

Why is Smartphone Addiction More Common in Adolescents with Harsh Parenting? Depression and Experiential Avoidance's Multiple Mediating Roles

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Purpose: Harsh parenting is positively correlated with adolescents' smartphone addiction, according to a growing corpus of studies. The various mediating processes that could underlie this link, however, are not well understood. Based upon the experiential avoidance model, the current research aimed to identify the relation between harsh parenting and adolescents' smartphone addiction and the mediating roles of adolescents' depression and experiential avoidance.

Methods: We recruited 456 adolescents (female = 52.6%; $M_{age} = 13.19$ years, $SD = 0.85$) at a public junior high school in China to complete the harsh discipline scale, 90-item Hopkins symptom checklist, acceptance and action questionnaire version II, and smartphone addiction scale short version. SPSS24.0 was used to conduct independent samples *t*-test, descriptive statistics, Pearson correlation analysis and common method bias test, PROCESS were used to conduct a significance test of the chain mediation effect on the data. Age, gender, and grade were used as con-founders that were controlled in order to make cautious predictions.

Results: The results showed that (1) harsh parenting was positively correlated with adolescents' depression, experiential avoidance, and smartphone addiction; (2) both depression and experiential avoidance fully mediated the link between harsh parenting and smartphone addiction; and (3) depression and experiential avoidance also sequentially mediated the link between harsh parenting and smartphone addiction. These findings have significant implications for the prevention and intervention of adolescents' smartphone addiction.

Conclusion: These findings suggested that harsh parenting may have an indirect impact on smartphone addiction in both a simple way (parallel mediation) and a complicated way (serial mediation). In addition, these studies shed light on smartphone addiction prevention and intervention.

Keywords: harsh parenting, depression, experiential avoidance, smartphone addiction, adolescents

Introduction

Unfortunately, smartphone addiction is a pressing social issue with a growing impact on society,¹ particularly affecting adolescents who may struggle with self-control over their media usage habits.² Smartphone addiction is characterized by difficulties in controlling smartphone use and a range of addiction-like symptoms, including overuse and withdrawal.^{3,4} Moreover, smartphone addiction has been linked to various mental health issues, such as depression and sleep disruptions, which can negatively impact physical health as well.^{1,5}

The 51st China statistical report on Internet development indicates that there are 1.067 billion Internet users, with 18.6% of them being under the age of 19, and 99.8% accessing the Internet using smartphones.⁶ Given these circumstances, it is essential to address the issue of smartphone addiction more effectively by gaining a better understanding of its risk factors. In recent years, research on smartphone addiction has predominantly focused on personality

traits, anxiety, or stress.^{7–9} However, the significance of parental factors, which serve as an important microsystem influencing individuals' psychological traits, personality, mental health, and problematic behaviors, has increasingly garnered attention.^{10–12} Therefore, it is crucial to investigate the role of parental influences in shaping smartphone addiction.

Harsh Parenting and Smartphone Addiction

Harsh parenting refers to a variety of acts of physical and verbal abuse directed at kids by parents who are unsatisfied with their children's performance, particularly when their children behave badly or annoy their parents.^{13,14} According to the problem-behavior theory, individuals' perception of the environment can affect their behavior.¹⁵ Based on this theory, parental harsh punishment of their children may cause them to engage in problem behaviors like smartphone addiction. Empirical study also pointed out that caregiver maltreatment can cause children to develop dysfunctional working models of themselves and others, which makes them feel insecure and increases their propensity to go for solace and security online.¹⁶ According to research, harsh parenting can cause adolescent anxiety in social situations away from home.¹⁷ Some adolescents have grown unduly dependent on their smartphones to interact with people to feel less stressed in face-to-face situations.¹⁸ In accord with this, adolescents who experience harsh parenting may pivot to excessive smartphone use as a mechanism to cope with their detrimental effects.¹⁹

These studies have provided strong evidence supporting the association between harsh parenting and adolescent smartphone addiction.^{16–19} However, there is a lack of research that investigates the underlying mechanisms that explain how harsh parenting contributes to adolescent smartphone addiction. Consequently, our understanding of the spillover effect of harsh parenting on smartphone addiction remains limited. Addressing this question is crucial for developing effective strategies for the prevention and intervention of adolescent smartphone addiction, especially from the perspective of school stakeholders. In this study, we aim to examine a theoretical model that suggests depression and experiential avoidance as mediating factors in the relationship between harsh parenting and adolescent smartphone addiction.

