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RESEARCH ARTICLE

PROBLEMATIC SMARTPHONE USE AND SOCIAL DISENGAGEMENT AMONG ADOLESCENTS: A SYSTEMATIC REVIEW OF PSYCHOSOCIAL CONSEQUENCES AND PREVENTIVE STRATEGIES

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ABSTRACT

The story of technology is always in a continuous process. Every era has witnessed various innovations that changed human life where the roots of technology are in the invention of the wheel. From the very beginning, technology has aimed a new lifestyle centred on connectivity and convenience for mankind. While it brings many benefits, it also requires responsibility and balance. As we look toward the future, embracing technology wisely will be key to building a more connected, innovative, and humane world. The late 20th century set a new milestone with the introduction of personal computers and mobile phones, followed by the digital revolution of the 21st century. While gadgets provide numerous educational and social benefits, excessive and uncontrolled use has led to increasing concerns regarding gadget dependence and its potential psychosocial consequences. One such consequence is social disengagement, characterized by less face-to-face interaction, withdrawal from social activities and weakened interpersonal relationships. The present paper aims to review and synthesize existing research evidence on the relationship between gadget dependence and social disengagement among adolescents. The present study adopts a descriptive and systematic review–based research methodology using secondary data sources. Relevant literature was identified from peer-reviewed journals, books, research reports, theses, conference proceedings and reputable online databases such as Google Scholar, ERIC, JSTOR, SagePub and ResearchGate. The selected literature was screened, categorized, and analysed thematically to identify major patterns, trends and relationships between gadget dependence and social disengagement among adolescents. Content analysis technique was used to synthesize findings and draw interpretations. The paper highlights the need for awareness among parents, teachers and policymakers regarding balanced digital usage and the promotion of healthy social interaction.

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INTRODUCTION

The lifestyle of adolescents has transformed in a drastic way due to the rapid advancement of digital technology. For communication, learning, entertainment and social interaction, gadgets such as smart phones, tablets, laptops and other digital devices have become integral tools in human life. Though these technologies offer numerous educational and developmental advantages, their excessive and uncontrolled use has given rise to a growing concern for future generations. Gadget dependence denotes a pattern of constant and compulsive use of digital devices that results indeclines in academic performance and psychosocial well-being. The growing popularity and use of social media have fuelled social media addiction as well as app-specific addictions like TikTok addiction, Facebook addiction, YouTube addiction and Snapchat addiction, etc. Similarly, AI addiction, mobile sports betting apps and mobile games are keeping smartphone users hooked to their devices more than ever.

Adolescence is the stage characterized by identity formation, emotional regulation and the establishment of social relationships. During this developmental period, healthy in-person interaction plays a vital role in developing communication skills, empathy and social competence among adolescents. It has been evident from various studies that increasing dependency on digital platforms is associated with less real-world social engagement, limited interpersonal communication and gradually leads to social disengagement. Social disengagement means isolating oneself from direct social interactions, diminished participation in social activities and weakened emotional connections with peers, family members and the broader community. Recent research indicates that adolescents who portray higher levels of gadget dependence tend to experience consequences like loneliness, poor peer relationships, reduced social confidence and a preference for virtual interaction over real-life communication. This relationship between gadget dependence and social disengagement raises important concerns for educators, parents, mental health professionals and policymakers.

In this context, this paper aims to provide a comprehensive study of existing research which can provide valuable insights into the psychological and social mechanisms. Such understanding is essential for developing preventive strategies, promoting responsible digital behaviour and supporting adolescents in achieving balanced technological use alongside healthy social development.

Review of Related Literature of the Stud

International Studies: Lee *et al*., (2024) conducted a study on Reciprocal longitudinal effects among Korean young adolescents' negative peer relationships, social withdrawal and smartphone dependence. The researchers used a longitudinal panel method for the study. They collected data between 2018 and 2020 and the sample of the study was 2230 adolescents from the Republic of Korea. Results found no reciprocal longitudinal relationships among Korean young adolescents; smartphone dependence and social withdrawal do not directly influence each other.

Karabey *et al*., (2023) Conducted a study on how smartphone addiction affects the lives of adolescents socially and academically: A systematic review study. This was a systematic review-based study conducted in China. The study found 'family problems' as a negative factor for smartphone addiction and the number of females was higher than that of males in terms of smartphone use. The impact of smartphone addiction found- sleep disturbance, lower academic performance and depression among adolescents.

Tabish, (2025) conducted a study on the topic "From Evolution to Obsession: Understanding Digital Addiction Among Youth in the Modern Age". The researcher conducted a comprehensive overview of various studies using narrative review methodology. The study aimed to explore digital addiction mechanisms and the consequences of digital addiction among adolescents and young adults. The study revealed that adolescents and young adults are easily influenced by features on digital platforms such as rewards, continuous scrolling, and social validation which increase compulsive engagement among them. The negative impacts of this include sleep disturbance, poor academic performance, and recreational conflicts. Digital addiction is linked to stress, anxiety and depression due to poor sleep cycles and cyberbullying.

