

How Do Traditional and Cyber Victimization Affect Sleep Quality among College Students? The Chain Mediating Role of Rumination and Anxiety

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Abstract

Previous studies have shown that peer victimization has a negative effect on sleep quality. However, there is limited understanding of how peer victimization affects sleep quality. According to the theoretical model of the stress-sleep relationship, stressors, such as peer victimization, affect individuals' sleep quality by affecting their cognitive processes and emotional responses. Therefore, this study aimed to investigate the cognitive (rumination) and emotional (anxiety) mechanisms of the relationship between peer victimization (traditional and cyber victimization) and sleep quality. Using a 2-wave longitudinal design, 1,092 college students (620 males, mean age at time 1 = 19.53 ± 0.83 years) completed self-reported measures

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of demographic characteristics, traditional victimization, cyber victimization, rumination, anxiety, and sleep quality. A structural equation model was conducted to test the chain mediating role of rumination and anxiety in the relationship between peer victimization (traditional and cyber victimization) and sleep quality. The findings showed that the mechanisms between traditional victimization and sleep quality were not exactly the same as those between cyber victimization and sleep quality. Specifically, traditional victimization indirectly predicted sleep quality through a separate mediating effect of rumination, a separate mediating effect of anxiety, as well as a chain mediating effect of rumination and anxiety. Cyber victimization indirectly predicted sleep quality through a separate mediating effect of rumination, as well as a chain mediating effect of rumination and anxiety. This study contributes to understanding how traditional and cyber victimization affect sleep quality among college students. It reminds us that when formulating programs to promote the sleep quality of college students, we should focus not only on reducing their traditional and cyber victimization but also on addressing rumination and anxiety.

Keywords

traditional victimization, cyber victimization, sleep quality, rumination, anxiety

Introduction

Peer victimization has emerged as a significant public health issue, garnering increased attention from researchers. Evidence indicates that the prevalence of peer victimization is about 10% to 30% or even more (Geng et al., 2025; Schoeler et al., 2018; Sullivan et al., 2021). Defined as the intentional and repeated harm inflicted by peers with an imbalance of power (Olweus, 1994), peer victimization can be categorized into traditional and cyber victimization based on the environment in which it occurs. Traditional victimization, which takes place offline, encompasses physical, relational, and verbal forms (Holfeld & Mishna, 2019). Cyber victimization occurs online and refers to receiving repeated aggressive messages from others in an electronic context (Tokunaga, 2010).

After entering university, college students are separated from the companionship of their families, and peers become one of their important sources of social support (Bronfenbrenner, 1986). Negative peer relationships, such as peer victimization, have been shown to lead to a range of negative developmental outcomes among college students, including

internalizing and externalizing problems (Fredrick et al., 2021; Luk et al., 2016). In addition, most college students have Internet devices and use the Internet daily, frequently engaging with peers through social media platforms such as Qzone and WeChat Moments (Pertegal et al., 2020). Although Internet access and use help college students connect and interact with their peers, they also contribute to the occurrence of cyber victimization (Williford et al., 2018). This study aimed to investigate the negative effects of traditional and cyber victimization in a sample of college students to provide theoretical support and practical implications to guide the mitigation of the negative effects of victimization.

Peer Victimization and Sleep Quality

Sleep is a complex biological need and physiological function that plays a vital role in survival and development (Yu & Zhu, 2023). Sleep quality is a comprehensive evaluation index of the sleep process and its effect, based on objective sleep conditions and focusing on subjective feelings (Yan et al., 2010). Sleep quality is typically assessed using the Pittsburgh Sleep Quality Index (PSQI), including subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, sleep medication use, and daytime dysfunction (Buysse et al., 1989). In higher education, college students generally face sleep problems (Chowdhury et al., 2021). A survey shows that the overall sleep quality of college students is poor, with 25.66% of college students experiencing sleep disorders (Hou et al., 2020).

The theoretical model of the stress-sleep relationship points out that stressors, such as peer victimization, can affect individuals' sleep quality via a series of cognitive processes and emotional responses (Yan et al., 2010). Previous empirical studies have consistently demonstrated that peer victimization could cause poor sleep quality. For instance, the study by Yang et al. (2024) showed that college students with victimization experiences had poorer sleep quality than those with no victimization experiences. Li et al. (2023) found that traditional and cyber victimization significantly predicted poor sleep quality.

