

The Impact of Cyberbullying Victimization on Internet Gaming Addiction Among College Students: The Mediating Roles of Basic Psychological Need Satisfaction and Frustration, and the Moderating Role of Parental Autonomy Support

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Purpose: Research on the relationship between cyberbullying victimization and Internet gaming addiction in China is limited, while the mechanisms underlying this association remain unclear. Based on the Self-Determination Theory, this study establishes a moderated mediation model to test the mediating roles of basic psychological need satisfaction and frustration between cyberbullying victimization and Internet gaming addiction, as well as the moderating role of parental autonomy support in this mediating effect.

Methods: 2819 college students were surveyed using self-reported questionnaires about cyberbullying victimization, basic psychological need satisfaction and frustration, parental autonomy support, and Internet gaming addiction. SPSS 24.0 was utilized to analyze the correlations between variables, and Amos 24.0 was employed to test the structural equation model of this study.

Results: Cyberbullying victimization was found to significantly predict Internet gaming addiction positively. Basic psychological need satisfaction and frustration played partial mediating roles between cyberbullying victimization and Internet gaming addiction respectively. Parental autonomy support further moderated the first half of the mediated model pathway. Specifically, the impact of cyberbullying victimization on basic psychological need satisfaction and frustration are more obvious among college students with high level of parental autonomy support.

Conclusion: The findings advance our understanding of how cyberbullying victimization affects Internet gaming addiction. Within the college environment, reducing cyberbullying victimization could prevent Internet gaming addiction. Furthermore, enhancing basic psychological need satisfaction, reducing basic psychological need frustration, and reinforcing parental autonomy support among college students who have experienced cyberbullying would be effective to prevent Internet gaming addiction.

Keywords: Cyberbullying victimization, internet gaming addiction, basic psychological need, parental autonomy support

Introduction

Internet gaming addiction, recognized in the 11th revision of the *International Classification of Diseases* (ICD-11), refers to uncontrollable and excessive use of internet games, leading to physiological, psychological, and social functional impairments.¹⁻³ Past research reports have shown that Internet gaming disorder is associated with various negative consequences, such as poorer sleep quality, increased anxiety and depression, declining academic performance, and lower life satisfaction.⁴⁻⁶ In China, college students typically range in age from 18 to 23, as most students enter university immediately after completing their senior high school education. College students who have more free time and less parental supervision

are especially prone to Internet gaming addiction.⁷⁻⁹ Two meta-analyses have reported the global prevalence of Internet gaming addiction, with inconsistent results of 3.3% and 6.04%, respectively.^{10,11} A study shows that the prevalence of Internet gaming addiction among Chinese college students is 5.5%.¹² Investigating the mechanisms of Internet gaming addiction among Chinese college students is crucial for formulating targeted intervention measures.

Cyberbullying Victimization and Internet Gaming Addiction

Cyberbullying victimization is a type of bullying victimization that occurs in the digital medium of electronic text.¹³ It refers to the phenomenon that an individual is intentionally and repeatedly harmed by others via electronic means during Internet use.¹⁴ A qualitative systematic review found that individuals aged between 15 and 24 were deliberately targeted in the majority of cyberbullying victimization incidents.¹⁵ A cross-sectional study based on 21,688 adolescents showed that the prevalence of cyberbullying victimization was 5.1% in 13 European and Asian countries.¹⁶ Another cross-sectional study showed that the prevalence of cyberbullying victimization among Chinese adolescents was 31.4%.¹⁷ Notably, in a university in the United States, nearly three out of five of participants reported having been previously victimized by a cyberbully.¹⁸ A recent study showed that 22.8% of Chinese college students had been involved in cyberbullying victimization.¹⁹ Cyberbullying might even be more detrimental due to the fast, easy and repetitive transmission of the harassing behaviors online by perpetrators who are often anonymous.²⁰ The aforementioned characteristics of cyberbullying have a unique impact on victims' psychology and behavior.

Theorists also believe that negative social factors can hinder individuals' mental health and behavior.²¹ Encountering cyberbullying may lead to Internet gaming addiction. A study has confirmed that peer victimization is a significant risk factor leading to Internet addiction among Chinese adolescents.²² Similarly, a cross-sectional study indicates that more frequent experiences of cyberbullying victimization are associated with a higher frequency of problematic internet use.²³ Additionally, a longitudinal study has shown that peer victimization can predict Internet gaming addiction two years later among Chinese adolescents.²⁴ The above evidences provide indirect support for the relationship between cyberbullying victimization and Internet gaming addiction. Thus, in this study, we explore the impact of cyberbullying victimization on Internet gaming addiction among Chinese college students.

