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ORIGINAL

How negative life events affect mobile phone addiction among college students

Cómo los eventos negativos de la vida afectan la adicción al teléfono móvil entre los estudiantes universitarios

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ABSTRACT

Mobile phone addiction, as an unhealthy internet usage habit, has had a significant negative impact on the physical and mental health of college students, especially in this vulnerable group. In view of this, it is necessary to conduct in-depth research on various factors and their mechanisms that affect mobile phone addiction among college students, in order to provide a new perspective and methodology for preventing and intervening in data addiction among college students. In this research context, this study will comprehensively apply quantitative and qualitative research methods to deeply analyze the intrinsic relationship between negative life events, depression, and mobile phone addiction, in order to provide strong scientific basis for solving this problem.

This study aims to explore the impact of negative life events on mobile phone addiction among college students and examine the mediating role of depression in this process. A two-year longitudinal study was conducted to conduct three consecutive questionnaire surveys on 5608 college students from a certain university. Research has found a significant positive correlation between negative life events and mobile phone addiction among college students, indicating that college students who experience more negative life events are more likely to develop mobile phone addiction behavior. Further analysis shows that depression plays a partial mediating role between negative life events and mobile phone addiction, that is, negative life events not only directly affect mobile phone addiction, but also indirectly promote the formation of mobile phone addiction by increasing individual depression levels. In addition, the study also found that gender Factors such as BMI and family economic level play important roles in the occurrence of mobile phone addiction.

This study found that negative life events affect mobile phone addiction among college students, with depression as a mediating factor. This provides a new perspective for the theory of mobile phone addiction and a scientific basis for intervention. Reducing negative events, lowering depression, and improving self-control can effectively reduce addiction rates and promote the physical and mental health of college students. Future research can expand samples and regions, delve deeper into the mechanisms of action, and explore more intervention strategies.

Keywords: Negative Life Events; Mobile Phone Addiction; Depression; College Student.

RESUMEN

La adicción al teléfono móvil, como hábito poco saludable de uso de Internet, ha tenido un impacto negativo significativo en la salud física y mental de los estudiantes universitarios, especialmente en este grupo vulnerable. Ante esto, es necesario realizar una investigación en profundidad sobre diversos factores y sus mecanismos que inciden en la adicción al teléfono móvil entre los estudiantes universitarios, con el fin de proporcionar una nueva perspectiva y metodología para prevenir e intervenir en la adicción a los datos entre

los estudiantes universitarios. En este contexto de investigación, este estudio aplicará de manera integral métodos de investigación cuantitativos y cualitativos para analizar en profundidad la relación intrínseca entre los eventos negativos de la vida, la depresión y la adicción al teléfono móvil, con el fin de proporcionar una base científica sólida para resolver este problema.

Este estudio tiene como objetivo explorar el impacto de los eventos negativos de la vida en la adicción al teléfono móvil entre estudiantes universitarios y examinar el papel mediador de la depresión en este proceso. Se llevó a cabo un estudio longitudinal de dos años para realizar tres encuestas consecutivas por cuestionario a 5608 estudiantes universitarios de una determinada universidad. La investigación ha encontrado una correlación positiva significativa entre los eventos negativos de la vida y la adicción al teléfono móvil entre los estudiantes universitarios. lo que indica que los estudiantes universitarios que experimentan más eventos negativos en la vida tienen más probabilidades de desarrollar un comportamiento de adicción al teléfono móvil. Un análisis más detallado muestra que la depresión desempeña un papel mediador parcial entre los eventos negativos de la vida y la adicción al teléfono móvil, es decir, los eventos negativos de la vida no solo afectan directamente a la adicción al teléfono móvil, sino que también promueven indirectamente la formación de la adicción al teléfono móvil al aumentar los niveles de depresión individual. Además, el estudio también encontró que los factores de género como el IMC y el nivel económico familiar juegan un papel importante en la aparición de la adicción al teléfono móvil.

Este estudio encontró que los eventos negativos de la vida afectan la adicción al teléfono móvil entre los estudiantes universitarios, con la depresión como factor mediador. Esto proporciona una nueva perspectiva para la teoría de la adicción al teléfono móvil y una base científica para la intervención. Reducir los eventos negativos, disminuir la depresión y mejorar el autocontrol puede reducir efectivamente las tasas de adicción y promover la salud física y mental de los estudiantes universitarios. La investigación futura puede ampliar muestras y regiones, profundizar en los mecanismos de acción y explorar más estrategias de intervención.