The Mediating Role of Depression

Anhedonia, lack of motor coordination, cognitive dysfunction, loss of interest, disturbed sleep, and feelings of guilt, sadness, or emptiness are all signs of depression, a mood disorder.²⁰ Geng et al reported that depression has the potential to negatively impact a person's quality of life, in addition to causing harm to their psychological and physical health.²¹ Feelings of emotional discomfort, loneliness, and isolation are common symptoms of depression in sufferers. They might use their smartphones as a way of escape or distraction in response to these symptoms.^{22,23} As a coping mechanism, this escape can result in excessive and obsessive smartphone use, which may reinforce addictive behavior. Additionally, Green et al stressed that depressed psychopathology can raise the danger of smartphone addiction since people who deal with depression turn to their smartphones for social connection and validation to help them cope.²⁴ Furthermore, Klietnik et al discovered a link between depressive stress and compulsive smartphone use, suggesting that the stress associated with depression may cause people to use their smartphones excessively in an effort to cope.²⁵

Meanwhile, ample empirical research has shown a positive correlation between harsh parenting and adolescent depression.²³ According to Beck's cognitive model of depression (1987), depression could be predicted by harsh parenting. Harsh parenting may convey to children that they are worthless and unloved, leading to low self-esteem and perceived competence.²⁶ Children who frequently receive critical feedback from significant others, such as harsh parents, are more likely to form negative self-perceptions.²⁷ They may vividly recall instances of mistreatment in their minds, which exacerbates depressive symptoms, including concern, hopelessness, and helplessness.²⁸ Additionally, parental emotional abuse can result in negative inferential styles and increased depressive symptoms in children.²⁹ These findings indicate that the association between harsh parenting and smartphone addiction may be significantly mediated by depression. Based on the relevant studies and the analysis above, we propose the first hypothesis for the current study: harsh parenting can influence smartphone addiction through the mediating role of adolescent depression (H1).

The Mediating Role of Experiential Avoidance

Experiential avoidance involves an individual's tendency to avoid or suppress emotions, thoughts, memories, and bodily sensations considered undesirable.³⁰ In light of the experiential avoidance model, this approach can manifest as a rigid and continuous response to negativity, leading to various psychological issues.³¹ Nevertheless, this strategy for dealing with evasion may have evolved in the setting of the new period. Smartphones are the darling of the new era because they can quickly answer people's requirements and have features like portability, convenience, and multi-function. Therefore, using mobile devices to look for pleasant experiences is the most likely strategy to avoid negative feelings when people wish to flee them.

Additionally, previous research revealed that experiential avoidance is a positive relation with harsh parenting.³² In accordance with the experiential avoidance model, the emergence of an irritating event causes individuals negative emotions, which are distressing and make them want to escape from it.¹⁹ Nevertheless, due to the insufficiency of emotion management techniques, individuals will rapidly relieve the uncomfortable experience of negative feelings by avoidance (eg, self-injury, alcohol abuse, substance abuse, etc.).¹⁹ Based on this model, the current study aimed to examine whether harsh parenting as an irritating event was likely to increase adolescents' depression and experiential avoidance, then bringing about their avoidance behavior such as excessive smartphone use. These findings suggest that experiential avoidance may be an important mediator that affects the relation between harsh parenting and smartphone addiction. We suggested the second hypothesis of the present study according to the pertinent studies and the analysis above harsh parenting can exert an influence on smartphone addiction through the mediating role of experiential avoidance among adolescents (H2).

The Mediating Roles of Depression and Experiential Avoidance

Based on the experiential avoidance model, on the one hand, irritating event (harsh parenting) has fueled negative emotions (depression).¹⁹ In line with the aforementioned model, Cole et al argued that individuals who grow up in a harsh parenting environment are prone to a diverse emotional response (eg, depression) due to prolonged exposure to stressful situations (harsh parenting).³³ Adolescents who experience harsh parenting may vividly recall their instances of mistreatment in their brains, which exacerbates depressive symptoms like helplessness and hopelessness. Numerous studies have demonstrated the association between harsh parenting and adolescent depression.³⁴

Additionally, inadequate experience and a lack of emotion regulation skills lead individuals to resort to experiential avoidance when confronted with intense emotions.³⁵ Depressed individuals, unable to express and cope with their emotions effectively, often engage in experiential avoidance by escaping or avoiding the source of their negative feelings. Excessive smartphone use becomes a common strategy for escaping negative emotional experiences like depression, ultimately leading to smartphone addiction.³⁶ In this way, depression and experiential avoidance play a moderating role in the relationship between harsh parenting and smartphone addiction.