The Mediating Roles of Basic Psychological Need Satisfaction and Frustration

According to Self-Determination Theory, which was proposed by Deci and Ryan in the early 1980s, people have a universal deep-seated psychological need for autonomy, relatedness, and competence.²⁵ Basic psychological need is crucial motivational mechanism through which the social environment impacts individual development, acting as mediator in this interaction.²⁵ It serve as essential psychological "nutrition" for individual growth and heavily depend on the external environment. If the social environment fails to meet basic psychological need, individuals may adapt poorly and turn to other activities for satisfaction.²⁵ Cyberbullying victimization significantly lowers the satisfaction of basic psychological need among college students,²⁶ driving them to seek compensation through Internet gaming and increasing their susceptibility to Internet gaming addiction.³ Empirical evidence supports this pathway: basic psychological need satisfaction mediates the relationship between stressful life events and Internet addiction,²⁷ and its lack is linked to adverse psychological outcomes in cases of workplace bullying.²⁸ Based on empirical evidence, basic psychological need satisfaction may mediate the relationship between cyberbullying victimization and Internet gaming addiction.

Basic psychological need frustration has been identified as a more appropriate mediator explaining the relationship between negative social environment and poor psychological functioning.²⁹ It is important to distinguish between basic psychological need satisfaction and frustration, which are asymmetrical dimensions of need experience, each serving different mechanisms.^{30,31} Low need satisfaction does not equate to need frustration, with the latter showing a stronger correlation with unhealthy outcomes.³² While a lack of positive social environment may lead to low need satisfaction and stunt personal growth, negative environment directly cause need frustration, which can severely impact mental health and potentially lead to mental illness.^{33,34} Cyberbullying victimization severely depletes an individual's psychological resources, causing need frustration and increasing the likelihood of compensatory behaviors like Internet gaming.^{35,36} Empirical studies have highlighted the mediating role of need frustration between negative environments and various negative outcomes, such as reduced psychological function from workplace bullying,

decreased well-being from social exclusion, and depression in stressful conditions.^{28,37,38} Yet, research specifically assessing basic psychological need frustration and its mediating effect between cyberbullying victimization and Internet gaming addiction is limited. In conclusion, basic psychological need frustration may mediate the relationship between cyberbullying victimization and Internet gaming addiction, exhibiting a stronger mediating effect than basic psychological need satisfaction.

The Moderating Role of Parental Autonomy Support

Autonomy is one of the most important developmental tasks in early adulthood. College students are precisely at this stage of life, parental autonomy support is crucial for successfully navigating this phase.³⁹ In the context of Chinese culture, although college students may live far from their parents, these parents continue to play an indispensable role across various functional domains and are still regarded as key sources of support on many important issues.^{40,41} For instance, when facing challenges related to academics, interpersonal relationships, and employment, college students' behaviors and emotions remain influenced by their parents.⁴² Especially when making significant decisions, they particularly need support from their parents.^{39,41} Some interesting studies suggest that even after reaching adulthood, college students continue to benefit from parental autonomy support in terms of their psychological states, academic decisions, and behaviors.^{43–45}

Parental autonomy support refers to the perception that parents encourage independent decision-making and choice. Within such an environment, individuals can gain valuable information and emotional recognition from their parents.⁴⁶ According to Self-Determination Theory, an environment of autonomy support promotes the satisfaction of basic psychological need, fostering the optimal use of inner resources and active personal growth.^{25,47} Research shows that individuals experiencing parental autonomy support report higher levels of basic psychological need satisfaction, leading to reduced academic burnout and improved subjective well-being.^{45,48,49} Furthermore, the “risk-buffering model” suggests that protective factors can mitigate the adverse effects of risk factors.⁵⁰ As such, parental autonomy support may buffer the harmful impact of cyberbullying victimization on basic psychological need. While the moderating role of parental autonomy support between bullying and basic psychological need remains underexplored, existing study indicates that positive parenting can reduce the negative effects of cyber victimization on basic psychological need.⁵¹ In view of the existing research, parental autonomy support may moderate the impact of cyberbullying victimization on the basic psychological need of college students.

The Present Study

Research on the relationship between cyberbullying victimization and Internet gaming addiction in China is limited, there remains a gap in understanding the mediating effect of basic psychological need and the moderating effect of parental autonomy support. Based on the Self-Determination Theory, we propose a moderated mediation model to investigate these relationships. Specifically, we aimed to test the following hypotheses:

H1: Cyberbullying victimization directly predicts Internet gaming addiction among college students.

H2: Basic psychological need satisfaction may mediate the relationship between cyberbullying victimization and Internet gaming addiction.