Palabras clave: Eventos Negativos de la Vida; Adicción al Teléfono Móvil; Depresión; Estudiante Universitario.

INTRODUCTION

In today's society, smartphones have become an indispensable part of our daily lives. However, with the widespread use and increasingly powerful functions of smartphones, the problem of mobile phone addiction is gradually becoming prominent, especially among college students. According to a CNNIC report, the number of mobile internet users in China has reached 986 million, and smartphones are popular among college students due to their openness, convenience, and practicality. College students generally use mobile phones for communication, socializing, and entertainment, leading to a serious problem of mobile phone dependence. The phenomenon of mobile phone addiction has also received attention from researchers.⁽¹⁾

Mobile phone addiction has been regarded as an unhealthy habit of internet use, silently eroding the physical and mental health of college students. This group is in a critical period of forming their outlook on life and values. They are more receptive to new things, but also more susceptible to external influences. Smartphones, due to their convenience, speed, and privacy, have become a choice for college students to seek comfort and vent their emotions, which may ultimately lead to mobile phone addiction behavior.⁽²⁾ Therefore, mobile phone addiction has a particularly serious impact on them and may even have profound negative impacts on their academic, social, and future development.

Negative life events have a negative impact on individual psychology and are an important factor in the mental health of college students. Interpersonal relationship disorders, academic pressure, and other common negative life events can easily lead to negative psychological experiences such as loneliness and lack of achievement. Previous research on mobile phone addiction has made some progress, clarifying that negative life events as a comprehensive and multifaceted stressor are an important risk factor for mobile phone addiction. However, the mechanism of psychological changes in individuals who experience negative life events during the development of mobile phone addiction is not yet clear. Therefore, this study further examines the impact of negative life events on mobile phone addiction and the mechanism of depression in this process over a longer time frame based on previous studies, which has certain theoretical significance. This has opened up a new perspective on the phenomenon of mobile phone addiction, provided new ideas for the theoretical construction of mobile phone addiction, and laid a solid theoretical foundation for in-depth exploration of its internal formation mechanism.

Given the prevalence and harmfulness of mobile phone addiction among college students, it is particularly important to conduct in-depth research on its influencing factors and mechanisms of action. This not only provides us with a new perspective and methodology to prevent and intervene in mobile phone addiction among college students, but also helps us to have a more comprehensive understanding of the essence of mobile phone

addiction. Especially when exploring the intrinsic correlation between negative life events, depression, and mobile phone addiction, we hope to reveal how these factors interact to exacerbate or alleviate the degree of mobile phone addiction.

This study emerged in this context, aiming to comprehensively analyze the relationship between negative life events, depression, and mobile phone addiction through the use of quantitative and qualitative research methods. We hope to provide strong scientific basis for solving the problem of mobile phone addiction among college students through this research, and also provide reference for the formulation of relevant policies and intervention strategies.

Definition of Related Concepts

Definition of negative life events

Negative life events are an important research object in the field of psychology, closely related to stressors. Stress is a non-specific response triggered by environmental, social, psychological, and other interfering stimuli, characterized by emotional states such as anger and worry. These stimuli are called stressors, and the corresponding responses are called stress responses.⁽³⁾ Life events, especially those that can change an individual's daily lifestyle, are considered a source of stress. These events not only include positive ones, such as those that bring happy emotions and positive emotional experiences, but also negative ones, such as negative life events.⁽⁴⁾ Negative life events refer to the changes that individuals experience in social life that can trigger negative emotional experiences, such as family, work, study, and other troubles. They can bring negative emotions such as anxiety, depression, and anxiety, which have a negative impact on cognition and behavior, leading to a tendency towards negative emotional development. Since the concept of "stress" was introduced into psychology, negative life events as a common source of psychological and social stress have become a focus of research by scholars.

The definition of depression

Depression is a common mental health problem characterized by low mood, decreased interest, and in severe cases, suicidal ideation, posing a threat to human physical and mental health. Depression originates from Latin and refers to an individual's poor emotional response to harsh situations, often considered a symptom of low mood. Depression is considered an unpleasant negative emotional state, characterized by symptoms such as low mood, delayed thinking, and decreased energy. Long term persistence may lead to psychological disorders.⁽⁵⁾ Scholars have described depression as "decadence" and "lack of goals", which often leads to individuals feeling depressed, irritable, and continuously feeling low, posing a serious threat to health.⁽⁶⁾ Different scholars have defined depression as highlighting its negative emotional state and adverse consequences. This study suggests that depression often accompanies symptoms such as low mood, delayed thinking, and decreased energy, and in severe cases, it can harm mental health.