Although research has shown that peer victimization could significantly and negatively affect sleep quality, there is limited understanding of how peer victimization affects sleep quality. To better improve college students' sleep quality, it is necessary to understand and examine the potential mechanisms underlying the relationship between peer victimization and sleep quality among college students. Therefore, this study aimed to investigate the cognitive (rumination) and emotional (anxiety) mechanisms of the relationship between peer victimization and sleep quality.

The Mediating Effect of Rumination

From a cognitive point of view, rumination may be the “bridge” between peer victimization and sleep quality. Rumination is defined as both self-reflection and a passive focus on distressing thoughts, emotions, and memories (Treyner et al., 2003). Control theory suggests that negative events can create discrepancies between goals or desired states and one’s current state, leading to rumination about how to reduce such discrepancies (Carver & Scheier, 1981; Michl et al., 2013). According to this theory, when individuals experience peer victimization, they fail to achieve their interpersonal goal (i.e., positive peer relationship) and further ruminate to figure out why they suffer victimization and how to avoid it. Thus, peer victimization may trigger rumination. The sleep-interfering processes theory posits that cognitive arousal—such as thinking, planning, and problem-solving—during sleep can interfere with sleep processes and reduce sleep quality (Lundh & Broman, 2000). Thus, rumination may be a crucial predictive factor of sleep quality. According to the above theories, rumination may mediate the relationship between peer victimization and sleep quality.

Empirical studies have proved this point of view. Jose and Vierling (2018) found that rumination mediated the relationship between cyber victimization and sleep adequacy, but they did not examine traditional victimization. Zou et al. (2023) found that rumination mediated the relationships between traditional victimization, cyber victimization, and insomnia in female college students. However, the participants in the study by Zou et al. (2023) were all female college students, which limited the conclusions’ generalizability. Thus, this study aimed to examine the mediating effect of rumination on the relationship between peer victimization and sleep quality in college students, including male and female college students.

The Mediating Effect of Anxiety

From an emotional point of view, anxiety may be the “bridge” between peer victimization and sleep quality. Anxiety is a negative emotional issue characterized by physiological and behavioral reactions such as restlessness, nervousness, increased arousal, avoidance, and fear (Gross & Hen, 2004). According to the interpersonal risk model, negative interpersonal experiences such as peer victimization can hinder the fulfillment of basic belongingness needs, leading to various emotional problems (Forbes et al., 2019). Consequently, peer victimization can contribute to anxiety. In addition, the vigilance-arousal framework suggests that emotionally salient experiences, whether positive or negative, will raise arousal and, in turn, inhibit sleep

(Dahl, 1996). A significant relationship between anxiety and poor sleep quality was observed in both clinical and nonclinical populations (Kortesoja et al., 2020). Thus, it is reasonable to hypothesize that anxiety mediates the relationship between peer victimization and sleep quality.

Existing studies have examined the mediating role of emotional problems in the relationship between peer victimization and sleep quality. A cross-sectional study showed that depression mediated the relationships between traditional victimization, cyber victimization, and sleep problems (Zhang et al., 2020). A longitudinal study with a 6-week interval by Herge et al. (2016) showed that relational and reputational victimization, but not cyber victimization, indirectly predicted sleep problems via depression. However, these studies were either cross-sectional or short-term longitudinal studies, and none focused on anxiety. Thus, this study aimed to examine the mediating effect of anxiety on the relationship between peer victimization and sleep quality in a longitudinal study with longer intervals.

The Chain Mediating Effect of Rumination and Anxiety

According to the response style theory (Nolen-Hoeksema & Morrow, 1991), individuals with higher levels of rumination tend to repeatedly think about the causes and consequences of negative events, thereby continuously experiencing negative emotions such as anxiety (Conway et al., 2000). Rumination has been shown to be a significant predictor of anxiety. McLaughlin et al. (2007) found that rumination could trigger anxiety using experimental research. A longitudinal study of 1,137 left-behind college students showed that rumination significantly predicted subsequent anxiety (Xie et al., 2023).

