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Investigating smartphone addiction among senior secondary school students

Aman Habbi * and Chaman Lal Banga

Department of Education, Himachal Pradesh University, Summer Hill, Shimla, Himachal Pradesh, India.

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Abstract

The present study is based on the smartphone addiction which is an emerging problem of the current time. Our youth is getting distracted due to excessive use of smartphones nowadays. The study aimed to find out the significant difference of smartphone addiction among senior secondary school students with respect to their gender (i.e. male and female); type of schools (i.e. government and private); streams (i.e. science, arts and commerce); type of families (i.e. joint and nuclear); and social category (i.e. general and scheduled castes). Tool used to collect the data was smartphone addiction scale developed by Dr. Vijayshri and Dr. Masaud Ansari. The sample consisted of 200 senior secondary school students, out of which 100 were males and 100 were females. Collected data was analyzed through mean, standard deviation and t-test. The results revealed that there was no significant difference in the smartphone addiction among senior secondary school students in relation to their gender (male and female), stream (i.e. science and commerce; arts and commerce), type of family (i.e. joint and nuclear), social category (general and scheduled castes). While there was a significant difference in the smartphone addiction among senior secondary school students in relation to their type of school (i.e. government and private) and stream (science and commerce). It was suggested that schools should integrate digital literacy into the curriculum which can educate students about the responsible use of smartphones highlighting potential risks of addiction.

Keywords: Smartphone; Smartphone Addiction; Senior Secondary School Students

1. Introduction

In the present era which is known as the computer era, the use of technical devices is increasing day by day and this use has reached such an extent that today's life is incomplete without these devices. These devices are especially needed in daily life. Its need and importance has increased not only in personal life but also in professional life and official work. If seen from the point of view of convenience and speed, then the use of the advanced technology seems justified because it has strengthened the pace of lifestyle and work style. Many such machines have been invented which have not only made big tasks easier but have also made improvement in the quality. Now many such software have been developed through which any information can be sent to any corner of the world within a few moments. With the inclusion of technology, life has become very simple and pleasant.

In this era of technological development, the invention of mobile phone proved to be a revolutionary invention that brought immense changes in our lifestyle. If we talk about the field of telecommunication, in the year 1876, Alexander Graham Bell brought a big change in the field of communication by inventing the telephone (Babe, 2012). After the invention of this resource of telecommunication, on 3rd April, 1973, American engineer Martin Cooper introduced the first handheld mobile phone at a press conference in New York. Its weight was 1.1 kg and its length was 9 inches. It provided 35 minutes of talk time before its battery died. After years of development, Motorola introduced the DynaTAC 8000x in 1983, the first portable cell phone for consumers (Gregersen, 2024). In 1992, the prototype of a smartphone was developed by America's IBM Company. The prototype resulted in an improved version called Simon Personal

*Corresponding author: Aman Habbi

Communicator which was the first smartphone with capabilities to send and receive e-mails including apps like an address book, calculator, calendar and notepad. In various dimensions of development, mobile has made its special place in daily life in the present time.

Many tasks that are performed on computers can be performed using smartphones now, for example circulating information is possible through smartphone, now large size files of audio and video can also be easily sent to another user, after the Covid-19 pandemic, trend of online classes has also increased, apart from this, many meetings are being held through teleconferencing and video conferencing without any travel or without going anywhere. In addition to voice calls and social media, smartphones offer text messaging, online shopping, online payments, news outlets, gaming, and entertainment. In this way the use of smartphones has increased significantly. Due to excessive use of smartphones, not only the number of users has increased but it is also being used unnecessarily, which is causing wastage of time and many health problems. Excessive use of smartphone is also leading to addiction of smartphone. According to forecast report by Statista, there are currently 6.9 billion smartphone users worldwide and will increase to 7.7 billion by 2028 in which China, India and United States are the countries with the highest number of smartphone mobile network subscriptions. According to Ericsson report, "Smartphone subscriptions in India have grown by 70 million in 2023." A report by Boston Consulting Group revealed that on an average, users check their phones 80 times/day and 1 in 2 (50%) times people pick up their phones without knowing why. According to this report 84% of the users check their phone within 15 minutes of waking up. If we talk about the screen time of users, According to a report by Redseer Strategy Consultants, at approximately 7.3 hours per day screen time, Indians are using their smartphones for various purposes, but mostly for online messaging, social media, YouTube streaming, OTT content and short form video. Worldwide, people spend an average of 6 hours and 40 minutes per day on screens. According to Whistle out the average person spends little more than 76,500 hours on their smartphones in their lifetime, which equates to 8.74 years. This statistic calculates the average age of phone acquisition with an average daily usage of 3.07 hours. Thus as per above data it can be seen how it is becoming addiction among all the human being, mostly among youngsters. Social media has become popular among youth and nowadays mobile phone has become a symbol of social status in our society. In this race of showing higher status symbol youngsters are demanding expensive mobile phones with advanced features.