Parent *et al*., (2022) conducted a study entitled "Should We Be Worried about Smartphone Addiction? An Examination of Canadian Adolescents' Feelings of Social Disconnection in the Time of COVID-19". The investigator focused on exploring the influence of smartphone addiction on mental health and social disconnection in the COVID-19 pandemic situation. The researcher took 1753 adolescents as the sample of the study and collected data between the year 2020 and May 2021. The researcher found a significant positive relationship between depression and social disconnection during COVID-19. Again, no direct relationship was found between smartphone addiction and social disconnection. Savci & Aysan, (2017) conducted a study on "Technological addictions and social connectedness: predictor effect of internet addiction, social media addiction, digital game addiction and smartphone addiction on social connectedness". The objective of the study was to find the relationship between social connectedness and technological addictions, including Internet addiction, social media addiction, digital game addiction and smartphone addiction. The result indicated that a high level of addiction leads to lower levels of social connectedness. Olaya-Cotera *et al*, (2025) conducted a study on Technological Addiction: Exploring the Risks of Excessive Use of Mobile Devices and Social Networks in Adolescents: A Systematic Review. This review paper found that adolescents prefer mobile devices and social networks to established interpersonal relationships. This intrinsically leads to an emotional dependence. Salepaki *et al*. (2025) conducted a study to explore the impact of excessive mobile phone use on young individuals aged 14–35 in Kastoria, Greece. The study mainly aimed to find out how smartphone addiction influences daily life and social interactions. It was a survey study among 150 respondents, and data were collected between May and August 2019. The study found that most of the individuals use mobile phones for social media and communication purposes. The findings revealed symptoms of smartphone addiction- reduced productivity and disrupted sleep among students and unemployed individuals.
Al-Abyadh *et al*. (2024) conducted a study to investigate how smartphone addiction and self-regulation failure influence students' academic life satisfaction. He considered the impacts of students' mind wandering and cognitive failures. The researcher used WarpPLS-SEM software to analyze the research data. The data was retrieved from a sample of 950 undergraduate students from universities in Egypt and the Kingdom of Saudi Arabia (KSA). The findings revealed that students' smartphone addiction and self-regulation failures negatively affect students' academic life satisfaction and positively affect students' mind wandering, cognitive failures and self-regulation.

Bullard (2023) conducted a study on Smartphone Addiction, Enhanced Learning Difficulties, and the future of Education: A Phenomenological Study of Secondary Christian School Students. Researcher selected 31 participants using a purposive sampling technique. Results found various negative impacts on distraction levels during academic and social tasks, anxiety and depression among the student body, negative changes in overall mood and daily behaviour, deterioration in the face-to-face relationships with peers and authority, moral frameworks and decision-making spiritual lives and religious engagement.

National Studies

Goswami & Deshmukh, (2023) Conducted a Correlation Study on Smartphone Addiction and Social Competence among Adolescents. The researchers took 363 adolescents as the sample of the study. The study revealed a significant positive relationship between smartphone addiction and social competence. The smartphone addiction was found higher in rural areas than in urban areas among adolescents.

Mohta and Halder (2021) conducted a comparative study on cognitive, emotional, and social functioning in adolescents with and without smartphone addiction. 100 adolescents between the ages of 12 and 17 years were taken as the sample of the study, and two groups were formed with 50 participants in each group. The result of the study found the smartphone addicted group had a high number of visual attention but lower in sustained attention; found fewer errors and faster processing speed in verbal working memory; use of phone to avoid negative emotions and lower social desirability. Again, the group without smartphone addiction had high levels of

sustained attention, found errors in verbal working memory, better emotion regulation and social adjustment.

Jain (2025) Studies on the Impact of Smartphone Addiction on Social Skills and Play Behaviour Among Children. The result showed that overuse of smartphones among children reduces physical play and social interaction and this leads to the problem of isolation (in children 3-5 years) and reduced communication and empathy (8-10 years). This study also highlights the role of parents to prioritize the outdoor physical activities and digital literacy to reduce smartphone addiction.

Joji and Nishan (2025) conducted a study on Digital Dependency and Changing Social Relationships among College Students in Kerala: A Sociological Study. 45 college students from three colleges in Kerala were used as the sample of the study. The study found that major students were emotionally connected to their phones and felt incomplete when the phone is not around. Though facetoface interactions were valued students prefer to interact with peers using socialmedia platforms like WhatsApp, Instagram, Snapchat and Telegram. Students prefer digital group chats for social connections with their class group, friend circle and prefer social media to maintain their identity in society. Emotional fatigue, self-doubt, anxiety and reduced self-esteem were found among students due to overuse of social media.

