices and 49 % of the subjects showed high degree of dependency on technology. Among addicted subjects feeling anxious/nervous was the commonest symptom reported; followed by feeling sad/depressed.

Conclusions: Prevalence of technology addiction was high among medical students and subjects engaged for more than 7 hours/day with technological devices, reported health problems in higher proportion.

Keywords: Technology, addiction, dependency, gadgets, youth

INTRODUCTION

In past few years, there is an alarming rise in technology usage among young adults worldwide, undoubtedly this has clear benefits to its users, but research has consistently proved that; over-usage and dependency on these devices is found to be associated with negative physical & mental health consequences.[1, 2]A recent study in America revealed; high rates of technology access & usage among young adults: Internet use: 84 percent,[3, 4]Social media use: 65 percent,[5] Smartphone ownership among adults & teens at 68 percent & 67 percent respectively.[3]Similarly a study conducted by Willems et al., in Switzerland found 98% adolescents in the age group of 12-19 years owned mobile phones.[2]Haug S et al. observed smart phone addic-

tion occurred in 16.9% of his subjects and social networking was significant function associated with smart phone addiction.[1] So what is addiction basically; Marlatt et al. defined addiction as"A *repetitive habit pattern that increases the risk of disease and/or associated personal and social problems. Addictive behaviors are often experienced subjectively as "loss of control"- The behavior contrives to occur despite volitional attempts to abstain or moderate use. The sehabit patterns are typically characterized by immediate gratification (short-term reward), often coupled with delayed deleterious effects (long term costs). Attempts to change an addictive behavior (via treatment) are typically marked with high relapse rates".[6]*Operational definition of technology addiction adopted in our study was *"engaging in use of any technological device for 7 hours or more per day with characteristic inducing fea-*

tures contributing to addictive tendencies".Young at al described characteristics of technological addiction based on DSM IV criteria for Pathological gambling as: gradual tolerance, withdrawal symptoms, compulsive behaviour or a sense of loss of control, unsuccessful attempts to quit or take control, and neglect of social, academic and occupational responsibilities with functional incapacitation.[7,8]Prevalence of internet addiction varies widely across all age groups, gender & regions, with multitude of addiction characteristics ranging from Internet addiction, online gaming addiction, addiction to social media, online shopping, pornography, video game, & TV addiction etc. In current days technology usage as become an invincible and integral part of college student life, without which many cannot think of their existence. Similarly it has become 'invisible' part of young adults because, often students fail to realise their addiction behaviour or extent of dependency on these devices until it is very late; or they manifest with some health problems.[9]According to Geser (2006), different motives for male & female generated unique usage patterns for technologies (e.g., the Internet) [10]for example Junco et al. (2010) observed female students saw technology as a tool of communication for maintaining and nurturing relationships whereas men pursued it as a means of entertainment.[11]

Some of the health problems identified with excessive usage of technological devices include neck pain symptoms, eye strain or accidents to pedestrians and drivers while usingcell-phone[12]and other associated mental problems include sleep disturbances, depression, less peer and family Interaction, poor academic performance and psychosocial developmental tasks.[13]In recent past years, like any other substance use disorders; problem of addiction to technology devices has gained momentum; after many countries & jurisdictions have started recognizing it as emerging public health problem.

Youth being the most vulnerable population; early identification of signs of addiction/dependency in this age-group is pivotal to institute all prophylactic measures is a first step towards recovery. Thus, in this context, current study was designed to estimate the prevalence of technology addiction & dependency on technological devices among young medical students and to find associated health problems among those addicted.

MATERIAL & METHODS

A cross-sectional study was conducted among under graduate medical students of Gulbarga Institute of medical sciences, Kalaburagi. Convenient sampling technique was adopted. Of total 162 stu-

dents studying in second and third phase (part I) MBBS, only 148 students in the age-group of18 to 22 years were contacted for the study. Ten students were excluded, as they did not to fulfil inclusion criteria. From remaining 138 students, 115 of them volunteered to participate in study. Data was collected individually from each subject through internet-link shared by e-mail. A structured e-questionnaire designed with google forms was adopted to collect data. Before administering questionnaire, participants were briefed about the contents of tool & the purpose of study. Follow-up reminders were sent through mail, to ensure completeness & timely filling of questionnaire. However, 13 responses were omitted as they were found to be inappropriate/incomplete. Thus the data was analysed for 102 respondents. Study was undertaken for two months from Dec 2017 to Jan 2018. The study was approved by Institutional ethics committee prior to its commencement. All willing participants were briefed about the study and informed consent was obtained from each of them before administering questionnaire.

