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Investigating the Relationship Between Competitive Styles and Emotional Aggression with Interpersonal Problems Among University Students: The Mediating Role of Anger Rumination and the Moderating Role of Self-Esteem

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ABSTRACT

Objective: The present study aimed to examine the role of competitive styles and emotional aggression in predicting interpersonal problems, with emphasis on the mediating role of anger rumination and the moderating role of self-esteem among university students in Salah al-Din Province, Iraq.

Methods: The research method was descriptive–correlational and based on structural equation modeling using the partial least squares approach. The statistical population consisted of all university students in Salah al-Din Province during the 2024–2025 academic year, from which 325 participants were selected using a convenience sampling method. Data collection instruments included the Interpersonal Problems Questionnaire by Barkham et al. (1996), the Competitive Styles Questionnaire by Franken and Brown (1995), the Aggression Questionnaire by Buss and Perry (1992), the Anger Rumination Scale by Sukhodolsky et al. (2001), and the Rosenberg Self-Esteem Scale (1965). For data analysis, SPSS-26 was used for descriptive analyses and SmartPLS-3 was used to test the research model and perform structural equation modeling based on partial least squares.

Results: The results indicated that competitive styles and emotional aggression had significant relationships with interpersonal problems and anger rumination. In addition, anger rumination played a significant mediating role in the relationship between the predictor variables and interpersonal problems. Furthermore, self-esteem, as a moderating variable, had a significant effect on the relationships between competitive styles and emotional aggression with interpersonal problems. The model fit indices also indicated a good fit and strong explanatory power of the research model.

Conclusions: Overall, the findings highlight the importance of cognitive-emotional factors in explaining students' interpersonal problems and may be useful in designing psychological interventions and mental health promotion programs.

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Introduction

Healthy interpersonal relationships are among the most fundamental indicators of psychological well-being and social adjustment during emerging adulthood, particularly among university students. Entering university is accompanied by substantial changes in social roles, interpersonal networks, academic expectations, and performance pressures. These transitions may create conditions that foster interpersonal tensions, academic competition, and heightened emotional sensitivity. Empirical evidence suggests that interpersonal problems among students are associated with negative outcomes such as decreased academic performance, increased anxiety and depression, reduced life satisfaction, and even withdrawal from university (American College Health Association, 2023). Consequently, identifying the psychological and emotional factors that contribute to interpersonal difficulties among university students is of considerable theoretical and practical importance.

One of the important variables within the university context is the competitive style used in conflict management. According to the Thomas–Kilmann model, individuals employ five main styles when dealing with conflict: competing, collaborating, avoiding, accommodating, and compromising (Thomas & Kilmann, 1974). The competitive style emerges when individuals prioritize achieving their own goals while giving little attention to the needs or concerns of others. Although this style can sometimes be effective in organizational or urgent decision-making contexts, its excessive use in peer relationships may intensify conflict, reduce relational closeness, and increase interpersonal tension. Research in conflict management indicates that strong competitive tendencies are associated with increased chronic conflict and poorer interpersonal relationship quality (Ayoko et al., 2018).

Alongside behavioral styles, emotional aggression is another important factor that can contribute to interpersonal difficulties. Emotional aggression refers to aggressive behaviors that arise in response to intense emotional arousal, particularly anger, and are often accompanied by impulsivity and weak emotional regulation (Berkowitz, 2012). According to Berkowitz's cognitive-neoassociation theory, experiences of frustration or perceived threat activate anger-related cognitive networks, thereby increasing the likelihood of aggressive reactions. Contemporary studies also indicate that difficulties in regulating emotions and high levels of anger

predict interpersonal conflicts and unstable relationships among university students (Garofalo et al., 2018).

However, the relationship between anger and interpersonal problems is not merely direct. Certain cognitive processes may intensify or maintain this relationship. One such process is anger rumination, defined as repetitive and persistent thinking about anger-provoking events and perceived injustices. This cognitive pattern prevents the natural decline of emotional arousal and prolongs anger experiences (Sukhodolsky et al., 2001). Research indicates that anger rumination can sustain negative emotions, reduce effective problem-solving, and increase aggressive responses during social interactions.

