



## The Relationship between Online Game Addiction, Emotional Regulation, and Social Interaction among Junior High School Students in Lubuk Besar District

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| <b>Keywords:</b><br>Emotional Regulation;<br>Junior High School;<br>Online Game Addiction;<br>Social Interaction;<br>Students;                                                                                                                                                                                                                                                                               | Online game addiction has become an important behavioral concern among adolescents and may be associated with difficulties in emotional and interpersonal functioning. This study examined the associations of emotion regulation and social interaction with online game addiction among junior high school students in Lubuk Besar District, Central Bangka Regency, Indonesia. A quantitative cross-sectional correlational study with an ex-post facto design was conducted among 190 students from three state junior high schools. Data were collected using four-point Likert-type scales measuring online game addiction, emotion regulation, and social interaction. The data were analyzed using descriptive statistics, Pearson correlation, and multiple linear regression. Emotion regulation was significantly and negatively associated with online game addiction after controlling for social interaction ( $\beta = -.180$ , $p = .016$ ). Social interaction also showed a significant negative association with online game addiction after controlling for emotion regulation ( $\beta = -.358$ , $p < .001$ ). Emotion regulation and social interaction were jointly associated with online game addiction, $F(2, 187) = 27.130$ , $p < .001$ , with the model explaining 22.5% of the variance in online game addiction ( $R^2 = .225$ ; adjusted $R^2 = .217$ ). These findings indicate that emotional and interpersonal functioning are relevant domains in understanding problematic gaming among junior high school students and may be considered in school guidance and counseling services. However, the cross-sectional design does not permit causal inference. Future research should employ longitudinal designs and examine additional psychological, family, academic, and environmental factors associated with online game addiction. |
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### INTRODUCTION

Online game addiction has become one of the most pressing behavioral concerns among adolescents in the digital era. It is defined as a persistent inability to control excessive gaming that generates problems in the social and emotional domains (Lemmens et al., 2009). The World Health Organization has formally recognized this pattern as gaming disorder in the 11th revision of the International Classification of Diseases, defined by impaired control over gaming and continuation of the behavior despite negative consequences (WHO, 2019; Saunders, J. B., Hao, W., Long, J., King, D. L., Mann, K., Fauth-Bühler, M., Rumpf, H.-J., Bowden-Jones, H., Rahimi-Movaghar, A., Chung, T., Chan, E., Bahar, N., Achab, S., Lee, H. K., Potenza, M., Petry, N., Spritzer, D., Ambekar, A., Derevensky, J., Gri, 2017). The scale of the phenomenon in Indonesia is considerable: the number of online game users is projected to reach 192.1 million by 2025, and national studies report gaming-disorder prevalence as high as 30.8% among junior high school students (Budi Satria, Mustanir Mustanir, Rina Suryani Oktari, 2024). Excessive gaming is therefore no longer a marginal issue but a widespread condition among adolescents.

Adolescence is a developmental period marked by heightened emotional intensity and an increasing need to form stable social relationships with peers and family (Mohammad Ali & Asrori, 2018; Akande, J. A., Olowonirejuaro, A. O., & Okwara-Kalu, 2014). At this stage, students are expected to regulate their emotions appropriately and to interact constructively with others in order to adapt to social and academic demands (Gross, 2014; Nashukah, F., & Darmawanti, 2013). Adolescents who struggle in these areas may be more vulnerable to using games as a way of coping, and heavy gaming may in turn leave less time and opportunity for healthy peer interaction. Addicted players have been reported to spend more than two hours daily or over fourteen hours weekly on gaming (Rudhiati et al., 2015), with extreme cases reaching up to 55 hours per week (Van Rooij et al., 2011). Such prolonged engagement has been linked to displacement of study, sleep, and family time, as well as to declining academic performance and impaired social and physical functioning (King and Delfabbro 2018; Mahardika 2016).

