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The fog of short videos among adolescents: the interwoven influence of family environment, psychological capital, and self-control

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Short videos, with their brevity and high entertainment value, attract many adolescent users. However, prolonged viewing may negatively impact adolescents' cognitive development, especially self-control and academic performance. This study explores the impact of the family environment on adolescents' addiction to short videos and reveals the intrinsic role of psychological capital and self-control in the relationship between the family environment and adolescents' short video addiction. Based on ecosystem theory, a hypothetical model was constructed in which psychological capital and self-control serve as chained mediators in the influence of the family environment on short video addiction. Revised scales for family environment, psychological capital, self-control, and short video addiction were used to conduct a survey among 1,735 middle school students from five provinces in China (51.7% male; M age = 15.2, SD = 1.8). This study found that: (1) A positive family environment, psychological capital, and self-control are significantly negatively correlated with adolescents' short video addiction; (2) The mediating effect of psychological capital between the family environment and short video addiction is not significant; (3) Self-control has a significant mediating effect between the family environment and short video addiction (6.8%); (4) Psychological capital and self-control have a significant chained mediating effect between the family environment and short video addiction (12.8%). The family environment has a significant impact on adolescents' short video addiction. Close family relationships and rich family recreational activities help reduce the risk of addiction. Psychological capital and self-control play important mediating roles in the relationship between the family environment and short video addiction. Enhancing adolescents' psychological capital and self-control abilities can effectively prevent and intervene in addiction issues.

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Introduction

With the rapid development of technology, short videos have become an indispensable part of modern life. According to the 52nd Statistical Report on China's Internet Development (China Internet Network Information Center, 2023), as of June 2023, the number of short video users in China reached 1.026 billion, with adolescents being the primary users (Wan, 2020; Kaye et al. 2021). However, excessive indulgence in short videos by adolescents has become a societal issue, as their cognitive and self-control abilities are relatively immature, making them prone to dependency (Throuvala et al. 2019). Research shows that more than half of respondents spend over an hour daily on short video platforms (Hayixibayi et al. 2021). Prolonged use of short videos not only leads to addiction but also has severe impacts on adolescents' physical and mental health and social functioning (Xu et al. 2023; Hu et al. 2022). Compared to online gaming addiction, short video addiction may have its unique characteristics, but related research remains limited.

Family Environment and Short Video Addiction. Ecological Systems Theory (Bronfenbrenner, 1979) posits that individual development is shaped by interactions within multiple systems, with the family as the most immediate and influential micro-system. A supportive family environment is characterized not only by material stability and relationships but also by emotional warmth, intimacy, and consistent support, which are essential for healthy adolescent development (Xiao and Xu, 2009). These elements provide a protective buffer against behavioral issues, including internet addiction. Studies consistently show that warm, nurturing family environments help reduce pathological internet use by fostering open communication, emotional security, and adherence to parental guidance, such as setting time limits on screen usage (Chng et al. 2015).

A key factor in this dynamic is family intimacy, which refers to close emotional connections between family members. Adolescents in such environments are more likely to seek support from their parents during times of stress, reducing their need to turn to the internet for emotional regulation (Sheng et al. 2023). Additionally, high-quality parent-child relationships play a pivotal role in helping adolescents develop better coping mechanisms, thereby lowering their reliance on internet use for problem-solving (Bleakley et al. 2016).

Conversely, dysfunctional family environments—marked by conflict, neglect, over-involvement, or authoritarian parenting—can exacerbate the risk of internet addiction (Liu et al. 2024; Lukavska et al. 2020). In these contexts, adolescents are more likely to seek escape or emotional solace through excessive internet use.

Short-video addiction, a distinct form of internet addiction, poses unique challenges due to its fast-paced, visually engaging content and personalized algorithms, making it more difficult to detect and prevent. Given that adolescents often consume short videos within the family setting, the family's role becomes even more significant. Research indicates that supportive family environments—particularly those characterized by warmth and strong parent-child bonds—are directly linked to reduced short-video addiction among adolescents (Zhang, 2022; Tian, 2023). This highlights the importance of cultivating close family relationships and an emotionally secure atmosphere to mitigate addiction risks.