As mentioned above, both rumination and anxiety are significantly associated with sleep quality. Therefore, it can be reasonably speculated that rumination and anxiety may play a significant chain mediating role in the relationship between peer victimization and sleep quality. While no empirical studies have directly addressed this speculation, some research offers support. For instance, Qiu et al. (2023) found that online risky behavior predicted sleep quality through the chain mediating role of rumination and anxiety. Although the study by Qiu et al. (2023) did not examine peer victimization, there is a high probability that the conclusions are generalized to peer victimization, considering that both peer victimization and online risky behavior have potentially adverse consequences for individuals. Thus, this study aimed to examine the chain mediating role of rumination and anxiety in the relationship between peer victimization and sleep quality to clarify the cognitive and emotional mechanisms of the relationship.

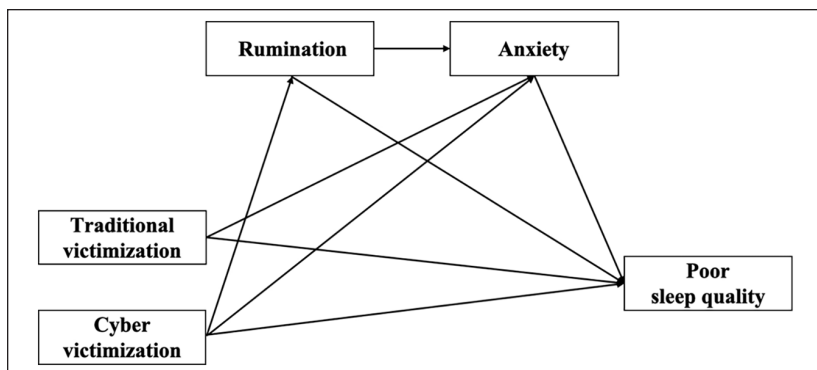


Figure 1. The proposed chain mediation model.

The Present Study

Taken together, the present study aimed to examine the mechanisms between peer victimization (traditional and cyber victimization) and sleep quality using a longitudinal design with a 6-month interval. More importantly, traditional and cyber victimization were included in a model to examine the unique mechanisms linking traditional victimization, cyber victimization, and college students' sleep quality (see Figure 1). To be more specific, we hypothesized that (a) rumination might play significant mediating roles in the relationships between traditional victimization, cyber victimization, and sleep quality; (b) anxiety might play significant mediating roles in the relationships between traditional victimization, cyber victimization, and sleep quality; (c) rumination and anxiety might play significant chain mediating roles in the relationships between traditional victimization, cyber victimization, and sleep quality.

Materials and Methods

Participants and Procedure

This study used a longitudinal research design with data collected at two time points, and the interval between each data collection was 6 months. All participants were recruited through convenience sampling techniques from two junior colleges in Shandong Province in Eastern China. One thousand one hundred fifty-four students participated in wave 1; 1,164 students participated in wave 2. Some students participated in the survey only at one

time point due to reasons such as taking leave, internships, or changing majors. After matching was performed at the end of the 2 waves, there were 1,092 students in the final valid sample (620 males). At time 1, the mean age of the final valid sample was 19.53 years ($SD=0.83$).

This study was approved by the ethics committee in the corresponding author's school. Before data collection, informed consent was secured from students and teachers. This survey was facilitated in the regular psychological health education courses. The research assistants introduced the details of the study (including the instructions, data confidentiality, and anonymity). Participants were informed that their involvement was entirely voluntary, and they had the option to withdraw at any time. Participants completed the questionnaires on their own with the guidance of well-trained research assistants in regular classroom environments. At time 1 (T1), participants completed measures of demographic characteristics, traditional victimization, cyber victimization, and rumination. At time 2 (T2), participants completed measures of anxiety and sleep quality.

Measures

Traditional Victimization. The Traditional Victimization Scale, revised by Li et al. (2012), was used to assess college students' traditional victimization in the past 6 months. The scale contains six items, such as "Some students hit, kicked, pushed, bumped or threatened me." All items were rated on a 5-point Likert scale ranging from 1 (*never*) to 5 (*several times per week*). Total scores were obtained by summing all items, with a higher score indicating more traditional victimization. The scale has been shown to have adequate reliability and validity in Chinese adolescents (Li, 2021). In the present study, Cronbach's alpha reliability of the scale was .64.