Based on the findings mentioned above, it can be inferred that harsh parenting may influence smartphone addiction through the mediating effects of depression and experiential avoidance. More specifically, depression and experiential avoidance act as serial mediators in the association between harsh parenting and smartphone addiction. Consequently, we propose the final hypothesis for this study: harsh parenting influences smartphone addiction through the serial mediation of depression and experiential avoidance among college adolescents (H3).

The Current Study

To sum up, the present study explores the mediating role of depression and experiential avoidance in the relation between harsh parenting and smartphone addiction. Building upon the experiential avoidance model and relevant literature, we propose the following hypotheses: (a) Depression acts as a mediator in the relationship between harsh parenting and smartphone addiction; (b) Experiential avoidance serves as a mediator in the connection between harsh parenting and smartphone addiction; (c) Both depression and experiential avoidance sequentially mediate the relationship between harsh parenting and smartphone addiction. A visual representation of all these hypotheses is depicted in [Figure 1](#).

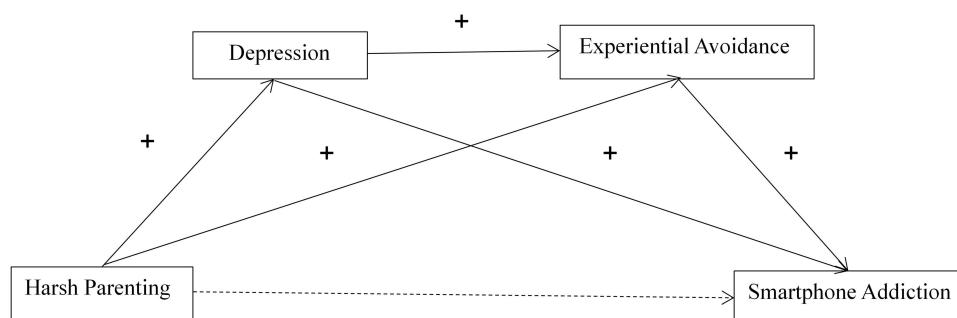


Figure 1 Assumption model of the current study.

Methods and Materials

Participants and Procedures

Participants in this study comprised 500 junior high school students from a single middle school (Grades 7–9) in Fujian Province, China. The convenience sampling approach was employed to gather data during the spring semester of 2022 within a single day. The participants completed the questionnaire during one class period in their respective classrooms. To maintain confidentiality, no identifying information was collected alongside the questionnaires. Additionally, a separate informed consent form was completed by the participants, ensuring their consent to participate in the study. Following the experimenter's instructions, the volunteers took approximately 40 minutes to complete a series of surveys.

Data from 44 participants were excluded from analysis due to a disproportionately high number of missing items in their responses or consistent uniformity in their answers across various questionnaire topics - a common phenomenon in questionnaire-based research. Ultimately, the final sample consisted of 456 junior high school students (91.20%), comprising 240 males (52.6%) and 216 females (52.6%). Among the participants, 149 (32.7%) were in grade one, 156 (34.2%) in grade two, and 151 (33.1%) in grade three. The average age of the participants was 13.20 years ($SD=0.85$ years, range 12–15).

The research procedure received approval from the University Utara Malaysia's School of Applied Psychology's Ethics Committee, adhering to the principles outlined in the Declaration of Helsinki. Informed consent was obtained from all study participants and their respective parents/legal guardians.

Research Tools

The Harsh Discipline Scale³⁷ is a widely used four-item questionnaire that assesses harsh parenting practices among Chinese adolescents. Participants rated these items to evaluate the extent of their father's and mother's adoption of harsh parenting techniques. Responses were measured on a 5-point scale, with 1 indicating "rarely" and 5 indicating "always". Higher scores corresponded to more severe instances of harsh parenting. In this study the Cronbach's alpha coefficient was 0.83.