1.1. Smartphone addiction

Smartphone addiction is a phenomenon that pertains to uncontrollability of smartphone use. The use of a smartphone not only produces pleasure and reduces feelings of pain and stress but also leads to failure to control the extent of use despite significant harmful consequences in financial, physical, psychological and social aspects of life (Cha and Seo, 2018). Smart phone utility and so-called addiction is mainly addiction to the internet. If we take away internet connectivity from the smartphone their usefulness as well as habitual use will reduce substantially. Therefore, the use of the term "Smartphone addiction" is technologically incorrect and it may be replaced by internet addiction. Smartphone addiction is a disorder involving compulsive overuse of the mobile devices, usually quantifies as the number of times users access their devices and/or the total amount of time they are online over a specified period (Panwar and Patel, 2023).

Smartphone phone addiction has four basic components: (i) compulsive phone use, such as often checking for messages or updates (ii) tolerance or prolonged and intensive use; (iii) withdrawal or feeling of agitation or distress in the absence of the phone; and (iv) functional impairment or interference with daily life activities and face-to-face social interactions (Moattari et al., 2017). Smartphone addiction, also known as "pathological smartphone use" or "smartphone dependence," is characterized as an individual's uncontrollable use of their smartphones, which can lead to serious negative behavior at work, while learning and in daily life. Smartphone addiction has been linked to a wide range of health effects including fatigue, headaches, musculoskeletal pain, blurred vision, and poor sleep quality. Tolerance, salience, withdrawal and cravings have also been associated with excessive smartphone use (Ratan et al., 2021; Lui et al., 2022). Electromagnetic waves from mobile phones also delay melatonin production and lead to sleep disorders and depression (Desouke and Zaid, 2020).

1.2. Terms associated with smartphone addiction

1.2.1. Nomophobia

Nomophobia was initially coined in 2008 British postal service study (Banerjee et al., 2024). It is abbreviation of "no mobile phone phobia," which literally conveys the meaning of the fear or anxiety people experience when they cannot use or access their mobile phones. Some of the symptoms in this area of research may be panic, stress and discomfort experienced by people in cases where they feel incapable of being connected. Emerging from this perspective of modern technology dependency, nomophobia reflects a societal shift toward constant connectivity and reliance on smartphones in the context of communication, information retrieval, and social interaction (King et al., 2010; Yildirim & Correia,

2015). It is characterized by having one's phone constantly at hand, even in the most inappropriate or unsafe situations, creating a behavior driven by the fear of losing contact with social networks or missing any important information. It is now widely accepted that nomophobia is a significant issue that affects all types of people. This psychological behavior exemplifies how digital connectivity can impact contemporary life (Bragazzi et al., 2014).

1.2.2. Fear of Missing Out (FOMO)

FOMO stands for Fear of Missing Out and can be explained as a kind of psychological phenomenon. It can be depicted by the generalized fear in a person that others might have rewarding experiences from which he or she is absent. This is further accelerated through continuous updates on social media platforms in which one sees friends and acquaintances engaging in several activities. The potential impact of FOMO could be compulsive checking of social media and one's smartphone, which often tends to be seriously disruptive in the cases of students. It is established that FOMO is associated with negative emotional states such as anxiety and depression and it greatly contributes to reduced academic performance since it steals the focus of students and results in increased stress (Przybylski et al., 2013).