Family Environment, Psychological Capital, and Short Video Addiction. Psychological capital refers to a positive psychological state, encompassing self-efficacy, optimism, hope, and resilience (Luthans et al. 2005). These elements collectively help individuals

cope with stress, enhance adaptability, and maintain a positive mindset. Research has shown that individuals with higher psychological capital perform better at work (Luthans et al. 2005), cope more effectively with challenges (Avey et al. 2009), and demonstrate greater enthusiasm for learning, leading to improved academic outcomes (Datu and Valdez, 2016).

The family environment plays a crucial role in developing psychological capital. This influence extends beyond economic conditions, such as parents' occupations and financial status, to include intangible factors like family intimacy and cultural atmosphere (Chen, 2004). Studies have found a positive correlation between family socioeconomic status and psychological capital (Jia et al. 2021), while financial hardship tends to diminish it (Zhang et al. 2022). Family intimacy and adaptability are also closely linked to self-efficacy (Deng et al. 2013; Zhang et al. 2021), although various family risk factors can negatively impact psychological capital (Ma et al. 2022).

Psychological capital not only supports mental health but also acts as a protective factor against stress and addictive behaviors (Luthans et al. 2006). For instance, self-efficacy boosts confidence in overcoming challenges, reducing the tendency to rely on avoidant behaviors like internet addiction (Xue and Zhang, 2021). Similarly, optimism and hope encourage individuals to face difficulties positively, decreasing the likelihood of turning to distractions such as short videos to escape reality. Resilience helps individuals recover quickly from stress, further reducing the risk of excessive short video consumption.

Family Environment, Self-Control, and Short Video Addiction. Short videos, with their concise, intuitive, and highly entertaining nature, easily capture people's attention. This appeal can, to some extent, exacerbate users' dependence on short videos, thereby increasing the risk of addiction (Peng et al. 2022). Self-control, as a critical ability for individuals to autonomously adjust their behaviour to align with personal values and societal expectations, plays a key role in inhibiting impulsive behaviours, resisting temptations, achieving delayed gratification, and formulating and executing behavioural plans (Kopp, 1982).

The family environment is closely linked to self-control abilities. Research shows that poor parenting practices often result in weaker self-control in individuals (Gottfredson and Hirschi, 1990). In fact, the family environment significantly influences juvenile delinquency by affecting self-control as an intermediary factor (Qu and Zou, 2009). According to family systems theory, self-differentiation is a goal that family members must pursue during their development (Papero, 1990). However, excessive emotional entanglement among family members or dysfunction within the family can affect levels of differentiation, thereby negatively impacting psychological and behavioural outcomes (Bowen, 1993). Therefore, it is reasonable to speculate that self-control mediates the relationship between self-differentiation and online game addiction (Li et al. 2023). Additionally, a meta-analysis revealed a positive correlation between impulsivity and internet addiction, while inhibitory control showed a negative correlation with internet addiction (Li et al. 2021). These findings further underscore the critical role of self-control in preventing internet addiction.

Research Framework and Hypothesis Summary. With the rapid rise of short video platforms, adolescent addiction has become an increasing concern. While previous studies have explored the impact of family environment on adolescent internet addiction (Chng et al. 2015; Liu et al. 2024), research on short video addiction remains limited, particularly regarding the mechanisms

through which family environment influences short video addiction via psychological capital and self-control. Based on Ecological Systems Theory (Bronfenbrenner, 1979), family environment is a critical factor in individual development and may reduce the risk of addiction by fostering adolescents' psychological capital and self-control (Luthans et al. 2006; Gottfredson and Hirschi, 1990). However, the instant gratification and high entertainment value of short videos differentiate this form of addiction from others, making it essential to study its specific mechanisms.

This study aims to fill this research gap by examining how family environment impacts adolescent short video addiction through psychological capital and self-control. Through a chain mediation model, this research provides theoretical support for interventions in adolescent addiction and family education. Based on the above analysis, the following hypotheses are proposed:

H1: A positive family environment is significantly negatively correlated with short-video addiction.

