Smartphone Addiction, Anxiety Symptoms and Depression among Young Adults

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Abstracts: Although a smartphone has proven to be a very useful tool, its obsessive usage can harm relationships, anxiety, and depression. This study amid to investigate the relationship between smartphone addiction, depression, and anxiety symptoms among young adults. The sample of the study consisting of (240) Jordanian young adults who randomly select from the universities in Jordan. The scales self-evaluation anxiety, PHQ-8, and smartphone addiction where use to gather the data. Finally, the results of the study revealed that the level of smartphone addiction was the highest, and the lowest level was depression. Moreover, the results showed a strong positive correlation between smartphone addiction, anxiety, and depression among the participants. Finally, no statistically significant difference in levels of depression, smartphone addiction, or anxiety between the participants based on their gender was found.

Keywords: Smartphone, Addiction, Depression Symptoms, Anxiety Symptoms, Young Adults.

1. INTRODUCTION

Smartphone use has spread like wildfire and growing worries about excessive and perhaps dangerous use have accompanied (Velthoven et al., 2018), there are increasing reports of problematic smartphone use behavior patterns that resemble addiction (Domoff et al., 2020). Issues related to the misuse of the internet are common causes of smartphone addiction. The compulsion to use smartphones is usually caused by the games, applications, and virtual worlds that these devices connect us to, rather than the devices themselves (Orben & Przybylski, 2019). Research suggests a negative correlation between smartphone addiction and academic success and productivity. This underscores the harmful effects of this addiction on the lives and prospects of young people. Smartphone addiction can also increase the likelihood of mishaps (Duke & Montag, 2017).

Smartphones and mobile phones are both personal, and portable gadgets that express social status and identity, however, smartphone is more accessible to the internet. Numerous benefits may be obtained via smartphones, such as enjoyment, socializing, finding information, time management, coping strategies, and social identity preservation (Panova & Carbonell, 2018). Smartphones have become an essential part of modern life, and research has proven that some users turned to be over reliant on them that they experience "separation anxiety" when separated from their devices (Lin, 2014). Smartphones can even provide a "security blanket" effect in stressful situations, similar to how children use a comfort item like a blanket to reduce their negative reaction to stressors (Panova & Lleras, 2016). With the widespread use of smartphones and consumers' close attachment to them, concerns about their potential for addiction have emerged (Panova & Carbonell, 2018).

Mental disorders can contribute to smartphone addiction. Studies have indicated that people with mental health disorders, such as anxiety, depression, or post-traumatic stress disorder (PTSD) may use substances like drugs, alcohol, or cell phones to self-medicate. However, although some medications may provide temporary relief from certain mental health symptoms, they could ultimately worsen the condition. Furthermore, brain abnormalities in individuals with mental illnesses may intensify the pleasurable effects of drugs, increasing the likelihood that they will keep using cellphones (Orben & Przybylski, 2019). Smartphone use has been linked to the emergence of additional mental health issues. It could result in modifications to the structure and function of the brain that increase a person's risk of mental illness (Santander-Hernández et al., 2022). The growing popularity of smartphone use has negative repercussions as well, negative consequences including smartphone addiction, finding negative effects that can be predicted by smartphone addiction has long been of interest to psychologists. One of those unfavourable effects is depression and anxiety. In addition to hurting a person's psychological and physical well-

being, depression and anxiety can also hurt a person's quality of life (Lee, Kim & Choi, 2017), there is evidence that smartphone addiction may contribute to depression and anxiety (Bi, 2022).

Smartphones provide features that can lead to compulsive behavior, tolerance, withdrawal, and functional impairment. Smartphones are said to be the direct cause of numerous health problems. Since smartphones promote a sedentary lifestyle, teenagers are more prone to encounter health issues such as low physical energy, physiological issues, and lowered immunity (Santander-Hernández et al., 2022). With a laptop or desktop computer, people may have trouble controlling their impulses, but because smartphones and tablets are highly portable and convenient to use, it difficult to resist the urge to use them. According to Velthoven et al. (2018), many of us are constantly glued to our mobile devices. This is because they have the ability to stimulate the release of dopamine, a neurotransmitter that can affect our mood, similar to drugs and alcohol. Over time, our bodies may become more tolerant to the effects of these devices, requiring us to use them more frequently to experience the same level of satisfaction (Duke & Montag, 2017).

