

Childhood trauma and major depression in Chinese college students: mediating role of Internet addiction and victimization of domestic violence

Zezheng Wang

Northeast Forestry University

2020223619@nefu.edu.cn

Abstract. Aim: Major depression disorder in adolescents has received much attention around the world. While the factors correlated with major depression in adolescents have been extensively described, the mechanisms underlying the complexity of the relationship between childhood traumatic experiences and major depression have been less studied. This study investigated both the direct influence of childhood trauma on major depression and whether the mediation of domestic violence victimization and Internet addiction played a role in connecting childhood trauma to major depression. Method: The school-based mental health survey was conducted in April 2023 in northeast China's Heilongjiang Province. We collected sociodemographic information and targeted mental health outcomes with standardized questionnaires. Hierarchical multiple logistic regression and structural equation modeling were used to analyze the data. Results: The study included 596 college students. The prevalence of major depression and Internet addiction was 31.2% and 21.6%, respectively. 16.4% of participants reported experiences of childhood trauma and 12.8% reported being victims of domestic violence. Childhood trauma, domestic violence victimization and Internet addiction have direct effects on major depression. The total effect of childhood trauma on suicidal ideation was 0.201 ($p < 0.001$). Domestic violence victimization and Internet addiction play mediating roles between childhood trauma and depression. Internet addiction plays a mediating role between domestic violence and major depression. Childhood trauma has direct and indirect effects on major depression of college students. Domestic violence victimization and Internet addiction play mediating roles in major depression of college students. Understanding these relationships will help develop and implement more targeted interventions and strategies to improve the mental health of Chinese college students.

Keywords: childhood trauma, Internet addiction, major depression disorder, victims of domestic violence, Chinese college students

1. Introduction

Depression is a prevalent mental health issue frequently encountered by college students [1, 2]. Several meta-analyses and prior studies found that the prevalence of depression in college students from China exceeds 25% [3], and more than half of depression cases first develop in childhood, adolescence, or early adulthood. Related studies have indicated that approximately 50% of college students experience some level of mental health problems linked with stress, including conditions such as anxiety and

depressive disorders [4]. Identifiable predictors of adolescent MMD include learning disabilities, self-harm events, eating disorders, substance use, and sexual assault [5]. Childhood trauma has been identified as a major predictor of lifelong DSM-IV disorder [6], and research suggests a connection between childhood trauma and the development of depression. Some studies have documented a strong association between childhood sexual abuse and depression in adulthood. Molnar et al. [8] showed that people with a sexual abuse history were at a 1.8 times higher risk of experiencing depression, with some other studies suggesting an even higher fourfold risk. A prior community survey by Fergusson and Mullen reported that more than half of the women who had a history of childhood sexual abuse fit the criteria for chronic major depression [9].

The presence of multiple traumas during childhood has a substantial influence on the course of major and chronic depression in adulthood. Approximately 37% of patients reported experiences with multiple childhood traumas [7], and multiple childhood traumas could be considered an independent determinant of the chronic nature of depression [10]. With the sharp increase in Internet usage, Internet addiction among college students has become a worrying problem. The Internet has benefited users to a certain extent while producing some maladaptive and harmful consequences. Children who experience abuse have relatively higher levels of post-traumatic stress disorder and Internet addiction in comparison to their peers [11].

Loss of self-worth, well-being, and self-efficacy mediate the association between childhood trauma and major depression [12]. These previous observations propose that Internet addiction along with domestic violence could potentially serve as mediating factors linking childhood traumatic experiences to major depression. The role of domestic violence and Internet addiction as mediators between experience in childhood trauma and suicidal ideation, especially among college students, remains unexplored and needs further investigation. In addition, examining the speculations described earlier would help disentangle potential relationships and provide valuable insights for targeted preemptive strategies.

Thus, the main aim of this study was to describe the prevalence of childhood trauma, major depression, domestic violence victimization, and Internet addiction in a sample of college students in Heilongjiang Province, China. The secondary objective was to examine the validity of the direct link between childhood trauma and major depression and to investigate the mediating influence of domestic violence victimization and Internet addiction in the connection between childhood trauma and major depression, utilizing structural equation models. Expanding upon prior studies, we hypothesized that childhood trauma would be linked to major depression, both directly and indirectly, through family victimization of origin and Internet addiction.

2. Method

2.1. Study design and data collection

In April 2023, an extensive mental health survey within school settings took place in Heilongjiang Province, located in Northeast China. Participants were recruited using a multi-stage, stratified cluster sampling technique. To begin, the stratified sampling method is employed to choose colleges and universities based on their grade and classification. Freshman to senior, 160 students per grade. Within each university or college, stratified random sampling methods, categorized by major, are used to select classes, and cluster sampling is utilized within each class.

Questionnaires were administered to participants and collected upon completion by our research personnel, who received uniform training prior to the field survey. Fully enrolled students are also included. A total of 640 questionnaires were distributed, with 596 returned, yielding a response rate of 93.1%. Finally, after removing the cases with missing data, the study analyzed data from 20 participants.

The survey was conducted anonymously and voluntarily, with informed consent provided by all participating college students. We followed the STROBE (Reporting of Enhanced Observational Epidemiological Studies) guidelines for reporting this study [13].

2.2. *Basic characteristic*

We collected essential socio-demographic and clinical data, including place of residence before entering university (urban/rural area), age (in years), race(Han/other), gender (male/female), self-perceived health (good/average/bad), self-perceived weight (underweight/normal/overweight), and various other variables. Additionally, we gathered information on participants' relationship status (in dating relationships: no/yes) and their perception of relationships with fellow family, students, and teachers (poor/fair/good).