H2: Psychological capital is significantly negatively correlated with short-video addiction.

H3: Psychological capital mediates the relationship between family environment and short-video addiction.

H4: Self-control mediates the relationship between family environment and short-video addiction.

H5: Psychological capital and self-control play a chain mediating role between family environment and short-video addiction.

Research Methods

Sample. Cluster sampling was conducted in seven middle and high schools across five provinces in China, namely Henan, Shanxi, Guizhou, Shandong, and Jiangxi. A total of 1765 middle school students were selected as the research subjects. Ultimately, 1735 valid questionnaires were obtained, resulting in an effective response rate of 98.3%. The grade distribution was as follows: 320 first-year middle school students (18.1%), 291 second-year middle school students (16.5%), 363 third-year middle school students (20.6%), 290 first-year high school students (16.4%), 264 second-year high school students (15%), and 237 third-year high school students (13.4%). Among the respondents, 912 were boys (51.7%) and 846 were girls (47.9%). The age range of the sample was between 12 and 18 years.

Research Instruments. Family Environment Scale (FES-CV): This scale, revised by Fei and colleagues (1991), was used to assess the family environment, based on the original Family Environment Scale (FES) developed by American psychologist Moos (1990). In this study, five subscales from the original instrument were chosen based on research relevant to the Chinese context: emotional expression, conflict, recreation, control, and cohesion. Each subscale consists of 9 items. For instance, the conflict subscale assesses the frequency of conflicts and disagreements within the family, with statements such as "Our family frequently engages in arguments and conflicts." Participants rated the items using a 5-point Likert scale (0 representing "completely disagree" and 4 representing "completely agree"), with higher scores indicating a poorer family environment. The KMO value for this scale was 0.92, and the Cronbach's Alpha coefficient was 0.68, indicating good reliability and validity.

Psychological Capital Scale: The Psychological Capital Questionnaire for adolescents, developed by Ye and Fang (2015), was used. The scale includes four factors: hope, optimism, self-confidence, and resilience. For example, the hope factor consists of 9 items, such as "I enjoy solving problems." A 6-point Likert scale was used (0 representing "completely disagree" and 5

representing "completely agree"), with higher scores indicating higher psychological capital. The KMO value for this scale was 0.94, and the Cronbach's Alpha coefficient was 0.87, indicating good reliability and validity.

Self-Control Scale: The Self-Control Scale (SCS), revised by Morean et al. (2014), was used to measure self-control in middle school students. The scale consists of two dimensions: discipline and impulse control. The discipline dimension (3 items) assesses individuals' self-discipline and planning abilities when working toward long-term goals, with items such as "I can work efficiently towards a long-term goal." The impulse control dimension (4 items) evaluates individuals' ability to restrain themselves when facing impulses, with items such as "Sometimes I can't help doing things that I know are wrong." A 5-point Likert scale was used, with 0 representing "completely disagree" and 4 representing "completely agree." Higher scores indicate stronger self-control. The KMO value for this scale was 0.69, and the Cronbach's Alpha coefficient was 0.83, indicating acceptable reliability and validity.

Short Video Addiction Scale: The Short Video Addiction Scale for high school students, developed by You and colleagues (2022), was used. It includes 7 items, such as "I find it hard to concentrate on my studies because of watching short videos" and "I feel anxious if I cannot watch short videos." A 5-point Likert scale was used, with 0 representing "strongly agree" and 4 representing "strongly disagree." Higher scores indicate a more severe level of short video addiction. The KMO value for this scale was 0.82, and the Cronbach's Alpha coefficient was 0.81, indicating good reliability and validity.

Procedure. Data for this study were gathered using paper-based questionnaires between October 20 and November 20, 2023, utilizing a cluster stratified sampling method for selecting participants. The research team mailed the questionnaires and instructions to the teachers, who then guided students in completing them during class. Students responded anonymously, and teachers helped with any questions based on the provided instructions.

After the questionnaires were filled out, the teachers returned them by mail to the research team. Each questionnaire was assigned a unique identifier, and the data were entered into SPSS software. The research team reviewed the responses and excluded any questionnaires with repetitive answers, clear logical errors, or more than four missing items in a row. A total of 1,735 valid questionnaires were included in the final analysis.

