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RELATIONSHIP BETWEEN CHILDHOOD PHYSICAL ABUSE, NEGLECT AND ALEXITHYMIA AND MOBILE PHONE ADDICTION IN ADOLESCENTS

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SUMMARY

Background: *The popularity of smart phones not only brings great convenience to people's lives, but also makes people more dependent on them. This study aims to explore the causes of mobile phone addiction in adolescents and clarify its correlation with childhood abuse, neglect, and alexithymia.*

Subjects and methods: *A total of 684 middle school students from Jingzhou City in China were selected as research participants to investigate the degree of childhood psychological abuse, neglect and alexithymia by using the "Child Psychological Abuse and Neglect Scale (CPANS)," "Mobile Phone Addiction Tendency Scale (MPATS)," and "Toronto Alexithymia Scale (TAS)". According to survey results of mobile phone addiction, they were divided into the tendency group and the control group.*

Results: *Students in the tendency group have shown higher scores in the dimensions of psychological abuse (scolding, intimidation and interference), neglect (emotional, education, physical/supervisory), compared to the control group. The total scores of psychological abuse and neglect were positively related to the total score of mobile phone addiction tendency. Students in the tendency group have shown higher scores in emotion identification difficulty, emotion description difficulty, extroversion thinking, and total scores of alexithymia than those of control group. The total score of alexithymia was positively related to the total score of mobile phone addiction tendency. Regression analysis has shown that childhood psychological abuse and neglect could significantly predict the mobile phone addiction status in students. Alexithymia could also significantly predict the mobile phone addiction status among the student sample.*

Conclusion: *Childhood abuse, neglect, and alexithymia were positively related to mobile phone addiction, and all of them had a significant regression-based predictive role regarding the mobile phone addiction in adolescents.*

Key words: *alexithymia - psychological abuse – neglect - mobile phone addiction - adolescents*

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INTRODUCTION

The arrival of smart phones has greatly changed the way of life of modern people, wherein communication was no longer the only function of mobile phones. The Internet, social networking, games, shopping, and mobile payment have become common functions of mobile phones. Smart phones not only bring great convenience to people's lives, but also make people more dependent on them. Using mobile phones for a long time, radiation from electronic devices and keeping a fixed posture for a long time will cause damage to eyes and cervical vertebra, thus causing headache, fatigue, impaired attention, sleep quality loss, hearing loss, and other problems. In addition, excessive addiction to mobile phones made it easy to separate people from society, resulting in loneliness, depression, and other poor psychological problems (Gz et al. 2020). Among various adverse effects of excessive use of mobile phones, mobile phone addiction tendency has received further attention in the field of psychology.

In recent years, mobile phone addiction has become a new social problem, in which adolescents are one of main groups of mobile phone users, and the tendency of mobile phone addiction is more common among adolescents. Because the mental development of adolescents is not sound, the harm caused by mobile phone addition is often more serious (Augner et al. 2021). A South Korean report determined that (Shahjehan et al. 2021) the number of adolescents addicted to smart phones accounted for 11% of the total population, while 2% of them have their daily life seriously affected. A report from European countries revealed that (Aydin et al. 2011) 72% of adolescents aged 9 to 16 expressed psychological pressure when contacting others after using smart phones, while 50% of them expressed anxiety when they could not use mobile phones. Zheng et al. (2014) investigated mobile phone addiction in middle school students in accordance with the mobile phone dependence scale, which indicated that 22% of them had a tendency to rely on mobile phones.

The research on mobile phone addiction is short and most of them are theoretical, in which few research evidence exists. Related studies mainly focus on the analysis of individual factors of mobile phone addiction, paying less attention to social environment and growth environment of individuals, and most of them are univariate studies, and few of them are multivariate studies. From the perspective of addiction relationship, this study focuses on the relationship between the individual environmental factors and mobile phone addiction, namely, analyzing the mobile phone addiction of adolescents, tracing the home environment characteristics of mobile phone addiction, and determining the deep reasons of mobile phone addiction in adolescents from the per-

spective of neglect experiences in childhood, psychological abuse, and alexithymia to arouse the attention of the family to adolescents and provide theoretical support for the intervention of mobile phone addiction.