Tabish (2025) conducted a study entitled "Digital Addiction: The Emerging Epidemic of the Modern Age". This article explores the trajectory of digital engagementfrom a beneficial evolutionary adaptation to a burgeoning obsession that threatens mental and social well-being. The study found that digital addiction significantly influences teenagers and young adults. The common symptoms of digital addiction are reduced attention span, sleep disturbances, social withdrawal and anxiety. Again, the normalization of digital interaction creates problems, such as delaying public and institutional responses.

Chowdhury (2024) Explored a Design Space of Digital Interventions for Early Adolescents' Disengagement from Technology Overuse. The researcher conducted his study on early adolescents aged between 11 and 14 years and used the co-design method of study. The study revealed that adolescents prefer interventions that balance autonomy with parental involvement, incorporate positive reinforcement and consider their emotions. Parents prefer active engagement and parental mentorship but also recognise the need for autonomy for early adolescents.

Study In North-East

Chakraborty *et al*. (2024) conducted a study titled Prevalence and Underlying Factors of Smartphone Addiction Among School Children in Selected Schools of Guwahati, Assam. The researcher conducted a descriptive study. The findings revealed that, among school children, the overall frequency and percentage distribution of prevalence of no smartphone addiction was 44.7%(170), and having smartphone addiction was 55.3% (210). Phukan *et al*., (2022) Explored smartphone addiction and associated risk factors among undergraduate medical students in a medical college in Assam: a cross-sectional study. The researcher conducted the study on 304 medical students and a cross-sectional method was used in the study. Nearly half of medical students (44.07%) exhibit smartphone addiction, with social media and video consumption identified as the primary drivers of use. The risk of addiction escalates dramatically with increased screen time and frequency, peaking at over 10 times the likelihood for those checking their phones more than 50 times daily.

Bhattacharjee *et al*. (2025) conducted a study entitled "Smartphone Addiction and Its Impact on Mental Health among Graduate Students: Evidence from South Assam, India". The study aimed to find out the relationship between smartphone addiction and mental health among graduate students in South Assam. The researcher collected primary data from premier colleges of South Assam. The researcher applied Chi-square and logistic regression to analyse the data and the relationship between variables. The results revealed a significant relationship between smartphone addiction and mental health, and regression analysis found the relationship between these two to be negative. It suggests that a lower addiction level is associated with better mental health.

DISCUSSION OF FINDINGS

The above review of literature highlights the major relationship among smartphone addiction, social disengagement and other psychological factors. The findings are discussed below:

Social Connectedness and Interpersonal Skills: Savci & Aysan (2017) and Olaya-Cotera *et al*. (2025) found high smartphone addiction levels linked to lower social connectedness. Adolescents often preferring digital networks over face-to-face relationships. Again, in national studies, Jain (2025) found reduced empathy and communication skills in children. Joji and Nishan (2025) found that although students value facetoface interaction, they still prefer digital platforms (WhatsApp, Instagram) for maintaining their social identity. Contrarily, Lee *et al*. (2024) and Parent *et al*. (2022) found no direct relationship between smartphone addiction and social disconnection during the COVID-19 pandemic, suggesting that other variables (like COVID-19) might influence this relationship. Goswami & Deshmukh (2023) also found a positive relationship between smartphone addiction and social competence; they also found phone is a tool for social mastery rather than a barrier for the participants.

Psychological and Physical Consequences: There is a strong consensus regarding the negative physical and mental health outcomes of excessive use of smartphones. Karabey *et al*. (2023), Tabish (2025) and Salepaki *et al*. (2025) all identified sleep disturbances and poor academic performance as universal symptoms of smartphone addiction. Bhattacharjee *et al*. (2025) established a significant negative relationship between smartphone addiction and mental health in South Assam. Furthermore, Tabish (2025) and Joji & Nishan (2025) highlighted digital dependency to anxiety, depression, and emotional fatigue.

Cognitive Functioning and Behavioural Patterns: Mohta and Halder (2021) found that smartphone addicted adolescents showed faster processing speeds and better visual attention than the non-addicted individuals, but they suffered from significantly lower sustained attention and poorer emotion regulation compared to non-addicted peers. This signifies that "digital brains" may struggle with deep, focused tasks.

Demographic and Regional Prevalence

The studies highlight specific vulnerabilities based on geography and gender:

- In North-East India,studies showed higher smartphone addiction rates. Chakraborty *et al*. (2024) found a 55.3% prevalence in Guwahati schools, while Phukan *et al*. (2022) found that 44.07% of medical students in Assam suffer from digital addiction and are primarily driven by excessive social media use.
- Karabey *et al*. (2023) noted higher use of smartphones among females, while Goswami & Deshmukh (2023) found that addiction levels were surprisingly higher in rural adolescents as compared to urban ones.

Academic Life Satisfaction

- Al-Abyadh *et al*. (2024) provided empirical evidence through their study across Egypt and Saudi Arabia; smartphone addiction and self-regulation failure directly influence mind wandering and cognitive failures. This significantly impacts a student's overall academic life satisfaction.
- This aligns with Mohta and Halder's (2021) study regarding decreased sustained attention, creating a clear link between addiction and a reduced ability to remain mentally present in academic settings.