Similar concerns were observed among junior high school students in Lubuk Besar District. A preliminary study conducted by the researcher in August 2023 involved interviews with school counselors and the administration of a 27-item questionnaire on online gaming behavior across three junior high schools. The questionnaire was developed with reference to the seven dimensions of online game addiction proposed by Lemmens et al. (2009), namely salience, tolerance, mood modification, relapse, withdrawal, conflict, and problems. The instrument used a four-point response scale, with favorable and unfavorable items scored in opposite directions. The preliminary screening identified reported proportions of students showing indications of problematic online gaming behavior of 23% at SMP Negeri 1 Lubuk Besar, 20% at SMP Negeri 2 Lubuk Besar, and 12% at SMP Negeri 3 Satap Lubuk Besar, reported in the preliminary study as a total of 55%. These findings should be understood as preliminary screening results rather than a clinical diagnosis of gaming disorder. Interviews with school counselors further indicated that some students frequently played online games during vacant class periods and school breaks, continued playing excessively at home, and neglected school-related responsibilities. Teachers also reported emotional and interpersonal difficulties among some students, including anger when gaming was interrupted, withdrawal from peer activities, and inappropriate verbal or behavioral responses when gameplay was disrupted. These conditions highlight the need for systematic efforts to understand factors associated with problematic online gaming, particularly through school guidance and counseling services, which play an important role in supporting students' personal and social development (Prayitno and Amti 2004; Tohirin 2015).

Emotion regulation and social interaction are two psychological and social factors that have been linked to problematic gaming. Adolescents with low emotion regulation are more prone to peer conflict and aggressive behavior (Endaryani, Yuniardi, and Syakarofath 2020; Habsy et al. 2019), and several studies report a significant relationship between online game addiction and diminished emotion regulation, particularly frustration tolerance after losing (Anita Nurazmi, Veny Elita, 2018). Gaming is also often used as an escape from negative emotions and stress, which corresponds to the mood-modification dimension of addiction (Lemmens et al., 2009). In parallel, addicted adolescents report fewer real-life interactions with friends and family even as their in-game interactions increase (Jeong et al. 2016; Sari 2021). and limited social competence, loneliness, and low life satisfaction have been identified as factors related to problematic gaming (Kneer et al., 2014). Evidence from counseling also suggests that these domains are relevant targets for school-based services: a group counseling program for adolescents with internet gaming disorder improved self-regulation and reduced weekend gaming hours and disorder severity (Choo et al., 2026). A clearer empirical understanding of how emotion regulation and social interaction are related to online game addiction can therefore inform the design of school-based counseling.

Nevertheless, research examining these two domains together in relation to online game addiction remains limited. Several studies have examined online game addiction in relation to a single correlate, such as parenting style (Bao et al., 2024), policy restriction (Yang et al., 2023), academic achievement, or aggressive behavior, while others found no significant relationship between game addiction and social skills (Natasha et al., 2022). Giordano, Schmit, and McCall (2023) showed that lower emotion regulation predicts internet gaming disorder severity among adolescents, and Ependi et al. (2024) reported that online game use was significantly related to

students' social interaction. However, these studies examined the two domains separately, and research that examines emotion regulation and social interaction together in relation to online game addiction among junior high school students in a specific regional context such as Lubuk Besar District is still lacking. This gap calls for a quantitative design able to test the individual and joint associations of both variables with online game addiction.

In this study, the constructs are defined based on established theoretical frameworks. Online game addiction is defined based Lemmens et al. (2009), comprising salience, tolerance, mood modification, withdrawal, relapse, conflict, and problems. Emotion regulation is defined based on (James J. Gross, 2007) comprising acceptance of emotional responses, engagement in goal-directed behavior, control of emotional responses, and strategies for emotion regulation. Social interaction is defined based on Sarwono (2009) comprising communication, attitude, group behavior, and social contact. These frameworks provide clearly observable indicators that can be measured with standardized instruments, which suits the quantitative design of this study.