Psychologists and scholars have given various explanations for the diagnosis of mobile phone addiction tendency, but no unified diagnostic standard has been observed now, and there is no standard disease classification system including it in the category of psychological disorders. Mobile phone addiction is also known as mobile phone anxiety disorder or mobile phone dependence syndrome. Sung (2008) defined it as an obsession state where individuals have significantly impaired physical, psychological or social functions resulting from out-of-control mobile phone use, and its essence is obsessive-compulsive disorder. Serotonin in mobile phone addicts is in an unbalanced state, in which they may have physiological symptoms, such as dizziness, palpitations, dry eyes, and gastrointestinal dysfunction (Lapierre et al. 2019). Choliz (2010) believed that mobile phone addicts rely not on the phone itself, but on on playing games, taking photos, surfing the Internet, social networking, and other functions, which causes individual pain and endanger their life and mental health. Existing studies generally refer to the diagnostic criteria of behavioral addiction and combine the negative effects of excessive use of mobile phones to develop the mobile phone addiction tendency scale (Hong et al. 2012). Although controversies in academic circles about the judgment of mobile phone addiction were observed, it has been agreed that the main criteria of mobile phone addiction are improved tolerance of mobile phones, a series of withdrawal symptoms due to absence of mobile phone, and damage caused by uncontrolled use of mobile phone to individual physical and mental health and social ability. As for research on the influencing factors of mobile phone addiction, previous studies mainly analyzed it from the three dimensions of individual, family and society. Kim & Kang (2017) used female college students as investigation objects and analyzed the relationship between attitudes of their parents perceived by them, and found that the tendency of dependence on mobile phones overprotected by their mothers was significantly higher than those patients who are less protected by their mothers. Barnes et al. (2019) found that the relationship of individuals in childhood with his or her mother can accurately predict the tendency of mobile phone addiction. High care and overprotection of mothers for their children can easily increase their sensitivity to loneliness in adulthood, which helps in increasing their tendency to rely on mobile phones. Psychologists determined that more attention should be paid to psychological abuse of children because it can cause serious obstacles to the growth of individuals and hinder the development of individuals in terms of physical, psychological, emotional, and other aspects. Zhang et al. (2018) stated some parenting methods may lead to passive neglect or active emotional abuse of infants and young children, and the psychological abuse and neglect of children may be an alternative expression of family education. The so-called psychological abuse and neglect mainly refers to behaviors that may cause negative consequences to the psychological, behavioral, and emotional development of children, such as humiliation, rejection, Isolation, intimidation, deprivation, indifference, and so on. Strathearn et al. (2020) believed that those children with higher scores in psychological abuse and neglect had higher scores in parental punishment, severity, excessive interference, protection, rejection, and other aspects, indicating that excessive control or protection of children or an excessive laissez-faire parenting style may make children be psychologically abused or neglected. Psychological abuse and neglect experience in childhood can reduce self-esteem of individuals and make them more likely to develop interpersonal-related problems in adulthood. A large number of studies have confirmed that (Fortier et al. 2020, Bhatia et al. 2020) psychological abuse and neglect in childhood will have adverse effects on their mental health, increase their loneliness and affect their self-consciousness development. Previous studies have shown that (Chen et al. 2019) low self-esteem, self-consciousness, and loneliness are all predictors of mobile phone addiction tendencies.

Therefore, it is speculated that a relationship between psychological abuse and neglect in childhood and mobile phone addiction tendency in adolescents may have been observed. Existing reports show that the frequency and intensity of psychological abuse and neglect in childhood are relatively high, but there is little public attention to it. In addition, psychological abuse and neglect have characteristics of “no pain” and “no serious consequences” themselves, which leads to people’s neglect of this problem. Therefore, there are few available references on relationship between mobile phone addiction in adolescents and psychological abuse and neglect in childhood. In this study, it attempts to determine the relationship between mobile phone addiction in adolescents and childhood experience, clarify the influence of psychological abuse and neglect in childhood on mobile phone addiction, and analyze the regulating effect of emotional disorders during this process, to provide useful references for the intervention of mobile phone addiction tendency.

SUBJECTS AND METHODS

Participants

A total of 684 students from three middle schools in Jingzhou City in China were selected as research objects through group random sampling, that is, five classes were randomly selected from each school as a sample. The research was implemented from March 2018 to August 2018, in which there were 287 boys and 397 girls, aged 12 to 18, with an average age of (15.6±2.8). Among them, 98 junior students Grade One, 102 junior students Grade Two, 146 junior students Grade Three, 120 senior students Grade One, 118 senior students Grade Two and 100 senior students Grade Three. There were 335 only children and 349 non-only children.

Methods and procedure

The subjects were provided with questionnaires and were tested in class as a unit, who were required to answer truthfully according to their actual situation and feelings. The questionnaire will be returned on the spot. A total of 700 questionnaires were distributed, and 684 valid questionnaires were obtained with an effective recovery rate of 97.71% after removed some questionnaires with a large number of questions unfilled.

