Research Article

A Cross-Sectional Research Study on Effects of Pre -Sleep Screen Time On Mood and Emotional Well Being

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Abstract

The digital age has fundamentally altered how individuals access information, communicate, and navigate their daily routines. Driven by rapid technological advancements, modern smartphones have transitioned from simple communication tools into multifaceted devices embedded in every household globally. While these advancements offer unprecedented convenience and immediate satisfaction, they present stark challenges to modern human functioning, particularly regarding psychological and emotional well-being. Emerging psychological research highlights a growing reliance on electronic screens immediately prior to sleep—a behavior known as pre-sleep screen time.

THIS ARTICLE EXPLORES THE BIGGEST ISSUE OF THE ERA: Over 90% of people use their smartphones right before bed. The blue light from screens blocks the sleep hormone melatonin, while stimulating content keeps the brain awake. This causes a bad cycle where poor sleep leads to daytime fatigue, causing people to rely even more on their phones at night to relax. The Study: This Article looked at 100 people across three age groups to see how this impacts their daily emotions and mood The Results: While most people generally felt positive, their emotional stability varied heavily by age: Ages 14–20: Had the most mood swings, showing frequent nervousness and anxiety from social and school pressures. Ages 21–30: Showed the most balanced emotions, with steady happiness and energy. Ages 30+: Were the most stable, reporting the highest levels of calmness and contentment.

Method: Participants completed the survey packets containing demographic questions Included In Brief Mood Introspection Scale (Mayer, J. D., & Gaschke, Y. N. 1988) Data analysis involved descriptive profiling and categorical cross-tabulation to evaluate variations in emotional intensity, overall well-being, and mood stability across the three designated age brackets This cross-sectional study investigates the intersection of pre-sleep screen time, physiological sleep disruptions, and subsequent mood variations . Three age groups were used to group the participants: 14–20 years old, 21–30 years old and over 30 years old. Out of all the participants, 44 were between the ages of 14 and 20, 43 were between the ages of 21 and 30, and 17 were older than 30.

Results: The analysis of the responses showed the majority of participants reported positive emotional experiences more frequently than negative. For emotions such as happiness, liveliness, caring, loving, contentment, and activeness, most people selected the responses —slightly feel‖ and —definitely feel. This indicates that a huge number of people generally experience positive emotional wellbeing And Pleasant Mood After Pre Sleep Screen Time. The analysis reveals that while positive emotional experiences remain dominant overall, younger cohorts exhibit significantly higher emotional fluctuations, nervousness, and mood variability. These findings underscore the profound impact of age and life stage on emotional stability when interacting with pervasive digital environments. The overall average emotional wellbeing indicates that emotional health varies with age and life stage. Age appears to influence emotional stability, stress levels, and overall mood patterns.

Keywords: Screen Time, Sleep Quality, Emotional Well Being, Mobile Phone Use Before Bed.

Introduction

O The Information Age, also known as the Digital Age, is a period characterized by the rapid expansion of information technology and the Internet, fundamentally changing how individuals' access and share information. This era began with the creation of the World Wide Web. Biscontini, T. (2025). In the 21st century, the younger generation has embraced technology and the digital world as an integral part of their lives.

Smartphones, social media, and the internet have transformed how they think, learn, and live. However, these conveniences come with significant challenges, particularly in the realm of mental health. (Rishabh, 2024)

The functions and design of phones have evolved significantly from standard handsets to smart phones, tablets, smart watches, and more as a result of technological advancements. All of the aforementioned forms of communication were initially replaced by it. In addition to enabling phone calls and message sharing, modern mobile phones incorporate cameras, calculators, alarms, notebook capabilities, email management, and internet access.

Everyone has access to it, regardless of location, age, or socioeconomic status. The multifaceted capabilities of mobile phones have led to a growth in human reliance on them, and using them has become essential in the current digital era. (Nordesjö et al., 2022)

In India, where more than 65% of the population is under 35, youth engagement with digital media is quickly growing. The twenty-first century has seen an extraordinary digital shift that has changed how young people connect, learn, and view themselves. (Dr. Surendra Pal Singh, 2024)

This increased technology access and its subsequent use, has been adopted more easily by younger populations than by older adults. The incorporation of technology into education is one theory as to why young people are using it more. Students' screen time has increased as a result of universities' decision to shift to internet-focused work over the past ten years, especially in the post-pandemic era. Many have adopted a hybrid or blended approach to education, and some offer totally online courses. In the end, internet and device usage habits have been significantly impacted by the widespread integration of technology into personal and educational realms, especially among university students who primarily rely on digital tools for learning and communication. (Veals, 2024).and this algorithmically engineered digital environments increasingly influencing young people's capabilities and functioning's (Thiagarajan et al., 2025).