Therefore, this study examined the association of emotion regulation and social interaction with online game addiction among junior high school students in Lubuk Besar District. Because the design is cross-sectional, the study does not test causal direction, and the associations may be reciprocal. The findings are expected to contribute empirically to guidance and counseling services by identifying emotion regulation and social interaction as areas that school counselors may consider when addressing excessive gaming among early adolescents.

## METHOD

### Research Design

This study used a quantitative, cross-sectional correlational approach with an ex-post facto design. Variables were not manipulated and were measured as they naturally occurred (Cahyana, 2015). Online game addiction was specified as the criterion (dependent) variable, and emotion regulation and social interaction as the predictor variables, based on the rationale presented in the Introduction. The design does not permit causal inference, and all results are interpreted as associations.

### Setting and Participants

The study population comprised 385 students who played online games across three public junior high schools in Lubuk Besar District, Central Bangka Regency, namely SMP Negeri 1 Lubuk Besar (174 students), SMP Negeri 2 Lubuk Besar (170 students), and SMP Negeri 3 Satap Lubuk Besar (41 students). The identification of students who played online games was informed by a preliminary study conducted in August 2023 through interviews with school counseling teachers and questionnaire administration to students. The preliminary study indicated that students in the three schools engaged in online gaming, including excessive gaming behavior that could interfere with their academic responsibilities.

The three schools were selected based on accessibility considerations, as their locations were relatively accessible to the researcher and facilitated coordination and data collection. From the total population of 385 students, the required sample size was determined using Slovin's formula with a 5% margin of error, resulting in a minimum sample of 197 students. The sample was then proportionally allocated across the three schools, consisting of 89 students from SMP Negeri 1 Lubuk Besar, 87 students from SMP Negeri 2 Lubuk Besar, and 21 students from SMP Negeri 3 Satap Lubuk Besar. Within each school, the participants were identified and selected based on student data provided by the school counseling teachers (BK). Of the 197 questionnaires distributed, seven were excluded from the analysis because they were incomplete. Therefore, the final sample consisted of 190 students with complete responses.

### Ethical Considerations

The study was conducted after obtaining permission from the researchers' university, the school principals, and the school counselors (guidance and counseling teachers) at the participating schools. Before completing the questionnaire, all participating students provided informed consent.

The confidentiality of participants' personal information was maintained, and the data collected were used solely for research purposes.

### Instruments

Three four-point Likert-type scales (strongly agree to strongly disagree) with favorable and unfavorable items were used (Table 1). Favorable items were scored 4 to 1 and unfavorable items 1 to 4, so higher scores indicate higher levels of the measured construct. Definitions of the constructs are given in the Introduction.

**Table 1.** Instrumens

| Scale                 | Items | Dimensions                                                                      | Source                 |
|-----------------------|-------|---------------------------------------------------------------------------------|------------------------|
| Online game addiction | 27    | Salience, tolerance, mood modification, relapse, withdrawal, conflict, problems | (Lemmens et al., 2009) |
| Emotion regulation    | 23    | Strategies, goals, impulse, acceptance                                          | (James J. Gross, 2007) |
| Social interaction    | 23    | Communication, attitude, group behavior, social contact                         | (Sarwono, 2009)        |

### Validity

Content validity was established through expert judgment by two experts in Guidance and Counseling at Universitas Negeri Yogyakarta, Prof. Dr. Muhammad Nur Wangid, M.Si., and Dr. Agus Basuki, M.Pd. The experts reviewed three research instruments measuring emotion regulation, social interaction, and online gaming addiction, with particular attention to the relevance and appropriateness of each item to its intended construct and indicator. The expert-review process was initially analyzed using Aiken's V coefficient to assess the content validity of the items. However, the original expert-rating sheets required to reproduce the Aiken's V coefficients are no longer available. Therefore, the present study does not report numerical Aiken's V values that cannot be independently verified. The content review by the experts was complemented.