H3: Basic psychological need frustration mediates the relationship between cyberbullying victimization and Internet gaming addiction, exhibiting a stronger mediating effect than basic psychological need satisfaction.

H4: Parental autonomy support moderates the impact of cyberbullying victimization on the basic psychological need of college students.

Methods

Participants

A questionnaire survey was conducted among college students in three universities in southwest China using convenient sampling. We selected the Questionnaire Star platform to conduct the survey. The survey team members distributed the Quick

Response code of the questionnaire in the classroom. The QR code was placed on a PPT slide by the members of the survey team and was fully displayed on the projection screen. Participants could scan and complete the survey via their mobile devices. Before the participants filled out the questionnaire, the survey team members provided them with detailed instructions about voluntary participation, informed consent and confidentiality. During the survey, if participants had any questions, they were addressed by the survey team members. All participants could withdraw at any time if they felt uncomfortable. Finally, a total of 2883 college students participated in the questionnaire survey, and 2819 valid questionnaires were obtained after eliminating invalid responses, with a response rate of 97.78%. Among the participants, 1082 (38.4%) were male students and 1737 (61.6%) were female students. The number of freshmen to 4th-year students were: 1269 (45.0%), 816 (28.9%), 567 (20.1%), and 167 (5.9%), respectively. The average age of participants was 19.66 ± 1.66 years. A post hoc power analysis was conducted using G*Power 3.1 to evaluate the current effective sample size for correlation analysis.^{52,53} With a total sample size set of 2819 participants, a significance level of $\alpha = 0.001$, and an effect size of $r = 0.33$ (the correlation between CV and IGA), the statistical power reached 1.00. Informed consent was obtained from all participants. The study adhered to the Declaration of Helsinki and received ethical approval from the Ethics Committee of North Sichuan Medical College.

Measures

Demographic Variables

Several demographic variables were collected in this study: gender, age, grade.

Cyberbullying Victimization

The Chinese version of Revised Cyber Bullying Inventory—Cyberbullying Victimization Subscale (RCBI-CVS) was used to evaluate the experience of cyberbullying victimization among college students. The subscale was initially revised by Topcu and Erdur-Baker and later revised by Chu and Fan in the context of Chinese culture.^{54,55} The subscale consists of 14 items, testing the frequency of cyberbullying incidents encountered by the participants in the last six months. It employs a 4-point Likert scale (1=*never encountered*, 2=*once*, 3=*2-3 times*, and 4=*more than 3 times*), with higher scores indicating a higher degree of cyberbullying victimization. In this study, the Cronbach's α coefficient for the cyberbullying victimization subscale was 0.882.

Basic Psychological Need Satisfaction and Frustration

The Basic Psychological Need Scale (BPNS) developed by Chen et al was used to assess the satisfaction and frustration of basic psychological need among college students.³⁴ The scale contains 24 items which are divided into six dimensions: autonomy satisfaction, relatedness satisfaction, competence satisfaction, autonomy frustration, relatedness frustration and competence frustration, with four items per dimension. The items are rated on a 5-point Likert scale ranging from 1(*does not apply at all*) to 5(*applies very much*), with higher total scores indicating higher levels of basic psychological need satisfaction and frustration. In this study, the Cronbach's α coefficient for the overall scale was 0.772, with the Cronbach's α coefficients for each dimension being 0.727, 0.793, 0.818, 0.757, 0.748, and 0.800, respectively.

Parental Autonomy Support

The Parental Autonomy Support Scale (PASS) developed by Robbins and later revised by Wang et al was used to assess the parental autonomy support situation among college students.^{56,57} This scale has shown good reliability and validity within the Chinese cultural context.⁴⁷ The scale consists of 12 items rated on a 5-point Likert scale ranging from 1(*does not apply at all*) to 5(*applies very much*). The scale's score is the average of the 12 items, with higher scores indicating higher levels of parental autonomy support. In this study, the Cronbach's α coefficient for this scale was 0.935.

Internet Gaming Addiction

The Chinese version of the nine-item Internet Gaming Disorder Scale-Short Form (IGDS-SF9) was used to assess the addiction levels of Internet gaming for college students. This scale was originally developed by Pontes and Griffiths.⁵⁸ The Chinese version of the IGDS9-SF has shown adequate psychometric properties in previous research.⁵⁹⁻⁶¹ There are nine items rated on a 5-point Likert scale ranging from 1(*never*) to 5(*very often*). The final score ranges from 9 to 45, with the higher scores representing higher levels of Internet gaming addiction. A study aimed to identify the appropriate cutoff

score for IGDS9-SF in a Chinese context. The final result indicates that if the participant has a total score of 32 or above, it is categorised as Internet gaming addiction in a Chinese context.⁶² The validity of this cutoff score has been confirmed among the population of Chinese college students.⁶² In addition, this cutoff score has been widely applied among Chinese college students.^{63–65} In this study, the Cronbach's alpha coefficient for the Chinese version of the IGDS9-SF9 was 0.909.