The questionnaire included "Mobile Phone Addiction Tendency Scale (MPATS)", "Child Psychological Abuse and Neglect Scale (CPANS)", and "Toronto Alexithymia Scale (TAS)". (a) "Mobile Phone Addiction Tendency Scale" is adopted from the "Internet Addiction Tendency Scale" (Kurokawa et al. 2018), which has good reliability and validity. The scale consists of 16 items in four dimensions of social comfort, sudden dominance, withdrawal symptoms and mood change. The answers of each item ranged from "very inconsistent" (1 point) to "very consistent" (5 points). The higher the score is, the higher the mobile phone addiction tendency would be, if the score is ≥ 48, it can confirm the student has mobile phone addiction tendency. (b) "Child Psychological Abuse and Neglect Scale (CPANS)" was compiled based on the reference of relevant theoretical research on psychological abuse and neglect. The scale contains two sub-scales: psychological abuse scale and neglect scale. The psychological abuse scale comprised 14 items in three dimensions of interference, intimidation, and scolding, while the neglect scale comprised 17 items in three dimensions of physical/supervisory neglect, educational neglect, and emotional neglect. A five-level scoring method (0-4 points) was adopted, and the final score of each sub-scale was taken from the average of total score of each item, in which the higher the score was, the more obvious the psychological abuse/neglect was. The score of psychological abuse scale ≥ 1 point was regarded as the existence of psychological abuse, and the score of neglect scale ≥ 1 point was regarded as the existence of neglect. Some scholars (Pan et al. 2010) investigated the reliability and validity of this scale in adolescents, and results show that this scale had good reliability and validity in adolescents. (c) "Toronto Alexithymia Scale" (TAS) (Parker et al. 1993) was compiled and revised by Taylor, with a retest reliability of 0.88 and validity of 0.84 for adolescents, which indicated good reliability and validity. The scale comprised 20 items from three dimensions in emotion identification difficulty, emotion description difficulty, and extroversion thinking. Each item ranged from 1 ("completely disagree") to 5 ("completely agree"). The higher the score was, the more serious the alexithymia was.

According to the survey results of "Mobile Phone Addiction Tendency Scale", the subjects with a total score≥48 were included in the tendency group, and those subjects with a total score < 48 were included in the control group. The results of "Child Psychological Abuse and Neglect Scale" and "Toronto Alexithymia Scale" were compared and analyzed in the two groups. A multiple linear regression analysis was performed using a Logistic model taking mobile phone addiction tendency as the dependence variable, scores of psychological abuse, neglect, and alexithymia as independent variables.

Statistical analysis

The data were analyzed and processed using SPSS20.0. The enumeration data (cases (%)) were evaluated by conducting a χ^2-test. The measurement data ($\bar{x} \pm s$) were evaluated by conducting a t-test. Spearman analysis and stepwise regression analysis were performed on the correlation of variables. $P<0.05$ indicates a significant effect.

RESULTS

Comparison of psychological abuse and neglect scores in childhood of two groups

Among 684 subjects, 205 of them scored ≥ 48 in mobile addiction tendency, accounting for 29.97%, who were included in the tendency group, while 479 of them scored < 48 in mobile addiction tendency, who were included in the control group. The scores obtained by the tendency group for scolding, intimidation, interference of psychological abuse, emotional neglect, education neglect, physical/supervisory neglect of neglect scale, emotion identification difficulty, emotion description difficulty and extroversion thinking of alexithymia, and the scales were significantly higher than those obtained by the control group ($P<0.05$). Results are shown in Table 1.

Correlation between scores of mobile phone addiction tendency and scores of psychological abuse, neglect, and alexithymia during childhood

A correlation analysis has shown that the total scores of psychological abuse, neglect and alexithymia were all positively correlated with total scores of mobile phone addiction tendency (P<0.05). No significant correlation between physical/supervisory neglect and scores for each dimension and total scores of mobile phone addiction tendency was observed. The scores for each dimension of psychological abuse and neglect and alexithymia were positively correlated with scores for each dimension and total scores of mobile phone addiction tendency (P<0.05). Results are shown in Table 2.

Regression analysis of alexithymia and mobile phone addiction tendency

The uniary linear regression analysis was performed first by taking the total scores of psychological abuse and neglect as independent variables and whether there was mobile phone addiction tendency as dependent variables. Results show that psychological abuse and neglect in childhood can significantly predict mobile addiction in college students (Beta=0.433, P=0.000), while the determination coefficient R^2=0.178, indicating that psychological abuse and neglect in childhood can explain 17.8% of variation of mobile phone addiction in college students (F=65.321, P=0.000).