According to Statista in 2022, about 83.72% of the world's population, over 6 billion people, will use a smartphone, with young people being the most common users. Once considered a luxury, smartphones today are an essential device in every household in all countries of the world.

Smartphone Immersion

Smartphone Immersion refers to the deep or excessive engagement with smartphones and their digital applications. It can lead to potential negative outcomes such as psychological effects like reduced awareness of the surrounding environment, decreased concentration due to constant notifications and distractions, and physical health problems caused by prolonged screen use and sedentary behavior. When smartphone use becomes excessive and replaces real-world interactions and activities, it may affect both individual well-being and social functioning.

Smartphone immersion combines the term smartphone, referring to a handheld digital device used for communication and internet-based activities, with immersion, derived from the Latin *immersio*, meaning to be deeply involved or absorbed. The concept reflects a state in which individuals become highly engaged with their smartphones. When this involvement becomes excessive, it may lead to potential risks affecting attention, real-world interaction, and overall well-being. (Sustainability Directory, n.d.) During 2016 there were 3.67 billion smartphone owners worldwide. The public now has nearly 90% access to smartphones after their number rose from 3.67 billion in 2016 to 7.2 billion users by 2025.

According to Statista, by 2024, the global number of smartphone users is set to reach an astounding 6.93 billion, equating to 85.74% of the world's population. This figure is expected to soar beyond 7.7 billion by 2028 (Wang et al., 2025a)

(Ratan et al., 2022a) indicates that smartphone addiction is more common among young individuals (aged ≤25). Young people's frequent usage of smartphones for social media could be one factor contributing to this. Another likely explanation is that young folks who grew up in the internet age may favor online contact over in-person interactions.

(Ratan et al., 2022b) Also indicates that —overuse, —problematic use and —excessive use‖ have been used alternatively to narrate SA According to Ching, Yee SA is —mainly characterised by excessive or poorly controlled preoccupations, usage or behavior regarding smartphone use; to the extent that individuals neglect other areas of life. According to Alhazmi, Alzahrani —the excessive use of smartphones to a level where it interferes with the daily lives of users is considered to be smartphone addiction.

Following the COVID-19 outbreak, smartphone usage among quarantined college students surged significantly, leading to a growing dependency on their devices and adversely impacting their emotional well-being. Consequently, the negative emotions associated with smartphone addiction have emerged as critical factors influencing students' life

Addiction to smartphones is also significantly influenced by sociodemographic factors including age and gender Notably, the use of smartphones and the propensity for addiction varied significantly between men and women

are more likely to use smartphones for communication and social contact, whereas men are more likely to use them for social media and gaming. Different consumption intentions could result in different addiction risks. Accordingly, women may be more prone to smartphone addiction due to social anxiety, whereas men are more likely to develop an addiction as a result of absorption in the virtual world. (Zhu et al., 2025)
Everyone devotes a large part of their daily schedule to screen viewing habits. Everyone uses their smartphone for 6 to 7 hours each day. (Suddala, 2025) FOUND the amount of time people spend on their smartphones changes according to who they are and where they live.

Breakdown of Daily Smartphone Usage by Age

- Gen Z (18-24 years): 9+ hours per day
- Millennial (25-40 years): 6-7 hours per day
- Gen X (41-56 years): 4-5 hours per day
- Baby Boomers (57+ years): 2-3 hours per day

PRE-SLEEP SCREEN TIME

Definition of Pre Sleep Screen Time

Screen time is the amount of time spent using an electronic device with a display screen such as a smartphone, computer, television, video game console, or tablet. The concept is under significant research with related concepts in digital media use and mental health. Screen time is correlated with mental and physical harm in child development. The cathode ray tube (CRT), created in 1922, was the first electronic screen. Prior to the advent of liquid crystal displays (LCDs) in the early 2000s, CRTs were the most widely used option for display screens. These days, screens are a crucial component of information technologies, entertainment, and advertising.
Pre-sleep screen time is defined as the use of electronic devices with screens (smartphones, tablets, TVs, laptops) within 30 to 60 minutes immediately before bed (Wikipedia contributors, n.d.)