Cyber Victimization. The E-Victimization Scale was used to assess college students' cyber victimization in the past 6 months (Lam & Li, 2013). The scale contains six items, such as "Some people used to laugh at me through email, SMS, instant messaging (QQ, Wechat), social networking sites (Qzone, Renren, Wechat moments), and so on." All items were rated on a 7-point Likert scale ranging from 0 (*never*) to 6 (*six times or more*). Total scores were calculated, and higher scores represented more cyber victimization. Previous research has demonstrated high reliability and validity of the scale in Chinese adolescents (Nie et al., 2024). In the present study, Cronbach's alpha reliability of the scale was .85.

Rumination. Rumination was measured by the brooding and reflective pondering subscale from the Chinese version of the Ruminative Responses Scale (Han & Yang, 2009). The scale consists of 10 items, such as “I often analyze recent events to understand why I feel depressed.” All items were rated on a 4-point Likert scale ranging from 1 (*almost never*) to 4 (*almost always*). Scores were calculated by adding all the items, with higher scores demonstrating more rumination. The scale showed good reliability and validity among Chinese college students (Qiu et al., 2023). In the present study, Cronbach’s alpha reliabilities of the brooding and reflective pondering subscales were .91 and .90, respectively.

Anxiety. The Generalized Anxiety Scale, developed by Spitzer et al. (2006) and revised by He et al. (2010), was used to measure anxiety. The scale comprises seven items rated using a 4-point Likert scale ranging from 0 (*never*) to 3 (*almost always*). Sample items are “I feel nervous, anxious, or irritable” and “It’s hard for me to relax.” The scores of the items were summed to obtain anxiety scores, with higher scores indicating higher levels of anxiety during the previous 7 days. This scale has been proven to have acceptable reliability and validity among Chinese college students (Zhao et al., 2023). In the present study, Cronbach’s alpha reliability of the scale was .92.

Sleep Quality. Sleep quality was assessed with the PSQI (Buysse et al., 1989). The scale includes 4 fill-in-the-blank questions (e.g., What time do you go to bed at night) and 14 choice questions (e.g., How do you feel about your sleep quality). There are seven components of sleep quality: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, sleep medication use, and daytime dysfunction. Scores in each component were summed to calculate the global score, ranging from 0 to 21, with higher scores indicating poorer sleep quality. This measure has been widely used to assess sleep quality among Chinese participants (Ye et al., 2024).

Socioeconomic Status. Family socioeconomic status (SES) is commonly measured by parental educational attainment, parental occupation, and family income (Xing et al., 2019). To avoid privacy issues related to family income, we followed the measure proposed by Shi and Shen (2007), assessing SES through the sum of parental educational attainment and occupation. Specifically, parental educational attainment was assessed on a 6-point Likert scale, ranging from 1 (*uneducated*) to 6 (*masters or doctoral degree*), and their occupation was assessed on a 5-point Likert scale, ranging from 1 (*unemployed*) to 5 (*professional/executive*). The higher the scores, the higher the

SES. In China, this measure is widely used to assess SES (Fu & Wang, 2021; Liu & Wang, 2020).

Statistical Analysis

We analyzed all data using SPSS 26.0 (IBM Corp.) and Mplus 8.3 (Muthén & Muthén). The percentage of missing data is only 0.62%, and the mean imputation was used to handle missing data. Data analyses proceeded in several steps. First, factor analysis was performed to test common method biases (Podsakoff & Organ, 1986). The results showed that the first factor in explaining the variance was 19.58%, indicating no significant common method biases. Second, descriptive statistics and Pearson correlation analysis were used to analyze research variables and their relationships preliminarily. Third, a structural equation model was used to test the relationship between peer victimization and sleep quality, as well as the mediating roles of rumination and anxiety. We used the bias-corrected percentile bootstrap method (with 5,000 resamples) for mediating effect analysis in the current study (Preacher & Hayes, 2008). The fit of the model was assessed with the Chi-square (χ^2), comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). CFI > 0.90, TLI > 0.90, RMSEA < 0.08, and SRMR < 0.08 indicate an acceptable model fit (Preacher & Hayes, 2008).