Data Analysis. Data were analysed using SPSS 24.0. Firstly, a descriptive statistical analysis was conducted on the basic information of the adolescents. Secondly, a correlation analysis was performed on core variables such as family environment, psychological capital, self-control, and short video addiction. Lastly, the chained mediation path of psychological capital and self-control between family environment and short video addiction was tested using the PROCESS macro (Model 6) developed by Hayes (2017).

Results

Common Method Bias Test. Since the data in this study were self-reported by participants, there may be a common method bias. The Harman single-factor test was used to test for common method bias (Zhou and Long, 2004). The results indicated that 17 factors with eigenvalues greater than 1 were identified without rotation, and the variance explained by the first factor was 15.60% (<40%). Thus, common method bias did not significantly affect the results of this study.

Table 1 Descriptive statistics A (N = 1735).

Variables	M	SD	[1]	[2]	[3]	[4]	[5]	[6]	[7]
[1] Gender	0.48	0.50	1						
[2] Grades	2.36	1.66	0.014	1					
[3] Left-behind	0.83	0.375	0.004	0.184***	1				
[4] Family Environment	8.44	1.91	0.034	−0.022	−0.149*	1			
[5] Psychological Capital	10.56	3.08	−0.064**	−0.036	0.073**	−0.395***	1		
[6] Self-control	1.85	0.70	−0.120**	−0.109***	0.024	−0.244***	0.446***	1	
[7] Short Video Addiction	16.66	4.98	−0.113**	0.026	0.080**	−0.194***	0.180***	0.210***	1

Notes: ***, **, and * indicate statistical significance at the 0.001, 0.01, and 0.05 levels, respectively; [1] represents Gender, [2] represents Grades, [3] represents Left-behind, [4] represents Family Environment, [5] represents Psychological Capital, [6] represents Self-control, [7] represents Short Video Addiction; Among the measurements of statistical data, Gender: 0 for Boy and 1 for Girl; Grades: 1-3 represent junior high school students in grades 1-3, and 4-6 represent senior high school students in grades 1-3; Left-behind type: 1 represents left-behind children, 2 represents non-left-behind children.

Table 2 Descriptive statistics B (N = 1735).

Variables	M	SD	[1]	[2]	[3]	[4]	[5]	[6]
[1] Intimacy	1.35	0.67	1					
[2] Emotional Expression	1.91	0.46	0.501***	1				
[3] Contradiction	1.51	0.60	0.610***	0.277***	1			
[4] Entertainment	1.91	0.66	0.540***	0.366***	0.365***	1		
[5] Controllability	1.75	0.56	−0.026	0.055*	0.052*	−0.109***	1	
[6] Short Video Addiction	16.66	4.98	−0.167***	−0.090***	−0.176***	−0.150***	−0.024	1

Notes: *** and * indicate statistical significance at the 0.001 and 0.05 levels, respectively; [1] represents Intimacy, [2] represents Emotional Expression, [3] represents Contradiction, [4] represents Entertainment, [5] represents Controllability, [6] represents Short Video Addiction.

Descriptive Statistics and Correlation Analysis. The results of the descriptive statistical analysis (see Table 1) showed that gender ($r = -0.113$, $p < 0.01$) and type of left-behind status ($r = 0.080$, $p < 0.01$) were significantly correlated with short video addiction, but grade level were not significantly correlated with short video addiction ($r = 0.026$, $p > 0.05$); Self-control was significantly negatively correlated with grade level ($r = -0.109$, $p < 0.001$), indicating that as grade level increases, the self-control ability of middle school students in this region decreases.

Family environment was significantly negatively correlated with psychological capital ($r = -0.395$, $p < 0.001$), self-control ($r = -0.244$, $p < 0.001$), and short video addiction ($r = -0.194$, $p < 0.001$), suggesting that the better the family environment, the higher the level of psychological capital and self-control ability of middle school students in this region, and the lower their degree of short video addiction.