Patterns of Smartphone Use before bed

(Sharma et al., 2025) found 92.05% used their phones at bedtime, with 35.29% using it between 16 and 30 min and 43.94% using it for browsing social media. More than 90% of people use their smartphones right before bed, and their usage habits frequently involve social media browsing, chatting, and streaming for at least 15 to 60 minutes before bed, which causes sleep to be postponed, shorter, and of lower quality. While interesting information stimulates the brain and increases sleep latency and daytime tiredness, blue light from screens interferes with the generation of melatonin. (Kiss et al., 2025)

Gender Differences

Women are more likely to use smartphones for social contact and digital shopping, while men show higher rates of nighttime usage and higher overall smartphone addiction scores. Daily cumulative mobile phone use and use with the lights off before sleep are associated with poorer sleep quality. (Meng et al., 2021)
(Wang et al., 2025b) showed that different demographics used smartphones in different ways. Through apps like Facebook and YouTube, participants mostly utilized cell phones for social interaction (average daily usage time = 1.52 hours) and recreational activities (average daily usage duration = 1.08 hours). Regular users frequently used their phones more at night, particularly for social media and entertainment. Male participants used their phones more at night, whereas female participants used them more regularly, mostly for social interactions and online shopping.
Lower use was associated with higher education After work, people who used smartphones for job-related purposes typically used them less. Smartphone usage was higher among women, young people, persons with less education, and unemployed people.

Why and what people do on smartphone before bedtime

Young adults are particularly vulnerable to sleep disturbances related to their cell phone use (CPU) but the question is why? And how?
Our devices' increased accessibility and engagement hold the key to the solution. We have instant satisfaction thanks to social media, chat applications, games, and films at our fingertips. Many people use their phones as a method to decompress after a demanding day, offering a brief diversion before going to sleep. Furthermore, smartphones are now essential to our ability to stay in touch. It can be challenging to resist the pull of notifications—emails, texts, and social media alerts—even as we get ready for bed. Even when our bodies are ready to relax, these gadgets' never-ending supply of entertainment keeps our minds active. Mbamara, A. (2024).

Mbamara, A. (2024) further explains that a cycle of reliance can also be produced by using phones in drowsy mode. We are more prone to rely on our phones as a means of relaxation the more we use them before bed. Sadly, there is a chance that this behavior will backfire. We feel more exhausted throughout the day and use our phones even more at night to relax when our sleep quality is negatively impacted by phone use. Breaking this loop might be challenging. While many individuals think that using a phone for a short while may help them fall asleep more quickly, this is frequently not the case. It becomes more difficult to fall asleep due to the stimulation of using a phone, and eventually, Smartphone addiction is increasing, according to several studies: 66% of people worldwide acknowledge that they "can't live without their smartphones." The average person checks their phone once every ten minutes, or 96 times a day! 46% of people use their smartphones for more than five hours every day. Within ten minutes of waking up, 71% of individuals check their phones. Even a new psychological disorder known as Nomophobia (No-Mobile-Phone Phobia) has emerged as a result of smartphone addiction. This phrase refers to the uneasiness people feel when they are not using their phones. (Zarhin, 2024) suggests that smartphones can be addictive and their use is linked to FOMO (fear of missing out), indicating that they draw people to use them even when they do not intend to do so when their phone battery falls below 20%, 53% of individuals experience anxiety. Even in the absence of notifications, 60% of users check their phones at least once every hour. Forty percent of Americans would rather lose their wallet than their smartphone. (Zarhin, 2024) explores this question by drawing on data from sleep diaries and in-depth interviews with 66 Israelis

Agentic Capabilities

The Ability to Take Action sleep is traditionally thought of as a passive condition in which we "shut down." According to this theory, people have agency—the ability to take action—even when they are in bed thanks to their phones.