Definition of negative life events

With the development of technology, "technology addiction", especially "mobile phone addiction", has attracted much attention. Mobile phone addiction manifests as excessive dependence on the phone, feeling uneasy and irritable when the phone is not present, affecting normal life,⁽⁷⁾ and even leading to the individual's physiological and psychological functions being affected, resulting in uncontrollable behavior, namely mobile phone dependence.⁽⁸⁾

Early research focused mainly on mobile phones, but with the popularity of smartphones, the focus of research has shifted towards smartphone addiction.⁽⁹⁾ There are two explanations for mobile phone dependence: one is perceived as behavioral addiction,⁽¹⁰⁾ similar to impulse control disorders. The second is to consider bad behavior habits.⁽¹¹⁾ This study adopts the former viewpoint, believing that mobile phone dependence is similar to pathological gambling and can cause damage to an individual's physiological and psychological functions.

Analysis of the influencing factors of three negative sexual activities on mobile phone addiction among college students: depressive factors

Research object

This study is based on the data collected by the research group in the early stage. Cluster sampling method was used to conduct a questionnaire survey on a certain university from September 2020 to March 2022 for a period of two years and three consecutive times. A total of 4486 college students (2324 males and 2162 females, with an average age of 18.63 years) were selected as valid participants. All investigation procedures of the study comply with the ethical requirements and norms of scientific research.

| Demographic variables | Level | Number | Percentage (%) |
|--------------------------|---|--------|----------------|
| Gender | Male | 2324 | 51,80 |
| | Female | 2162 | 48,20 |
| Only child or not | Yes | 962 | 21,45 |
| | No | 3524 | 78,55 |
| Place of residence | City | 1592 | 35,49 |
| | County | 628 | 14,00 |
| | Township | 911 | 20,31 |
| | Village | 1355 | 30,21 |
| Family economic level | Very poor | 102 | 2,28 |
| | Poor | 885 | 19,77 |
| | Medium | 338 | 7,53 |
| | Good | 2761 | 61,56 |
| | Very good | 401 | 9,00 |
| Father's education level | Primary school or below | 767 | 17,10 |
| | Junior high school | 1962 | 43,74 |
| | High school or technical secondary school | 1082 | 24,12 |
| | College degree or above | 676 | 15,07 |
| Mother's education level | Primary school or below | 1331 | 29,67 |
| | Junior high school | 1817 | 40,51 |
| | High school or technical secondary school | 901 | 20,09 |
| | College degree or above | 438 | 9,76 |

Research tools

The research tool of this study consists of several parts: personal basic information, a self-designed version of the Self Rating Life Event Scale, a simplified version of the Self Control Scale, a depression symptom screening scale, and a nine item mobile phone obstacle scale.

The main content is as follows:

1. Self rated Life Event Scale: adapted from the Adolescent Self rated Life Event Scale, 10 commonly occurring negative life events among college students were selected.⁽¹²⁾ The revised scale does not have reverse scoring, and all items are scored by changing from 1 (not occurred or had no impact) to 5 (extremely influential) to 0-4 levels (i.e. 5 becomes 4, 4 becomes 3). After changing the scoring, all items are added together, and the higher the score, the greater the impact of negative life events. This scale has no boundary score. Exploratory factor analysis and confirmatory factor analysis were conducted on all items, and the results showed that the loadings of all items ranged from 0,43 to 0,90, and the model fit was acceptable ($\chi^2/df=10,624$), CFI=0,960, TLI=0,948, RMSEA=0,059, SRMR=0,034). For large samples ($n>1000$), The χ^2 value is often large, and as long as multiple indicators are good, it can be considered acceptable to the model to a certain extent. In this study, the Cronbach alpha coefficient was 0,82.
2. Depression Symptom Screening Scale: assesses the depressive mood of college students within 2 weeks. This scale has a total of 9 items.⁽¹³⁾ Using a 0-3 level scoring system, ranging from 0 representing "not at all" to 3 representing "almost every day", with no contraindications, the higher the total score, the more severe the depressive symptoms. In this study, the Cronbach alpha coefficient was 0,81.
3. The Nine Point Mobile Phone Disability Scale: it is based on the nine core standards for mobile phone disabilities in DSM-5. This scale assesses the symptoms and prevalence of mobile phone disorders in the general population by examining online or offline gaming activities that occur over a period of 12 months. Including 9 items, scored on levels 1-5, with no negative items. The total score is obtained by adding up all items, with a range of 9-45. The higher the score, the more severe the addiction to online games. The critical value used in this study is 21 points, which has been validated in the context of Chinese culture.⁽¹⁴⁾ In this study, the Cronbach alpha coefficient was 0,93.

