

A Review Study of Mobile Phone Addiction and Sleep Quality and Anxiety in College Students

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Abstract: Mobile phone addiction among college students has aroused widespread concern in society. At present, the existing research reviews focus more on the physical and psychological problems caused by Internet addiction among college students, and there are relatively few reviews on the physical and psychological problems caused by mobile phone addiction, among which the research on the decline in sleep quality and anxiety caused by mobile phone addiction still lacks a comprehensive and systematic overview. The aim of this review is to provide a comprehensive overview of sleep quality loss and anxiety caused by mobile phone addiction among college students. The author searched: Science, Nature, Wiley, Springer etc. electronic databases with appropriate keywords. Fifteen descriptive studies were finally included. The result shows that there is no significant difference between genders on mobile phone addiction, but the causes of mobile phone addiction differ between male and female students. Mobile phone addiction among college students was significantly associated with insomnia and decreased sleep quality, in which sleep disorders were also confirmed to be directly related to mobile phone addiction among the dimensions of sleep quality assessment. In addition, mobile phone addiction is also associated with higher rates of anxiety among college students.

Keywords: college students, mobile phone addiction, sleep quality, insomnia, anxiety

1. Introduction

In today's highly developed technology, people's daily lives have been fully intertwined with all kinds of electronic products; mobile phones are one of the most typical. But it brings convenience at the same time. However, while it brings convenience, the problem of mobile phone addiction has also become more and more obvious [1]. Studies have shown that mobile phone addiction will cause a series of physical and mental health problems among college students, such as poor sleep quality, insomnia, poor mental state, low mood, anxiety, depression, and other psychological problems. The study shows that mobile phone addiction will lead to a series of physical and mental health problems, such as poor sleep quality, insomnia, poor mental state, low mood, and even anxiety and depression [2]. Four years of university is a critical period for college students to mature from youthfulness to maturity, in which good sleep quality is an important prerequisite for college students to achieve successful transformation. At present, the sleep quality problem of college students is relatively serious, and a study shows that 452 out of 2496 college students have sleep problems, with PSQI=8 [3]. It has been shown that severe insomnia affects college students' academic performance and social

performance [4]. When students do not sleep well, they are highly susceptible to depressed mood or even anxiety and depression during the day, and their physical functioning (physical or mental, memory, concentration, etc.) is also affected [5]. Based on this, this review comprehensively describes the problems related to mobile phone addiction or the wrong use of mobile phones among college students, and summarises the problems related to the decline in sleep quality caused by mobile phone addiction, with a view to attracting the attention of students and society, and providing effective targeted interventions to reduce the chances of mobile phone addiction among college students, and to improve the physical and mental health of college students. The current situation of mobile phone addiction among college students, as well as the sleep and anxiety problems caused by mobile phone addiction, are summarised.

2. Method

After identifying the research areas to be screened, the author searched for keywords such as college students, mobile phone addiction, sleep quality, and the effects of mobile phone addiction using different search strategies and various databases including: science, Nature, Nature Human Behaviour, Wiley, Springer, as well as Knowledge.com and Google Scholar, and a total of 132 articles were retrieved. The author developed inclusion and exclusion criteria for literature selection and finally selected 15 quantitative studies. 14 articles were organised according to their authors, published journals, time and region of study, number and group of subjects, and research methodology in Table 1. The subjects of the articles included in the review were all young people or university students. The studies were conducted in China (35.71%), followed by Iran (21.43%), and other countries from all over the world (Table 1).

Inclusion criteria included studies published in peer-reviewed journals to ensure a high degree of credibility in the selection of articles, literature published in English between 2010 and 2022 to ensure a broader applicability of the articles, and timeliness.

Exclusion criteria included: incomplete description of the questionnaire information, empirical procedures, and outcome data used in the study methodology; studies related only to internet addiction without mentioning mobile phone addiction; and studies that have not been published as of April 2023.

3. Result

Demographic variables

Students of both genders were present in all studies, and the age of the subjects met the World Health Organisation's criteria for defining the age of young people. No significant differences were found in the gender of mobile phone addiction, but the likelihood of internet addiction increased with age for both male and female students [6][7]. In addition, the factors associated with mobile phone addiction differed significantly between male and female students; for example, playing smartphone games and using smartphone media apps were more often associated with smartphone addiction in males, while in females, mobile phone-addicted students spent more money per month compared to non-mobile phone-addicted students [8]. Problems with mobile phone addiction or frequent use of mobile phones is a sign of an increased risk of sleep disorders in men and depression in women.