Depression

People who are addicted to smartphones are often sad, and mistreatment of internet users can either induce or worsen depressive symptoms such as hopelessness, despair, and loneliness (Thornicroft et al, 2017). Depression is one of the most common mental health conditions, and it often co-occurs with anxiety. According to Steer, Rissmiller, and Beck (2000), depression may vary in severity from mild and temporary to severe and long-lasting. Some people may only ever experience depression once, but others may go through several episodes. Depression may lead to suicide, but with the correct support, it can be prevented. It's important to realize that young individuals contemplating suicide can get help in a variety of methods (Hojat et al., 1986). Depression may be a response to domestic violence, abuse, violence, the loss of a loved one, or problems within the family. Someone may get depression after a period of high stress. It could also run in families. There are instances when an issue's etiology is undetermined (Buckner & Mandell, 1990).

Anxiety

Psychiatric research has revealed that anxiety-related disorders and smartphone usage have a significant overlap, beyond what would be expected by chance alone (Kushner et al., 2008). Due to the higher incidence of this overlap, growth and maintenance features, clinical relevance, and unique treatment requirements, physicians and researchers have been interested in understanding the relationship between anxiety and smartphone use (Kessler et al., 2005).

Smartphones

According to Domoff et al. (2020), a smartphone is a kind of tiny computer that combines computing capability and mobile phone functions. In contrast to feature phones, they have more robust hardware and full-featured mobile operating systems that allow users to access a greater variety of apps, browse the web via mobile broadband, and enjoy multimedia features like texting and voice calls in addition to standard phone functions like a voice call and text messaging (Duke & Montag, 2017). One of the most important characteristics of a smartphone is the ability to access an app store. An app store is a dedicated website where users can search for and download applications to operate on their smartphones. A typical app shop offers many mobile apps for word processing, productivity, gaming, social media, and other uses (Lee et al., 2017).

LITERATURE REVIEWS

The relationship between smartphone addiction, depressive disorders, and anxiety disorders has been the subject of a comprehensive review and consolidated meta-analysis of the literature. The goal of Al-Mohaimeed's and Alharbi's (2022) study was to evaluate the relationship between smartphone use and life satisfaction. They surveyed a sample of college students and members of the public who went to medical facilities in the Saudi Arabian area of Qassim. collecting data on the amount and usage patterns of smartphones as well as the perceived

value of life through the use of already created and tested surveys. The study's findings presented that 73% of the respondents were college students between the ages of 18 and 24; women made up a slightly larger percentage of the sample than males. Females, singles, students, and those between the ages of 18 and 24 had considerably poorer mean quality of life scores for both physical and psychological health. Users of music and movie applications reported much worse perceived mental and physical well-being than users who used faith-based applications. Individuals who rated their physical and mental health as the lowest were 2.5–2.7 times more inclined to use smartphones problematically than those who did not.

Wang, Li, Ding, and Chen (2022) examine whether the amount of time Chinese university students spent using their smartphones during the COVID-19 outbreak was related to their worry. 9716 university students from Liaoning, China, including 5458 males and 4258 women, took part. The frequency of smartphone use evaluating using a self-reported questionnaire. The generalized anxiety disorder seven-item scale was used to measure anxiety. The adjusted connection between smartphone uses and anxiety was ascertained using a multivariate logistic regression analysis. The study demonstrated a positive correlation between the amount of time spent using a smartphone and the prevalence of anxiety across all participants after controlling for confounding variables. The odds ratios (95% confidence interval) for moderate and long smartphone usage durations were 1.17 (1.00, 1.36) and 1.58 (1.36, 1.83), respectively, as compared to short periods of smartphone usage. The sex-stratified analysis did not alter this highly significant positive correlation (for both men and women).

To investigate the relationship between social anxiety and problematic smartphone use (PSU) by examining the mediated nature of time spent on the phone and the moderating effect of dispositional trust toward others, Annoni, Petrocchi, Camerini, and Marciano (2021) employed a moderated mediation model with PSU as the outcome. A total of 240 young individuals responded to an online survey that comprised the 10-item Smartphone Addiction Scale Short Version, a single-item measure of dispositional trust, a question on the daily length of smartphone usage, and the 12-item Social Anxiety Scale. Two factors were included: gender and occupation. Findings showed that PSU was strongly and favorably correlated with social anxiety, but smartphone use did not mitigate this correlation. Although there was a strong and favorable correlation between smartphone use and PSU, there was no such interaction between social anxiety and smartphone use. Both the direct associations between social anxiety and PSU and the associations between smartphone use and PSU were reduced and increased by the dispositional trust.