Universities themselves represent complex social systems in which interpersonal relationships play a critical role in students' experiences and adjustment. The student period is a decisive stage of life that not only involves acquiring specialized knowledge but also provides a context for developing social, emotional, and interpersonal competencies (Wang & Chapman, 2023). University students are at a developmental stage characterized by major cognitive, emotional, and social transformations (Kouzes et al., 2024). This stage is marked by increased independence, expanded social relationships, exposure to academic and career expectations, and participation in formal and informal competitive environments (Northouse, 2025). Recent research emphasizes that universities function not only as educational institutions but also as complex social environments in which the quality of interpersonal experiences significantly influences students' mental health, sense of belonging, academic achievement, and overall adjustment (Wang & Xian, 2024; Al-Thawabiya et al., 2023). Therefore, investigating the psychological constructs that shape students' social interactions—particularly within competitive academic environments—has become an important focus in contemporary research on higher education psychology.

Despite extensive research on competitive styles, emotional aggression, anger rumination, and self-esteem, most previous studies have examined these variables separately or focused primarily on simple relationships between two variables. Less attention has been paid to the complex mechanisms through which cognitive processes and internal psychological resources influence the relationship between emotional characteristics and interpersonal outcomes. Consequently, a comprehensive understanding of how personality, emotional, and cognitive factors interact to produce interpersonal problems among university students remains incomplete.

In particular, excessive competitive styles may stimulate emotional aggression and increase anger rumination, which in turn may lead to conflict, misunderstandings, and reduced quality of interpersonal interactions. Conversely, self-esteem may function as a protective psychological resource that moderates the intensity and direction of these relationships. Individuals with higher self-esteem are generally more resilient in the face of interpersonal challenges and may experience fewer negative consequences from competitive environments and emotional arousal. Investigating these variables simultaneously within a single conceptual model may therefore help clarify both the direct and indirect pathways through which emotional and cognitive processes contribute to interpersonal difficulties.

Previous research provides empirical support for this integrated perspective. Payandeh et al. (2025), in a study examining a structural model of depression based on self-esteem and self-compassion with the mediating role of rumination among adolescents, found that self-esteem and self-compassion predicted depression both directly and indirectly through rumination. Their findings highlight the important mediating role of cognitive rumination processes in linking personality characteristics with emotional outcomes. Similarly, Nasiri and Nouri (2021) investigated the mediating role of anger rumination in the relationship between self-esteem and aggression while controlling for narcissism. Their results indicated that higher self-esteem was associated with lower aggression and that anger rumination significantly mediated this relationship.

Research focusing on interpersonal problems among students has also highlighted the importance of emotional and relational factors. Miniati et al. (2025), in a study of Latin American university students, found that separation anxiety and depressive symptoms were positively associated with interpersonal difficulties, particularly problems in establishing close relationships and managing interpersonal conflicts. Furthermore, Yang et al. (2025) examined the influence of classroom competitive climate on interpersonal relationships and students' willingness to seek academic help. Their findings demonstrated that highly competitive classroom environments reduced students' willingness to seek help and weakened interpersonal interactions, whereas cooperative learning environments enhanced the quality of social relationships. These findings suggest that unhealthy competitive environments may contribute to interpersonal tensions and difficulties among students.

Considering these theoretical perspectives and empirical findings, it appears that the interaction between competitive behavioral styles, emotional aggression, cognitive rumination processes, and psychological resources such as self-esteem may play a crucial role in shaping students' interpersonal relationships. However, studies that examine these variables simultaneously within a comprehensive structural model remain limited, particularly within university student populations.

Therefore, the main problem addressed in the present study is to determine how competitive styles and emotional aggression contribute to the development of interpersonal problems among university students through the mediating role of anger rumination and the moderating role of self-esteem. Addressing this issue may help fill existing theoretical gaps and provide practical insights for designing psychological interventions and educational programs aimed at improving interpersonal relationships and promoting mental health in university environments.

Based on this framework, the main objective of the present study is to examine the relationship between competitive styles and emotional aggression with interpersonal problems among university students while investigating the mediating role of anger rumination and the moderating role of self-esteem.

More specifically, the study aims to examine:

- (1) the relationship between competitive styles and interpersonal problems among university students;
- (2) the relationship between emotional aggression and interpersonal problems;
- (3) the relationship between anger rumination and interpersonal problems;
- (4) the relationship between competitive styles and anger rumination; and
- (5) the relationship between emotional aggression and anger rumination.

In addition, the study seeks to investigate two indirect pathways:

- (6) the mediating role of anger rumination in the relationship between competitive styles and interpersonal problems;
- (7) the mediating role of anger rumination in the relationship between emotional aggression and interpersonal problems;
- (8) the moderating role of self-esteem in the relationship between competitive styles and interpersonal problems; and

(9) the moderating role of self-esteem in the relationship between emotional aggression and interpersonal problems.

