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Relation between Internet Gaming Addiction and mental issues in Chinese young adults

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Abstract. The rising dependency on video games is increasingly posing substantial social and therapeutic challenges and can be diagnosed as a disease. Extensive research in the past has explored the relationship between game addiction and various mental problems, but there is limited research in this area in China's cultural environment. This study explored the impact of depression, aggression, and perceived stress on Internet Gaming Disorder (IGD) among young adults in China with Spearman analysis and multiple linear regression. This paper hopes to contribute to solving the increasingly common IGD (Internet gaming addiction). Findings revealed a positive correlation between depression, aggression, and IGD, with both depression and aggression serving as significant predictors. Yet, there wasn't a significant correlation between perceived stress and IGD. The model elucidates 20.5% of the variance in gaming dependency, underscoring the multifaceted nature of IGD and hinting at the presence of a myriad of other contributing determinants. These results underscore the importance of considering mental health in identifying and addressing IGD, while also highlighting the need for further research, particularly regarding cultural differences in stress coping mechanisms and deciding the causal relationship between mental issues and IGD.

Keywords: Video game use, mental health, depression, perceived stress, aggression.

1. Introduction

In recent day, with the rapid advancement of technology and the expansion of online gaming communities, concerns about excessive gaming and its potential harm to mental health have emerged, Internet Gaming Disorder (IGD) is a condition synonymous with an addiction to electronic games. This affliction is typified by the enduring and recurring engagement with internet-based gaming activities, as outlined by the The American Psychiatric Association (APA), IGD may lead to significant impairment or distress [1]. It is particularly prevalent among young adults aged between 18 and 25, who are heavy users of digital media and at a developmental stage where such addictive behaviors can take root [2].

In China, as one of the most populous countries, the potential social and psychological issues of internet gaming addition have attracted the attention of the academic community. However, existing research focused on the Chinese context and the associated psychological predictors of IGD remains limited, thereby further examination have necessity.

The emergence of IGD as a unique and clinically relevant disorder has ignited a lot of scientific inquiry, attempting to discern the pathophysiology, risk factors, and repercussions of this digital age

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phenomenon [3]. What researcher have discerned from these investigations is that the trigger and impact of IGD are multi-layered and complex, with a wide array of individual and contextual factors. The relationship between IDG and psychological problems, such as manic disorder and depression, has been widely concerned by researchers.

Stress is notably highlighted as a major predictor of problematic online gaming behaviors. As pinpointed by Canale et al., at times, gaming is utilized as a method to manage stress [4]. Furthermore, individuals coping with IGD often display a higher tendency to several symptoms of psychopathologies, such as depression, suggesting an intricate correlation between mental disorders and gaming addiction [5].

The link between gaming and aggressive behaviors has been closely examined, study by Li et al. documented a salient relationship between violent video game exposure and a surge in aggressive conduct. Nevertheless, this area remains contentious, with an ongoing debate around the potential confounding factors and the difference of result [6].

In view of the above findings, this study predicts that higher levels of depression, stress and aggression are positively correlated with the severity of game addiction. In addition, these factors will become important predictors of game addiction, and together lead to the severity of IGD.

Despite these insights, the dearth of research investigating the simultaneous effects of depression, aggression, and perceived stress on IGD still lack of exploration, particularly within the Chinese context. therefore, this seeks to contribute to this area of research by examining the relationships and predictive power of these three psychological factors on IGD in a Chinese sample of young adults. Through exploration, it is hoped to yield actionable findings that can inform the development of effective preventative measures and interventions for gaming-related issues.

2. Method

2.1. Participant

Individuals aged 18 to 25 years voluntarily took part in the study as participants. The recruitment of participants and the spread of the online questionnaire were conducted via common internet media platforms in China, such as forums and discussion groups. From a total of 154 respondents, 152 valid samples were used in this study. 60% male and 15% female ,25% not willing to share gender. Invalid responses were identified as subscale responses were the same answer. All participants were given the choice to share their age and gender and were required to agree to an informed consent form before participating.

2.2. Measures

Center for Epidemiologic Studies Depression Scale (CES-D): This is a self-assessment instrument developed by Radloff to evaluate symptoms of depression experienced over the past week , which have total of 20-items,Feedback is gauged with score ranging from 0 (never and ever) to 3 (Very often)[7]. The cumulative scores span between 0 and 60, with elevated scores signaling intensified depressive symptoms.