Holistic and Behavioural Impact on Education

Bullard (2023) in this study identified that addiction leads to a deterioration in moral frameworks and decision-making. This behavioural shift is reflected in the findings of Joji and Nishan (2025) regarding emotional fatigue and Salepaki *et al*. (2025) regarding reduced productivity. The studies revealed that smartphone overuse creates a "digital barrier". It prevents students from engaging with traditional social and moral structures.

Objectives of the Study

Following are the objectives of this study:

- To understand the Relationship between Smartphone Addiction and Social Withdrawal.
- To understand the Psychological and Social Consequences of Smartphone Addiction.
- To understand the Factors Contributing to Smartphone Addiction among Adolescents.
- To understand the Preventive and Remedial Measures of Smartphone addiction.

Methodology of the Study: The methodology of the present study is a systematic review of related literature. The purpose of the literature review is to synthesise the findings of existing studies and understand the relationship between smartphone addiction and social disengagement. The platforms used to locate previous studies were Google Scholar, JSTOR, Research Gate, and Sage Pub. The selected studies range from 2016 to 2026.This study maintains its ethical standards through properly citing and referencing all secondary sources.

Understanding Problematic Smartphone Use: With technological advancements, smartphones and other electronic gadgets are permanent companions in our everyday lives. Bayer, Dal Cin, Campbell, & Panek (2016) are of the view that "the resulting constant connectivity often ends up in the dependent and unconscious immersion with the smartphone, both in public and in private spaces, in work contexts and in the intimate sphere, making the smartphone the major vehicle for news and social media use". In this context, an emerging trend of individuals' disconnection from smartphones, popularly called digital detoxing, can be witnessed (Sutton, 2017).

Although some studies have taken into account the role of self-regulation in the context of smartphone use (e.g., Schnauber-Stockmann, Meier, & Reinecke, 2018) but most research to date focused on the compulsive dimension of smartphone use, characterized by a lack of control (e.g., Bayer *et al*., 2016). This dimension partially refers to concepts such as compulsive mobile phone use (Lee, Chang, Lin, & Cheng, 2014), excessive mobile phone use (Knop, Hefner, Schmitt, & Vorderer, 2015), or mobile phone addiction (Kwon *et al*., 2013). These excessive forms of use are typically defined as "high cognitive and behavioral salience of the mobile phone that can conflict with other important activities" (Hefner, Knop, Schmitt, & Vorderer, 2019, p. 82) and have been found to increase negative outcomes such as stress among smartphone users (Lee *et al*., 2014; Thomée, Härenstam, & Hagberg, 2011). As of 2024, there are over 6.8 billion smartphone users in the world and within that population, 6.3% have a phone addiction. Research published by Virgin Mobile discovered that those billions of smartphone users receive 427% more messages and notifications than they did a decade ago. They also send 278% more texts. The rise in phone use seems like a natural necessity for modern life; however, it can also cause concern and negative consequences. The heavy use of these devices has consumers questioning their cellular habits. According to Google Trends, since 2004, searches for "cell phone addiction" have been rising.

Social Disengagement as a Psychosocial Phenomenon: Social withdrawal is a new characteristic that is visible among adolescents nowadays. Because of social withdrawal, adolescents often avoid friends, family and even when these connections are wanted. Over time, this pulling away can lead to isolation, loneliness, and worsening mental health. Social withdrawal is not a personal failing, but it is often a response to stress, trauma or an underlying mental health condition like depression or anxiety. The issue of unaddressed social withdrawal can quietly chip away at relationships and the well-being of adolescents.

Fortunately, several treatment options can help parents, teachers and policymakers understand withdrawal, address the root causes of isolation and find healthier ways to connect. Social withdrawal might happen during stressful times or periods of transition, but when the avoidance lasts for weeks or months, it can result in worsening mental health issues. In fact, research shows that long periods of withdrawal can be associated with an increase in depression and thoughts of suicide. Recognizing these patterns early is key to offering support and beginning treatment.

Symptoms of Social Withdrawal in Adults: Social withdrawal can show up in many ways, and the signs often build on one another. The following are some symptoms you

might want to look out for if you think you're socially isolating:

- **Emotional symptoms:**These symptoms includeconstant loneliness, sadness, numbness, or loss of motivation to connect.
- **Behavioural symptoms:**These symptoms include avoiding phone calls, declining invitations, skipping work or social obligationsor losing interest in hobbies and activities.
- **Cognitive symptoms**: These symptoms include negative self-talk, believing oneself to be a burden, feeling unworthy of relationships or assuming this disconnection is permanent.
- **Physical symptoms:**These symptoms include disrupted sleep, appetite changes or frequent health complaints.

When these symptoms continue over time, they often reinforce one another making it harder for one to break the cycle of withdrawal and isolation. Therefore, seeking timely support can make a big difference to recovery outcomes.