Short video addiction was significantly positively correlated with psychological capital ($r = 0.180$, $p < 0.001$) and self-control ($r = 0.210$, $p < 0.001$), indicating that higher levels of psychological capital and stronger self-control abilities are associated with a lower likelihood of short video addiction among middle school students in this region.

Additionally, among the five sub-dimensions of the family environment, nearly all variables except for control were significantly negatively correlated with short video addiction ($r = -0.176$ to -0.090 , $p < 0.001$) (see Table 2). This indicates that higher family intimacy, more abundant family recreational activities, more sufficient emotional expression, and fewer family conflicts are associated with lower levels of short video addiction among adolescents.

Test of the Mediation Model. All variables were standardised, and Model 6 of the PROCESS macro for SPSS, provided by

Hayes (2017), was used to examine the mediating roles of psychological capital and self-control between family environment and short video addiction. Gender, grade, and left-behind status were included as covariates in the regression equation. The bootstrap method was employed to test the mediation effects with 5000 resamples. The results (see Table 3) indicated that the total effect of family environment on short video addiction was -0.1951 , and the direct effect was -0.1325 , with the bootstrap 95% confidence intervals not including 0. Furthermore, the total mediation effect of the three paths was significant (bootstrap 95% confidence intervals did not include 0), with a mediation effect value of -0.0626 , accounting for 32.1% of the total effect.

Path 1: Family Environment \rightarrow Psychological Capital \rightarrow Short Video Addiction. The indirect effect was -0.0243 , and the bootstrap 95% confidence intervals included 0, indicating that the mediating role of psychological capital between family environment and short video addiction was not significant.

Path 2: Family Environment \rightarrow Self-Control \rightarrow Short Video Addiction. The indirect effect was -0.0133 , and the bootstrap 95% confidence intervals did not include 0, indicating that the mediating role of self-control between family environment and short video addiction was significant, accounting for 6.8% of the total effect.

Path 3: Family Environment \rightarrow Psychological Capital \rightarrow Self-Control \rightarrow Short Video Addiction. The indirect effect was -0.0250 , and the bootstrap 95% confidence intervals did not include 0, indicating that the chained mediation effect of psychological capital and self-control between family environment and short video addiction was significant, accounting for 12.8% of the total effect.

The specific mediation path analysis model is illustrated in Fig. 1.

Table 3 Intermediary path effect size analysis (N = 1735).

Effect type	Path	Effect	SE	t	LLCI	ULCI	Effect size
Total effect	FE → SVA	−0.1951	0.0236	−8.274***	−0.2414	−0.1489	
Total direct effect	FE → SVA	−0.1325	0.0253	−5.228***	−0.1822	−0.1325	
Total indirect effect	FE → SVA	−0.0626	0.0128		−0.0890	−0.0380	32.1%
Indirect effect	FE → PC → SVA	−0.0243	0.0126		−0.0502	0.0002	
	FE → SC → SVA	−0.0133	0.0047		−0.0233	−0.0051	6.8%
	FE → PC → SC → SVA	−0.0250	0.0051		−0.0358	−0.0154	12.8%
	R ²	0.040					
	F	18.224***					

Notes. *** indicate statistical significance at the 0.001 levels, respectively; LLCI, lower confidence interval; ULCI, upper confidence interval; FE, Family Environment; PC, Psychological Capital; SC, Self-control; SVA, Short Video Addiction.

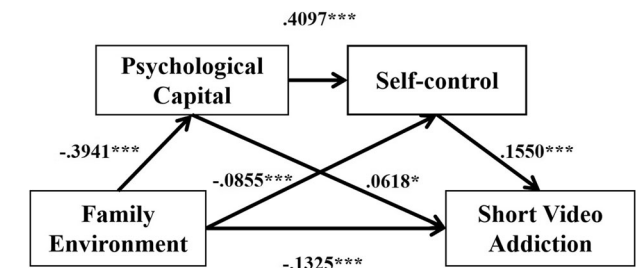


Fig. 1 Intermediate path analysis model (N = 1735). Notes: ***, **, and * indicate statistical significance at the 0.001, 0.01, and 0.05 levels, respectively.