Table 1. Comparison of psychological abuse and neglect scores in childhood of two groups ($\bar{x} \pm s$, scores)

Item	Tendency group (n=205)	Control group (n=479)	t	P
Psychological abuse scale				
Scolding	4.92±3.11	3.87±2.41	4.767	0.000
Intimidation	4.20±2.61	3.63±2.27	2.873	0.004
Interference	4.53±0.51	4.17±0.11	14.685	0.000
Total score	4.55±3.07	3.89±2.61	2.870	0.004
Neglect scale				
Emotional neglect	11.20±1.14	9.73±1.85	10.549	0.000
Education neglect	4.85±1.76	4.12±1.33	5.943	0.000
Physical/supervisory neglect	4.16±2.75	3.76±2.14	3.545	0.000
Total score	6.73±1.92	5.87±1.71	5.804	0.000
Total score of psychological abuse and neglect	11.28±1.99	9.76±2.32	8.180	0.000
Alexithymia scale				
Emotion identification difficulty	21.62±4.32	16.65±4.36	13.695	0.000
Emotion description difficulty	15.31±3.15	12.36±2.30	13.680	0.000
Extroversion thinking	22.02±3.62	18.61±3.32	11.973	0.000
Total score	56.02±8.71	48.62±8.50	10.354	0.000

Table 2. Correlation between scores of mobile phone addiction tendency and scores of psychological abuse, neglect and alexithymia in childhood (r)

Psychological abuse and neglect	Mobile phone addiction tendency				
	Withdrawal symptoms	Sudden prominence	Social comfort	Mood change	Total score
Psychological abuse scale					
Scolding	0.158*	0.161*	0.171*	0.178*	0.215*
Intimidation	0.095*	0.126*	0.091*	0.151*	0.130*
Interference	0.186*	0.224*	0.165*	0.212*	0.271*
Total score	0.169*	0.199*	0.162*	0.208*	0.269*
Neglect scale					
Emotional neglect	0.117*	0.112*	0.127*	0.135*	0.147*
Education neglect	0.125*	0.085*	0.096*	0.096*	0.126*
Physical/supervisory neglect	0.061	0.030	0.032	0.075*	0.041
Total score	0.163*	0.089*	0.115*	0.127*	0.131*
Alexithymia scale					
Emotion identification difficulty	0.261*	0.316*	0.328*	0.343*	0.374*
Emotion description difficulty	0.126*	0.163*	0.314*	0.217*	0.225*
Extroversion thinking	0.158*	0.222*	0.257*	0.186*	0.245*
Total score	0.242*	0.282*	0.369*	0.321*	0.372*

Note: * refers to P<0.05

Table 3. Regression analysis of alexithymia and mobile phone addiction tendency

Independent variable	Nonstandard coefficient		Standard coefficient	t	P	R^2	F
	B	Std.Error					
Total scores of alexithymia	0.301	0.049	0.425	6.375	0.000	0.172	56.981

Table 4. Regression analysis of psychological abuse and neglect in childhood and mobile phone addiction tendency

Independent variable	Nonstandard coefficient		Standard coefficient	t	P	R^2	F
	B	Std.Error					
Total scores of psychological abuse	0.296	0.051	0.231	6.375	0.000	0.178	43.254
Total scores of neglect	0.141	0.036	0.130	3.692	0.000		

The uniary linear regression analysis was performed taking total scores of alexithymia as independent variables and whether there was mobile phone addiction tendency as dependent variables. The results show that alexithymia may significantly predict the mobile phone addiction in college students (Beta=0.425, P=0.000), and the determination coefficient R^2=0.172, indicating that alexithymia can explain 17.2% of the variation of mobile phone addiction in college students (F=56.981, P=0.000). Results are shown in Table 3.

Regression analysis of psychological abuse and neglect in childhood and mobile phone addiction tendency

The multiple linear regression analysis was performed taking total scores of psychological abuse scale and neglect scale as independent variables and whether there was mobile phone addiction tendency as dependent variables. Results showed that the overall statistical test of regression model achieved a significant level (F=43.254, *P*=0.000), and the determination coefficient R^2=0.178, indicating that psychological abuse and neglect in childhood can explain 17.8% of the variation of mobile phone addiction in college students. Both of them had a significant and positive predictive effect on mobile phone addiction, Beta=0.231 (*t*=6.375, *P*=0.000), 0.130 (*t*=3.692, *P*=0.000). Results are shown in Table 4.