1.2.3. Problematic Smartphone Use

Problematic smartphone use may be defined as patterns of smartphone use that "interfere with daily life and responsibilities, causing negative consequences." It typically involves excessive time investments with the device, preventing the execution of relevant academic or professional duties and creating a state of withdrawal symptom in case one is not able to use the phone. Problematic smartphone use is often related to other behaviors like social media addiction, gaming addiction and constantly checking notifications. According to Lin et al., problematic smartphone use is related to various mental health issues such as anxiety, depression and sleeping disorders. It is also observed that it can decrease the concentration power of students and face-to-face interaction ability, hence causing a behavioral problem in their academic and social life (Lin et al., 2016).

1.2.4. Social Media Addiction

Social media addiction means a behavioral addiction that is characterized by excessive preoccupation with social media, irresistible compulsion to use social media and spending so much time on social media that it impairs other important areas of life. As a result, this type of addiction could cause serious harm in the decline of students' academic performance, sleep disturbances and decrease in social interactions led in person. Andreassen et al. (2012) have stated that the problem of addiction with regard to social media is associated with many various psychological problems: low self-esteem, anxiety and depression. In the educational context, the student addicted to social media may lose the ability to focus attention on studying, leading to poorer academic outcomes.

1.2.5. Internet Addiction

The broader concept of Internet addiction concerns excessive and compulsive Internet use and can be viewed in addictive behavior happening on the Internet. Internet addiction is a kind of impulse-control disorder whereby an individual uses internet services to excess, most of which impede daily activities, including academic responsibilities, by consuming a disproportionately large amount of time and attention. The symptoms include a preoccupation with the Internet, increased tolerance, withdrawal symptoms and negative consequences in academic, social, and occupational functioning (Young, 1998).

2. Review of the related literature

Nikhita et al. (2015) studied the prevalence of Mobile Phone Dependence in secondary school adolescents by cross-sectional and observational method. Smartphone addiction was significantly associated with gender, family types, type of mobile phone used, average time per day spent using mobile phone and years of mobile phone usage. Joy and Mathew (2016) found high level of mobile phone addiction among college going youth. Mailk (2018) pointed out the high level of mobile phone addiction among Kashmiri male students and it was moderate in Kashmiri female students. Nair (2019) conducted a study on smartphone addiction among youth and found that 63% of the respondents were addicted to their phones. Renuka et al. (2019) in their study found that male respondents were more addicted to their phones than the female respondents. Kaur et al. (2020) also found out that usage was more by the males than females in terms of duration and frequency of usage of smartphone. Desai (2020) in her study found that anxiety and depression were highly correlated with smartphone addiction followed by sleep disturbance, isolation and fear of missing out. It was found that there were high chances of anxiety and stress for cell phone addicts. Malla (2021) conducted a study on academic procrastination among secondary school students and founs male students to be procrastinating in academics more and were more addicted to smartphones than female students. Nehra and Mehrotra (2022) studied the impact of smartphone addiction on academic performance of adolescent. The results revealed a negative aspect which indicated