To measure individual levels of depression, the current study employed the depression dimension of the 90-item Hopkins symptom checklist (HSCL) developed by Lipman.³⁸ This subscale consists of 13 items, each rated on a scale ranging from 1 ("never") to 5 ("severe"). Higher scores reflected greater levels of depression. The Cronbach's alpha coefficient of scores for the present sample was 0.92.

The Acceptance and Action Questionnaire-II (AAQ-II), initially developed by Bond et al³⁹ was translated and adapted by Cao et al⁴⁰ for use in this study. It comprises seven items, rated on a scale from 1 ("never") to 7 ("always"). The AAQ-II aims to assess constructs such as acceptance, experiential avoidance, and psychological inflexibility. Higher scores indicate higher levels of experiential avoidance. The Cronbach's alpha coefficient of scores for the present sample was 0.91.

The Smartphone Addiction Scale Short Version (SAS-SV), developed by Kwon et al,⁴ was utilized to measure smartphone addiction. This scale consists of ten items scored on a six-point Likert scale, ranging from 1 ("strongly disagree") to 6 ("strongly agree"). The individual item scores were averaged to obtain a final numerical score. The total

scores ranged from 10 to 60. Higher scores indicated a greater risk of addiction, while lower scores indicated a lower risk.⁴ Previous studies have established that a threshold of 32 out of 60 was utilized as a criterion to categorize individuals with smartphone addiction.⁴¹ Given the SAS - SV's Cronbach's alpha value of 0.81, it was deemed valid and reliable.

Data Analysis

The current study had a negligible rate of missing data, with less than 1% of the data missing. Mean imputation was employed to address the missing data.⁴² The data analysis process involved three main steps. Firstly, descriptive statistics and correlation analysis were conducted to explore the characteristics of the data. Next, to assess the individual mediating effects of depression and experiential avoidance, Hayes's PROCESS macro for SPSS (Model 4) was utilized.⁴³ Finally, to examine the multiple mediation model involving depression, experiential avoidance, harsh parenting, and smartphone addiction, Hayes's PROCESS macro for SPSS (Model 6) was employed. In other words, Model 6 examined all possible pathways linking harsh parenting and smartphone addiction. Hayes emphasizes that the analyses conducted using Models 4 and 6 in PROCESS provide insights into direct effects, indirect effects, and bootstrap confidence intervals (CIs) for the indirect effects. An effect is considered significant if the 95% confidence interval does not encompass the value 0. Additionally, demographic factors were accounted for in all analyses by including them as covariates in the models

Common Method Bias

The present study employed a combination of statistical analysis and anonymous survey responses to mitigate potential methodological bias. Anonymous survey responses were utilized throughout the data collection phase, ensuring participant confidentiality. Furthermore, Harman's one-factor test was employed to assess the presence of any common method bias among the measurement items.⁴⁴ This test examines whether a single factor emerges or if a general factor accounts for the majority of the variance (>40%) if common method bias is evident. Results from the current study revealed that the unrotated factor structure did not yield a general factor, with the initial factor explaining only 32% of the total variance. Therefore, it is unlikely that common method variance poses a significant threat in this investigation.

The current study used statistical analysis and anonymous replies to compensate for potential method bias. The anonymous replies approach was used throughout the data-gathering phase. In addition, Harman's one-factor test was used for all measurement items to evaluate any potential common method bias.⁴⁴ A single component will either emerge or one general factor will explain the majority of the variance (> 40%) if the bias is significant. Results from the current study showed that the unrotated factor structure did not include a general factor, and the initial factor only explained 32% of the variation. Therefore, it was unlikely that common method variance would pose a severe hazard in this investigation.

Results

Difference of Variables

The samples were categorized into two groups: smartphone addiction group and non-smartphone addiction group. An examination of Table 1 reveals noteworthy distinctions in harsh parenting, depression, and experiential avoidance among these groups.

Cohen's d was computed to gauge the effect size, providing insight into the significance of the differences.⁴⁵ The findings indicate a substantial disparity between the smartphone addiction group and the non-smartphone addiction group.

Table 1 Difference Comparison Results of Each Variable

	Non-Smartphone Addiction (M ±SD)	Smartphone Addiction (M ±SD)	t	Cohen's d
Harsh Parenting	1.99±0.907	2.20±0.849	2.456*	0.240
Depression	2.03±0.764	2.33±0.889	3.601***	0.356
Experiential Avoidance	3.77±1.418	4.32±1.651	3.601***	0.356

Note: *P <0.05, ***P <0.001.