Results

Descriptive and Correlational Analyses

Descriptive statistics and correlations for all the study variables are presented in Table 1. Specifically, there were significant positive relationships between T1 traditional victimization, T1 cyber victimization, T1 rumination, T2 anxiety, and T2 poor sleep quality ($.14 < rs < .57, ps < .001$). In addition, SES was positively associated with T2 anxiety ($r = .09, p < .01$). Gender was positively associated with T1 rumination ($r = .11, p < .001$), T2 anxiety ($r = .17, p < .001$), and T2 poor sleep quality ($r = .11, p < .001$). Thus, SES and gender were included as covariates in the subsequent analyses. Specifically, we controlled for the relationship between T2 anxiety and SES, as well as the relationships between T1 rumination, T2 anxiety, T2 poor sleep quality, and gender.

Testing for the Mediation Model

We constructed a chain mediation model to examine the mechanisms between traditional victimization, cyber victimization, and sleep quality. The model

Table 1. Descriptive Statistics and Correlations among Variables.

Variables	1	2	3	4	5	6
1. T1 Traditional victimization	—					
2. T1 Cyber victimization	.57***	—				
3. T1 Rumination	.22***	.26***	—			
4. T2 Anxiety	.14***	.22***	.33***	—		
5. T2 Poor sleep quality	.15***	.21***	.26***	.53***	—	
6. SES	.04	.01	.01	.09**	.04	—
7. Gender	.02	.01	.11***	.17***	.11***	—
M	6.43	0.96	19.05	2.88	4.02	11.28
SD	1.32	3.34	7.27	3.62	3.03	3.82

Note. Gender was coded as 0 = male, 1 = female. SES = socioeconomic status; SD = standard deviation.

** $p < .01$. *** $p < .001$.

exhibited an excellent fit, with all fit indices within the acceptable range: $\chi^2/df=1.02$, CFI=1.00, TLI=1.00, RMSEA=0.01, and SRMR=0.01. As shown in Figure 2, T1 traditional victimization could significantly positively predict T1 rumination ($\beta = .20, p < .001$) and T2 anxiety ($\beta = .15, p < .001$), but could not significantly predict T2 poor sleep quality ($\beta = .06, p > .05$). T1 cyber victimization could significantly positively predict T1 rumination ($\beta = .11, p < .01$), but could not significantly predict T2 anxiety ($\beta = -.02, p > .05$) and T2 poor sleep quality ($\beta = .04, p > .05$). T1 rumination could significantly positively predict T2 anxiety ($\beta = .28, p < .001$) and T2 poor sleep quality ($\beta = .08, p < .01$). T2 anxiety could significantly positively predict T2 poor sleep quality ($\beta = .48, p < .001$).

Three indirect pathways connecting traditional victimization and sleep quality were identified by bias-corrected percentile bootstrap method (with 5,000 resamples): (a) the indirect pathway1 of “T1 traditional victimization→T1 rumination→T2 poor sleep quality” (indirect effect=0.02, 95% CI [0.004, 0.033]); (b) the indirect pathway2 of “T1 traditional victimization→T2 anxiety→T2 poor sleep quality” (indirect effect=0.07 [0.035, 0.113]); (c) the indirect pathway3 of “T1 traditional victimization→T1 rumination→T2 anxiety→T2 poor sleep quality” (indirect effect=0.03 [0.016, 0.042]). Two indirect pathways connecting cyber victimization and sleep quality were identified by bias-corrected percentile bootstrap method (with 5,000 resamples): (a) the indirect pathway1 of “T1 cyber victimization→T1 rumination→T2 poor sleep quality” (indirect effect=0.01