DISCUSSION

We have shown that scores for each dimension and the total scores of the tendency to mobile phone addiction group in psychological abuse and neglect were significantly higher than those of the control group. Hu (2020) studied the relationship between mobile phone addiction tendency and individual trauma in childhood and found that college students with mobile phone addiction tendencies scored higher on the childhood trauma questionnaire than those without a mobile phone addiction tendency. Psychological abuse and neglect in childhood can be understood as one of the types of childhood trauma, and the aforementioned results indicated that mobile phone addiction tendency may be related to psychological abuse and neglect in childhood. Mobile phone addiction tendency is the result of joint action of many factors, such as mobile phone itself, social support, family environment, their feelings (loneliness, personality, identity, and so on.), which are important factors of mobile phone addiction tendency. As the main place of early socialization of individuals, parents are the earliest educators of individuals, and the family plays a key role in the process of psychological development of children, wherein may be a key factor of the mobile phone addiction tendency in adolescents (Sun et al. 2020).

Also, scores of psychological abuse and neglect for multiple dimensions are positively correlated with each dimension of mobile phone addiction tendency. Liang et al. (2020) investigated 712 medical students and found that the detection rate of mobile phone addiction was 25.28%, psychological abuse with 33.71%, and neglect with 45.08%. Mobile phone addiction is related to gender and other factors. The psychological abuse and neglect of children are all positively correlated with mobile phone addiction in medical students, but are negatively correlated with psychological toughness and life satisfaction. This result agrees with the findings of this literature.

We have also shown that alexithymia can explain 17.2% of the variation of mobile phone addiction in college students. Tables 1 and 2 show that alexithymia scores of college students with mobile phone addiction tendency increased significantly, and it has a positive relationship with mobile phone addiction tendency. This result agrees with the findings of relevant reports (Cerutti et al. 2021), indicating that the total score of alexithymia can significantly predict mobile phone addiction tendency in adolescents. Alexithymia is also called the inability express emotion, which is a type of multi-dimensional personality construction characterized by the defects in the ability to express and regulate their own emotions. Alexithymia is not an independent mental disorder, but it is manifested in a variety of mental disorders and psychosomatic diseases. Meanwhile, alexithymia may also appear in normal people. The generation of alexithymia includes neurobiological mechanism, genetic factors, and social mechanism, of which the contribution rate of social mechanism is close to 60% (Monica et al. 2021). In addition to neurobiological basis, the growth experience and growth environment of individuals are also main sources of alexithymia, wherein these factors will affect psychological activities of individual through various ways, then evolve into alexithymia. This study (Ayaz & Dincer 2021) found that social culture, poor family function, family environment, family education style and economic status are the main influencing factors of alexithymia. The psychological abuse, emotional neglect, insecure attachment in childhood, and lack of social support also have an important predictive value for alexithymia. The individuals with alexithymia are unable to recognize the others' emotions and express their own emotions in real life effectively, and are easy to reduce the effectiveness of communication with others, and thus can easily cause a sense of frustration and loneliness. Adolescents always have high psychological needs for self-identity and belonging, in which people with alexithymia tend to use mobile phones to fulfill psychological needs of communication with others to relieve the anxiety of poor social interaction in reality. Similarly, alexithymia has previously been connected to the Facebook addiction (Rogier et al. 2022).

Further, psychological abuse and neglect in childhood can explain 17.8% of the variation of mobile phone addiction in college students, indicating that psychological abuse and neglect in childhood can significantly predict mobile phone addiction tendencies in adolescents. The children who have experienced psychological abuse and emotional neglect are more likely to rely excessively on mobile phones during adolescence, and evolve into mobile phone addiction because parents of the children suffering from psychological abuse and neglect always refuse, excessively interfere, punish, deny and disregard them, while interference, blame, and emotional neglect may lead to adverse

emotional reactions of individuals in the process of growth, cause mental disorders, reduce their self-esteem and self-identity level, and increase loneliness, but they may need to use mobile phones to compensate for their emotional defects, and avoid face-to-face social pressure, which leads to mobile phone addiction (Fu et al. 2020). Similarly, it was recently shown that social support can lower levels of mobile phone addiction among adolescents by reducing depression and loneliness (Peng et al. 2022).

CONCLUSION

The mobile phone addiction in adolescents is closely related to their family environment and parenting methods. Psychological abuse, neglect, and alexithymia in childhood are the influencing factors of mobile phone addiction in adolescents, which are positively correlated with mobile phone addiction in adolescents, wherein they had positive predictive effects on mobile phone addiction tendency in adolescents. It is an important direction to pay attention to family education of children and mental health to prevent mobile phone addiction in adolescents.

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