Descriptive Statistics and Correlations

Table 2 presents a correlation matrix displaying the variables and descriptive statistics. Notably, no evidence was found to suggest any positive or negative associations between demographic factors such as age, gender, or grade, and smartphone addiction (the dependent variable). Consequently, these demographic factors were excluded from subsequent analyses. The findings of the bivariate correlations largely align with our initial predictions. Specifically, harsh parenting exhibited a positive relationship with smartphone addiction ($r = 0.134, p < 0.01$), highlighting a significant association. Moreover, depression displayed a positive correlation with smartphone addiction ($r = 0.288, p < 0.01$), indicating a noteworthy connection. Notably, experiential avoidance demonstrated a positive correlation with smartphone addiction ($r = 0.303, p < 0.01$), emphasizing a substantial link. Furthermore, significant positive correlations were observed between harsh parenting and both depression ($r = 0.357, p < 0.01$) and experiential avoidance ($r = 0.385, p < 0.01$). Additionally, experiential avoidance exhibited a strong positive correlation with depression ($r = 0.693, p < 0.01$), further underscoring its influence.

Testing the Mediation Role of Depression

The PROCESS macro's Model 4 was used to test Hypothesis 1 which suggests that depression mediates the association between harsh parenting and smartphone addiction.⁴³ Harsh parenting was positively correlated with depression ($\beta = 0.359, p < 0.001$), which was connected to smartphone addiction ($\beta = 0.169, p < 0.001$) after adjusting for all factors (age, gender, and grade). It is worth noting that the direct path from harsh parenting to smartphone addiction was not significant ($\beta = 0.028, p > 0.05$). Meanwhile, the relation between harsh parenting and smartphone addiction was fully mediated by depression ($\beta = 0.061, SE = 0.024, 95\% CI = [0.013, 0.108]$). The model explained 40% of junior high school students' smartphone addiction, confirming Hypothesis 1.

Testing the Mediation Role of Experiential Avoidance

Hypothesis 2, which posits that experiential avoidance acts as a mediating factor in the relationship between harsh parenting and smartphone addiction, was examined using the PROCESS macro with Model 4. Harsh parenting showed a significant positive correlation with experiential avoidance ($\beta = 0.396, p < 0.001$), and in turn, experiential avoidance was found to be associated with smartphone addiction ($\beta = 0.162, p < 0.001$) after adjusting for all relevant variables. Furthermore, the results revealed that experiential avoidance sufficiently explained the link between harsh parenting and smartphone addiction ($\beta = 0.064, SE = 0.026, 95\% CI = [0.015, 0.117]$), indicating a significant relationship between these factors. This model accounted for 42% of the variation in junior high school students' smartphone addiction. In conclusion, Hypothesis 2 was supported by the findings, demonstrating that experiential avoidance plays a mediating role in the association between harsh parenting and smartphone addiction.

Testing the Multiple Mediation Model

The PROCESS macro's Model 6 was utilized to test the multiple mediation model (Hypothesis 4).⁴³ Table 3 and Figure 2 present the results, showing that all the routes had significance, except for "harsh parenting \rightarrow smartphone addiction". Firstly, the pathway of "harsh parenting \rightarrow depression \rightarrow smartphone addiction" was significant (indirect effect = 0.061,

Table 2 Lists All of the Variables' Descriptive Statistics and Correlations (N = 456)

	M	SD	1	2	3	4	5	6	7
1. Harsh Parenting	2.07	0.891	1	–	–	–	–	–	–
2. Depression	2.14	0.823	0.357**	1	–	–	–	–	–
3. Experiential Avoidance	3.09	1.415	0.385**	0.693**	1	–	–	–	–
4. Smartphone Addiction	2.89	0.925	0.134**	0.288**	0.303**	1	–	–	–
5. Age	13.20	0.846	–0.093*	0.032	0.107*	0.189**	1	–	–
6. Gender	1.47	0.500	0.030	0.243**	0.140**	0.010	–0.074	1	–
7. Grade	2.00	0.812	–0.085	0.067	0.129**	0.186**	0.859**	–0.005	1

Note: * $p < 0.05$; ** $p < 0.01$.

Abbreviations: M, mean; SD, standard deviation, Gender was dummy coded, which zero standing for male, and one standing for female.