Study tool: The questionnaire used in this study is a structured one. The first part consisted of the demographic profile of the participants followed by four sections. Later half was divided into three parts of close ended questions pertaining to the use of the technological devices and their current health status.

Part - A of the tool contained questions regarding the type of the device used, time spent with different devices and services provided by them. Information on time spent included "surfing the Internet" for pleasure or personal interest (e.g., e-mail, scanning Whatsapp groups or Facebook, news, playing interactive games) including academic related purposes. Options provided were: 1-2 hours, 3-4 hours, 5-6 hours and ≥7 hours; against each gadgets and services. Time spent by each respondent with different technological devices was finally summed up to get total time expenditure in a day. The percentage calculation of the respondents was made as per the time spent with the devices and for the purposes. Use of the device for more than 7 hours/day was considered as addictive behaviour regardless of type of device used. *Part - B* contained 10 questions pertaining to dependency on the technological devices and services viz., Survival is difficult without technological devices, technology makes the young mass smart, Social relationship is ruined by technology etc. Questions with negative statements were reverse coded for calculation. All questions were in 5-point Likert-scale. Total score varied from lowest ten to highest fifty. A score more than or equal to 34 was considered high dependency, whereas a score ranging from 17 to 33 and from 10 to 16 were considered as

moderate dependency and low dependency respectively. *Part - C* consisted of questions pertaining to health status assessment.

Data analysis: Descriptive analysis was undertaken in excel sheet, whereas a comparative univariate analysis to know the impacts of the addictive use of tech-devices on health and lifestyle of the respondents was performed using SPSS vs 20. Qualitative variables, like prevalence were summarized by frequencies & represented graphically.

RESULTS

Socio-demographic profile:

Out of 102 students 42 were male and 60 were female students. Female students represented more in number, than males. The age varied from 19 to 22 years; mean age of participants was 21 years**.** Parental income of the students ranged from 30 thousand to 1.5 lakhs per month; mean parental income of was 60 thousand per month. This means; most of the students belonged to either middle class or upper- middle class family. Total time spent by a student in hours/day with multiple devices viz. Mobile phone, Laptops, Tablets etc. was summed up to determine presence of addiction to technological devices. It was observed that; none of the students were addicted to any single device but however, 60 % of the study subjects spent more than 7 hour/day with more than one technical devices, whereas only 5% of them spending less than 2hrs/day (as shown in Table 1).

Mobile phone was the most commonly used device (31%) followed by laptops (27%), tablets (23%) & other devices like iPod, TV, Music systems etc. (as shown in Table 1).

Most common purpose of addiction was for entertainment, followed by communication & study. 43% of the students' utilised technology for the mere entertainment purposes; with only 27% using it for study purposes (as depicted in Table 1).

All the subjects showed some degree of dependency on technological devices of which,49 % of the participants showed high degree of dependency, whereas 51% participants showed moderate degree of dependency, while none showing low dependency (Table 1).

Feeling nervous/anxious was the most commonly reported symptom (with about 56%) among all participants. Other associated symptoms were in the following order: Feeling sad or depressed (51%), reading difficulties (41%), physical discomforts (32%), and breathing problems (25%), thinking/ memory problems (19%), speech (17%) & lastly hearing problems (9%) as shown in table 2.