that excessive smartphone use by adolescents negatively impacts their learning and academic performance, while the positive aspect indicated that the use of smartphones by adolescents increased their skills and cognitive abilities. Rafee, et. Al (2023) pointed out that students were not ready to participate in social events, skip meals and do not like to avoid frequently checking their mobile for alerts/ notifications. Ince and Kilic (2016) stated that students check their mobiles at least once every half an hour. It has been evaluated that students had less movement and less learning achievement on the days they use smartphones. Abed et al. (2017) found a significant association between mobile phone addiction and age groups. Boumosleh and Jaalouk (2017) found that 35.9% felt tired during daytime due to late night smartphone use, 38.1% acknowledged decreased sleep quality and 35.8% slept less than four hours due to smartphone use more than once. Cakir and Oguz (2017) found that a significant and positive correlation between smartphone addiction and loneliness. Bağcı and Pekşen (2018) investigated the smartphone addictions of vocational school studentsand found that students, who used more than 5 hours of telephone, were more addicted than other students and students who used the phone between 3 hours and 5 hours were more smartphone addicts than students who used the telephone between 0-3 hours. It was found that students who have social media accounts were more addicted to smartphones than those who do not have social media accounts. Cha and Seo (2018) found that the risk group for smartphone addiction used a smartphone for an average of 313.13 minutes per day, which was 33.17 minutes longer than that of the normal user group. Out of 1824 middle school students in South Korea, 563 (30.9%) were at risk for smartphone addiction, while 1261 (69.1%) were normal users. Obadofin et al. (2020) studied the impact of smartphone addiction on academic performance of students in senior secondary schools and found a significant impact of smartphone addiction on academic performance of students in senior secondary school. Tangmunkongvorakul (2020) studied the factors associated with smartphone addiction comparatively between Japanese and Thai High school students. The study revealed that prevalence of smartphone addiction was 35.9% among Thai students and 12% among Japanese students. Thai students were more likely to have smartphone addiction than Japanese students. Females in both countries had higher odds of smartphone addiction compared to males. Parental connectedness, such as parents noticing when the students were unhappy or did something good, was associated with lower odds of smartphone addiction among Japanese students. Guifang et al. (2020) found a positive co-relation between cell phone use time and cell phone dependence. In a study, done by Cheng and Zhang (2020), women exhibited higher mobile phone addiction scores than men, and students in literature and history had higher addiction scores than those in science and engineering. Mansoor et al. (2020) found a positive significant correlation between smartphone addiction and sleep disturbance. Ali et al. (2021) suggested that the usage of mobile phones can cause more psychological problems in females as compared to males. Siddiqui et al. (2021) stated that most popular mobile use among the primary section students was playing games on mobile phone whereas, secondary section students mostly used their phones to access internet. 86.7% of primary section students said that their parents were aware of how they used their mobiles compared to 83.4% students of secondary section. Lee et al. (2021) detected long duration of smartphones use during the weekend with more than three hours per day and social media (81.8%) was the frequently visited function in the smartphones. Sunday et al. (2021) found that smartphone impacts negatively on the skills and cognitive abilities needed for students' academic success and learning are negatively impacted. Achangwa et al. (2022) found that smartphone addiction was associated with physical health leading to sleep disorders and musculoskeletal and neurological problems. Smartphone addiction has also been found to have a negative correlation with academic performance, procrastination, impulsivity, self-esteem, decreased social interaction, solitude, and suicide. Simsek (2023) found that distraction occurs as smartphone use time increases and it was found that this distraction is more in males than females. Norazman et al. (2023) conducted the study on the influence of mobile phone addition on academic achievement among teenagers. The results revealed that 64% students had midrange addiction, 19% had low addiction and 16.5% had high addiction. Those students who were addicted to mobile phones received lower grades in school. Alahdal (2023) studied the impact of smartphone addiction on sleep quality among high school students in Makkah, Saudi Arabia. The sample consisted of 373 high school students. The results revealed that the participants had problems using smartphones longer than they intended, constantly checking them and missing planned works. Khan et al. (2023) studied the role of smartphone addiction, fear of missing out on perceived competence among secondary and intermediate students. The results revealed that there was a positive correlation between smartphone addiction and fear of missing out, while there was a negative correlation between fear of missing out and perceived competence.

Significance of the study

The present study on "Smartphone Addiction among Senior Secondary School Students in Relation to Socio-Demographic Variables" holds significance while ascertaining the influence of different socio-demographic factors gender, type of school, stream and social category on smartphone addiction amongst students. While evaluating how smartphone addiction differs between the two genders (male and female), it will be possible for the research to establish whether trends or susceptibilities specifically linked to male or female students are evident. This is important to understand in targeting interventions and support mechanisms. A comparison of smartphone addiction between government and private school students can, therefore, reveal the effect of school environment and resources on the

nature of technology use and the manifestation of addictive behaviors among students. All these insights will be useful while formulating educational policies and some interventions that ought to be correctly targeted at episodes within school settings. Comparing the addiction in streams of education, such as science, arts, and commerce, will help bring out whether the nature of curriculum or academic focus influences the pattern of technology use and levels of addiction. This information helps educators in bringing about a balanced technology. The present study shall help in understanding the extent and nature of smartphone addiction among senior secondary school students. With the high level of acceptance of mobile devices among young people, the study of addiction tendencies suggests risks and possible protectors.