Causes of Isolation and Social Withdrawal: There is no one single cause for social withdrawal and isolation; it's often caused by a combination of mental health challenges, medical issues, and life experiences. Some of the common causes of social withdrawal in adults include:

•**Depression and Social Withdrawal:** Depression is one of the most common causes of our social withdrawal. In fact, studies show that around 60% of people diagnosed with major depressive disorder experience social withdrawal.The reason behind this might be that depression drains energy, creates feelings of hopelessness and can make onceenjoyable activities feel meaningless. Therefore, many adults who struggle with depression might find it easier to retreat rather than face daily demands or social interaction.

•**Anxiety and Avoidance:** Anxiety can make social settings feel overwhelming, leading to patterns of avoidance. Those who are dealing with anxiety, especially social anxiety or specific phobias, might fear judgment, embarrassment or conflict. As a result, people may withdraw to cope with the discomfort even when they might be craving connection. However, over time, this can perpetuate the cycle of anxiety, leading to more isolation and feelings of distress.

•**Stress-Related Withdrawal:** Prolonged stress, whether it's related to work, caregiving or personal struggles, can push us to withdraw from those around us. By shutting down socially, we might be unconsciously trying to conserve our energy or protect ourselves from additional pressure.

•**Loneliness in Adults:** Ironically, withdrawal can often lead to deeper loneliness, which can then further reinforce isolation. When we already feel misunderstood, disconnected, or unsupported, we may stop reaching out altogether, believing we're a burden to others. So, without opportunities to challenge such beliefs, we may inadvertently reinforce them.

•**Medical or Neurological Conditions:** If you struggle with chronic illnesses, pain, or neurocognitive decline, like Alzheimer's Disease, you might be more likely to limit social interaction. This could be because you aren't able to get out and engage socially, or it may be a way to protect yourself both emotionally and physically. Over time, these physical barriers may blend with emotional distress, creating an even stronger pull toward isolation.

•**Trauma and Life Events:** Experiences such as grief, abuse, or sudden loss can trigger withdrawal. For many, pulling away feels like a form of self-protection, even if it ultimately increases feelings of isolation. For instance, in cases of PTSD, people may avoid people who inadvertently trigger memories of past trauma. Smartphone overuse causes significant social disengagement, with over 78% of users accessing social media via mobile, leading to "phubbing" (ignoring others for phones), reduced face-to-face interaction, and increased loneliness. This dependency fosters anxiety, weakens real-life relationships, and disrupts daily life, particularly among youth.

Key Aspects of Social Disengagement Due to Smartphones

- Phubbing and Relationship Strain: Constant phone checking during face-to-face conversations, known as phubbing, damages relationships and decreases satisfaction in social interactions.
- Reduced Social Competence: Excessive virtual communication hinders the development of real-life social skills, leading to isolation and anxiety.
- The "Vicious Cycle": Individuals may turn to smartphones to escape negative emotions or social discomfort, which in turn causes further withdrawal from real-world interactions.
- Impact on Youth: Adolescents, in particular, face reduced participation in, and lower quality of, in-person social activities, causing, for example, poorer academic performance.
- Mental Health Consequences: The shift from physical to digital interaction is associated with higher rates of depression, anxiety, and loneliness.

Common Behaviour Leading to Disengagement

- Ignoring friends or family in social settings to check notifications.
- Using social media as a primary form of interaction.
- Using phones to avoid uncomfortable in-person social situations.

Psychosocial Consequences of Problematic Smartphone Use: The findings reported across contemporary literature consistently indicate that smartphone addiction has profound psychological and social consequences, particularly among adolescents and young adults. Excessive smartphone use is no longer perceived merely as a technological habit; rather, it has emerged as a behavioural concern that influences emotional regulation, cognitive functioning, and interpersonal adjustment. From a psychological perspective, smartphone addiction is strongly associated with increased levels of anxiety, stress, and depressive symptoms. Many studies suggest that adolescents develop a compulsive urge to remain constantly connected, resulting in restlessness and discomfort when access to smartphones is limited. This dependency reflects impaired self-regulation and heightened vulnerability to emotional instability. Moreover, excessive exposure to social media content often leads to negative self-comparisons, fear of missing out (FOMO), and feelings of inadequacy, which further contribute to low self-esteem and depressed mood. Sleep disturbances are another prominent psychological consequence, as late-night smartphone use disrupts circadian

rhythms, leading to fatigue, irritability, and reduced cognitive efficiency. Collectively, these psychological difficulties adversely affect attention, memory, and academic engagement. Socially, smartphone addiction significantly alters patterns of interpersonal interaction. Adolescents with high levels of smartphone dependence tend to prefer virtual communication over face-to-face interactions, which gradually weakens real-life social bonds. This behavioural shift often results in social withdrawal, characterized by reduced participation in family interactions, peer activities, and community involvement. As a consequence, communication skills such as effective listening, emotional expression, and non-verbal communication may remain underdeveloped. Several studies also indicate that excessive smartphone use is linked with feelings of loneliness and social isolation, despite increased online connectivity. This paradox highlights that digital connectedness does not necessarily translate into meaningful social relationships.