Tables 1: Prevalence, time expenditure pattern, purpose, dependency on technology devices

Time spent with the devices (in hours)	Subjects (%)
1-2	5 (5)
3-4	12(12)
5-6	24(24)
≥7	61(60)
Total	**102(100)**
Type of device	**Time spent (in hrs) (%)**
Mobile phones	180 (31)
Laptops	157 (27)
Tablets	135 (23)
Others	116 (20)
Total	**588(100)**
Purpose of use	**Time spent (in hrs) (%)**
Study	151(27)
Communication	173(31)
Entertainment	243(43)
Total	**567(100)**
Degree of dependency	**Subjects (%)**
High	50(49)
Moderate	52(51)
Total	**102(100)**

Table 2: Frequency & nature of health symptoms reported with excess technology usage

Symptoms	Frequency of symptoms			
	1-2 hrs	3-4 hrs	5-6 hrs	≥7 hrs
Feeling anxious/ nervous	5	5	13	34
Feeling sad/depressed	5	5	12	30
Physical discomforts	1	3	4	25
Reading difficulties	1	5	11	25
Thinking/memory problems	1	3	1	14
Breathing difficulties	1	3	6	15
Speech problems	1	2	3	11
Hearing problems	0	1	3	5

Subjects spending more than 7 hours/ day with technical devices reported health symptoms in greater proportion when compared to those who spent less than 7 hours. Among addicted subjects, again feeling anxious/nervous was commonest reported symptom (21%), followed by feeling sad/ depressed (19%), physical discomforts & reading difficulties (16% each). Other minor symptoms reported included, thinking & memory problems, speech problems, breathing difficulties, and hearing problems.

DISCUSSION

In our study 60 percent of the study subjects were observed to be addicted to some technical devices. Similar to our findings, a survey in America observed 61% of subjects being addicted to internet in 2010, which shows the seriousness of the problem.[14] A systematic review of studies on American adolescents and college students reported a range

of prevalence estimates between 0 and 26 percent.[15] In 2010, a study among 8 to 18 years age group found; 29 percent of young people were engaged in media multitasking of their overall media use time, fitting over 10 hours of media use into 7 and half hours of their days.[16] Similarly in a study by Young KS, the length of time using the Internet, differed substantially between dependents and Non-Dependents. Dependents spent nearly eight times the number of hours per week compared to Non-Dependents in using the Internet. Our study observed a high degree of dependency i.e. 49 %, and moderate degree of dependency among 51% participants. Young et al., observed dependent users were likely to use the Internet from twenty to eighty hours per week, with single sessions that could last up to fifteen hours.[8]Their unsuccessful attempts to gain control simulates alcoholics who are unable to regulate or stop their excessive drinking despite relationship or occupational problems caused by drinking; and can be linked to tolerance levels which develop among alcoholics who gradually increase their consumption to achieve the desired effect. Presence of certain risk factors, increase the risk of technology abuse.[17] Problematic media use" is a term that describes dysfunctional ways of engaging with media and encompasses many related terms, including Internet addiction, technology addiction, Internet gaming disorder, and others.[18]

The study by Phillips, Ogeil and Blaszczynskiin 2011 purports to support this theory. They concluded in the study that individuals who used smart phones at high levels had low levels of self-esteem and they frequently used their mobile phones to increase their self-esteem. In such studies, low self-confidence and problems of social skills were considered to be the main problems that aroused Internet and mobile phone addiction.[19, 20]

Some psychological vulnerabilities are (extraversion and low self-esteem), presence of stressors and poor family and social support.[21] Most recognized and established model, is symptom-centred, that is "components model". According to this model, similar to substance-related addictions, technological addictions are the result of bio psychosocial processes, and share neurobiological and psychosocial risk factors, the presence of (stressful) psychosocial events and shifts in mood induced by the addictive behaviours, as well as natural history, treatment non-specificity and addiction hopping, suggesting technological addictions can be understood within a syndrome model of addictions.[22] It is possible that reinforcement of virtual contact with on-line relationships may fulfil unmet real life social needs. Individuals who feel misunderstood and lonely may use virtual relationships to seek out feelings of comfort and community. However, greater research is needed to investigate how such interactive applications are capable of fulfilling such unmet needs and how this leads to addictive patterns of behaviour. A study by Seok et al., revealed; addicted and highly engaged individuals did not show statistically significant differences across frequency of online video game play scores, with regard to the following questions "How often do you play online video games?" That is, the addicted (53.3%, $n = 16$) and the highly engaged (50%, $n = 19$) reported a close percentage in terms of daily play, indicating that a duration of play was a crucial deciding factor. No significant difference was found between 2 groups. Instead, not surprisingly, statistically significant differences were found between the addicted and the non-highly engaged. Findings, illustrate the difficulty in separating those involved in an excessive activity versus an addictive activity.[23]