Research results

To control for common method bias, this study used Harman's univariate test to conduct factor analysis on negative life events, depression, and mobile phone addiction data. The results showed that there were 7 factors with eigenvalues greater than 1, and the first unrotated factor only explained 22,27 % of the total variation, far below the critical value of 40 %. This indicates that this study was not affected by severe common method bias, confirming the scientific validity of the research method and the accuracy of the data.

1. The overall situation of negative life events, depression, and mobile phone addiction:
 - Descriptive statistics were conducted on three variables: negative life events, depression, and mobile phone addiction, in order to provide a clear understanding of the overall situation. The results are shown in table 2:

Table 2. Descriptive statistics of negative life events, depression, and mobile phone addiction

| Variable | Items | M | SD | Min | Max |
|------------------------|-------|-------|------|-----|-----|
| Negative life events | 10 | 7,60 | 6,43 | 0 | 40 |
| Depressed | 9 | 4,87 | 4,11 | 0 | 27 |
| Mobile phone addiction | 9 | 12,14 | 4,99 | 9 | 45 |

2. Detection of mobile phone addiction among college students:
 - This study analyzed the demographic information of the participants in detail and conducted an in-depth examination of their addiction to mobile phones. A boundary of 21 points was drawn between mobile phone addicts and non addicts. The results show that 6,42 % of college students have a mobile phone addiction. In addition, this study also explored the differences in negative life events, depression, and demographic variables among addicts, as shown in table 3 and table 4:

Table 3. Detection of mobile phone addiction among college students

| Variables | Group | Number of Participants | Mobile Phone Addiction | | X ² /t | p |
|-----------------------|-----------------|------------------------|------------------------|--------------|-------------------|--------|
| | | | Non-addicted (%) | Addicted (%) | | |
| Gender | | 4486 | | | | |
| | Male | 2324 | 2119 (91,19) | 205 (8,81) | | |
| | Female | 2162 | 2079 (96,15) | 83 (3,85) | | |
| BMI, M(SD) | | 20,58 (4,16) | 20,54 (4,14) | 21,19 (4,34) | 2,86 | 0,004 |
| Family Economic Level | | 4486 | | | 35,93 | <0,001 |
| | Very Poor | 102 | 92 (89,84) | 10 (10,16) | | |
| | Poor | 885 | 802 (90,69) | 83 (9,31) | | |
| | Medium | 338 | 327 (94,73) | 11 (5,27) | | |
| | Relatively Good | 2761 | 2503 (94,73) | 145 (5,27) | | |
| | Very Good | 401 | 383 (95,61) | 17 (4,39) | | |

Table 4. Differential detection of mobile phone addiction behavior

| Variable | Mobile Phone Addiction (M±SD) | | t |
|----------------------|-------------------------------|-------------|----------|
| | NO (N=4197) | Yes (N=289) | |
| Negative life events | 7,39±6,32 | 10,29±7,00 | 7,61*** |
| Depression | 4,64±3,96 | 7,98±4,63 | 13,32*** |

Note: *p<0,05, **p<0,01, ***p<0,001

As shown in table 4, college students with mobile phone addiction experienced negative life events ($t(400,21)=7,61, p<0,001$). The scores of depression ($t(395,95)=13,32, p<0,001$) were significantly higher than those of non-mobile phone addicts.

3. Demographic differences in negative life events, depression, and mobile phone addiction:
- Gender differences in negative life events, depression, and mobile phone addiction: independent sample t-test was used to statistically analyze the gender differences in negative life events, depression, and mobile game addiction. The results are shown in table 5.

| Variable | Gender (M±SD) | | t |
|------------------------|---------------|-----------------|----------|
| | Male (N=2324) | Female (N=2462) | |
| Negative life events | 7,50±6,37 | 7,66±6,45 | -0,93 |
| Depression | 4,38±3,98 | 5,36±4,13 | -9,07*** |
| Mobile Phone Addiction | 13,96±5,55 | 11,21±4,06 | 1349*** |

Gender factors have a significant impact on depression and mobile phone addiction among college students. According to research data, in terms of depressive symptoms ($t(5606)=-9,07, p<0,001$). The overall score of female college students is significantly higher than that of males. In terms of mobile phone addiction tendency ($t(5314,72)=13,49, p<0,001$). The overall score of male college students is significantly higher than that of females. It is worth noting that in terms of negative life events ($t(5606)=-0,93, p=0,35$). There was no significant difference between male and female college students. These findings reveal the complexity and differences of gender in mental health issues.