Buss-Perry Shortened Aggression Scale (BPAQ-SF): This 12-item tool delves into four distinct aggression dimensions: physical acts, verbal outbursts, internal anger, and hostility. Serving as a streamlined version of the initial 29-item measure from Buss and Perry's 1992 work, each statement has respondents select from a 5-point spectrum, where 1 signifies strong disagreement and 5 embodies full agreement [8]. Score spans from 12 to 60, with a rising score signifying heightened aggressive tendencies.

The Perceived Stress Measure (PSS): Originating from the work of Cohen, Kamarck, and Mermelstein in 1994, this 10-item tool quantifies how frequently an individual encounters situations deemed stressful [9]. Responses fall on a 5-tiered Likert spectrum, from 0 (Not at all) to 4 (Almost always). Cumulative scores can vary between 0 and 40, where an upward trend suggests an increase in sensed stress.

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Internet Gaming Disorder Scale (IGDS9-SF): This inventory create and valid by Pontes and Griffiths , this concise 9-point questionnaire evaluates the intensity of Internet gaming issues[10]. Responses are captured on a 5-tiered Likert range, spanning from 1 (Rarely) to 5 (Almost always). With a potential scoring window from 9 to 45, escalating scores suggest a pronounced severity in online gaming disorders.

2.3. Procedure

The questionnaire was compiled using the Wjx website, a popular online survey platform in China. It is worth noting that the website's sample service was not recruited; instead, it merely served as a platform for questionnaire creation. The questionnaire was then disseminated and collected data via various Internet media channels across China. These channels were chosen due to user are high concentration of the target age demographic for this study (18-25 years old).

2.4. Data analysis

The present study planned to analyze the total scores of sub scales, describe and statistically report the mean, standard deviation, and range. Analysis was conducted through SPSS version 29.0.0.0 (241). By the result of the Kolmogorov-Smirnov (K-S) test, results indicated that the aggression and depression indices were not normally distributed. Spearman's correlation analysis was used in this study. This paper also performs multiple linear regression analysis to determine to what extent can depression, aggressive and stress can predict game addiction.

2.5. Ethical considerations

Ethical standards were diligently adhered to throughout the research. Before partaking in the survey, participants were apprised of the study's objectives through an informed consent process. and participants had the option not to disclose their age or gender and withdraw anytime, Furthermore, the collected data were securely stored and analysed with confidentiality.

2.6. Incentive

Aiming to encourage participation in the survey, out of the 150 respondents, 30 were randomly selected to receive a reward of 10 RMB.

3. Result

3.1. Descriptive analysis

The descriptive analysis for the variables of interest in the study are illustrate in Table 1. The average scores for depression, aggression, stress, and game addiction were 36.90 (SD = 7.83), 33.03 (SD = 6.96), 28.16 (SD = 5.47), and 23.39 (SD = 5.94) respectively.

Table 1. Descriptive analysis.

	Depression	Aggressive	Stress	Game addiction
SD	7.83	6.96	5.47	5.94
Mean	36.90	33.03	28.16	23.39
Median	37.00	33.00	28.00	24.00
Range	37.00	44.00	40.00	33.00

3.2. Normality testing

Table 2 displays the outcomes of the normality tests. with Kolmogorov-Smirnov test revealed that game addiction (D = .085, p = .009), and aggression (D = .079, p = .004) significantly deviated from normality, whereas depression (D = .066, p = .200) and stress (D = .070, p = .062) did not.

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Table 2. Result of K-S.

	Depression	Aggressive	stress	Game addiction
D value	.066	.079	.070	.085
P value	.200	.004	.062	.009
N	153	153	153	152

3.3. Test of relationship

Table 3 outlines Pearson's correlation values. The data matrix revealed notable positive associations between gaming dependency and depression ($r = .409$, $p < .001$), and also between gaming dependency and aggression ($r = .377$, $p < .001$). And there wasn't a significant link between stress and gaming dependency ($r = .095$, $p > .05$).

Table 3. Result of correlation test.

	Game addiction	Depression	Aggressive	Stress
Depression	.409**	1.00	.336**	.049
Aggressive	.377**	.336**	1.00	.195*
Stress	.095	.049	.195*	1.00
Game addiction	1.00	.409**	.377**	.095

* $p<0.05$
** $p<0.001$

3.4. Test of multiple linnear regression

In Table 4, both unstandardized and standardized regression coefficients are presented, along with the standard errors, t-values, and respective levels of significance for predictors within the regression framework.

Table 4. Multiple linear regression analysis.