### Reliability Testing

Reliability refers to the consistency and stability of measurement results when an instrument is used repeatedly under comparable conditions (Nursalam, 2016). In this study, the internal consistency of the three instruments was assessed using Cronbach's alpha with IBM SPSS Statistics 27 for Windows. A Cronbach's alpha coefficient of  $\geq 0.60$  was used as the criterion for acceptable reliability. The reliability coefficients obtained for the three instruments were 0.714 for emotion regulation, 0.742 for social interaction, and 0.803 for online gaming addiction. As all coefficients exceeded the predetermined criterion of 0.60, the three instruments were considered reliable and were subsequently used for data collection.

**Table 2.** Reliability of the Research Instruments

| Variable              | Cronbach's $\alpha$ | Interpretation |
|-----------------------|---------------------|----------------|
| Emotion regulation    | 0.714               | Reliable       |
| Social interaction    | 0.742               | Reliable       |
| Online game addiction | 0.803               | Reliable       |

### Data Analysis

Data were analyzed using IBM SPSS Statistics 27 for Windows. Descriptive statistics, including the mean, standard deviation, minimum, and maximum scores, were calculated, and the scores were categorized into low, moderate, and high levels based on the mean and standard deviation. Prior to hypothesis testing, the assumptions of regression analysis were examined. Normality was assessed using the Kolmogorov-Smirnov test and Normal Probability Plot, with a significance value  $> 0.05$  indicating normally distributed data. Heteroscedasticity was assessed using the Glejser test, with a significance value  $> 0.05$  indicating the absence of heteroscedasticity.

Multiple linear regression was conducted with online game addiction as the dependent variable and emotion regulation and social interaction as independent variables ( $Y = a + b_1X_1 + b_2X_2$ ). Normality of the unstandardized residuals (Kolmogorov-Smirnov with Lilliefors correction and normal probability plot), heteroscedasticity (Glejser), and multicollinearity (tolerance  $> .10$ , VIF  $<$

10) were examined. Partial associations were tested with t-tests, the overall model with an F-test, and explained variance with  $R^2$  ( $\alpha = .05$ ). All findings are interpreted as associations.

## RESULTS AND DISCUSSION

### Descriptive Statistics

Of the 197 students who completed the questionnaires, seven were excluded (reason and criteria as described in the Method), leaving 190 students for analysis. Table 3 presents the descriptive statistics of the three variables.

**Table 3.** Descriptive Statistics of the Research Variables

| Variable              | N   | Min | Max | Range | Mean  | SD   |
|-----------------------|-----|-----|-----|-------|-------|------|
| Online Game Addiction | 190 | 65  | 102 | 37    | 83.29 | 7.59 |
| Emotional Regulation  | 190 | 52  | 86  | 34    | 66.75 | 7.03 |
| Social Interaction    | 190 | 56  | 85  | 29    | 66.69 | 6.92 |

Scores on each variable were categorized as low, moderate, or high using the sample mean (M) and standard deviation (SD): high ( $X > M + 1 \text{ SD}$ ), moderate ( $M - 1 \text{ SD} \leq X \leq M + 1 \text{ SD}$ ), and low ( $X < M - 1 \text{ SD}$ ). The results are shown in Table 4.

**Table 4.** Categorization of the Research Variables

| Variable              | Low, n (%) | Moderate, n (%) | High, n (%) |
|-----------------------|------------|-----------------|-------------|
| Online Game Addiction | 20 (10.5%) | 15 (7.9%)       | 155 (81.6%) |
| Emotional Regulation  | 95 (50.0%) | 81 (42.6%)      | 14 (7.4%)   |
| Social Interaction    | 25 (13.2%) | 133 (70.0%)     | 32 (16.8%)  |

Most students (81.6%) were in the high category of online game addiction, which is consistent with the sampling of students identified as online game players. Half of the students (50.0%) were in the low category of emotion regulation, and most (70.0%) were in the moderate category of social interaction. These categories describe participants' relative standing in this sample and are not clinical prevalence estimates.