- Differences in negative life events, depression, and mobile phone addiction in family economic levels: single factor analysis of variance was used to statistically analyze the differences in negative life events, depression, and mobile phone addiction in family economic levels. The results are shown in table 6.

| Variable | Family Economic Level | | |
|--------------------------|-----------------------|---------------------|------------------------|
| | Negative life events | Depression | Mobile Phone Addiction |
| Very Poor (N=102) | 10,07±6,83 | 5,37±4,93 | 13,30±6,20 |
| Poor (N=885) | 9,29±6,82 | 5,59±4,32 | 13,00±5,82 |
| Medium (N=338) | 7,67±6,48 | 5,20±4,12 | 12,81±5,82 |
| Relatively Good (N=2761) | 7,19±6,27 | 4,74±4,00 | 11,84±4,56 |
| Very Good (N=401) | 6,11±5,64 | 3,91±3,95 | 11,57±4,49 |
| F | 35,14*** | 17,72*** | 16,86*** |
| Post Hoc Comparison | 1, 2>3, 4>5 | 2,3>4, 1, 2, 3, 4>5 | 1, 2, 3>4, 5 |

Note: * $p<0,05$, ** $p<0,01$, *** $p<0,001$

As shown in table 6, the household economic level is at a negative life event of 0 ($F(45603)=35,14, p<0,001$). Depression ($F(45603)=11,72, p<0,001$). Mobile phone addiction ($F(45603)=16,86$). The difference is significant ($p<0,001$).

After detailed post hoc comparative analysis, this study found a complex relationship between family economic status and individual experiences of negative life events, depression level, self-control ability, and mobile phone addiction level. Specifically, compared to individuals with excellent family economic conditions, individuals with moderate to slightly better economic levels experience more setbacks and misfortunes and those individuals who face extremely difficult and relatively difficult economic conditions experience far greater difficulties than those with moderate and slightly better economic levels. In terms of depression level, individuals with poor and moderate economic conditions exhibit a higher tendency towards depression than those with slightly better economic conditions. At the same time, compared to individuals with excellent economic conditions, individuals with all other economic levels show higher levels of depression.

In terms of self-control, individuals with extremely difficult economic conditions exhibit stronger self-restraint abilities than those with moderate economic levels individuals with excellent economic conditions perform better in this regard than those with slightly better economic conditions. It is worth noting that individuals with slightly better economic performance perform better in self-control than those with poorer and moderate economic performance. In addition, individuals with very poor, relatively poor, and moderate

economic conditions exhibit a higher degree of dependence on mobile phone addiction compared to those with slightly better and better economic conditions. These findings reveal the profound impact of family economic conditions on individual mental health and behavioral habits.

4. Correlation analysis of negative life events, depression, and mobile phone addiction: pearson correlation analysis was conducted on negative life events, depression, and mobile phone addiction among college students, and the results are shown in table 7:

Table 7. Analysis of negative life events, depression, and mobile phone addiction

| | M±SD | 1 | 2 | 3 | 4 |
|---------------------------|------------|----------|----------|-----------|---|
| T1 Negative life events | 7,59±6,42 | 1 | | | |
| T2 Depressed | 4,86±4,10 | *** | 1 | | |
| T3 Mobile phone addiction | 12,13±4,98 | 0,161*** | 0,284*** | -0,411*** | 1 |

Note: *p<0,05, **p<0,01, ***p<0,001

The results indicate a significant correlation between negative life events, depression and mobile phone addiction. There is a significant positive correlation (p<0,001) between negative life events and depression and mobile phone addiction. There is a significant positive correlation between depression and mobile phone addiction (p<0,001).

Analysis of the mediating role of depression between negative life events and mobile phone addiction

The mediation model was tested using the SPSS macro program process developed by Hayes, with Model 4 repeated sampling of 500000 times and a 95 % confidence interval, controlling for gender BMI. The results of the three variables of household economic level are shown in figure 1 and table 8.