Table 3 Testing the Multiple Mediation Model's Routes (N = 456)

Effect	β	SE	BCa 95% CI	
			Lower	Upper
Direct effects				
Harsh Parenting → Depression	0.358***	0.043	0.274	0.441
Harsh Parenting → Experiential Avoidance	0.169***	0.036	0.099	0.238
Harsh Parenting → Smartphone Addiction	0.027	0.049	−0.069	0.122
Depression → Experiential Avoidance	0.632***	0.037	0.561	0.704
Depression → Smartphone Addiction	0.170**	0.063	0.046	0.293
Experiential Avoidance → Smartphone Addiction	0.164**	0.036	0.040	0.287
Indirect effects				
Harsh Parenting → Depression → Smartphone Addiction	0.061	0.024	0.015	0.108
Harsh Parenting → Experiential Avoidance → Smartphone Addiction	0.028	0.013	0.006	0.070
Harsh Parenting → Depression→ Experiential Avoidance → Smartphone Addiction	0.037	0.016	0.001	0.070

Note: ** $p < 0.01$. *** $p < 0.001$.

SE = 0.024, 95% CI = [0.015, 0.109]). Additionally, the pathway of “harsh parenting → experiential avoidance → smartphone addiction” was also significant (indirect effect = 0.028, SE = 0.013, 95% CI = [0.006, 0.057]). Thus, the relationship between harsh parenting and smartphone addiction was entirely mediated by depression and experiential avoidance. Furthermore, the sequential pathway of “harsh parenting → depression → experiential avoidance → smartphone addiction” was significant (indirect effect = 0.037, SE = 0.015, 95% CI = [0.009, 0.069]). Therefore, higher levels of harsh parenting were sequentially linked to higher levels of depression ($\beta = 0.359$, $p < 0.001$), experiential avoidance ($\beta = 0.631$, $p < 0.001$), and finally smartphone addiction ($\beta = 0.162$, $p < 0.01$). Thus, depression and experiential avoidance completely mediated the link between harsh parenting and smartphone addiction. The multiple mediation model significantly explained adolescents' smartphone addiction ($R^2 = 0.816$). Hypothesis 3 was confirmed.

Discussion

Difference of Variables

The results show that there are significant differences in harsh parenting, depression, and experiential avoidance between smartphone addiction group and non-smartphone addiction group. The experiential avoidance model posits that individuals may turn to smartphone addiction as a coping mechanism when facing harsh parenting, leading to increased stress and depression.³⁰ Experiential avoidance behaviors, such as excessive smartphone use, may temporarily alleviate negative emotions but contribute to a cycle of addiction.⁴⁶

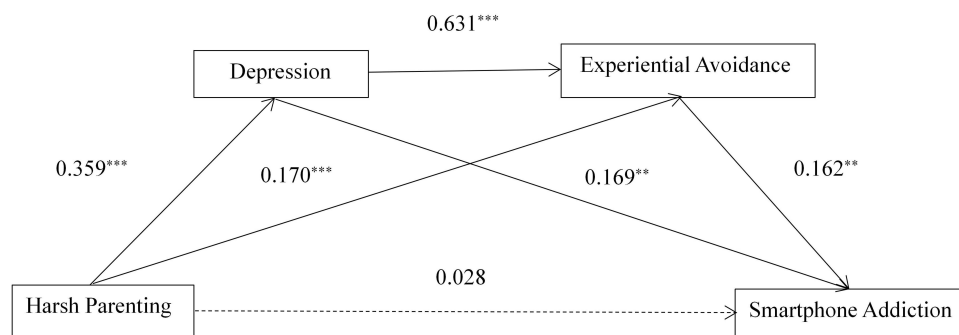


Figure 2 The multiple mediation model. ** $p < 0.01$. *** $p < 0.001$.

Parenting and Smartphone Addiction

The current study aimed to gain a comprehensive understanding of the relationship between harsh parenting and smartphone addiction. Drawing from the problem-behavior theory and the experiential avoidance model, we examined the multiple mediating roles of depression and experiential avoidance (both parallel and serial) in the connection between harsh parenting and smartphone addiction among adolescents. The hypothesized multiple mediator model, consisting of depression and experiential avoidance, received support from the results, underscoring the crucial role these factors play in the pathway between harsh parenting and smartphone addiction. Furthermore, these findings offer valuable insights for prevention and intervention strategies.