### Assumption Tests

The assumptions of multiple regression were examined before hypothesis testing. Unstandardized residuals were normally distributed (Kolmogorov-Smirnov with Lilliefors correction:  $D = .035$ ,  $p = .200$ ; Monte Carlo  $p = .841$ , 99% CI [.832, .851]; see also the normal probability plot in Figure 1). The Glejser test indicated no heteroscedasticity for emotion regulation ( $p = .177$ ) or social interaction ( $p = .194$ ). Multicollinearity was not a concern: tolerance was .752 and VIF was 1.330 for both predictors (tolerance  $> .10$ , VIF  $< 10$ ). The data therefore met the assumptions for multiple linear regression.

### Correlations among Variables

**Table 5.** Pearson Correlations among Variables

| Variable              | 1      | 2     | 3 |
|-----------------------|--------|-------|---|
| Online Game Addiction | -      |       |   |
| Emotional Regulation  | -.359* | -     |   |
| Social Interaction    | -.448* | .498* | - |

\* $p < .001$ .

Online game addiction was negatively correlated with emotion regulation ( $r = -.359$ ) and with social interaction ( $r = -.448$ ). The two predictors were moderately and positively correlated ( $r = .498$ ), indicating that they share part of their association with online game addiction.

### Hypothesis Testing

Three hypotheses were tested: (H1) emotion regulation is negatively associated with online game addiction, controlling for social interaction; (H2) social interaction is negatively associated with online game addiction, controlling for emotion regulation; and (H3) emotion regulation and social interaction are jointly associated with online game addiction.

### Multiple regression: partial associations (t-test)

**Table 6.** Multiple Regression of Online Game Addiction on Emotion Regulation and Social Interaction

| Predictor            | B      | SEB   | $\beta$ | t      | P     |
|----------------------|--------|-------|---------|--------|-------|
| (Constant)           | 40.346 | 4.490 | -       | -      | -     |
| Emotional Regulation | -0.138 | 0.057 | -0.180  | -2.429 | .016  |
| Social Interaction   | -0.363 | 0.075 | -0.358  | -4.820 | <.001 |

Emotion regulation was significantly and negatively associated with online game addiction after controlling for social interaction ( $\beta = -.180$ ,  $t(187) = -2.429$ ,  $p = .016$ ), supporting H1. Social interaction was also significantly and negatively associated with online game addiction after controlling for emotion regulation ( $\beta = -.358$ ,  $t(187) = -4.820$ ,  $p < .001$ ), supporting H2. Students with lower emotion regulation and social interaction scores therefore tended to report higher online game addiction.

### Simultaneous association (F-test)

The F-test was conducted to examine the joint association of emotion regulation and social interaction with online game addiction. The results of the overall regression model are presented in Table 7.

**Table 7.** ANOVA of the Regression Model

| Source     | SS        | df  | MS      | F      | P     |
|------------|-----------|-----|---------|--------|-------|
| Regression | 1,783.170 | 2   | 891.585 | 27.130 | <.001 |
| Residual   | 6,145.546 | 187 | 32.864  |        |       |
| Total      | 7,928.716 | 189 |         |        |       |

The overall regression model was statistically significant,  $F(2, 187) = 27.130$ ,  $p < .001$ , indicating a significant joint association between emotion regulation, social interaction, and online game addiction. This result indicates that the two predictors, when considered simultaneously, were significantly associated with variation in online game addiction in the sample.