2.3. *Major depressive Disorder (MDD)*

Major depressive disorder (MDD) was assessed using the Baker Depression Scale Second Edition, a commonly utilized self-report screening tool. If there is at least one affirmative answer to the question, then lifelong MDD is considered [14].

2.4. *Childhood trauma*

Childhood trauma is analyzed by asking, "Have you suffered a serious psychological trauma or significant life adversity before the age of 16?" The potential responses are either "no" or "yes".

2.5. *Intermediate variable*

The Internet Addiction Test (IAT), with satisfactory psychometric properties (Kronbach α : 0.713) [15], has been widely validated in countries, and its Chinese version was used to examine the presence and severity of IA in our study. Overall RESULTS: Results 50 indicate moderate and heavy dependence on the Internet and are defined as "suffering from IA" [15]. Results: Victims of domestic violence are assessed with a yes/no question: "Before age 16, were you harmed or threatened in your home (e.g., physical harm or mental or verbal assault, etc.)?"

3. *Data analysis*

Sociodemographic and clinical characteristics are described by numbers (n) and percentages (%) or in cases where appropriate, as mean and standard deviation (s.d.). We examined the association between childhood traumatic experiences and suicidal ideation using a stratified multiple logistic regression. In step 1, model adjustments were eliminated by setting the independent variable as childhood trauma and major depression as the dependent variable. During step 2, adjustments were made for only child status, age (year), perceived weight, gender, place of residence before entering college, race, perceived family economic level, school relationships, perceived health status, and family relationships. In the third step, domestic violence victimization was added, and in the last step, Internet addiction was added. In each step of the analysis, we used the R2 change (ΔR^2) to assess the additional predictive power of each set of predictors when accounting for previous predictors. We conducted a post-mortem analysis by reversing steps 3 and 4, and the findings were displayed using odds ratio (OR) along with their respective 95% confidence interval (CI).

3.1. *Sample characteristics*

The study encompassed 596 college students, with an average age of 19.6 years (s.d.=1.63). Of the participants, 53.2% (317) were female, 91.4% (545) were Han, and 72.1% (430) lived in rural areas before entering university.

The lifetime prevalence of Internet addiction in major depression was 31.2% (186/596; 95%CI 30.0-32.5%) and 21.6% (129/596; 95%CI 20.6-22.7%). Overall, 16.4% (98/596; 95%CI 15.4-17.4%) and 12.8% (76/596; 95%CI 11.9-13.6%) of college students disclosed experiences of childhood trauma and domestic violence.

3.2. *Hierarchical regression analysis*

With the findings from stratified regression analysis, overall, clinical measures and basic sociodemographic attributed to 14.6% of the variability of outcomes outside the influence of childhood

traumatic experience (adjusted $R^2 = 0.201$, $\delta r^2 = 0.146$). In step 3, when examining the impact of domestic violence on major depression, we observed a 0.9% difference in major depression rates (adjusted $R^2 = 0.209$, $\delta r^2 = 0.009$). This difference was observed while considering the influence of basic sociodemographic and clinical factors, as well as the experience of childhood trauma. When Internet addiction was added in the last step, it produced an additional variance of 0.8% (adjusted $R^2 = 0.217$, $\delta r^2 = 0.008$, $p < 0.001$), indicating that history with childhood trauma, Internet addiction, and domestic violence victimization has a positive association with suicidal thoughts. When we inverted the entry order in the regression model, inputting Internet addiction at step 3, bullying victimization projected a higher degree of suicidal ideation compared to Internet addiction at step 4 (0.001).

4. Discussion

The study, conducted with a sample of 596 college students from northeastern China (Heilongjiang Province), enabled us to determine the following: (1) Mental health problems, such as major depression, are prevalent among college students in China; (2) Childhood trauma, domestic violence victimization, and Internet addiction were associated with suicidal ideation; (3) Childhood trauma has indirect effects on major depression, mediated by domestic violence victimization and Internet addiction; (4) Internet addiction acts as an intermediary factor in the link between domestic violence and major depression.

In summary, this study builds upon prior research and elucidates the direct impact of childhood trauma, domestic violence victimization, and Internet addiction on major depression in college students. Furthermore, we investigated how domestic violence victimization and Internet addiction may mediate the connection between childhood trauma and toxic depression. Holistic targeted interventions and strategies should be designed and put into action to address and alleviate the consequences of domestic violence incidents, Internet addiction, and childhood trauma. These efforts are essential for lowering the risk of major depressive disorder and enhancing the overall mental well-being of Chinese college students.

5. Conclusion

The study included 596 college students. The prevalence of major depression and Internet addiction was 31.2% and 21.6%, respectively. Overall, 16.4% of participants reported experiences of childhood trauma, and 12.8% of participants reported domestic violence victimization. Childhood trauma, domestic violence victimization, and Internet addiction have direct effects on major depression. The total effect of childhood trauma on suicidal ideation was 0.201 ($p < 0.001$). Domestic violence victimization and Internet addiction mediate the relationship between childhood trauma and depression. Internet addiction serves as an intermediary role between domestic violence and major depression.

Childhood trauma exerts both direct and indirect effects on major depression, with domestic violence victimization and Internet addiction serving as mediators among Chinese college students. Understanding these relationships will facilitate the development and implementation of more targeted interventions and strategies to improve the mental health of Chinese college students.

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