Statistical Analyses

Questionnaire reliability test, harman's single-factor test, descriptive statistics and correlation analysis were conducted using SPSS 24.0 to analyze the data. Structural Equation Modeling (SEM) and tests for mediation and moderation effects using bias-corrected percentile Bootstrap method were conducted through Amos 24.0. The study used the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) greater than 0.90,^{66,67} and the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR) less than 0.08 as criteria to evaluate the goodness of model fit.^{68,69}

Results

Common Method Biases Analyses

The Harman's One-factor Test was used to examine common method bias. It was found that eight factors with a characteristic root >1. The first factor explained 21.31% of the variation, which was below the critical value of 40% suggested by Podsakoff et al.⁷⁰ Therefore, there was no significant common method bias in this study.

Descriptive Statistics and Correlation Analysis

We have found that cyberbullying victimization has been experienced by 57.2% of college students at least once. The prevalence of Internet gaming addiction is 6.1% in this study.

The mean, standard deviation and correlation coefficient of each variable are shown in Table 1. The results from Pearson correlation analysis reveal significant relationships: cyberbullying victimization positively correlates with both basic psychological need frustration and Internet gaming addiction, while showing a negative correlation with basic psychological need satisfaction and parental autonomy support. Furthermore, frustration of basic psychological need is negatively associated with both basic psychological need satisfaction and parental autonomy support, yet positively with Internet gaming addiction. Satisfaction of basic psychological need positively correlates with parental autonomy support and negatively with Internet gaming addiction. Lastly, parental autonomy support shows a significant negative correlation with Internet gaming addiction.

Table 1 Correlation Analysis Among Variables

Variables	M	SD	1	2	3	4	5
1. CV	1.20	0.36	1				
2. BPNF	2.71	0.67	0.224***	1			
3. BPNS	3.58	0.61	-0.160***	-0.288***	1		
4. PAS	3.63	0.74	-0.181***	-0.233***	0.579***	1	
5. IGA	1.76	0.85	0.333***	0.295***	-0.217***	-0.145***	1

Note: *** $p < 0.001$.

Abbreviations: CV, Cyberbullying victimization; BPNF, Basic Psychological Need Frustration; BPNS, Basic Psychological Need Satisfaction; PAS, Parental Autonomy Support; IGA, Internet Gaming Addiction.

Cyberbullying Victimization and Internet Gaming Addiction: A Moderated Mediation Model

Cyberbullying Victimization and Internet Gaming Addiction

Data analysis utilized a moderated mediation model testing procedure.⁷¹ Previous research has indicated that gender and grade are significant factors affecting Internet gaming addiction.^{27,72} Independent sample *t*-test and one-way ANOVA indicate statistically significant differences in Internet gaming addiction among college students of different genders and grades. Gender and grade, as control variables, are included in the subsequent moderated dual pathway model. The structural equation model was established according to the hypotheses of this study (Figure 1). The model demonstrated a good fit, with fit indices: $\chi^2/df=12.23$, CFI=0.955, TLI=0.931, SRMR=0.054, RMSEA=0.063). As shown in Figure 1 and Table 2, cyberbullying victimization significantly predicts Internet gaming addiction ($\beta = 0.23$, $p < 0.001$), affirming H1.

Mediating Effect Analysis of Basic Psychological Need Satisfaction and Frustration

As shown in Figure 1 and Table 2, cyberbullying victimization also negatively impacts basic psychological need satisfaction ($\beta = -0.07$, $p < 0.001$), which in turn negatively predicts Internet gaming addiction ($\beta = -0.11$, $p < 0.001$), supporting the mediating role of need satisfaction with a mediation effect of 0.008 and a Bootstrap 95% CI of [0.003, 0.02] (H2). Cyberbullying victimization significantly predicts basic psychological need frustration ($\beta = 0.27$, $p < 0.001$), which in turn significantly predicts Internet gaming addiction ($\beta = 0.22$, $p < 0.001$), confirming the mediating role of need frustration. The mediation effect is 0.057, with a Bootstrap 95% CI of [0.04, 0.07]. Comparative analysis of path coefficients showed that the mediating effect of need frustration was significantly higher than that of need satisfaction ($p < 0.001$), supporting H3.