### Explained variance and relative contribution

**Table 8.** Model Summary and Contribution of Predictors

| Model statistic            | Value |
|----------------------------|-------|
| R                          | .474  |
| R <sup>2</sup>             | .225  |
| Adjusted R <sup>2</sup>    | .217  |
| Std. error of the estimate | 5.73  |

| Predictor            | $\beta$ | r     | Effective contribution<br>(SE = $\beta \times r$ ) | Relative contribution<br>(SR = SE / R <sup>2</sup> ) |
|----------------------|---------|-------|----------------------------------------------------|------------------------------------------------------|
| Emotional Regulation | -.180   | -.359 | 6.5%                                               | 28.8%                                                |
| Social Interaction   | -.358   | -.448 | 16.0%                                              | 71.2%                                                |
| Total                |         |       | 22.5%                                              | 100%                                                 |

Emotion regulation and social interaction together were associated with 22.5% of the variance in online game addiction (adjusted R<sup>2</sup> = .217; Cohen's f<sup>2</sup> = .29), leaving 77.5% associated with factors not examined in this study. The total effective contribution (22.5%) equals R<sup>2</sup>. Social interaction accounted for about 71% of the explained variance and emotion regulation for about 29%, so social interaction was the stronger correlate of online game addiction. Semi-partial correlations showed

the same pattern: emotion regulation uniquely accounted for about 2.5% of the variance, social interaction for about 9.6%, and the remaining 10.4% was shared by the two predictors.

## Discussion

The present study examined the associations of emotion regulation and social interaction with online game addiction among junior high school students in Lubuk Besar District. The findings showed that both emotion regulation and social interaction were significantly and negatively associated with online game addiction. Specifically, emotion regulation remained significantly associated with online game addiction after controlling for social interaction ( $\beta = -.180$ ,  $p = .016$ ), while social interaction showed a stronger negative partial association ( $\beta = -.358$ ,  $p < .001$ ). Furthermore, the two predictors were jointly associated with online game addiction, with the regression model explaining 22.5% of the variance in online game addiction. These findings suggest that students' emotional and interpersonal functioning are relevant correlates of problematic gaming behavior, although the cross-sectional design does not permit conclusions about causal direction.

### Emotion Regulation and Online Game Addiction

The negative association between emotion regulation and online game addiction indicates that students with lower levels of emotion regulation tended to report higher levels of online game addiction, even after social interaction was statistically controlled. This finding is consistent with the theoretical perspective that problematic gaming may be related to difficulties in managing emotional experiences and regulating behavioral responses. Adolescence is characterized by substantial emotional and social development, and difficulties in regulating emotional responses may make some students more likely to rely on immediately rewarding activities when experiencing frustration, stress, boredom, or other unpleasant emotional states.

This interpretation is also consistent with previous research cited in the present study. Nurazmi et al. (2017) reported a significant relationship between online game addiction and emotion regulation, particularly in relation to frustration tolerance following gaming losses. Similarly, Giordano et al. (2023) found that lower emotion regulation predicted greater internet gaming disorder severity among adolescents. The present findings extend this evidence by showing that the association between emotion regulation and online game addiction remained significant when social interaction was simultaneously considered in the regression model. Thus, the relationship between these two variables cannot be attributed solely to differences in students' social interaction within this sample.

One possible explanation is that gaming may function as a form of mood modification for adolescents who experience difficulties managing negative emotional states. Lemmens et al. (2009) conceptualized mood modification as one of the dimensions of problematic gaming, referring to the use of gaming experiences in relation to changes in emotional states. From this perspective, students who have greater difficulty accepting emotional responses, maintaining goal-directed behavior, controlling emotional responses, or employing appropriate regulation strategies may be more likely to engage in gaming as an alternative activity when experiencing unpleasant emotions. However, because the present study measured the variables at a single point in time, it cannot determine whether poor emotion regulation increases problematic gaming, whether excessive gaming contributes to poorer emotion regulation, or whether both processes operate reciprocally.

The magnitude of the partial association was relatively modest ( $\beta = -.180$ ), suggesting that emotion regulation is relevant but does not independently account for a large proportion of individual differences in online game addiction. This interpretation is important because problematic gaming is a multidimensional behavior that may be related to psychological, social, family, academic, and environmental factors. The present model therefore supports the relevance of emotion regulation without suggesting that it is the sole or dominant factor associated with online game addiction.