Ayandele, Popoola, and Oladiji (2020) investigated the frequency of smartphone addiction and its correlation with anxiety and depressive symptoms among female students. Anxiety, sadness, and smartphone addiction were assessed using standardized measures on 398 female students who were randomly selected from two sizable higher education institutions in southwest Nigeria. According to the findings, 1.01% of the participants were likely smartphone addicts, 17.34% were at danger, and 14.32% and 16.33%, respectively, had signs of moderate-to-severe sadness and anxiety. Addiction to smartphones has a substantial correlation with depression ($p < 0.01$) and anxiety ($p < 0.01$). Due to the respondents' homogeneity, it may be challenging to generalize these results to other at-risk demographic groups and clinical settings. Addictive/at-risk smartphone users considerably scored higher on symptoms of anxiety (M = 229.27) than normal smartphone users (M = 192.81; U = 9689.00; Z = −2.46, "$p < 0.05$"). Additionally, addictive/at-risk smartphone users considerably scored higher on depression symptoms (M = 233.40 compared to normal smartphone users M = 191.88; U = 9387.50; Z = −2.81, "$p < 0.05$").

It may be inferred that the majority of the prior research mentioned before found a link between various factors and smartphone addiction. Studies examining the connection between young adult smartphone addiction, anxiety, and depression are still scarce, though. In addition, the majority of earlier research has not thoroughly examined the connection between several factors, including gender and qualification, and smartphone addiction.

Significance of the Study

This study's importance stems from the necessity to investigate the intricate connection between young adults' smartphone addiction, anxiety, and depression. Our study aims to examine the association between young adult

smartphone addiction, and depressive and anxious symptoms. It is motivated by the varied findings of past similar studies about the connection between anxiety and depression associated with technology addiction. To address this connection, it's also important to discuss responsible smartphone-using habits and implement stress and anxiety reduction strategies. These include establishing time limits and boundaries for smartphone use, engaging in offline activities, practicing mindfulness and relaxation techniques, asking for social support, and, if necessary, seeking professional assistance from mental health specialists who can offer direction and support in managing depression, anxiety, and smartphone addiction.

Statement of Problem

Many young people rely increasingly on smartphones. Despite their importance in daily life, psychologists warn of the seriousness of the symptoms of addiction to these phones, stressing the importance of treating them as soon as possible. The widespread use of smartphones in daily life causes an advanced state of behavioral addiction, which psychiatrists call 'no-mobile phobia', which is a phobia of losing a mobile phone or being unable to use it. It is a condition that affects phone users in a way that makes them attached to it all the time, which pushes them to use it without any reason. Although smartphone addiction has no physical risks, mental health experts warn of its psychological, social, and emotional risks. According to (Alkhutaba, Alali & Nashwan, 2023) mobile phone addiction causes serious mental health problems, and adolescents are more likely to become addicted to mobile phones than any other age group. Alkhutaba (2023) confirmed that young people under the age of 20 are generally the most prone to addiction to mobile phones, which causes behavioral problems for them. Also, there has been a high rise in anxiety, depression, and suicide among teenagers in recent years related to phone addiction.

Most young people are addicted to holding their smartphones throughout the day and even before they go to sleep, without realizing that this habit is seriously reflected in their health and may increase their exposure to anxiety or depression in addition to damaging the body, mind, and even feelings. While technology has benefits and advantages that make life easier, it is a double-edged sword, and it has a lot of negatives. As for the emotional and psychological levels, mobile addiction may cause the phenomenon of Numofobia, the fear of the lack of a smartphone, or the inability to reach it. These symptoms are added to depression and permanent anxiety from the inability to keep pace with all the new on social media. The problem of the study is to reveal the nature of the relationship between smartphone addiction, anxiety, and depression among young people.

Moreover, additional investigation is required to have a deeper comprehension of the fundamental mechanisms and causal connections among these variables. It is advisable for students who are suffering from severe stress, anxiety, or smartphone addiction to get professional assistance from a mental health specialist who can offer individualised counsel and support. Examining the relationship between depression and anxiety symptoms as indicators of smartphone addiction in international students is the study's main concern.

Research Objectives

The current study was designed according to semi-structured data to unleash the nature of the nexus of depression, smartphone addiction, and anxiety in a sample of Young Adults. Furthermore, to examine whether the variation in smartphone addiction, depression, and anxiety symptoms be explained through variation in the participants' gender.