Objectives of the study

- To find the significant difference in smartphone addiction among senior secondary school students with respect to their gender (i.e. male and female).
- To find the significant difference in smartphone addiction among senior secondary school students with respect to their type of schools (i.e. government and private).
- To find the significant difference in smartphone addiction among senior secondary school students with respect to their streams (i.e. science, arts and commerce).
- To find the significant difference in smartphone addiction among senior secondary school students with respect to their type of families (i.e. joint and nuclear).
- To find the significant difference in smartphone addiction among senior secondary school students in respect to their social category (i.e. general and scheduled castes).

Hypotheses of the study

- There is no significant difference in smartphone addiction among senior secondary school students with respect to their gender (i.e. male and female).
- To find the significant difference in smartphone addiction among senior secondary school students with respect to their type of schools (i.e. government and private).
- To find the significant difference in smartphone addiction among senior secondary school students with respect to their streams (i.e. science, arts and commerce).
- To find the significant difference in smartphone addiction among senior secondary school students with respect to their type of families (i.e. joint and nuclear).
- To find the significant difference in smartphone addiction among senior secondary school students in respect to their social category (i.e. general and scheduled castes).

3. Research methodology

According to the objectives of this study the 'Survey Technique' under descriptive research method was used by the investigator. The sample for the present study consisted of 200 students studying 11th and 12th classes. For the present study, the smartphone addiction scale developed by Dr. Vijayshri and Dr Masaud Ansari was used. The scale comprised of total 23 items.

3.1. Variables

3.1.1. Independent Variable: Smartphone Addiction.

Dependent Variables: Gender (Male and Female); Type of School (Government and Private); Streams (Science, Arts and Commerce); Type of family (Joint and Nuclear); Social Category (General and Scheduled Castes).

3.2. Procedure of data collection

The process of data gathering was done using a structured questionnaire with close-ended questions. Data was collected during the period from April, 2024 to May, 2024. The survey was started only after the permission from the respective Principals of the both government and private schools. Researcher visited all the schools for the collection of the data. The researcher would provide the printed questionnaire in English language to the individual student with brief explanation of the purpose and motive of the study. After brief explanation researcher explained all the items to the participants. The student was left completely free to fill in the responses that required about 15-20 minutes and collected the filled-up questionnaire.

3.3. Statistical technique used

The objectives intended to study the significant difference between different variables. In this case, mean, standard deviation and t-test was used.

4. Results and discussions

4.1. Hypotheses 1: There is no significant difference between male and female senior secondary school students in smartphone addiction.

Table 1 Gender Wise Differences in Smartphone Addiction among Senior Secondary School Students

Gender	N	Mean	SD	df	't' value	Level of Significance
Male	100	54.96	12.97	198	1.37	NS
Female	100	52.58	11.40			

NS- Not statistically significant at 0.05 level of significance

Table 1 indicates that the mean score of overall smartphone addiction among male and female senior secondary schools students are 54.96 and 52.58 respectively, with standard deviations of 12.97 and 11.40. It shows that the computed value of 't' for studying the significance of difference between means of smartphone addiction among male and female senior secondary school students come out to 1.37, which is non significant at 0.05 level of significance for 198 df. This indicates that there is no significant difference in the overall smartphone addiction among senior secondary school students at two levels of gender i.e. male and female.

Hence, the hypotheses 1 as stated above: "There is no significant difference between male and female senior secondary school students in overall smartphone addiction", was accepted.

4.2. Hypotheses 2, "There is no significant difference between government and private senior secondary school students in overall smartphone addiction."

Table 2 School wise Differences in Smartphone Addiction among Senior Secondary School Students

Type of School	N	Mean	SD	df	't' value	Level of Significance
Government	100	56.03	11.94	198	2.65	*S
Private	100	51.51	12.17			

*S- Statistically significant at 0.01 level of significance; Table value of 't' for df 198 at 0.01 level of significance = 2.60

Table 2 indicates that the mean score of smartphone addiction among government and private senior secondary school students are 56.03 and 51.51 respectively, with standard deviations of 11.94 and 12.17. It shows that the computed value of 't' for studying the significance of difference between means of smartphone addiction among government and private senior secondary school students come out to 2.65, which is significant at 0.01 level of significance for 198 df. This indicates that there is a significant difference in the overall smartphone addiction among senior secondary school students at two levels of type of school i.e. government and private.