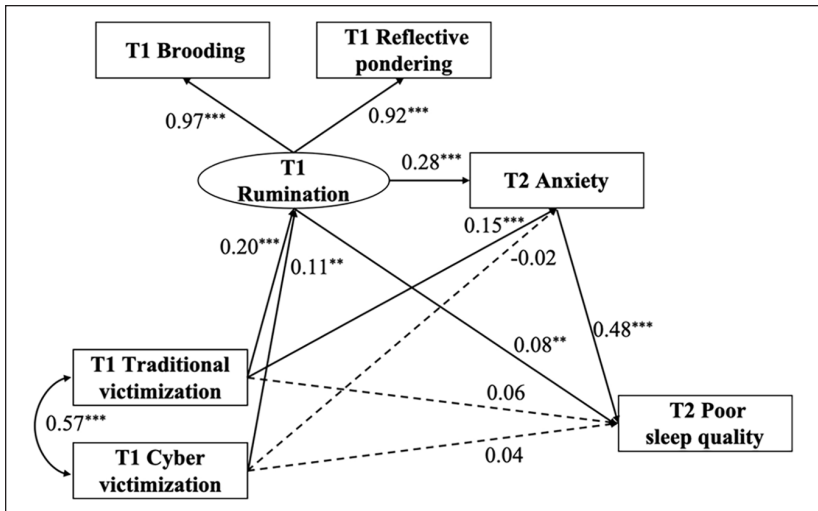


Figure 2. The chain mediation model. SES and gender were included as covariates for the examination but not shown in the figure. The model that controlled for SES and gender exhibited better fit than the model that did not control for SES and gender, but there was no difference in the significance of the pathways between the two models.

Note. SES = socioeconomic status.

** $p < .01$, *** $p < .001$.

[0.002, 0.022]); (b) the indirect pathway2 of “T1 cyber victimization→T1 rumination→T2 anxiety→T2 poor sleep quality” (indirect effect=0.01 [0.004, 0.027]). The indirect pathway from T1 cyber victimization to T2 poor sleep quality via T2 anxiety was not significant (indirect effect=-0.01 [-0.045, 0.030]).

Discussion

Previous studies have documented a significant negative relationship between peer victimization (traditional and cyber victimization) and sleep quality among college students. However, the underlying mechanisms of this relationship are not yet well understood. To further clarify the mechanisms of this relationship, the present study established a chain mediation model to investigate whether rumination and anxiety mediate the relationship between peer victimization (traditional and cyber victimization) and sleep quality among college students. The findings of this study revealed that three indirect pathways connecting traditional

victimization and sleep quality were identified, including the mediating effect of rumination, the mediating effect of anxiety, as well as the chain mediating effect of rumination and anxiety. Two indirect pathways connecting cyber victimization and sleep quality were identified, including the mediating effect of rumination, as well as the chain mediating effect of rumination and anxiety. These key findings are discussed in detail below.

The results showed that rumination mediated the relationship between peer victimization (traditional and cyber victimization) and sleep quality. The social cognitive processing model proposed by Kliever et al. (1998) states that victimized individuals may develop repetitively intrusive thoughts in response to their negative experiences and fall into a negative thinking dilemma (i.e., rumination). As a negative response, rumination can not solve problems and consistently causes high levels of cognitive arousal (Nolen-Hoeksema et al., 2008), which further leads to poor sleep quality. Therefore, victimized college students were more likely to ruminate, thus affecting their sleep quality.

The results showed that anxiety mediated the relationship between traditional victimization and sleep quality, rather than the relationship between cyber victimization and sleep quality. Based on the “stress process” model, traditional victimization, as a highly stressful event, can increase psychological vulnerability and lead to anxiety (Pearlin, 1989). Individuals with high levels of anxiety will experience continuous fear and emotional arousal, leading to difficulties in falling asleep and sleep problems (Chen & Zhu, 2023). Therefore, college students with traditional victimization had higher levels of anxiety, which further caused poor sleep quality.

Interestingly, anxiety could not mediate the relationship between cyber victimization and sleep quality, even though bivariate correlations revealed that anxiety was significantly related to cyber victimization and sleep quality. These results were consistent with the findings of Herge et al. (2016), which showed that cyber victimization could not indirectly predict sleep problems via depression. Unlike traditional victimization, which mostly occurs in face-to-face situations, cyber victimization occurs in a virtual environment, with concealment and anonymity (Gini et al., 2018; Kowalski et al., 2014). As a result, cyber victimization may not directly trigger negative emotions, but rather through a series of individual evaluations and reflections. For example, a victim may initially perceive cyber victimization as less threatening due to the lack of immediate physical confrontation. However, as the victim reflects on cyber victimization, he or she may feel hurt and experience negative emotions such as anxiety and depression. Therefore, the separate mediating effect of anxiety on the relationship between cyber victimization and sleep quality was not significant.