Research Questions

1. To what level do young adults exhibit signs of anxiety, sadness, and smartphone addiction?

2.   What is the link between smartphone addiction, depression, and anxiety symptoms among young adults?

3.   To what extent can variation in smartphone addiction, depression, and anxiety symptoms be described through gender of participant?

2. MATERIEL AND METHODS

To investigate the relationship between the under-examine variables, a mix-methods approach were used such as interviews, observation, and questionnaires. The goal of the explanatory design is to gather quantitative data initially, and then provide context for the quantitative findings using qualitative data. A 5-point Likert scale survey utilized to collect quantitative data, and the young adults asked to choose the characteristics that best describe their symptoms of anxiety, depression, and smartphone addiction. Furthermore, a qualitative, multiple case study method were utilized to examine the young adult's answers to the impact caused by smartphones on their psychological well-being, to explore additional survey responses offering individual accounts, and to respond to the research questions, in line with the current study's goal of "determining the essence of a single phenomenon."

2.1. Study Sample

The population current study consists of 240 (120 male & 120 female) young adults in Jordanian universities in Amman who were randomly select from a different educational stream. The young adults homogenous in socioeconomic classes (low, middle, and high class) and age rating between 18 to 25 years.

2.2. Tools

To gather the data, the study adopts three tools The scales of Zung's (1980) self-evaluation anxiety consisting of (20) items, PHQ-8 for measure the current depression (Kroenke et al., 2001) consisting of (8) items, and smartphone addiction scale (Taylor Bradish, 2020) consisting of (33) items. In addition to (interviews, and observation), all items of the three scales are positively oriented. Each item on the scale has five possible answers, and each response is rated based on: often (5 points), usually (4 points), occasionally (3 points), infrequently (2 points), and never (1 point). The scales use a five-point Likert style. A panel of professionals with backgrounds in mental health, psychometrics, and language analysis checked and reviewed the instruments to determine their validity. Additionally, test-retest is used to achieve the instruments' "Pearson correlation coefficient" between the scales items; results showed that (self-evaluation anxiety, r = 0.82., PHQ-8 r = 79 and smartphone scale r = 0.85. Furthermore, utilizing two statistical techniques: Split-Half Dependability Table (1) and Cronbach's Alpha correlation. The scales have been selected because they have been used successfully in measuring similar dimensions that are targeted in the current study. Moreover, they have a high degree of validity and reliability and have already been applied to participants with similar characteristics as our participants.

Table (1): "Cronbach's Alpha and Split-Half"

Scales	"Cronbach's Alpha"	"Split-Half"
Smartphone addiction	0.87	0.84
self-evaluation anxiety	0.84	0.82
Depression	0.82	0.79

2.3. Procedures

For data collection, the researchers used three tools to gather information about the participants. The methods used in Arabic were translated by English language professors who are skilled in both English and Arabic. After obtaining approval from the chosen institutions, participants were asked to take part in the study and, following an overview, the study's aims and purpose are explained to them. Following receiving the responses from the participants, the data entered IBM SPSS Statistics. To answer the research questions raised earlier, several statistical tests were run. The outputs will be presented, explained, and discussed. Statistical techniques following the various objectives and research questions employed descriptive techniques such as one sample test, t-test, ONE WAY ANOVA, and Person correlation analysis. To determine the interview and observation findings, the researcher will index the data by determining the sorts of data, general frameworks, and their types, and the results will be analysed by indexing them by scientific research and methodology.

3. RESULTS AND DISCUSSIONS

3.1. Quantitative findings

One sample test has been conducted to express the level of smartphone addiction, anxiety, and depression. Findings show that the level of smartphone addiction was the highest (M 3.96, Sig = 0.00). While the lowest level was the depression (M = 3.38, Sig = 0.00). as expressed in Table (2).

Table (2): One sample test.

Variables	Mean	St. dev	T	Sig
Smartphone addiction	3.96	0.77	1.29	0.00*
Anxiety	3.62	0.85	1.55	0.00*
Depression	3.38	1.07	1.65	0.00*

To find out the nature of the relationship between smartphone addiction, anxiety, and depression between the participants. "Pearson correlation coefficient" has been run as indicated in Table (3).

Table (3): "Pearson correlation coefficient".

Variables	Smartphone addiction	Anxiety	Depression
Anxiety	0.67*	1	0.54*
Depression	0.48*	0.54*	1

Table (3) expressed that there is a strong positive correlation between smartphone addiction, anxiety, and depression among the participants. The value of correlation between the smartphone addiction and anxiety r = 0.67. moreover, the value of correlation between the smartphone addiction and depression r = 0.48. Furthermore, the value of correlation between the anxiety and depression r = 0.54.