Our findings revealed mobile phone was the most commonly used device followed by laptops, tablets & other devices like iPod, TV, Music systems etc. the most common purpose of addiction was for entertainment, followed by communication & study. Young et al., claimed dependents predominantly used two-way communication functions (i.e., chat rooms, social networks, or email) whereas Non-Dependents used only those aspects of the internet, which allowed them to gather information (e.g. Google) and found that there was an increased risk of addictive behaviour the more interactive the application being used.[8]

In present study, feeling nervous/anxious was the most commonly reported symptom among all participants followed by; feeling sad or depressed, reading difficulties, physical discomforts, breathing problems, thinking or memory problems, speech &hearing problems. In a study at Bradford it was found that; to compensate excessive technology use, sleep patterns were typically disrupted due to late night log-ins & early wakeup. Such sleep depravations caused excessive fatigue often making academic or occupational functioning impaired and decreased immune system predisposing to health problems. Additionally, the sedentary act of prolonged computer use resulted in a lack of proper exercise and lead to an increased risk for carpal tunnel syndrome, neck and eyestrain.[8] Current study observed; health symptoms were reported more among those who spent more than 7 hours/day with technological devices. Among addicted subjects again, feeling anxious/nervous was commonest symptom reported; followed by depressive symptoms & physical discomforts. Individuals with Internet Gaming Disorder are known to experience extreme negative consequences as a result of their game play, such as

exhaustion and loss of relationships.[18]A seminal research study involving 262 college students found that heavy media multitaskers have a harder time filtering out irrelevant information. An empirical study of 241 organizational mobile email users revealed that their levels of addiction to mobile email increased their perceived work overload and technology–family conflict.[24]

Most addiction experts agree that negative consequences, such as depression, anxiety, job loss, poor academic outcomes, or damage to relationships, are a central feature of addiction. Many researchers have noted that narcissism seems to be increasing, while empathic traits have been on the decline, and have pointed to social media as a driver for that change.[25,26] After surveying 3,461 North American girls in 8 to 12 year age group, Roy Pea et al., found that high levels of media use (e.g., talking on the phone, communicating online, watching video, listening to music, and reading) were related to negative social well-being, while face-to-face communication was associated with positive social and emotional outcome.[27]Media multitasking is very common among children and young adults, even though there is concern over how it affects our abilities to pay attention and avoid distraction. Adolescents addicted to technology, often get socially isolated.[26]

Limitations:

Sample size being small considering 47 million current Internet users.[28]This study has some inherent biases in its methodology by using convenient sampling technique & thus is not generalizable. Study design being cross-sectional, does not allow to draw conclusions about underlying cause. List of technological devices considered in current study may not be comprehensive.

CONCLUSIONS

Overall prevalence of technology addiction was high among medical students (i.e. 60%) and subjects engaged for more than 7 hours/day with technological devices reported with multitude of health problems of diverse nature. Mobile phone was the most commonly used device (31%) followed by other technological devices. All subjects in current study showed some degree of dependency on one or the other technological devices;with 49% of them showing high level of dependency. It is clear that, for some youth, it is possible to overuse technologies in compulsive ways that had severe negative health outcomes. Over the past few years, there has been a massive change in how we access and use technology, thus parents, educators,

researchers, and other stakeholders in youngster's lives should be alert to both problems and opportunities for their development.

RECOMMENDATIONS

In a "constantly connected" society, media literacy may be more important in developing a healthy digital lifestyle. Therefore, formal media-literacy education may be a valuable tool for encouraging healthy media habits. Additionally, longitudinal and experimental research that shows changes over time and support causal rather than correlational relationships, helping parents to better understand problematic media use; should be undertaken. Research is needed to better understand how and why people engage with media in problematic ways and whether particular age-groups (i.e., children who are already depressed, socially isolated, etc.) are especially vulnerable.

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