You're not just lying there; you're actively making the decision to preserve your privacy (setting the phone on "Do Not Disturb") or deepen your relationship (texting a lover "goodnight").

Blue Light Exposure and Sleep Disruption

One color in the visible light spectrum that is visible to the human eye is blue light, commonly referred to as high-energy visible (HEV) light. These visible and invisible light wavelengths are measured in nanometers (nm), and generally speaking, the shorter the wavelength, the higher the energy. Because blue light has a short wavelength, it generates more energy.

Because blue light is more difficult for the eyes to filter than other types of light, more of it can reach the retina. For our eyes and general health, blue light has both advantages and disadvantages.

Blue light is almost always present in our environment. Sunlight is the main source of blue light, although other sources include TVs, laptops, computer monitors, cellphones, tablets, and fluorescent and CFL bulbs. Because of the close proximity of the screens, the amount of time we spend using them, and the cumulative effects of daily use, our exposure to blue light from digital devices is especially concerning.

Over the past 20 years, screen usage has increased and is currently surpassing 13 hours daily.1 The visual Council reports that prolonged use of digital gadgets causes eye strain and visual issues for many people. (Eyesafe, n.d.) Most people agreed that blue light from electronic media had a detrimental effect on the quality of sleep. This, however, does not accurately reflect the entirety of the blue light study that has been done. In fact, numerous studies report that blue light exposure did not only have negative, but also positive effects. For example, blue light exposure has been shown to stimulate cognitive brain activity and be an effective treatment for significant depressive symptoms (Strong et al., 2009).

(Silvani et al., 2022) discovered that the non-blue light condition had better sleep quality than the blue light condition, supporting the idea that blue light can lower sleep quality. There is more proof that exposure to blue light can reduce sleep efficacy because two studies found that sleep efficacy was higher in the non-blue light condition than in the blue light condition.

In one study, sleep latency was shown to be lower in the non-blue light condition than in the blue light condition. (Ishizawa et al., 2021) FOUND Short-wavelength radiation, such as blue light, weakens and decreases the production of melatonin in the evening discovered that increased exposure to blue light at night has been shown to negatively impact sleep and the circadian rhythm cycle.

NEGATIVE EFFECTS OF EXCESSIVE SMARTPHONE USE BEFORE SLEEP

High Exposure to Radiations

As mobile communication has advanced from 1G to 5G, more radiation frequencies are being employed. The usual frequency range for mobile phones is 900 MHz to 2.5 GHz. Over 80 crore people use mobile phones in

India, and there are roughly 4.5 lakh mobile towers to facilitate connection. The health and well-being of people who live within ten meters of a mobile tower may be adversely affected by signals that are 10,000–100,000 times stronger than those needed for transmission. DNA damage has been linked to electromagnetic radiation. In brain cells, single and double-stranded DNA may break and raise the risk of apoptosis. Electromagnetic radiation exposure can cause long-term chromosomal damage and gene mutations in human blood leukocytes and lymphocytes. Additionally, this could cause dangerous free radicals to be released, which could result in immunity loss, damage to the blood-brain barrier, altered metabolism, compromised brain function, and an increased risk of cardiovascular disease. (Tyagi et al., 2021)

Sleep Disturbances

Sleep is a homeostatically controlled physiological condition of unconsciousness. Citation 1 We sleep for nearly one-third of our lives. Citation 2 Sleep is critical for both physical and cognitive processes, the elimination of cellular toxins, the prevention of disease, and the recovery of the body and mind. Citations 3–5 Over the past 20 to 30 years, there has been a significant decrease in sleep hours and a clear association with obesity, diabetes, and other chronic debilitating disorders.

A higher Sleep disturbance is a commonly reported symptom among persons who perceive themselves as sensitive to low-level electromagnetic field exposure. Use of mobile phone was significantly associated with a poor sleep quality. (Röösli et al., 2004)

Media content might also have an impact on sleep. The media contains a lot of sexual and violent content. Children who are exposed to such content may experience stress, anxiety, and arousal Poor sleep quality or trouble falling asleep may be linked to the increased excitement and stimulation brought on by this exposure. (Exelmans & Van Den Bulck, 2016). revealed poor sleep quality is positively correlated with using a mobile device for at least 30 minutes before bed after turning off the lights, keeping the device close to the pillow, and utilizing the screen for at least 8 hours each day. Additionally, I found that Mobile Related Sleep Risk Factor was very common among mobile users.