Specifically, the study found a positive association between harsh parenting and smartphone addiction, which is consistent with the results of previous studies on Internet addiction.⁴⁷ Caregiver maltreatment can lead adolescents to seek solace and security on smartphones due to heightened feelings of insecurity.^{19,48} The examination of harsh parenting expands the understanding of family risk factors influencing smartphone addiction, particularly from the perspective of a specific parenting style that involves treating children harshly after they make mistakes. However, the precise mechanisms through which harsh parenting influences smartphone addiction warrant further investigation.

Depression as a Mediator

In line with our hypothesis 1, our study reveals that depression plays a pivotal role in explaining the relationship between harsh parenting and smartphone addiction. While this theoretical perspective has been empirically supported by previous research, our study is the first to apply it to understand how depression correlates with addictive behaviors, such as smartphone addiction. In addition to the direct “harsh parenting → smartphone addiction” pathway, each individual link in our mediation model deserves attention. Our findings support the notion that harsh parenting is associated with internalizing issues in adolescents, such as depression.⁴⁹ Additionally, adolescents subjected to harsh parenting may not have had the opportunity to learn effective emotional regulation and coping strategies. As a result, they may struggle to manage their emotions and find it challenging to navigate life’s difficulties, increasing their vulnerability to depression.⁵⁰ Moreover, we found a positive association between depression and adolescent smartphone addiction. This result aligns with earlier studies that identify depression as a crucial and significant predictor of smartphone addiction.⁵¹ According to Elhai et al, individuals experiencing depression may lose interest in social activities, which could explain why engaging with smartphones offers them a sense of comfort.⁵² Therefore, it is plausible to consider smartphone addiction as a coping mechanism for depression, particularly in the context of harsh parenting in real-life situations.

Experiential Avoidance as a Mediator

It is possible to see smartphone addiction as deviant behavior that is perpetuated by avoiding situations where harsh parenting failed to provide the required social control, supporting Hypothesis 2. This research implies that interpersonal risk variables, such as harsh parenting, may affect adolescents’ propensity to expose themselves to risk in other contexts, such as experiential avoidance, which increases the risk of problem behaviors. Our findings are in agreement with earlier research, which shows that high levels of harsh parenting predict high levels of experiential avoidance. One explanation is that the family, as a significant stressor, has a significant impact on each person’s feelings and behaviors.⁵³ Individuals who have been in a bad home environment (such as harsh parenting) for a long time and are unable to change this environment, will develop experience avoidance. Moreover, a previous empirical study found that people with higher levels of experiential avoidance are more likely to engage in addictive behaviors.⁵⁴ That is, smartphones may provide a means for people to avoid unpleasant situations or mental pain by making them look less damaging to themselves.⁵⁵ Specifically, smartphones offer quick and easy access to various forms of entertainment, social media, and online content. Experiential avoidance can lead individuals to seek immediate relief from discomfort, even if it’s temporary, by engaging in smartphone use. This instant gratification can reinforce the habit of constantly checking and using the device.⁵⁶

Depression and Experiential Avoidance as Mediators

In this study, the sequential mediating effect of depression and experiential avoidance between harsh parenting and smartphone addiction has also been validated. Hypothesis 3 is supported.

Based on experiential avoidance model,⁵⁷ adolescents who experience harsh parenting may recall their maltreatment incidents in their brains and are more prone to experience depression and anxiety in social situations away from the family.¹⁷ Depression can lead to social withdrawal and isolation. Additionally, because of insufficient experience and a lack of emotion management abilities, the need for experiential avoidance when emotions arise is heightened.³⁵ Smartphones offer immediate access to various forms of entertainment, social media, and online content. This instant gratification can be highly appealing to individuals practicing experiential avoidance, as it provides quick relief from emotional distress. The ease of access and the rapid reward can reinforce the habit of using the smartphone excessively.¹⁸ Besides, smartphones, with their access to social media and virtual interactions, can serve as a way for individuals to maintain a sense of connection with others, even if it's in a digital format. This can lead to excessive smartphone use as individuals seek social validation and support,¹⁷ raising the likelihood of adolescent smartphone addiction. This discovery provides direct theoretical evidence of the intrinsic relationship between emotions and smartphone addiction. Additionally, while the experiential avoidance model is often employed to elucidate the persistence and recurrence of self-harming behaviors,^{57,58} our study suggests its relevance in explaining non-substance addictive behaviors, such as smartphone addiction. This not only broadens the applicability of the model but also aids in understanding the coexistence of smartphone addiction with other psychological pathological behaviors.