Importantly, psychological and social consequences of smartphone addiction appear to be mutually reinforcing. Psychological distress may drive individuals to seek escape through smartphone use, while prolonged isolation and weakened relationships further intensify emotional problems. This cyclical relationship creates a self-perpetuating pattern that places adolescents at risk for long-term maladjustment. In the educational context, these consequences have serious implications. Psychological distress, reduced concentration, poor sleep, and social disengagement collectively undermine students' academic motivation and performance. Therefore, addressing smartphone addiction is not only a matter of technological regulation but also a crucial aspect of promoting students' mental health, social competence, and academic success. Overall, the literature emphasizes the need for preventive and intervention strategies focusing on digital awareness, self-regulation skills, parental guidance, and school-based programs that encourage balanced technology use and healthy social interaction. Such efforts are essential to minimize the psychological and social risks associated with smartphone addiction and to support holistic development among adolescents.

Phone addiction, sometimes colloquially known as "nomophobia" (fear of being without a mobile phone), is often fuelled by an internet overuse problem or internet addiction disorder. After all, it's rarely the phone or tablet itself that creates the compulsion, but rather the games, apps, and online worlds it connects us to.Smartphone addiction can encompass a variety of impulse-control problems, including:

- **Virtual relationships:** Addiction to social networking, dating apps, texting, and messaging can extend to the point where virtual, online friends become more important than real-life relationships. While the internet can be a great place to meet new people, reconnect with old friends, or even start romantic relationships, online relationships are not a healthy substitute for real-life interactions. Online friendships can be appealing as they tend to exist in a bubble, not subject to the same demands or stresses as messy, real-world relationships.
- **Information overload:** Compulsive web surfing, watching videos, playing games, or checking news feeds can lead to lower productivity at work or school and isolate individuals for hours at a time. Compulsive use of the internet and smartphone apps can cause anyone to neglect other aspects of their life.
- **Cybersex addiction:** Compulsive use of internet pornography, sexting, nude-swapping or adult messaging services can leave individuals more vulnerable to "sextortion" and impact negatively on their real-life intimate relationships. While online pornography and cybersex addictions are types of sexual addiction, the internet makes it more accessible, relatively anonymous, and very convenient. It's easy to spend hours engaging in fantasies impossible in real life. Excessive use of dating apps that facilitate casual sex can make it more difficult to develop long-term intimate relationships or damage an existing relationship.
- **Online compulsions:** Different sites,such as gaming, gambling, stock trading, online shopping, or bidding on auction sites like eBay, can often lead to financial stress and job-related problems. While gambling addiction has been a well-documented problem for years, the availability of internet gambling has made gambling far more accessible. Compulsive stock trading or online shopping can be just as financially and socially damaging. eBay addicts may wake up at strange hours in order to be online for the last remaining minutes of an auction.

Causes of phone and internet addiction

Heavy smartphone use can often be symptomatic of other underlying problems, such as stress, anxiety, depression, or loneliness. At the same time, it can also exacerbate these problems. If individuals use their smartphone as a "security blanket" to relieve feelings of anxiety, loneliness, or awkwardness in social situations, they will succeed only in cutting themself off further from people around you. Staring at the phone will deny the face-to-face interactions that can help to meaningfully connect individuals to others, alleviate anxiety and boost their mood.

Effects of phone addiction

Smartphone or internet addiction can also negatively impact your life by:

- **Increasing loneliness and depression:** While it may seem that losing yourself online will temporarily make feelings such as loneliness, depression, and boredom evaporate into thin air, it can actually make you feel even worse. A 2014 study found a correlation between high social media usage and depression and anxiety. Users, especially teens, tend to compare themselves unfavourably with their peers on social media, promoting feelings of loneliness and depression.
- **Fuelling anxiety:** One researcher found that the mere presence of a phone in a workplace tends to make people more anxious and perform poorly on given tasks. The heavier a person's phone use, the greater the anxiety they experience.
- **Increasing stress:** Using a smartphone for work often means work bleeds into your home and personal life. You feel the pressure to always be on, never out of touch from work. This need to continually check and respond to email can contribute to higher stress levels and even burnout.
- **Exacerbating attention deficit disorders:** The constant stream of messages and information from a mobile phone can overwhelm the brain and make it impossible to focus attention on any one thing for more than a few minutes without feeling compelled to move on to something else.

- **Diminishing ability to concentrate and think deeply or creatively:** The persistent buzz, ping or beep of your phone can distract you from important tasks, slow your work, and interrupt those quiet moments that are so crucial to creativity and problem solving. Instead of ever being alone with our thoughts, we're now always online and connected.
- **Disturbing your sleep:** Excessive smartphone use can disrupt your sleep, which can have a serious impact on your overall mental health. It can impact your memory, affect your ability to think clearly, and reduce your cognitive and learning skills.
- **Encouraging self-absorption:** A UK study found that people who spend a lot of time on social media are more likely to display negative personality traits such as narcissism. Snapping endless selfies, posting all your thoughts or details about your life can create an unhealthy self-centeredness, distancing you from real-life relationships and making it harder to cope with stress.