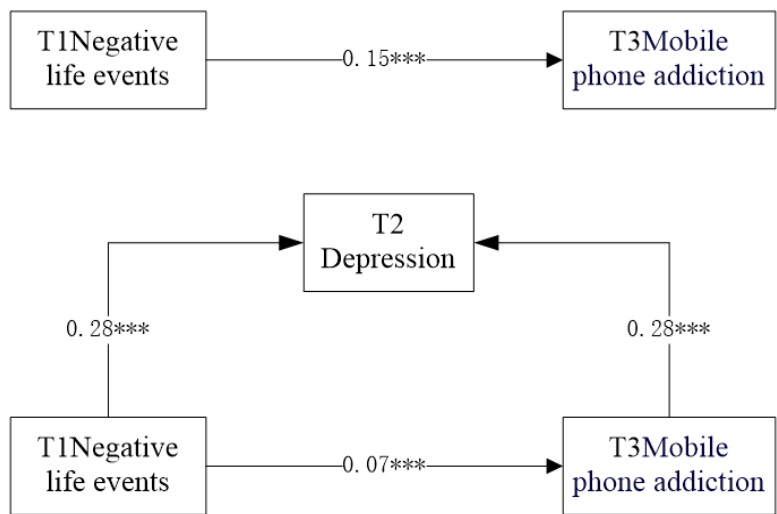


Figure 1. The mediating role of depression

Table 8. Regression analysis of various variables in the mediation model

| Outcome variables | Predictive variables | R2 | F | B | t |
|---------------------------|-------------------------|------|-----------|------|----------|
| T3 Mobile phone addiction | T1 Negative life events | 0,06 | 91,50*** | 0,15 | 11,55*** |
| T2 Depression | T1 Negative life events | 0,10 | 158,93*** | 0,28 | 21,56*** |
| T3 Mobile phone addiction | T1 Negative life events | 0,13 | 169,34*** | 0,07 | 5,65*** |
| | T2 Depression | | | 0,28 | 21,24*** |

Note: *p<0,05, **p<0,01, ***p<0,001

According to table 8, it can be seen that:

- After controlling gender BMI: after analyzing the family economic level variable, mobile phone addiction was taken as the dependent variable, and negative life events and depression were taken as independent variables. It was found that negative life events (p<0,001) and depression (p<0,001) had a significant predictive effect on mobile phone addiction.

- After controlling gender BMI: after analyzing the family economic level variable, depression was taken as the dependent variable and negative life events were taken as the independent variable. It was found that negative life events ($p < 0,001$) can significantly predict depression. Further analysis was conducted using the Bootstrap method, and the test results are shown in table 9.

| Effect | Effect value | Boot standard error | 95 % CI | Relative effect value |
|-----------------|--------------|---------------------|--------------|-----------------------|
| Direct effect | 0,07 | 0,01 | [0,05, 0,10] | 46,67 % |
| Indirect effect | 0,08 | 0,01 | [0,07, 0,09] | 53,33 % |
| Total effect | 0,15 | 0,01 | [0,13, 0,18] | |

As shown in table 9, the mediating effect value of depression between negative life events and mobile phone addiction is 0,08, with a 95 % confidence interval of [0,07, 0,09] (excluding 0). Therefore, depression partially mediates the relationship between negative life events and mobile phone addiction.

DISCUSSIONS

The research results indicate that the average score for negative life events is 7,60 ($SD=6,43$), the average score for depression is 4,87 ($SD=4,11$), and the average score for mobile phone addiction is 12,14 ($SD=4,99$). These results indicate that there is a certain degree of negative life events, depression, and mobile phone addiction among the surveyed college student population. Depression plays a partial mediating role between negative life events and mobile phone addiction. This means that negative life events not only directly affect mobile phone addiction, but also indirectly affect mobile phone addiction through depression as a mediating variable. This discovery provides a new perspective for understanding the formation mechanism of mobile phone addiction and emphasizes the importance of considering negative life events and depression factors in intervention measures.