Limitations and Future Recommendations

Despite the fact that the current study clarifies the mediating processes through which harsh parenting is linked to adolescent smartphone addiction, the study has several limitations. Firstly, it is impossible to infer causality from the result of the current study's cross-sectional design. Cross-sectional mediation, however, can offer important insights into the interactions between the variables when the mediation models are based on theoretical underpinnings and are partially confirmed by prior empirical studies. Additionally, cross-sectional data cannot be used to investigate alternative models with various time orderings of the variables. Therefore, to more thoroughly assess the validity of the multiple mediation model explored in this study, the follow-up study can further test the results of the current study by using longitudinal method or intervention trials.⁵⁹ Second, the findings stem from self-administered surveys, potentially skewing the results due to respondents' inclination towards presenting themselves favorably. As highlighted in earlier studies, individuals frequently report lesser durations of mobile device usage than their actual consumption.⁶⁰ However, to get more detailed data and effectively handle shared-reporter variance, future studies would benefit from multi-method and multi-informant approaches. Third, it is uncertain whether our findings can be extrapolated to other contexts or geographical regions as this study is based on a sample of Chinese adolescents. Fourth, the sample size is relatively small for the population of middle school students in China, which might limit the generalizability of the findings. Finally, future studies should look at the mediating impact of other factors like adolescents' self-esteem given that depression and experiential avoidance fully mediated the harsh parenting and smartphone addiction. This study employed the experiential avoidance model as a theoretical framework and confirmed that negative emotions (such as depression) and certain individual predisposing variables (such as experiential avoidance) can predict smartphone addiction, while other factors like adolescents' self-esteem was not addressed. Future research can delve into other aspects to further investigate the underlying causes of smartphone addiction.

Implications of Findings

Our findings have important implications for the prevention and intervention of smartphone addiction notwithstanding these drawbacks. First, our findings point to harsh parenting as a substantial barrier to smartphone addiction. Interventions meant to lower the likelihood of smartphone addiction should therefore concentrate on minimizing the severity of parenting. Recent studies have shown that different intervention strategies can lessen harsh parenting. Second, since depression is a significant factor in how harsh parenting affects smartphone addiction, programs designed to reduce smartphone addiction should focus on precisely identifying adolescents who experience depression and harsh parenting with the necessary tools to help these students. Third, lowering experiential avoidance may aid in lowering smartphone

addiction since it also mediates the relation between harsh parenting and addiction to smartphones. Finally, given that our findings indicate that numerous mediators connect harsh parenting and smartphone addiction, therapies that focus on both mediators at once are more likely to be successful than those that focus on a single mediator. Programs that try to change adolescents' avoidance of depression and other negative emotions should also work on lessening harsh parenting. This is significant since excessive harsh parenting is a risk factor that promotes depression and experiential avoidance, and the connection between harsh parenting and smartphone addiction is completely mediated by the two mediators.

Conclusion

In conclusion, this study provides valuable insights into the relationship between harsh parenting, depression, experiential avoidance, and smartphone addiction in Chinese adolescents. The findings suggest that harsh parenting is positively associated with smartphone addiction, and this link is mediated by depression and experiential avoidance. Specifically, significant disparities exist in harsh parenting, depression, and experiential avoidance between the smartphone addiction and non-smartphone addiction groups, demonstrating clear differential effects. Adolescents who experience harsh parenting are more likely to develop depression and engage in experiential avoidance, which in turn increases their risk of developing smartphone addiction.

Overall, this study highlights the need for a comprehensive and integrated approach to addressing the complex interplay between parenting, mental health, and smartphone use in adolescents. By understanding the underlying mechanisms of smartphone addiction, we can develop more effective prevention and intervention strategies that promote healthy development and well-being in this vulnerable population.

Data Sharing Statement

The information that underpins the study's conclusions is freely accessible on "Figshare" at <http://doi.org/10.6084/m9.figshare.24100509>.

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Disclosure

Wanqing Lin and Hanyu Liang are co-first authors for this study. Huaibin Jiang and Mohd Azrin Mohd Nasir are co-correspondence authors for this study. The authors report no conflicts of interest in this work.

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