Hence, the hypotheses 2 as stated above: "There is no significant difference between government and private senior secondary school students in overall smartphone addiction", was rejected.

4.2.1. Hypotheses (3) – (i): "There is no significant difference between science and arts senior secondary school students in overall smartphone addiction."

Table 3.1 indicates that the mean score of overall smartphone addiction among science and arts senior secondary schools students are 50.63 and 56.15 respectively, with standard deviations of 12.08 and 12.08. Table 3 shows that the computed value of 't' For studying the significance of difference between means of overall smartphone addiction among science and arts senior secondary school students come out to 2.93, which is significant at 0.01 level of significance for 166 df. This indicates that there is significant difference in the overall smartphone addiction among senior secondary school students at two levels of stream i.e. science and arts.

Table 3 Stream wise Differences in Smartphone Addiction among Senior Secondary School Students

Stream	N	Mean	SD	df	't' value	Level of Significance
Science	80	50.63	12.08	166	2.93	*S
Arts	88	56.15	12.08			

*S- Statistically significant at 0.01 level of significance' Table value of 't' for df 198 at 0.01 level of significance = 2.60

Hence, the hypotheses (3) – (i): as stated above: "There is no significant difference between science and arts senior secondary school students in overall smartphone addiction", was rejected.

4.2.2. Hypotheses (3) – (ii): "There is no significant difference between science and commerce senior secondary school students in smartphone addiction."

Table 4 Stream wise Differences in Smartphone Addiction among Senior Secondary School Students

Stream	N	Mean	SD	df	't' value	Level of Significance
Science	80	50.63	12.26	110	1.75	NS
Commerce	32	55.03	11.20			

NS- Not statistically significant at 0.05 level of significance

Table 3.2 indicates that the mean score of overall smartphone addiction among science and commerce senior secondary schools students are 50.63 and 55.03 respectively, with standard deviations of 12.26 and 11.20. It shows that the computed value of 't' for studying the significance of difference between means of overall smartphone addiction among science and commerce senior secondary school students come out to 1.75, which is non significant at 0.05 level of significance for 110 df. This indicates that there is no significant difference in the overall smartphone addiction among senior secondary school students at two levels of stream i.e. science and commerce.

Hence, the hypotheses (3) – (ii): as stated above: "There is no significant difference between science and commerce senior secondary school students in smartphone addiction", was accepted.

4.2.3. Hypotheses (3) – (iii): "There is no significant difference between arts and commerce senior secondary school students in overall smartphone addiction."

Table 5 Stream wise Differences in Smartphone Addiction among Senior Secondary School Students

Stream	N	Mean	SD	df	't' value	Level of Significance
Arts	88	56.15	12.08	118	0.46	NS
Commerce	32	55.03	11.20			

NS- Not statistically significant at 0.05 level of significance

Table 3.3 indicates that the mean score of overall smartphone addiction among arts and commerce senior secondary schools students are 56.15 and 55.03 respectively, with standard deviations of 12.08 and 11.20. It shows that the computed value of 't' For studying the significance of difference between means of overall smartphone addiction among arts and commerce senior secondary school students come out to 0.46, which is non significant at 0.05 level of significance for 118 df. This indicates that there is no significant difference in the overall smartphone addiction among senior secondary school students at two levels of stream i.e. arts and commerce.

Hence, the hypotheses (3) – (iii): as stated above: "There is no significant difference between arts and commerce senior secondary school students in overall smartphone addiction", was accepted.

4.3. Hypotheses 4 "There is no significant difference between joint and nuclear family senior secondary school students in overall smartphone addiction."