Preventive and Remedial Measures to Address Social Withdrawal and Problematic Smartphone Use

Role of Family

The role of the family in preventing problematic smartphone use

- Establish healthy digital boundaries at home by setting screen-time limits and tech-free hours (mealtimes, bedtime).
- Encourage open parent–child communication, allowing adolescents to share online experiences without fear of punishment.
- Promote offline family interactions such as shared meals, storytelling, outdoor activities, and cultural practices to strengthen emotional bonding.
- Act as positive role models by demonstrating balanced smartphone use.
- Identify early signs of social withdrawal, such as isolation, irritability, or loss of interest in family and peers.
- Gradually replace excessive screen time with engaging real-life activities rather than imposing abrupt restrictions.
- Provide emotional support and reassurance, especially for adolescents using smartphones as a coping mechanism for stress or loneliness.
- Seek professional guidance when excessive smartphone use is linked with anxiety, depression, or behavioural issues.

Role of School

- Integrate digital well-being and media literacy into the curriculum to promote responsible technology use.
- Create opportunities for collaborative learning, group discussions, debates, sports, and co-curricular activities that foster social interaction.
- Implement school policies on smartphone use during academic hours to minimize distraction and dependency.
- Encourage peer engagement programs such as clubs, group projects, and mentoring systems.
- Identify students showing signs of academic decline, isolation, or excessive gadget dependence.
- Provide structured social environments that help withdrawn students re-engage with peers.
- Refer students to school counsellors for targeted intervention when problematic smartphone use affects emotional or social functioning.
- Conduct awareness programs for parents and students on the psychological impact of excessive smartphone use.

Role of Teachers and Counsellors

- Promote metacognitive strategies such as planning, self-monitoring, and reflection to enhance self-regulation in students.
- Encourage active learning methods that require participation, interaction, and teamwork.
- Sensitize students about the difference between healthy and problematic smartphone use.
- Build supportive teacher–student relationships to create a sense of belonging.
- Use individual or group counselling sessions to address smartphone dependency and social withdrawal.
- Help students develop time management and self-control skills through goal setting and structured routines.
- Apply cognitive behavioural strategies to modify maladaptive smartphone use patterns.
- Guide students toward real-world social engagement, confidence building, and emotional expression.

Community and Policy-Level Measures

- Promote community-based programs encouraging sports, arts and cultural participation among adolescents.
- Support NEP 2020 initiatives emphasizing life skills, social–emotional learning and responsible technology use.
- Conduct digital wellness campaigns highlighting balanced and mindful smartphone usage.
- Provide access to mental health services at the community and school levels.
- Develop screening and early intervention programs for adolescents at risk of digital addiction and social disengagement.
- Encourage collaboration between schools, parents and mental health professionals.

CONCLUSION

The growing dependence on smartphones among adolescents has emerged as a significant psychosocial concern, particularly due to its strong association with social withdrawal and disengagement from reallife interactions. Evidence from existing literature consistently indicates that excessive smartphone use not only disrupts academic focus and emotional well-being but also weakens interpersonal relationships, peer bonding, and social participation. Adolescence, being a critical stage for social and identity development, is especially vulnerable to the adverse effects of uncontrolled digital engagement. The review highlights that smartphone addiction is closely linked with psychological outcomes such as anxiety, depression, loneliness and reduced self-regulation, which further contribute to social isolation. At the same time, the findings suggest that protective factors such as metacognitive awareness, time management skills, family support and positive school environments can play a crucial role in mitigating these risks.

In the context of the digital age and the vision of NEP 2020, there is an urgent need to promote balanced and responsible technology use through preventive education, early intervention and collaborative efforts involving families, schools, teachers, counsellors, and policymakers. Future research may focus on developing culturally relevant assessment tools and intervention models to foster healthy digital habits and social connectedness among adolescents. Overall, addressing smartphone addiction is essential not only for academic success but also for ensuring holistic social and emotional development.

REFERENCES

Lee, H.-S., Choi, M., & Na, E.-Y. (2024). Reciprocal longitudinal effects among Korean young adolescent' negative peer relationships, social withdrawal, and smartphone dependence. *Heliyon*, *10*. https://doi.org/10.1016/j.heliyon.2024.e25188

Karabey, S. C., Palancı, A., & Turan, Z. (2023). How does smartphone addiction affect the lives of adolescents socially and academically: a systematic review study. *Psychology Health & Medicine*, 1–24. https://doi.org/10.1080/13548506.2023.2229241

Tabish, S. (2025). From Evolution to Obsession: Understanding Digital Addiction Among Youth in the Modern Age. *American Journal of Health Research*, *13*(4), 248–258. https://doi.org/10.11648/j.ajhr.20251304.17