Current situation of mobile phone addiction among university students

Mobile phone addiction among university students is very serious. Özlem Çağan surveyed and studied 700 university students in 2012, and the average score obtained by using the Problematic Mobile Phone Usage Scale was 57.17 ± 22.75 . It was much higher than the score dimensions that are generally obtained from the Mobile Phone Addiction Scale for all groups (16.5-33.2) [9]. A study showed that 38.63% of 422 college students had sleep problems [10]. In addition, the use of devices

after lights out by college students is a significant manifestation of mobile phone addiction, with studies showing that 58.9% of college students will use their devices every night after lights out, and over 60% of students use them for an hour or more [11].

The relationship between mobile phone addiction and sleep quality

Reports show that 50% of students who are mobile phone addicted and have low sleep quality sleep close to their mobile phones at bedtime and check their phones at least once a night or even more [12]. The report shows that 50% of students who are addicted to mobile phones and have low sleep quality are near their mobile phones when they sleep and check them at least once a night or more. Many students cut their sleep short by staying up late in front of their mobile phones or computers for a variety of reasons, such as not being able to meet deadlines, attending meetings, chatting with others or playing games. But also because after heavy mobile phone use, students can bring task-related problems or over-excitement from passionate entertainment to bed and have difficulty falling asleep, and many students can vividly report the gaming images that go through their minds before they go to sleep [13]. In addition, poorer quality of sleep for individuals can further lead to increased risk issues for mobile phone addiction that are caught in a vicious circle [14]. Overall, college students with mobile phone addiction have poor sleep quality, with 33.5% of students having less than 7 hours of sleep per night. The overall average sleep duration is 6.68 hours, which does not meet the recommended minimum sleep duration for individuals (7 hours) published by the National Sleep Foundation [12].

Mobile phone addiction and sleep disorders and insomnia

College students' sleep quality due to mobile phone addiction is poor overall, but of the indicators assessing sleep quality, sleep disorders are directly and significantly correlated with mobile phone addiction scores, and average sleep disorders are also the most severe of the indicators [7][10][15][16]. Specifically, 23% of male and 34% of female mobile phone-addicted college students exhibited sleep disturbances. In contrast, only 15% and 20% of non-cell phone addicted male and female college students had sleep disorders [17]. The problem of insomnia caused by mobile phone addiction among college students is also obvious [18]. Research shows that over 50% of college students suffer from insomnia, with 33.4% experiencing mild insomnia, 18.9% experiencing moderate insomnia, and 3.0% experiencing severe insomnia [11].

Mobile phone addiction and anxiety

In addition to the sleep-related problems that mobile phone addiction can cause in college students, anxiety issues are another obvious consequence of its causes. One study showed that more than 45% of 1,441 college students measured using the Depression Anxiety Stress Scale had anxiety symptoms, and as many as 36% of them had moderate (10–14), severe (15–19), or extremely severe (20 or more) anxiety symptoms [19]. However, depending on the intensity and manner in which individuals use their mobile phones, the majority of college student anxiety problems are found among younger students, those who use their mobile phones more to send messages, and those who browse the Internet less frequently [19]. In addition, excessive use of mobile phones by students due to stress is more likely to lead to the development of anxiety symptoms than depressive symptoms [20].

Table 1: List of Studies Included in the Review (N = 14).

Author(s) and Journal	Year, Setting	Sample Size	Instruments
Min et al. PLOS ONE [6]	2013, South Korea	540 college students	Smartphone addiction scale Smartphone Addiction Proneness Scale Korean self-reporting internet addiction scale short-form scale

Table 1: (continued).