### Social Interaction and Online Game Addiction

Social interaction demonstrated a stronger negative association with online game addiction than emotion regulation. After controlling for emotion regulation, social interaction remained significantly associated with online game addiction ( $\beta = -.358$ ,  $p < .001$ ). This finding indicates that

students reporting lower levels of social interaction also tended to report higher levels of online game addiction. The result is consistent with previous literature suggesting that problematic gaming is related to reduced real-life social engagement and difficulties in social competence.

The finding can be understood in relation to the social displacement perspective. Adolescents have an increasing developmental need for meaningful relationships with peers and family. When real-world social interaction is limited, gaming may become an increasingly important context for entertainment, social connection, or psychological engagement. Previous studies cited in the Introduction reported that adolescents experiencing problematic gaming may have fewer interactions with friends and family while simultaneously increasing their interactions within gaming environments (Jeong et al., 2016). Kneer et al. (2014) likewise identified limited social competence, loneliness, and low life satisfaction as factors associated with problematic gaming. The present findings are broadly consistent with this body of evidence, particularly in showing that lower social interaction is associated with higher levels of online game addiction among junior high school students.

At the same time, the relationship should not be interpreted as evidence that poor social interaction causes online game addiction. The relationship may operate in more than one direction. Students who experience difficulties communicating, maintaining social contact, or participating in group activities may spend more time gaming because gaming provides an alternative source of engagement. Conversely, prolonged gaming may reduce opportunities for face-to-face interaction by displacing time that could otherwise be spent with peers, family, or school activities. The reciprocal possibility is particularly relevant because the present study uses a cross-sectional design.

The relatively stronger partial coefficient for social interaction ( $\beta = -.358$ ) suggests that, within this particular sample and regression model, social interaction had a stronger unique statistical association with online game addiction than emotion regulation. This pattern is also reflected in the contribution analysis, in which social interaction accounted for approximately 71.2% of the explained variance, compared with approximately 28.8% for emotion regulation. These percentages should be understood as relative contributions within the model's explained variance rather than causal effects. The findings therefore indicate the greater statistical relevance of social interaction in this sample, but they do not establish that improving social interaction would necessarily produce a corresponding reduction in online game addiction.

### **Joint Association of Emotion Regulation and Social Interaction with Online Game Addiction**

The multiple regression analysis further demonstrated that emotion regulation and social interaction were jointly associated with online game addiction,  $F(2, 187) = 27.130$ ,  $p < .001$ . The model produced an  $R^2$  of .225 and an adjusted  $R^2$  of .217, indicating that the two predictors together were associated with 22.5% of the variance in online game addiction, while approximately 77.5% remained associated with factors outside the present model. This finding supports the view that problematic gaming among adolescents is unlikely to be adequately understood through a single psychological or social factor.

The two predictors were themselves moderately and positively correlated ( $r = .498$ ), indicating that emotion regulation and social interaction were related but represented distinguishable domains. Students with stronger emotion regulation tended, in this sample, to report better social interaction. Nevertheless, each predictor retained a statistically significant association with online game addiction when the other was controlled. This suggests that emotional and interpersonal functioning may provide partially overlapping but also distinct information about differences in problematic gaming behavior.

The contribution analysis provides additional information about this pattern. Social interaction accounted for approximately 16.0% effective contribution to the explained variance, whereas emotion regulation accounted for approximately 6.5%, producing a total explained variance of 22.5%. When expressed as relative contributions within the model, these corresponded to approximately 71.2% for social interaction and 28.8% for emotion regulation. The stronger statistical contribution of social interaction may indicate that interpersonal functioning is particularly relevant to online game addiction in this sample. Nevertheless, the remaining 77.5% of

variance indicates that substantial variation in online game addiction is related to other factors not included in the model.