The "independent sample t-test" has been calculated to determine whether the variation in smartphone addiction, depression, and anxiety symptoms be explained through variation in the participants' gender. The results did not find any statistically significant levels of depression, smartphone addiction, and anxiety among the participants based on their gender as manifest in Table (4).

Table (4): "Independent sample t-test"

Variable	Gender	Mean	St. dev	t	Sig
Smartphone addiction	"Male"	3.78	0.93	0.46	0.24
	"Female"	3.69	0.97		
Anxiety	"Male"	3.55	1.12	0.88	0.18
	"Female"	3.51	1.07		
Depression	"Male"	3.34	1.28	1.03	0.11
	"Female"	3.49	1.25		

3.2. Qualitative Findings

Following the quantitative analysis of the descriptive data, a number of respondents was selected for individual face-to-face interviews. The interviews were adopted as a qualitative method to validate the quantitative data and triangulate the data analysis to provide a more in-depth examination of this issue. Such triangulation is expected to further elucidate the factors associated with stress, anxiety symptoms, and smartphone addiction among expatriate students. Thus, the interviews were designed to explore to what extent depression and anxiety symptoms were associated with smartphone addiction. The interviews were conducted face-to-face on the participants' university campus. The interviews were videotaped following the consent of the participants, and each interview lasted for approximately 40 minutes. With the permission of the participants, the interviews were videotaped, and each interview lasted approximately forty minutes. The interviewees' responses provided interesting perspectives on the reasons behind their smartphone addiction and how stress and anxiety are related to it. One participant continued: "Sometimes I play video games for hours." Participant A, a 19-year-old student in the College of Medical Sciences, said that because smartphones are a constant source of social communication, entertainment, and knowledge, they provide a way to escape from the stresses of daily life. "Online search or check." He added, "The fear of missing out

on social interactions or updates can drive me to constantly check my devices."

Participant G (female, 23, a student at the faculty of Arts) noted that the constant connectivity through smartphones to the different social media platforms mitigate the fear from missing out any important events, updates, or social interactions. Such fear induces depression and anxiety, leading me to spend excessive time on my smartphones to stay connected and up-to-date. She elaborated, "I worry about my family and home country, so I stay online to always be updated". Furthermore, the respondents confirmed that they use mobile games, videos, or other applications to distract themselves from any negative emotions or mundane daily tasks. Besides, Participant H (female, 19, a student at the faculty of social sciences) mentioned that "I feel stressed to respond to messages, emails, and notifications immediately". As a result, this increases the depression levels and contributes to the feeling of being overwhelmed. While Participant Y (male, 24, a student at the faculty of engineering) said that "I use my smartphone to escape or avoid anxious thoughts or situations, and checking notifications, scrolling through social media feeds, or engaging in excessive gaming can provide temporary relief from anxiety symptoms. As for Participant Z (male, 20, a student at the faculty of Islamic studies), he believed that the exposure to negative news, distressing social media content, or inescapable media feeds makes him feel highly anxious. He added "the fear of missing calls, messages, or updates creates a sense of attachment and dependency on smartphones". Likewise, Participant N (female, 27, a student at the faculty of political sciences) reported that social media podiums through smartphones may result in higher anxiety or depression in case the smartphones users compare their life to the more ideal or perfect life of others. She stated, "I hate when people show off on social media. This makes me feel less than others". Finally, Participants V (male, 25, a student at the faculty of) suggested that smartphones can provide constant access to news, notifications, information and infotainment. Nevertheless, such constant influx of information is overwhelming and immersing, which can lead unprecedented increased anxiety levels. Besides, the fear of missing out on important updates or the pressure to stay constantly connected contributes to the feeling of anxiety.

4. DISCUSSION

The current study was designed according to semi-structured data to unleash the nature of the nexus of depression, smartphone addiction, and anxiety in a sample of Young Adults. Furthermore, to examine whether the variation in smartphone addiction, depression, and anxiety symptoms be explained through variation in the participants' gender. The results of the study uncovered that the level of smartphone addiction was the highest one, and the lowest level was depression. Moreover, results find out that a strong positive correlation between smartphone addiction, anxiety, and depression among the participants. Finally, no statistically significant levels of depression, smartphone addiction, and anxiety among the participants based on their gender were found. The use of smartphones has become widespread among children and young people today and over the past decade, prolonged use of smartphones has been associated with new types of addiction such as: Internet addiction, Facebook addiction, shopping addiction or what is known as buying mania. The severity of the addiction made one of these young people "troubled" and "anxious" if he was prevented from using a smartphone continuously. While technology has benefits and advantages that make life easier, it is a double-edged sword, and it has many negatives, but on the emotional and psychological levels, mobile addiction may cause exposure to the phenomenon of nomophobia, or fear of not having a smartphone, or not being able to access it. Added to these symptoms is depression and constant anxiety about not being able to keep up with everything new on social networking sites.