Parent, N., Xiao, B., Hein-Salvi, C. V., & Shapka, J. D. (2022). Should We Be Worried about Smartphone Addiction? An Examination of Canadian Adolescents' Feelings of Social Disconnection in the Time of COVID-19. *International Journal of Environmental Research and Public Health*, *19*(15), 9365. https://doi.org/10.3390/ijerph19159365

Savci, M., & Aysan, F. (2017). Technological addictions and social connectedness: predictor effect of internet addiction, social media addiction, digital game addiction and smartphone addiction on social connectedness. *Düşünen Adam: The Journal of Psychiatry and Neurological Sciences*, *30*(3), 202–216. https://doi.org/10.5350/DAJPN2017300304

Olaya-Cotera, S., Iparraguirre-Villanueva, O., & Flores-Castañeda, R. O. (2025). Technological Addiction Exploring the Risks of Excessive Use of Mobile Devices and Social Networks in Adolescents: A Systematic Review. *Academic Journal of Interdisciplinary Studies*, *14*(1), 206. https://doi.org/10.36941/ajis-2025-0014

Salepaki, A., Zerva, A., Kourkouridis, D., & Angelou, I. (2025). Unplugging youth: Mobile phone addiction, social impact, and the call for digital detox. *Psychiatry International*, 6(1), Article 4. https://doi.org/10.3390/psychiatryint6010004

Goswami, S., & Deshmukh, A. (2023). A correlation study on smartphone addiction and social competence among adolescents (p. 427). *Satraachee, 40*(28). https://www.researchgate.net/profile/Rachna-Saxena-2/publication/385582209_20240318011643Sat_40/links/672b40a5db208342deee607c/20240318011643Sat-40.pdf#page=428

Mohta, R., & Halder, S. (2021). *A comparative study on cognitive, emotional, and social functioning in adolescents with and without smartphone addiction.Journal of Indian Association for Child and Adolescent Mental Health*, 17(4), 44–65. https://doi.org/10.1177/0973134220210404

Jain, P. (2025). *The impact of smartphone addiction on social skills and play behaviour among children.International Journal of Innovations in Science, Engineering and Management*, 4(1), 1–7. https://doi.org/10. 69968/ijisem. 2025 v4i101-07

Joji, S. M., & Nishan, M. P. (2025). Digital dependency and changing social relationships among college students in Kerala: A sociological study. *International Journal of Research and Scientific Innovation*, *12*(10), 2203–2213. https://dx.doi.org/10.51244/IJRSI.2025.1210000196

Tabish, S. A. (2025). Digital addiction: The emerging epidemic of modern age. *Journal of Clinical Medicine & Health Care*, *2*(3), 1–9. https://doi.org/10.61440/JCMHC.2025.v2.34

Chowdhury, A. (2024). *Exploring a design space of digital interventions for early adolescents' disengagement from technology overuse* [Doctoral dissertation, University of Manitoba]. MSpace. https://mspace.lib.umanitoba.ca/server/api/core/bitstreams/1fcd5e27-5593-4a89-b923-192b0c311d57/content

Chakraborty, A., Gogoi, N., & Goswami, A. (2024). Prevalence and underlying factors of smart phone addiction among the school children in selected schools of Guwahati, Assam. *International Journal of Novel Research and Development*, *9*(5), c403–c410. https://www.ijnrd.org/viewpaperforall.php?paper=IJNRD2405246

Phukan, I., Chetia, A., & Mahanta, B. (2022). Smartphone addiction and associated risk factors amongst undergraduate medical students in a medical college of Assam: A cross-sectional study. *International Journal Of Community Medicine And Public Health*, *9*(5), 2085–2089. https://doi.org/10.18203/2394-6040.ijcmph20221027

Bhattacharjee, B., Bhattacharjee, B., & Choudhury, S. (2025). Smartphone addiction and its impact on mental health among graduate students: Evidence from South Assam, India. *Universal Journal of Public Health*, *13*(2), 388–406. https://doi.org/10.13189/ujph.2025.130211

Al-Abyadh, M. H. A., Alatawi, M. A., Emara, E. A. M., Almasoud, S. A., Alsetoohy, O., & Ali, A. R. M. (2024). Do smartphone addiction and self-regulation failures affect students' academic life satisfaction? The role of students' mind wandering and cognitive failures. *Psychology Research and Behavior Management*, *17*, 1231–1253 https://www.tandfonline.com/doi/full/10.2147/PRBM.S437076%4010.1080/tfocoll.2024.0.issue-Social-Media-Mental-Health?scroll=top&needAccess=true

Bullard, J. L. (2023). Smartphone addiction, enhanced learning difficulties, and the future of education: A phenomenological study of secondary Christian school students [Doctoral dissertation, Regent University]. *Pro Quest Dissertations and Theses Global*. https:// www. proquest. com/openview/5b3 4ad51c21ec6 5deac 4b9ac c253e b 40/1?pq-origsite=gscholar&cbl=18750&diss=y

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