Moderating Effect of Parental Autonomy Support

Additionally, Figure 1 shows that the interaction term of cyberbullying victimization and parental autonomy support significantly predicts need satisfaction ($\beta = -0.04$, $p < 0.05$) and frustration ($\beta = 0.16$, $p < 0.001$). This indicates that parental autonomy support moderates the relationship between cyberbullying victimization and basic psychological need satisfaction, and cyberbullying victimization and basic psychological need frustration, affirming H4.

To better understand the moderating effect of parental autonomy support, simple slope analysis was conducted. In this study, the moderating variable was divided into groups using $Z=0\pm1$, with $Z=0+1$ representing the high parental autonomy support group and $Z=0-1$ representing the low parental autonomy support group. Simple slope analysis indicates that when parental autonomy support is high ($Z_{\text{parental autonomy support}} = 1$), cyberbullying victimization significantly negatively predicts the

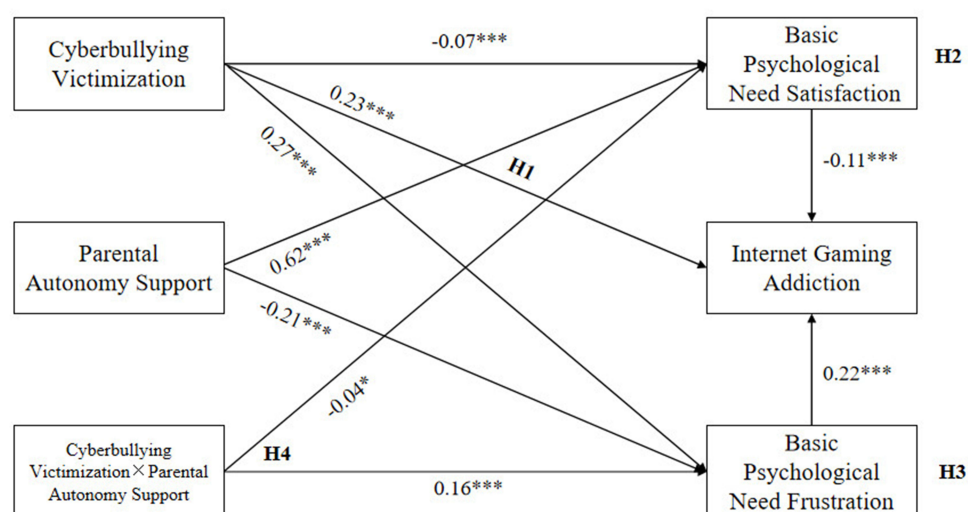


Figure 1 Moderated Dual Pathway Model.

Notes: The solid line represents a significant path. * $p < 0.05$, *** $p < 0.001$.

Table 2 The Mediating Effect of Basic Psychological Need Satisfaction, Frustration

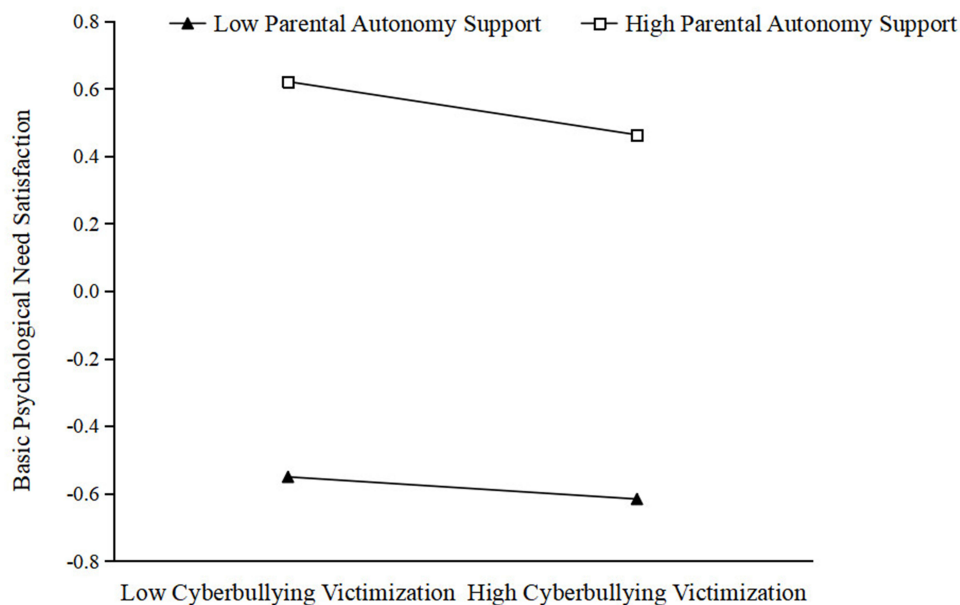
Path	β	SE	95% CI	p
Total effect	0.297	0.02	[0.25,0.34]	<0.001
Direct effect (CV→ IGA)	0.231	0.02	[0.18,0.27]	<0.001
Total indirect effect (CV→BPN→ IGA)	0.066	0.01	[0.05,0.08]	<0.001
Indirect effect 1 (CV→BPNS→ IGA)	0.008	0.003	[0.003,0.02]	<0.001
Indirect effect 2 (CV→BPNF→ IGA)	0.057	0.007	[0.04,0.07]	<0.001
Indirect effect 1-Indirect effect 2	-0.049	0.009	[-0.06,-0.03]	<0.001