The blue light that mobile phone screens emit is one of the main factors that can cause Poor Sleep Quality. Melatonin, the hormone that regulates the circadian rhythm or sleep/wake cycle, may be produced less frequently as a result of this blue light. It is more difficult to fall and keep asleep when melatonin levels are lower. According to certain research, blue light exposure improves brain attentiveness. PSQ may result from the stimulation of cognitive processes. (Rafique et al., 2020).

Emotional And Psychological Effects

Young adults have a high prevalence of potential cell phone addiction. • Negative emotions (NE) are positively correlated with mobile phone addiction. • The effects of cell phone addiction level on NE are mediated by interpersonal issues.

Living conditions and gender may also play a role in the emergence of mobile phone addiction and the expression of depressive symptoms. According to a review of the literature, women are more likely than men to have issues with using mobile phones. This could be explained by the finding that women are more likely to experience mood fluctuations, which could cause them to use their phones to purge unpleasant feelings. (Chen et al., 2016). Sleep disturbance partially mediated the relationship between electronic media use in bed before sleep and symptoms of depression. Use of electronic media was positively correlated with sleep problems and negatively correlated with sleep duration, both of which were linked to depressive symptoms. (Lemola et al., 2015)

Effects on Pre-Sleep Screen Time on Mood and Emotional Well Being

Longer periods of time spent on a cell phone are linked to negative psychological moods, especially depression. Reducing cell phone use could help long-term users maintain proper mental health. (Ikeda & Nakamura, 2014). (Mohd Saat et al., 2024) showed that screen time directly, favorably, and significantly affects anxiety (Mean = 0.134, $\beta = 0.123$, $p < 0.01$) and sadness (Mean = 0.202, $\beta = 0.194$, $p < 0.01$). Additionally, screen time had little impact on the quality of sleep (Mean = 0.128, $\beta = 0.117$, $p < 0.05$). But in the indirect relationship between screen time and anxiety (Mean = 0.047, $\beta = 0.040$, $p > 0.05$) and depression (Mean = 0.044, $\beta = 0.043$, $p < 0.05$), the mediating factor, sleep quality, was not significant.

METHOD

Sample and Participant Characteristics

The empirical component of this study evaluated a cross-sectional sample of N = 100 participants gathered across diverse age cohorts to map psychological reactions and emotional baselines. The sample was stratified into three specific age brackets representing key developmental and life stages

Adolescent/Early Young Adult Cohort	14 - 20 Years	n = 44
Established Young Adult Cohort	21-30 Years	n =43
Mature Adult Cohort	Abobe 30	n = 17

Data Analysis

A sample of 100 people of various age groups participated in the current study. The study's goal was to investigate Effect of Pre Sleep Screen Time on Mood using a variety of emotional markers, including happiness, melancholy, fatigue, caring, anxiety, peacefulness, and activity. Three age groups were used to group the participants: 14–20 years old, 21–30 years old and over 30 years old. Out of all the participants, 44 were between the ages of 14 and 20, 43 were between the ages of 21 and 30, and 17 were older than 30.

The analysis of the responses showed the majority of participants reported positive emotional experiences more frequently than negative. For emotions such as happiness, liveliness, caring, loving, contentment, and activeness, most people selected the responses —Slightly Feel and Definitely Feel. This indicates that a huge number of people generally experience positive emotional wellbeing in their daily lives.