Table 4 indicates that the mean score of overall smartphone addiction among joint and nuclear senior secondary schools students are 53.86 and 53.70 respectively, with standard deviations of 11.60 and 12.69. It shows that the computed value of 't' for studying the significance of difference between means of overall smartphone addiction among joint and

nuclear senior secondary school students come out to 0.87, which is non significant at 0.05 level of significance for 198 df. This indicates that there is no significant difference in the overall smartphone addiction among senior secondary school students at two levels of type of family i.e. joint and nuclear.

Table 6 Family wise Differences in Smartphone Addiction among Senior Secondary School Students

Type of Family	N	Mean	SD	df	't' value	Level of Significance
Joint	80	53.86	11.60	198	0.87	NS
Nuclear	120	53.70	12.69			

NS- Not statistically significant at 0.05 level of significance

Hence, the hypotheses 4 : as stated above: "There is no significant difference between joint and nuclear family senior secondary school students in overall smartphone addiction", was accepted.

4.4. Hypotheses 5: "There is no significant difference between general and schedule caste senior secondary school students in overall smartphone addiction."

Table 7 Category wise Differences in Smartphone Addiction among Senior Secondary School Students

Social Category	N	Mean	SD	df	't' value	Level of Significance
General	132	53.17	12.05	198	0.95	NS
Scheduled Castes	68	54.92	12.60			

NS- Not statistically significant at 0.05 level of significance

Table 5 indicates that the mean score of overall smartphone addiction among general and schedule caste senior secondary schools students are 53.17 and 54.92 respectively, with standard deviations of 12.05 and 12.60. It shows that the computed value of 't' for studying the significance of difference between means of overall smartphone addiction among general and schedule caste senior secondary school students come out to 0.95, which is non significant at 0.05 level of significance for 198 df. This indicates that there is no significant difference in the overall smartphone addiction among senior secondary school students at two levels of type of social category i.e. general and schedule caste.

Hence, the hypotheses 5 : as stated above: "There is no significant difference between general and schedule caste senior secondary school students in overall smartphone addiction", was accepted.

4.5. Major findings of the study

- There is no significant difference in the smartphone addiction among senior secondary school students at two levels of gender i.e. male and female.
- There is a significant difference in the smartphone addiction among senior secondary school students at two levels of type of school i.e. government and private.
- There is a significant difference in the smartphone addiction among senior secondary school students at two levels of stream i.e. science and arts.
- There is no significant difference in the smartphone addiction among senior secondary school students at two levels of stream i.e. science and commerce.
- There is no significant difference in the smartphone addiction among senior secondary school students at two levels of stream i.e. arts and commerce.
- There is no significant difference in the smartphone addiction among senior secondary school students at two levels of type of family i.e. joint and nuclear.
- There is no significant difference in the smartphone addiction among senior secondary school students at two levels of type of social category i.e. general and schedule caste.

4.6. Educational implication

- Schools should integrate digital literacy into the curriculum which can educate students about the responsible use of smartphones highlighting potential risks of addiction.
- Authorities should conduct teacher training programs to manage use of smartphones in classroom.

- Schools should conduct workshops for guardians to educate them signs of smartphone addiction and steps to decrease the addiction of smartphone.
- Schools should engage students in extracurricular activities and sports which excludes screen.
- Authorities should monitor pattern of smartphone usage and assess the effectiveness of smartphone in educational activities.
- Authorities should develop such apps which can utilize time of students while using the smartphone for studies.

7 Conclusion

The rapid growth of smartphones has introduced major changes in the lives of senior secondary school students. These devices become very important to the students due to high-speed internet, social media applications, games and multimedia. Due to constant connectivity, smartphones create opportunities for students to always be in touch with peers, easily access entertainment and participate in educational activities. This is leading to addictive behavior of students. This compulsive behavior mostly results in excessive screen time and interferes with the process of regular academic performance, sleep and social activity.

The role of parents and teachers in managing smartphone use has not adjusted with the rapid technological changes. Parents often provide smartphones to their children without any clear limits, perhaps underestimating the potential risks of excess use. On other hand, schools don't know how to balance the use of smartphones for educational purposes and distraction due to smartphones. Excessive smartphone addiction can lead to forgetfulness, a lack of attention, depression, anxiety, disturbed hunger and sleep and social withdrawal among students.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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