Abolfazl Mohammadbeigi et al. Journal of Research in Health Sciences [7]	2016 Iran	380 undergraduate students	Cell-Phone Over-Use Scale Pittsburgh sleep quality questionnaire
Chen et al. BMC Psychiatry [8]	2017 China	1441 undergraduate students	Smartphone Addiction Scale short version
Hsien-Yuan Lane et al. International Journal of Environmental Research and Public Health [10]	2021 China	422 university participants	The Smartphone Addiction Inventory Tri-Dimensional Personalit Questionnaire Chinese Version of the Pittsburgh Sleep Quality Index
Nyissa A. Walsh et al. Sleep Health [11]	2020 Canada	4156 college students	Insomnia Severity Index Hospital Anxiety and Depression Scale
Larry Rosen et al. Sleep Health [12]	2015 America	734 college students	Media and Technology Usage and Attitudes Scale Webexec Multitasking preference Medical Outcomes Study Sleep Measure
Thomée et al. BMC Public Health [13]	2010 Sweden	32 young adults	Semi-structured interviews
Ruipeng Wu et al. Frontiers [14]	2021 China	4325 college students	Chinese Version of Pittsburgh Sleep Quality Index Smartphone Addiction Scale-Short Version Patient Health Questionnaire-9 Generalised Anxiety Disorder-7
Jocelyne Matar Boumosleh & Doris Jaalouk PLOS ONE [15]	2017 America	688 undergraduate students	Smartphone Addiction Inventory PHQ-2 and GAD-2
Yang Song et al. Journal of Affective Disorders [16]	2021 China	666 medical students	Chinese version of the Generalized Anxiety Disorder scale Smartphone addiction scale — short version PROMIS Sleep Disturbance scale (short form)
Thomée et al. BMC Public Health [17]	2011 China	4156 young adults	Mobile phone exposure variables
Nisreen Al Battashi Clinical Nursing Research [18]	2020, Sultan	404 college students	Depression Anxiety Stress Scale Smartphone Addiction Scale Insomnia Severity Index
Aleksandar Višnjić et al. International Journal of Environmental Research and Public Health [19]	2018, Serbia and Italy	785 undergraduate students	Depression Anxiety Stress Scale

Table 1: (continued).

Hashemi et al. BMC Psychiatry [20]	2022, Iran	212 undergraduate students	Cell-phone Over-use Scale Depression, Anxiety and Stress
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4. Discussion

Growing up in the era of rapid development of science and technology, contemporary young people are more and more exposed to electronic products at an earlier age, becoming a high incidence group of mobile phone addiction [21][22]. In addition, there is no significant difference between male and female students on mobile phone addiction in terms of gender differences, which is consistent with previous research findings [23]. Overall, mobile phone addiction can cause some damage to an individual's sleep, and most researchers will use the Pittsburgh Sleep Scale to determine the sleep quality of college students, but the questionnaire is divided into more sub-dimensions, and it has been found that not all dimensions are related to mobile phone addiction [10]. Only individual subjective sleep quality, sleep disorders, and daytime dysfunction have been found to be associated with mobile phone addiction. A number of studies have confirmed the correlation between sleep disorders and mobile phone addiction [6][7][17]. However, more studies are needed to confirm the correlation between the remaining dimensions.

The psychological problems caused by mobile phone addiction are also worth paying attention to. Anxiety psychology is one of them. The numerous results reviewed by the research institute on mobile phone addiction and anxiety psychology are consistent with existing research results. Mobile phone addiction and anxiety emotions are highly correlated [11][15][18][20]. In addition, considering the high correlation between anxiety itself and sleep quality, the relationship between sleep quality and mobile phone addiction and anxiety is also worth further exploration [24][25].

The articles selected for the review came from college students in different regions and the number of groups investigated varied widely. Existing collected studies can tentatively conclude that the incidence of sleep problems due to cell phone addiction among college students is rising. Two studies have shown that using the same questionnaire Smart phone Addiction Scale short version (SAS-SV), 29.8% of 1,441 college students were measured in China in 2017, which is higher than 24.8% of 540 college students in South Korea in 2013, but the regions and subject groups are not the same, and further validation of the sample is needed. However, neither the region nor the subject group is the same, and it is still necessary to further examine the influence of factors such as sample size and geographic environment on the results of the study [6][8].

5. Conclusion

The college student group is a high prevalence group of mobile phone addiction and the incidence increases over time, and there is no significant difference gender factors in mobile phone addiction. Mobile phone addiction among college students is significantly associated with insomnia, decreased sleep quality, and sleep disorders. In addition, the occurrence of anxiety due to mobile phone addiction among college students also rises. However, the psychological problems associated with mobile phone addiction are much more than just anxiety, and future research could provide a detailed summary and further discussion of other psychological problems associated with mobile phone addiction.

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