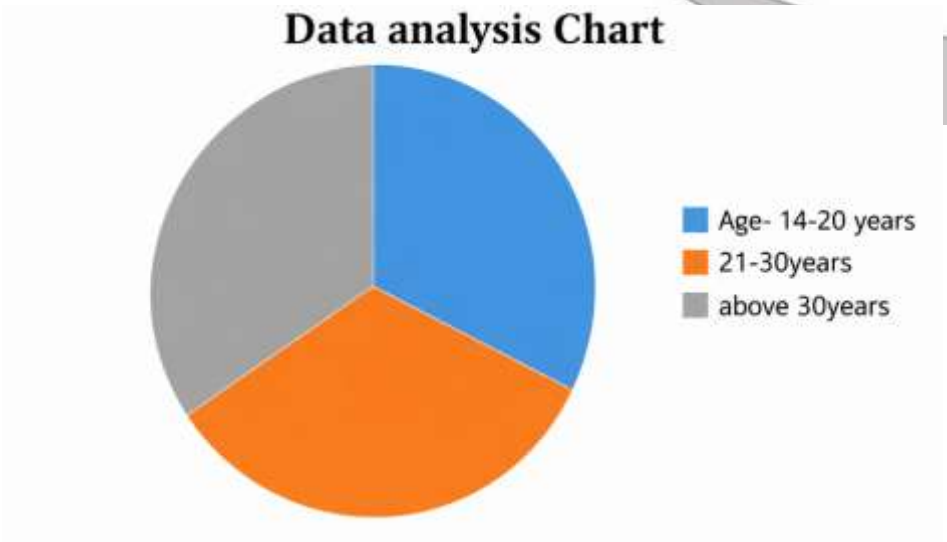
Age-Group Variations and Emotional Stability

When stratified by age, data revealed noticeable differences in emotional patterns and stability across the three distinct cohorts:

Age Cohort	Sample Size (n)	Dominant Emotional Profile and Stability Characteristics
14–20 Years	44	Characterized by high emotional fluctuations and mood variability. Participants reported frequent episodes of nervousness and jitteriness, likely reflecting developmental, academic, or social pressures.
21–30 Years	43	Demonstrated relatively balanced emotional responses. Participants reported moderate to high baseline levels of positive emotions, including happiness, liveliness, calmness, and activeness.
Above 30 Years	17	Displayed the most stable emotional patterns. This cohort reported significantly higher baseline levels of calmness and contentment compared to both younger groups.

Key Findings

1. **Variation Across Age Groups**
   Emotional wellbeing after high screen time differentiate noticeably among the three age categories.
   Each age group showed different emotional patterns and intensity levels.
2. **21–30 Years Group**
   This group generally showed balanced emotional responses.
   People in this group reported moderate to high levels of positive emotions such as happiness, liveliness, calmness, and activeness.
3. **14–20 Years Group**
   Younger people showed comparatively much emotional fluctuations.
   Response indicating occasional nervousness, jitteriness, and mood variability, which may reflect academic, social, or developmental pressures.
4. **Above 30 Years Group**
   People of above 30 years displayed relatively stable emotional patterns.
   In this category reported higher levels of calmness and contentment compared to younger groups.
5. **Positive vs. Negative Emotions**
   Positive emotions (happy, lively, caring, loving& calm) were much more dominant overall than negative emotions (sad, gloomy, nervous, and fed up).
   This suggests that most people maintained moderate emotional wellbeing.
6. **Overall Emotional Wellbeing**
   The overall average emotional wellbeing indicates that emotional health varies with age and life stage.
   Age appears to influence emotional stability, stress levels, and overall mood patterns.



Discussion

The empirical findings confirm that age and life stage significantly influence emotional stability, stress thresholds, and overall mood patterns. The high emotional fluctuation observed in the 14–20 age bracket aligns with literature highlighting young adults as exceptionally vulnerable to digital over-dependence and smartphone addiction. Younger cohorts face unique pressures, using devices heavily for social interaction, media streaming, and peer connectivity. This aligns with documented usage data showing that Gen Z averages over 9 hours of daily smartphone use, compared to the 6 to 7 hours typical of Millennials.

This excessive screen time creates a cycle of digital dependence. Individuals often turn to late-night phone browsing as a deliberate tool to relax or decompress from daily stressors. However, this behavior backfires; the resulting blue light exposure and cognitive stimulation actively disrupt sleep architecture by suppressing evening melatonin release. This sleep deficit leads to daytime exhaustion and elevated negative affect. This, in turn, drives individuals to use their devices even more intensely at night to unwind, reinforcing a damaging loop that impairs emotional well-being.

While the majority of our sample reported a baseline of positive emotional experiences, the literature emphasizes that sustained screen immersion can erode these protective factors over time. Addressing pre-sleep screen routines appears crucial for safeguarding sleep hygiene and stabilizing mood variations in young adults.

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