Discussion

The widespread use of short video applications among adolescents has raised concerns due to their addictive nature. Previous studies highlight the negative effects of short video addiction on adolescents’ academic performance, emotional regulation, and social skills. However, the influence of family environment on this addiction remains underexplored. This study aimed to examine the roles of family environment, psychological capital, and self-control, and their chain mediation effect on adolescent short video addiction.

Hypothesis Testing Results. The study tested five hypotheses, and the results are summarized below:

H1: A positive family environment is significantly negatively correlated with short video addiction. This was confirmed, indicating that a supportive family environment reduces the likelihood of addiction.

H2: Psychological capital is significantly negatively correlated with short video addiction. The results supported this, showing that higher levels of psychological capital lower the risk of addiction.

H3: Psychological capital mediates the relationship between family environment and short video addiction. This hypothesis was not supported, possibly due to the strong direct influence of the family environment.

H4: Self-control mediates the relationship between family environment and short video addiction. The findings confirmed that higher self-control, shaped by the family environment, reduces the risk of addiction.

H5: Psychological capital and self-control play a chain mediation role between family environment and short video addiction. This was supported, showing that both factors work together to mediate the relationship.

The Impact of Family Environment on Short Video Addiction. The results of this study indicate that the family environment has a significant impact on adolescent short video addiction, which is consistent with previous research. Numerous studies have highlighted that a positive family environment helps reduce the risk of internet

addiction among adolescents (Casaló and Escario, 2019; Dong et al. 2019; Shek et al. 2019; Wang et al. 2018). In harmonious family relationships, adolescents’ emotional regulation abilities are significantly enhanced. This means that when they encounter negative emotions in real life, they are less likely to rely on the internet for emotional regulation (Chi et al. 2019). Additionally, a positive family environment encourages adolescents to engage more in social activities and real-life interactions, thus reducing their immersion in the virtual online world (Chi et al. 2019). Furthermore, this study also found a positive correlation between family conflict and adolescent short video addiction, which aligns with previous findings on internet addiction (Liu et al. 2024). This could be because short videos provide adolescents with a personalised and convenient immersive emotional space (Huang et al. 2010), serving as an escape from family conflicts.

Moreover, this study discovered an association between family entertainment and adolescent short video addiction, a finding that has not been thoroughly discussed in previous research. Studies show that the primary motivations for adolescents to watch short videos are emotional engagement and entertainment (Bossen and Kottasz, 2020). This finding may suggest the existence of a “substitution effect” within the family environment. If families can offer diverse and engaging entertainment activities, these activities could replace the time and desire adolescents have for watching short videos (Dwyer et al. 2018), providing them with opportunities to develop other interests, thereby helping to reduce their dependence on short videos.

Finally, this study presents results that differ from previous research. Earlier studies indicated that family control significantly impacts adolescent online gaming addiction (Yin et al. 2023). However, in this study, we found that family control does not significantly affect adolescent short video addiction. This discrepancy may be due to the different characteristics and social perceptions of media addiction. Compared to online gaming addiction, the potential harms of short videos, a relatively new medium, have not yet garnered widespread attention, and thus may not be a focal point of family education and control.

The Mediating Role of Psychological Capital and Self-Control.

The study results show that the family environment has a significant impact on adolescents’ psychological capital, and psychological capital is significantly associated with adolescent short video addiction. However, the mediating effect of psychological capital between family environment and short video addiction was not significant, possibly due to the overpowering direct influence of the family environment, which creates a masking effect.

A positive and healthy family environment greatly promotes adolescents’ psychological capital (Chen et al. 2017). According to attachment theory, secure family attachment relationships strongly foster the development of positive psychological traits, such as hope (Otis et al. 2016; Sulimani-Aidan et al. 2017), resilience (Zhang

et al. 2021), and self-efficacy (Li et al. 2013). Therefore, children growing up in a loving and caring family environment tend to have a healthier psychological state (Nickerson and Nagle, 2004; Bretherton, 1985). Conversely, insecure attachment relationships and family conflicts undermine children's psychological safety, thereby reducing their psychological capital (Bowlby, 2010; Sroufe et al. 2009; Masten, 2001). Particularly, frequent violent conflicts between parents can cause profound psychological trauma and immense stress for children (Hu et al. 2022). Adolescents with lower levels of psychological capital often deeply doubt their abilities and worth, lacking confidence and motivation to face life's challenges (Luthans et al. 2006; Avey et al. 2009). In such situations, short videos become an easy and thoughtless entertainment choice, providing them with an immersive flow experience (Lu et al. 2022), helping them temporarily escape from the pressures and negative emotions of reality. This, in turn, increases their risk of short video addiction.