Predictor	B-value	Standard Error	standardized coefficient (Beta)	T-value	Significance(Sig.)
Constant	9.268	2.965		3.125	.002
Depression	.171	.060	.226	2.843	.005
Aggression	.283	.070	.332	4.024	<.001
Stress	.283	.084	-.051	-.652	.515

The Durbin-Watson statistic of 2.241 (Table 5) suggests that the assumption of independent errors was met. The Variance Inflation Factor (VIF) for all predictors was found to be less than 5, indicating no multicollinearity.

Table 5. Summary of multiple linear regression analysis.

Metric	Value
Coefficient of Correlation (R)	.453
Coefficient of Determination (R^2)	.205
Adjusted Coefficient of Determination(adjust R^2)	.189
Durbin-Watson Statistic	2.241
Std. Error of the Estimate	5.346

The unstandardized coefficients indicated that for each unit increase in the depression score, the game addiction score increased by .171 units ($\beta = .226$, $t = 2.843$, $p = .005$). Similarly, for each unit increase in the aggression score, the game addiction score increased by .283 units ($\beta = .332$, $t = 4.024$,

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$p < .001$). Stress did not significantly contribute to the prediction of game addiction ($\beta = -.051$, $t = -.652$, $p = .515$).

Table 6's ANOVA analysis outcomes indicate that the multivariable linear regression framework was substantial, with $F(3, 148) = 12.757$, $p < .001$. As showcased in Table 5, this model elucidates close to 20.5% of the fluctuation in gaming addiction, holding an R value of .453. This translates to a median effect magnitude based on benchmarks set by Cohen [11].

Table 6. ANOVA.

	Sum of Squares	Degrees of Freedom (df)	Mean Square	F-value	Significance(Sig.)
Regression	1093.918	3	364.639	12.757	<0.001
Residual	4230.398	148	28.584		
Total	5324.316	151			

4. Discussions

This research sought to explore the interconnections and forecasting capacities of depression, aggression, and perceived stress concerning Internet Gaming Disorder (IGD) in Chinese young adults. The findings somewhat validated the proposed hypotheses. Elevated degrees of depression and aggression manifested positive ties with IGD and were notable determinants of the disorder. Conversely, perceived stress didn't showcase a significant linkage with IGD.

Depression's positive association with IGD aligns with previous research indicating that online gaming might serve as an escape from reality for individuals. This digital immersion can offer temporary relief from some negative emotion, reinforcing the gaming behavior and potentially leading to IGD [12]. The predictive power of depression in this study model underscores the need for a comprehensive mental health evaluation when identifying individuals at risk for IGD and formulating intervention strategies.

Aggression also demonstrated a significant positive relationship with IGD, lending support to past research that has explored the link between aggression and addictive gaming [13]. Violent video games can intensify aggressive thoughts, emotions, and actions, as pointed out by Anderson et al. [14]. This potentially aids the onset and persistence of IGD. Echoing the findings of this research, it suggests that aggression might act as a factor for IGD. Such a reciprocal dynamic calls for deeper exploration and ought to be considered when formulating preventive and therapeutic approaches, as well as determining underlying causal connections.

Contrary to hypothesis and previous studies, perceived stress was not significantly related to IGD in this study [4]. This could be attributed to cultural differences in stress perception and coping mechanisms, with Chinese individuals possibly using other methods besides online gaming to cope with stress. Future studies should consider cultural factors in experiment on IGD to provide a more comprehensive view, additionally, the study's sample size is relatively small, potentially leading to some discrepancies. Future research should aim to include a larger sample to bolster the validity of findings.

The results highlight that the model accounts for 20.5% of the variability in gaming addiction. With this considered a medium effect size, as per Cohen's criteria, it suggests that there might be additional variables, not yet examined, influencing the onset and nature of IGD [11]. Factors like personality characteristics, societal influences, gaming-associated thought processes, and various mental health disorders may correlate with IGD. Importantly, prior research, such as by Gentile et al. and Kardefelt-Winther , has yet to clarify the direct causal links between mental issues and IGD, emphasizing the need for continued investigation[12,15].

5. Conclusion

In conclusion, result of this study provide evidence and understanding of the relationships between depression, aggression, stress, and IGD among young adults in China. The results lead a possibility to

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early identification and intervention for individuals showing high levels of depression and aggression, to potentially prevent or reduce the development of IGD. Further research should explore other potential predictors of IGD, considering both individual and contextual factor, and try to develop effective intervention measures.

This study has several limitations as follows. Cross sectional design and questionnaire survey only prevent the exploration of causality. Longitudinal research is necessary to discover the chronological order of the observed relationships. In addition, the age range and the number of samples are not enough to prove the validity of the study, which limits the universality of the research results. Future research should adopt broader demography and consider the impact of gender.

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