What's more, the present study investigated the chain mediating effect of rumination and anxiety on the relationship between peer victimization (traditional and cyber victimization) and sleep quality among college students. We found that rumination and anxiety played a chain mediating role in the relationship between peer victimization (traditional and cyber victimization) and sleep quality. According to the cognitive model of insomnia (Harvey, 2002), excessive negatively toned cognitive activity, such as ruminating about the experiences and outcomes of victimization, can heighten the risk for anxiety and, in turn, lead to sleep deficit. From this perspective, rumination and anxiety serve as cognitive and emotional mechanisms for the relationship between peer victimization and sleep quality. Therefore, victimized college students tended to engage in heightened rumination and thus felt anxious, finally contributing to poor sleep quality.

Implications of Study Findings

Taken together, these findings constitute a significant contribution to reducing the adverse effects of peer victimization and improving sleep quality among college students in terms of theoretical and practical applications. Theoretically, our study adopted a longitudinal design, revealing the mechanisms between peer victimization and sleep quality. The present study expands upon previous research by examining the unique mechanisms between traditional victimization, cyber victimization, and sleep quality. We found that traditional victimization indirectly predicted sleep quality through a separate mediating effect of rumination, a separate mediating effect of anxiety, as well as a chain mediating effect of rumination and anxiety. Cyber victimization indirectly predicted sleep quality through a separate mediating effect of rumination, as well as a chain mediating effect of rumination and anxiety.

Practically, our findings are valuable because they provide empirical evidence for the formulation of intervention programs to improve sleep quality among college students. This study found that traditional and cyber victimization indirectly predicted sleep quality through rumination and anxiety. Thus, intervention programs should not only focus on reducing traditional and cyber victimization but also on lowering rumination and anxiety. Educators should focus on preventing and intervening in school bullying. In addition, rumination-focused cognitive behavioral therapy and emotional regulation training may also be effective intervention strategies for improving sleep quality.

Limitations and Future Research Directions

There are several limitations in this study that should be acknowledged. First, the variables collected at each time point were different, which

restricted the understanding of changes in the variables over time. In addition, because this study used a two-wave longitudinal design, the variables in the chain mediation model overlapped in time points, limiting the chain mediation analysis. Future studies should use a four-wave longitudinal design or experimental design to better capture the temporal dynamics of the variables and draw a conclusion of causality. Second, this study explored the one-way relationship between anxiety and sleep quality. Previous studies have shown that poor sleep quality could also lead to anxiety (Chellappa & Aeschbach, 2022), so the two-way relationship between anxiety and sleep quality should be explored in the future. Third, this study adopted self-report measures, which might cause reporting bias. Therefore, it is suggested that future studies gather data from various sources, such as parents, teachers, and peers.

Conclusion

The present study provides valuable insights into the mechanisms linking peer victimization and sleep quality among college students, underscoring the critical roles of rumination and anxiety. The mechanisms between traditional victimization and sleep quality were not exactly the same as those between cyber victimization and sleep quality. Specifically, traditional victimization indirectly predicted sleep quality through a separate mediating effect of rumination, a separate mediating effect of anxiety, as well as a chain mediating effect of rumination and anxiety. Cyber victimization indirectly predicted sleep quality through a separate mediating effect of rumination, as well as a chain mediating effect of rumination and anxiety. These findings suggest that interventions aimed at reducing rumination and anxiety may be effective in improving sleep quality in victimized college students.

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Data Availability

Data will be made available on request.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

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Ethical Approval

All procedures were in accordance with the ethical standards of the Institutional Review Board at Renmin University of China.

Consent to Participate

Informed consent was obtained from all individual participants included in the study.

Consent for Publication

Informed consent was obtained from all authors.

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