Furthermore, the study results significantly reveal the mediating role of self-control between family environment and short video addiction. Existing research has confirmed that individuals' behaviours and personality traits are largely influenced by their environment (Qian et al. 2020; Li et al. 2024; Mikulincer and Shaver, 2019). In a family setting, parents providing secure attachment enable children to better regulate their emotions and behaviours (Al-Yagon, 2011). In a good family environment, parents cultivate healthy living habits and enhance self-control in their children by arranging regular daily activities (Wu et al. 2021). Therefore, adolescents with stronger self-control abilities can resist the temptation of short videos and effectively plan and manage their tasks.

Practical Applications and Implications. Given the significant impact of the family environment on short video addiction, parents should actively create a warm and harmonious family atmosphere. They can strengthen communication with their children, enhance the closeness of parent-child relationships, and enrich daily family activities by providing diverse entertainment and learning methods. Additionally, parents should closely monitor their children's use of short videos, incorporating it into family management, and reasonably control the viewing time and content.

Considering the crucial role of psychological capital and self-control in preventing and intervening in adolescent short video addiction, parents should focus on enhancing these abilities in their children. Cultivating positive psychological qualities such as hope, resilience, and self-efficacy, and strengthening training in self-discipline and impulse control can effectively prevent and intervene in short video addiction. These efforts will help adolescents better cope with challenges and pressures, form healthy habits, and reduce excessive dependence on short videos.

Research Limitations. Although this study provides certain insights, it also has some limitations. Firstly, we used self-report methods to collect data, which may be influenced by subjective factors. Future research should consider using multiple data sources for cross-validation to obtain more objective measurements. Secondly, this study is cross-sectional, so it cannot directly verify causal relationships between variables. However, our research provides valuable cross-sectional data and information for future longitudinal studies, which can use longitudinal methods to confirm the causal relationships between variables. Lastly, although our chained mediation effect model successfully linked family environment, psychological capital, self-control, and short video addiction, there may be other unexplored mediating variables in this system. Future research can further explore these potential mediating factors.

Conclusion

Based on the research findings, we draw the following conclusions: The family environment significantly impacts adolescent short video addiction. Close family relationships and rich family recreational

activities help reduce the risk of addiction. Psychological capital and self-control play important mediating roles between the family environment and short video addiction. Enhancing adolescents' psychological capital and self-control abilities can effectively prevent and intervene in addiction problems.

Data availability

All data generated or analysed during this study are included in this published article.

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Author contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, acquisition of data, analysis and interpretation. Wang, Guo and Lan took part in drafting, revising or critically reviewing the article.

Competing interests

The authors of this study declare no conflict of interest and that the study has not been submitted for publication anywhere else.

Ethical approval

This study was approved by the Human Research Ethics Committee of Yibin University, China on October 10, 2023 (2023101001E). Ethical approval includes the requirement to inform participants of voluntary participation and informed consent, and to explain the purpose and procedure to participants. All methods were carried out in accordance with the Declaration of Helsinki and approved by the aforementioned ethics committee.

Informed consent

Before conducting the survey, all participants and their guardians were verbally informed of the study's purpose and objectives, with assurances of anonymity provided. The study did not cause any physical, emotional, or psychological issues for participants, nor did it involve any privacy risks or significant ethical concerns. All participants provided their consent, with an emphasis on the voluntary nature of their participation. Participants were also informed that they could withdraw from the study at any time. Additionally, they were briefed on the procedures prior to the tasks, ensuring they understood what would occur and how to complete the tasks.

Additional information

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