The Direct Relationship between Negative Life Events and Mobile Phone Addiction among College Students

This study reveals a close link between the negative life events experienced by college students and their addiction to mobile phones. Through in-depth exploration of vast time series data, this study explores in detail how negative life events can shape the long-term mobile phone dependence behavior of college students, and further reveals the potential mediating and regulatory mechanisms involved. The research results show that negative life events have a significant predictive effect on future mobile phone addiction, which is consistent with previous studies based on cross-sectional data. The research results further confirm the compensatory Internet use theory, that is, individuals may be more inclined to overuse mobile phones as an escape or coping strategy when facing psychosocial difficulties. In other words, the degree of mobile phone addiction among college students is directly proportional to the severity of negative life events they experience in their early years. This discovery not only has innovative significance in the field of mobile phone use, but also expands our understanding of the long-term evolution of internet related addictive behaviors. Previous studies have hinted at a potential link between stress and smartphone addiction. Unlike previous studies that only focused on a single risk factor, this study views negative life events as a comprehensive stressor that gathers risk factors from multiple fields, thus more realistically reflecting the multiple challenges faced by college students in real life. Similar to games often used as a means of escaping real-life difficulties, college students who have experienced negative life events tend to seek ways to alleviate stress and pain. In this process, mobile phones stand out as the first choice for college students due to their convenience, interactivity, sociability, entertainment, and immersive experience. Immersing oneself in the virtual world of a mobile phone for a long time, seeking happiness and avoiding reality, may ultimately lead to addictive behavior on the phone that cannot be extricated.

The mediating role of depression between negative life events and mobile phone addiction

This study reveals that depression plays a partially transmitted role in the long-term relationship between negative life events and online gaming addiction. Specifically, negative life events can enhance a tendency towards depression, while depressive states can further promote an individual's dependence on mobile phones. Depression, a common psychological disorder among college students, is deeply shaped by past negative life experiences. The more severe the negative life events encountered in the early stage, the deeper the subsequent depression will become. These negative life events, as the source of psychological pressure, can reduce an individual's psychological satisfaction, increase mental pain, and pose a serious threat to their mental health. In addition, as negative life events continue to accumulate, they will induce college students

to adopt more negative coping strategies, which not only amplifies the adverse effects of stress, but also significantly increases the risk of falling into depression.

The level of individual depression plays a crucial role in the formation and persistence of online gaming addiction. The more significant the symptoms of depression, the deeper the individual's dependence on mobile phones. It is worth noting that among the various manifestations of mobile phone addiction, "avoiding negative emotions such as tension, sadness, and anger" has become a core element closely related to depression. In other words, individuals who suffer from both online gaming addiction and depression may use online gaming to avoid negative emotions triggered by negative life events. In addition, the internet not only provides a space for escape, but also has the function of venting. The stimulation and pleasure brought by the internet can help individuals release negative emotions, thereby alleviating depressive states. However, this emotional release is often accompanied by excessive dependence on the internet. The worse the emotional state, the longer an individual desires to stay in the online world, which in turn exacerbates the risk of smartphone addiction.

On this basis, a detailed investigation was conducted on the mediating effect of depression. The research results show that in a broader time dimension, negative life events are not only directly associated with mobile phone addiction, but can also indirectly promote the formation of online game addiction by triggering depressive emotions. This discovery is consistent with previous related studies, confirming the crucial role of depression in driving individuals to form non adaptive network behaviors. Meanwhile, depression also serves as a point of tolerance for negative life events, building a bridge between the two and revealing the underlying mechanisms of their connection. When individuals encounter negative life events, they often trigger negative thinking patterns, which in turn trigger more depressive symptoms. In this situation, mobile phones have become a tool for dealing with negative emotions, and their use is negatively reinforced, making individuals more likely to fall into the vortex of mobile phone addiction. This phenomenon indicates that in exploring how negative life events affect mobile phone addiction, we must attach great importance to the role of emotional coping strategies.

This study empirically analyzed and verified the mediating effect of depression on the relationship between negative life events and mobile phone addiction among college students, revealing the boosting effect of emotional factors between external risks and negative behavior. In future research or psychological intervention work, continuous attention should be paid to the multiple stress environments and negative emotional states faced by college students, and corresponding measures should be taken when necessary to effectively maintain the mental health of college students.

Education Strategies and Suggestions

Firstly, approach negative life events with a calm and rational perspective, and adopt appropriate ways to handle stress. During the growth process, college students need to improve their ability to cope with complex pressures and face challenges more maturely. Therefore, schools and teachers need to closely monitor the psychological changes of students, guide them to establish a scientific "stress view" through lectures, group counseling, and other methods, improve their skills in coping with stress, and cultivate their problem-solving thinking as the core. This not only eliminates sources of stress, but also ensures the mental health of students. At the same time, students themselves should bravely face the pressure of life and study, and set goals based on actual situations. They need to learn and apply effective stress relief strategies, such as appropriate physical exercise and regular sleep, to build a solid psychological defense line. This not only relieves personal stress, but also reduces negative behaviors caused by excessive stress, thereby maintaining a good psychological state. Through these efforts, we can better protect the mental health of college students and help them grow smoothly.