basic psychological need satisfaction ($\beta=-0.101$, $t=-3.83$, $p<0.01$). When parental autonomy support is low ($Z_{\text{parental autonomy support}} = -1$), cyberbullying victimization significantly negatively predicts the basic psychological need satisfaction ($\beta=-0.042$, $t=-2.42$, $p<0.05$), though the predictive effect is smaller (Figure 2). In addition, when parental autonomy support is high ($Z_{\text{parental autonomy support}} = 1$), cyberbullying victimization significantly positively predicts the basic psychological need frustration ($\beta = 0.369$, $t = 12.08$, $p < 0.001$). When parental autonomy support is low ($Z_{\text{parental autonomy support}} = -1$), cyberbullying victimization also has a significant positive predictive effect on basic psychological need frustration ($\beta = 0.123$, $t = 6.09$, $p < 0.001$), though the predictive effect is smaller (Figure 3). The impact of cyberbullying victimization on the basic psychological need satisfaction and frustration varies in intensity depending on the level of parental autonomy support.

Discussion

Cyberbullying Victimization and Internet Gaming Addiction

In line with previous study,¹⁹ we find that cyberbullying victimization has been experienced by 57.2% of college students at least once. Notably, the prevalence of Internet gaming addiction in the present sample is 6.1%, which is similar to previous report.^{73,74}

**Figure 2** The Moderating Effect of Parental Autonomy Support on the Impact of Cyberbullying victimization on the Basic Psychological Need Satisfaction.

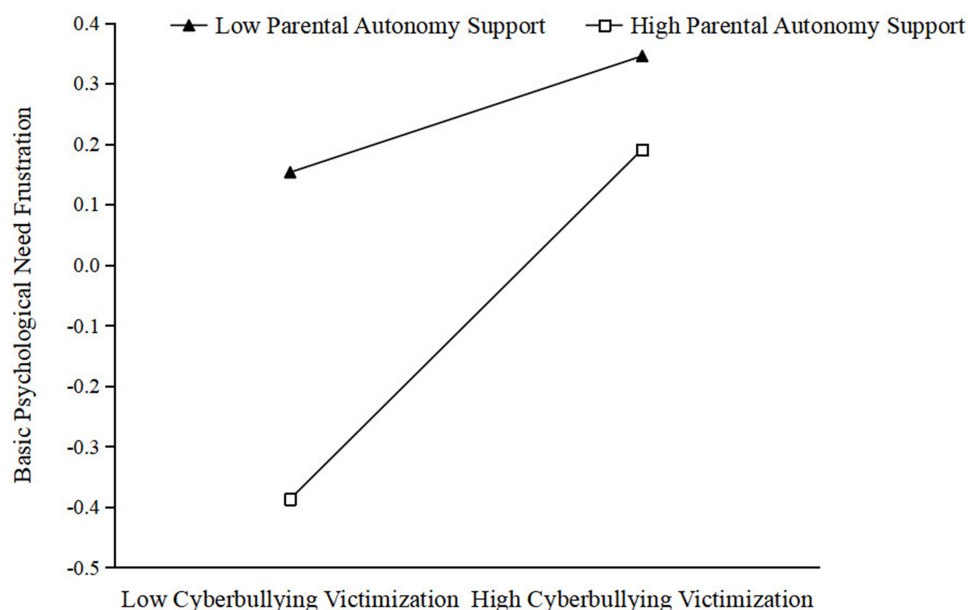


Figure 3 The Moderating Effect of Parental Autonomy Support on the Impact of Cyberbullying victimization on the Basic Psychological Need Frustration.