When someone is missing their smartphone for a long time, they typically experience bodily symptoms including sweating, shivering, and heart palpitations. Using a smartphone two hours before bed might disrupt the body's normal melatonin synthesis due to the light it emits. It may result in trouble getting to sleep or remaining asleep all night. This may result in more severe mental health problems, tiredness throughout the day, and poor-quality sleep. Nonetheless, a lot of young adults struggle to limit the length of time they pass looking at their devices because they have developed a smartphone addiction. An increase in mental and physical health problems, such as anxiety, sadness, loneliness, eye strain, neck and back discomfort, anxiety, depression, and sleep difficulties, has been linked to excessive smartphone usage. The results of the study are consistent with those of Annoni, Petrocchi, Camerini, & Marciano (2021) who discovered that smartphone use is strongly and positively associated with social

anxiety in young people. In addition to the findings of Al-Mohaimeed & Alharbi (2022) who hypothesized that the perceived quality of physical and mental health, especially related to anxiety and depression, was significantly lower among users of smartphone applications such as music and movies. Participants with the lowest perceived quality of physical and mental health related to anxiety and depression were 2.5 to 2.7 times more likely to receive the highest level of problematic smartphone use. The results are also consistent with those of Wang et al., (2021) which revealed that psychological capital and perceived stress are inversely associated with smartphone addiction, while the relationship between perceived stress and smartphone addiction has been shown to largely mediate negative emotions. Finally, findings agree with the results of Ayandele, Popoola & Oladiji (2020) which indicated that smartphone addiction is significantly positively associated with depression and anxiety among young people.

5. Limitations and Implications of the Study

It is worth acknowledging a number of limitations and implications for this study. First, the findings obtained here need to be interpreted with attentiveness due to the socioeconomic specifications of the participants. Second, the size of the sample recruited in this study was not large enough, which may confine the generalization of the results. Third, the presence of response bias is possible due to the employment of self-reported approaches to gauge the respondents' levels of depression and anxiety. Additionally, due to the fact that the current study targeted exclusively expatriate students, it may flop to consider the role of other confounding variables such as socioeconomic status or study adherence. Such variables are predicted to interact positively or negatively with stress, anxiety and smartphone addiction (Alkhutaba. 2023).

The findings of this study can impact the current clinical procedures and treatments. Medical professionals should, first and foremost, be aware of depression and anxiety that students experience in relation to study abroad experience. Consequently, they should consider incorporating special psychological testing and therapies into their treatment plans that take into consideration the negative influence of smartphone addiction. The well-being of smartphone users and control of smartphone usage can be improved by addressing the different causes and symptoms of anxiety and perceived stress that arise from addiction to smartphones.

CONCLUSIONS

The findings attained from this research propose an association between stress, anxiety symptoms and smartphone addiction. Despite the fact that smartphones have undeniably revolutionized communication and offered plentiful benefits, their excessive use can still have negative consequences on the users' mental health. Depression and anxiety symptoms are often associated to smartphone addiction. Reversely, smartphone addiction may also intensify the levels of depression and anxiety. However, smartphones can offer a convenient escape from the feeling of depression and anxiety. Expatriates' students may turn to their devices as a coping mechanism with living abroad through using apps, social media, or games to distract themselves from expatriates' negative emotions.

However, excessive reliance on smartphones for escapism can lead to a vicious cycle, where depression and anxiety can be intensified with the upsurge use of smartphones. Smartphone use, chiefly ahead of sleep time, may result in sleep disorder or insomnia. Any revelation to the light emanated by smartphone screens, engagement with stimulating content, or responding to notifications can make it difficult to fall asleep or get quality rest. Sleep deprivation, in turn, can increase depression and anxiety levels. Moreover, the continual access to incoming information, social media updates, and notifications can overstimulate the brain. This can thus lead to emotional states of characterized with high levels of stress and anxiety. The illusional need to continuously be connected online and respond immediately to incoming notifications can create a repeated sense of stress, anxiety and depression with further aggravating of their symptoms.

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