Secondly, reshape emotional management abilities and reform individual psychological situations. In depth research has found that emotional distress is often a key factor in triggering individual behavioral problems. Therefore, higher education institutions need to attach great importance to the mental health of college students, promote deeper interaction between teachers and students, track students' emotional states in real time, popularize professional knowledge of emotional management, focus on cultivating students' emotional regulation skills, and thereby strengthen their psychological quality. At the same time, actively implementing psychological intervention strategies, such as personalized psychotherapy, collective skill training, etc., to correct psychological cognitive biases, enhance students' emotional management abilities, and guide them to adopt positive emotional regulation methods to achieve effective adjustment of emotional states. On an individual level, one should keenly identify and bravely face negative emotions, and use some empirical and effective emotional relief methods, such as listening to music, exercising, traveling to relax, and talking to friends, to guide and release emotions in a reasonable way, improve one's ability to manage emotions, prevent falling into the "abyss" of emotions, and thus reform one's psychological situation.

Thirdly, reshape self-management abilities and establish clear life pursuits. The research results show that excellent self-management ability of individuals has a significant moderating effect on excessive use of mobile phones, which can reduce the impact of risk factors on mobile phone dependence. Therefore, schools can

consider enhancing self-management skills as a key point in preventing and improving non adaptive behaviors. The use of psychological intervention strategies, such as mindfulness meditation, which has been proven to significantly enhance individual self-management abilities, or the design of targeted self-management training programs to optimize thinking patterns and cognitive styles, enhance confidence and effectiveness in self-management, thereby significantly enhancing the self-management abilities of college students. At the same time, students can actively explore ways to enhance their self-management abilities, such as learning to plan their time and schedule reasonably, paying attention to their task execution ability and reflecting and summarizing, or using time management applications to assist in achieving high-quality self-management.

Fourthly, enrich college life and use mobile phones correctly. In the wave of the information age, college students not only enjoy the convenience brought by advanced network technology, but also often face its temptation. Especially when a large amount of time is occupied by mobile phones, the hidden dangers of mobile phone addiction become increasingly prominent. In view of this, higher education institutions urgently need to strengthen their guidance for students and help them build clear career and learning plans. Through diverse extracurricular activities, broaden students' horizons and thinking, enrich their life experiences, and enhance their knowledge and skills. At the same time, we advocate for students to grasp a good pace of life, efficiently use their spare time, and reduce excessive reliance on mobile phones, making college life more colorful, fulfilling, and meaningful.

CONCLUSIONS

This study delves into the impact mechanism of negative life events on mobile phone addiction among college students, including the mediating role of depression. Three consecutive questionnaire surveys were conducted on college students from a certain university through longitudinal research, with a valid sample of 5608 people. The research results show that there is a significant positive correlation between negative life events and mobile phone addiction among college students, and this relationship is mediated by depression. Specifically, negative life events not only directly increase the risk of mobile phone addiction, but also indirectly promote the formation of mobile phone addiction by increasing an individual's level of depression. In addition, the study also found that gender BMI and family economic level play important roles in the occurrence of mobile phone addiction.

This study further confirms the view that negative life events are an important risk factor for mobile phone addiction, and reveals the mediating role of depression in it, providing new ideas for the theoretical construction of mobile phone addiction. The research results provide scientific basis for mental health workers to develop targeted long-term intervention plans, which can help reduce the incidence of mobile phone addiction among college students and promote their physical and mental health development.

Future research can expand and deepen the impact of negative life events on mobile phone addiction among college students from multiple dimensions. Firstly, by expanding the sample size and geographical scope of the study, we can more comprehensively understand the general impact of negative life events on mobile phone addiction among college students. Secondly, more complex statistical methods and techniques can be used to deeply analyze the specific pathways and mechanisms between negative life events and mobile phone addiction, as well as the role of mediating factors such as depression. Furthermore, based on current research findings, future research can conduct targeted intervention studies to explore effective intervention methods and strategies to reduce the incidence of mobile phone addiction among college students. These studies can comprehensively consider multiple levels such as individuals, schools, and families to form comprehensive intervention plans. Finally, it is necessary to pay attention to other potential influencing factors besides negative life events and depression and explore their relationship and mechanism of action with mobile phone addiction, in order to form a more comprehensive and in-depth understanding.

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