Importantly, this research finds that cyberbullying victimization is a significant predictor of Internet gaming addiction, thus supporting H1. Previous research has shown that cyberbullying victimization was positively correlated with problematic Internet use.⁷⁵ This study further confirms that cyberbullying victimization increases the risk of Internet gaming addiction, thereby expanding upon previous studies. Firstly, due to the lack of time and space constraints and the presence of a large potential audience online, victims of cyberbullying may suffer more intense and excessive harm. This may lead to more psychological and behavioral problems in victims of cyberbullying, which may include Internet gaming addiction.⁷⁶ Secondly, with the widespread popularity of Internet and entertainment culture in China, Internet gaming has become an important form of entertainment for college students. This causes college students who have experienced cyberbullying victimization to tend to comfort themselves with Internet gaming, which may increase the risk of addiction. Thirdly, influenced by China's face-saving culture, people are ashamed to express their experiences of cyberbullying victimization in order to maintain their own dignity. College students who have experienced cyberbullying may be reluctant to disclose their suffering. This may hinder them from seeking appropriate coping strategies, leading them to play Internet games alone to alleviate their pain.^{77,78} Fourth, due to the rapid development of society and the accelerated pace of life and study, contemporary Chinese college students inherently feel loneliness. Furthermore, college students who experience cyberbullying victimization often tend to avoid social interactions in real life, resulting in poor interpersonal relationships. They may choose to excessively engage in Internet gaming to establish connections and gain a sense of belonging.^{79,80} These may explain why they continue to engage with the online world despite facing cyberbullying.

The Mediating Roles of Basic Psychological Need Satisfaction and Frustration

This study finds that basic psychological need satisfaction and frustration play a partial mediating role between cyberbullying victimization and Internet gaming addiction respectively, which verifies H2 and H3.

Existing research has confirmed that basic psychological satisfaction and frustration play a mediating role between workplace bullying and employee functioning, which provides empirical evidence for our study.²⁸ We separately explore the unique roles of basic psychological need satisfaction and frustration in the relationship between cyberbullying victimization and Internet gaming addiction for the first time. The mediating role of basic psychological need satisfaction can be explained by Self-Determination Theory. The theory states that people have universal need for autonomy, relatedness, and competence that form the basis of behavioral and mental health.²⁵ The supportive social environment can satisfy the basic psychological need of individuals, while the environment characterized by

rejection, exclusion and control is the opposite.⁸¹ Specifically, cyberbullying victimization deprives individuals' feelings of autonomy, control and positive relationship, which means lack of basic psychological need satisfaction.⁸² This may reduce positive psychological responses and increase the risk of Internet gaming addiction.^{83,84}

The basic psychological need satisfaction may not fully describe the mechanism which cyberbullying victimization affects Internet gaming addiction. The basic psychological need frustration plays a unique role beyond satisfaction, serving as a stronger mediator linking cyberbullying victimization with Internet gaming addiction. Research has repeatedly supported the distinction between basic psychological needs satisfaction and frustration, which are two asymmetrical dimensions of need experience.^{30,31,34} Low need satisfaction does not necessarily involve need frustration, but need frustration involves low need satisfaction.²⁹ While the lack of basic psychological need satisfaction can hinder individual growth, the basic psychological need frustration may be particularly harmful or even pathogenic.²⁹ In other words, basic psychological need frustration is a more serious obstacle to the need experience. Cyberbullying not only deprives the victims of the opportunity to experience autonomy, relatedness and competence, but also makes them feel constrained and depressed, experience failure and incompetence, and generate feelings of alienation and loneliness, which makes them more prone to psychological symptoms and behavioral problems.⁸⁵ Compared to the basic psychological need satisfaction, need frustration may more accurately represent the harmful effects of cyberbullying and explain the subsequent Internet gaming addiction.⁸⁶

Research has shown that cultural diversity may influence the importance of basic psychological need among different social groups.⁸⁷ As some cross-cultural psychologists suggest, individuals in the Western societies influenced by individualistic cultures may benefit more from autonomy need satisfaction.⁸⁸ In Chinese collectivist culture, individuals place greater emphasis on harmonious relationships with others and the environment. Relatedness need may be more important to them.⁸⁹ Furthermore, Chinese students may have stronger expectations regarding competence need satisfaction.⁹⁰ This study further confirms that, similar to individuals in Western cultures, individuals in Chinese culture possess a universal basic psychological need.³² Basic psychological need is a key motivational mechanism for individual development, and this influence exhibits cross-cultural universality.³⁴

The Moderating Role of Parental Autonomy Support

Another important finding of this study is that parental autonomy support has a significant moderating effect on the relationship between cyberbullying victimization and basic psychological need satisfaction, cyberbullying victimization and basic psychological need frustration, which validates H4. For individuals with high levels of parental autonomy support, the impact of cyberbullying victimization on their basic psychological need satisfaction and frustration are more obvious.