This unexplained variance is important for interpreting the findings. Previous literature has identified several other factors potentially associated with problematic gaming, including parenting characteristics, academic functioning, loneliness, life satisfaction, behavioral problems, and environmental influences. The present study therefore should not be interpreted as providing a comprehensive model of online game addiction. Rather, it identifies emotion regulation and social interaction as two statistically significant domains that are associated with problematic gaming within the studied population.

### **Implications for Guidance and Counseling**

The findings have implications for school guidance and counseling, particularly because emotion regulation and social interaction are domains that can be addressed within students' personal and social development. The high proportion of students classified as having high online game addiction scores in the present sample (81.6%) should be interpreted cautiously because participants were selected from students identified as online game players, and the categories represent relative standing within this sample rather than clinical prevalence estimates. Nevertheless, the findings indicate the relevance of these psychological and interpersonal domains for counseling assessment and prevention efforts in the participating schools.

From a counseling perspective, assessment of students experiencing problematic gaming may consider not only gaming behavior itself but also how students respond to emotional difficulties and how they participate in relationships with peers and others. The association with emotion regulation suggests that counseling may need to pay attention to students' ability to manage emotional responses, maintain goal-directed behavior, control impulses, and use adaptive regulation strategies. The association with social interaction similarly highlights the importance of communication, social contact, attitudes, and participation in group contexts.

These implications are consistent with evidence cited in the Introduction that school-based counseling may be relevant to problematic gaming. Choo et al. (2026), for example, reported improvements in self-regulation and reductions in weekend gaming hours and gaming-disorder severity following a group counseling program for adolescents with internet gaming disorder. However, the present study itself did not evaluate a counseling intervention. Therefore, the findings should be used to inform the identification of relevant counseling domains rather than interpreted as evidence that a particular counseling approach will reduce online game addiction.

### **Limitations and Directions for Future Research**

This study has several limitations that should be considered when interpreting its findings. First, as data were collected through a self-administered online questionnaire (Google Form), the researcher was unable to fully control respondents' testing conditions, which may have introduced response inconsistencies not fully reflective of participants' actual conditions. Second, the ex-post facto design precludes causal inference; the observed relationships indicate significant associations but do not establish that online game addiction directly causes changes in emotional regulation or social interaction, or vice versa. Future research employing longitudinal or experimental designs would help clarify the directionality of these relationships.

## **CONCLUSIONS**

This study found that emotion regulation and social interaction were significantly and negatively associated with online game addiction among junior high school students in Lubuk Besar District. Emotion regulation remained significantly associated with online game addiction after controlling for social interaction, while social interaction showed a stronger partial association with online game addiction. Furthermore, emotion regulation and social interaction were jointly associated with online game addiction, explaining 22.5% of its variance. These findings indicate that emotional and interpersonal functioning are relevant domains to consider in understanding problematic gaming among adolescents.

The findings also have practical implications for school guidance and counseling services. Assessment and counseling related to problematic gaming may consider students' emotion regulation and social interaction alongside gaming behavior itself. However, because this study employed a cross-sectional design, the findings represent associations rather than causal relationships. The remaining 77.5% of unexplained variance also indicates that other psychological, family, academic, and environmental factors may be relevant. Future research should therefore employ longitudinal designs and examine additional factors to develop a more comprehensive understanding of online game addiction among adolescents..

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### AUTHOR CONTRIBUTION STATEMENT

This research was conducted independently and was self-funded by the authors, without any external institutional or grant funding. Wia Rasyida was responsible for all components of the research process, including the conceptualization, research design, data collection, data analysis, interpretation of results, and manuscript preparation. Diana Septi Purnama acted as the academic supervisor, providing guidance and critical review throughout the research and manuscript preparation process. Both authors read and approved the final manuscript.

### AI DISCLOSURE STATEMENT

The authors disclose the use of artificial intelligence (AI) tools in a limited capacity during the preparation of this manuscript, specifically to assist in searching for relevant literature references and in correcting language and writing mechanics (grammar, spelling, and sentence structure).

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