It is important to note that this moderation pattern does not mean that parental autonomy support is a detrimental factor for basic psychological need. Due to the emphasis on respect for authority and obedience to parents in Chinese Confucian philosophy, some researchers argue that the negative effects of parental control may be less significant within the context of Chinese culture.^{91,92} Parental autonomy support might not have the same positive effects on individual social functioning as it does in Western cultures.⁹³ However, the results of this study support self-determination theory, indicating that parental autonomy support still has universal benefits in China.⁴⁰

A possible explanation for this moderation pattern is that individuals with high levels of parental autonomy support experience more basic psychological need satisfaction and less basic psychological need frustration.^{45,94} With the increase of cyberbullying victimization, the decline trend of basic psychological need satisfaction and rise trend of basic psychological need frustration of individuals are more obvious. The above change akin to a "world turned upside down". On the other hand, individuals with low levels of parental autonomy support have experienced less basic psychological need satisfaction and more basic psychological need frustration.^{95,96} When these individuals encounter cyberbullying, the decrease level of basic psychological need satisfaction and increase level of basic psychological need frustration are not significant. Such a change seem like "adding frost to snow".

Limitations and Implications

This study need to point out several limitations, which also indicate the direction of future research. Firstly, the use of convenience sampling and the participants from three universities in southwest China may limit the generalizability of

the current findings across different age periods, regions and cultural contexts. Future research needs to change sampling method and expand the scope of sampling. Secondly, the research relies on cross-sectional data, which limits the ability to infer causal relationships between variables. For example, there may be an interactive relationship between cyberbullying victimization and Internet gaming addiction, which needs to be further clarified in the future longitudinal research. Thirdly, the self-report nature of the questionnaire may introduce social desirability and memory bias, which could affect the accuracy of the findings. Future research may consider qualitative research through interviews and case studies to further validate our findings. Fourth, we need to promote the prevalence of Internet gaming addiction reported in this study with caution. In future research, we will use structured clinical interviews and receiver operating characteristics (ROC) curve to enhance the accuracy of the prevalence of Internet gaming addiction.

Despite these limitations, this study has examined the mechanism of cyberbullying victimization on Internet gaming addiction among college students, and reveals the moderating role of parental autonomy support and the mediating role of basic psychological need satisfaction and frustration. This research has several practical implications and provides important insights for early intervention. Firstly, cyberbullying victimization is a trigger factor for Internet gaming addiction. Reducing the likelihood of cyberbullying victimization may be one of the direct methods to decrease Internet gaming addiction among Chinese college students. Relevant management departments, schools, and parents should form a collaborative network to provide college students with a more supportive and safe environment, thereby reducing their experiences of cyberbullying victimization. Relevant management departments should implement comprehensive anti-cyberbullying policies, such as clear regulations and systems, to reduce the occurrence of cyberbullying victimization incidents. Schools can implement mental health education to help college students prevent and cope with cyberbullying victimization. Parents participating in regular training can enhance their understanding of cyberbullying victimization incidents, thereby providing appropriate support to their children.

Secondly, the basic psychological need satisfaction and frustration are crucial mechanisms linking cyberbullying victimization and Internet gaming addiction, with frustration serving as a stronger mediator. Educators should strive to meet the basic psychological need of college students who are victims of cyberbullying. Teachers can implement various activities and develop strategies to build college students' self-confidence, enhance their effectiveness, and improve their relationships. Mental health educators can conduct group counseling activities to support students' sense of autonomy, relatedness and competence. These measures will be effective in reducing Internet gaming addiction among college students.

Thirdly, parental autonomy support can moderate the relationship between cyberbullying victimization and basic psychological needs, suggesting that the role of parental autonomy support is an integral part of prevention and intervention programs. Parental autonomy support is crucial for college students' basic psychological need. Considering that Chinese culture emphasizes obedience to parents, we should particularly focus on Chinese parents with a high level of psychological control. Parents should strive to establish effective communication channels, respect and trust their children, while providing appropriate support.

Conclusion

The study finds that cyberbullying victimization positively predicts Internet gaming addiction among college students. Cyberbullying victimization can also indirectly predict Internet gaming addiction among college students through the mediation of basic psychological need satisfaction and frustration. Parental autonomy support moderates the first half of the mediating process. When the level of parental autonomy support is high, the impact of cyberbullying victimization on basic psychological need satisfaction and frustration are more obvious. These findings provide evidences to understand the effects of cyberbullying victimization on Internet gaming addiction among college students, as well as the role of basic psychological needs and parental autonomy support. Future research needs to further explore the relationship between cyberbullying victimization and Internet gaming addiction, such as validating these conclusions across different cultural groups and employing longitudinal designs to examine the dynamic relationships between variables.

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval and Informed Consent

The study received approval from the Ethics Committee of North Sichuan Medical College and complied with the Declaration of Helsinki. Informed consent was obtained from all participants.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising and critically reviewing the article; gave final approval of the version published; have agreed on the journal to which the article has been submitted; and agreed to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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