Accordingly, the study proposes that competitive styles, emotional aggression, and anger rumination will be significantly associated with interpersonal problems among university students. It is further hypothesized that anger rumination will mediate the relationships between competitive styles and interpersonal problems as well as between emotional aggression and interpersonal problems. Finally, it is expected that self-esteem will moderate the relationships between competitive styles and interpersonal problems and between emotional aggression and interpersonal problems.

Overall, examining these relationships within an integrated framework may contribute to a deeper understanding of the cognitive-emotional mechanisms underlying interpersonal problems among university students. Such insights may also inform the development of preventive and intervention programs that focus on strengthening self-esteem, promoting adaptive anger regulation strategies, and encouraging healthy forms of competition in university environments.

Material and Methods

The present study was applied in terms of its objective and descriptive–correlational in terms of method, using a structural equation modeling (SEM) approach. This method was selected due to the multivariate nature of the study and the need to simultaneously examine the direct and indirect relationships among competitive styles, emotional aggression, anger rumination, self-esteem, and interpersonal problems. Structural equation modeling is considered one of the most advanced statistical methods in behavioral sciences, as it enables the simultaneous testing of hypothesized causal relationships, mediating and moderating effects, as well as the evaluation of the fit of a theoretical model with empirical data (Hair et al., 2022; Kline, 2023). In the present study, anger rumination was examined as a mediating variable, and self-esteem was examined as a moderating variable in the relationship between the predictor and criterion variables. This approach provided a more comprehensive explanation of the psychological mechanisms influencing students' interpersonal problems.

The statistical population of the study consisted of all university students in Salah al-Din Province, Iraq, during the 2024–2025 academic year. This population included students studying at public

and private universities in the province at the bachelor's, master's, and doctoral levels. Given the geographical dispersion of the population and the limited access to all its members, a convenience sampling method was used. Ultimately, 325 students who met the inclusion criteria and completed the questionnaires fully were selected as the final sample.

The sample size was determined based on the recommendations of Kline (2023) and the guidelines of Hair et al. (2022) for studies based on structural equation modeling. Accordingly, for stable parameter estimation and achieving desirable statistical power, at least 15 to 20 observations are required for each free parameter in the model. The sample size of 325 participants in the present study not only meets this criterion but also provides sufficient adequacy for testing mediation and moderation models.

Instruments

The research data were collected using a set of standardized psychometric instruments. To measure interpersonal problems, the short form of the Inventory of Interpersonal Problems developed by Barkham et al. (1996) was used. This instrument has a multidimensional structure and has demonstrated appropriate evidence of validity and reliability in previous studies.

To measure competitive styles, the Competitiveness Questionnaire developed by Franken and Brown (1995) was used. This questionnaire consists of 19 items and five subscales: satisfaction with progress, desire to win, motivation to make effort, satisfaction with performing tasks well, and preference for difficult tasks.

In addition, standardized scales with valid psychometric support were used to measure anger rumination, self-esteem, and emotional aggression. The content validity of the instruments was examined through consultation with experts in psychology and counseling, and their construct validity was assessed using confirmatory factor analysis. Reliability was also evaluated using Cronbach's alpha coefficients, composite reliability (CR), and average variance extracted (AVE). Based on the criteria proposed by Fornell and Larcker (1981), Cronbach's alpha and composite reliability values above 0.70, and AVE values above 0.50, were considered evidence of acceptable reliability and convergent validity.

Data Collection Procedure and Data Analysis

After obtaining the necessary permissions from the relevant university authorities, the questionnaires were distributed among eligible students. Before completing the instruments, the

participants read and signed the informed consent form and were informed about the confidentiality of their information and the voluntary nature of participation in the study. The collected data were then entered into SPSS-26 and SmartPLS-3 software.

In the first stage, descriptive indices including mean, standard deviation, skewness, and kurtosis were calculated. In the second stage, the measurement model was evaluated by examining convergent validity, discriminant validity, and construct reliability. In the third stage, the structural model was tested using the partial least squares structural equation modeling method (PLS-SEM). To assess the significance of the path coefficients, the bootstrapping method with 5,000 resamples was used. In addition, the indices of R^2 , Q^2 , and effect size (f^2) were reported to evaluate the predictive power of the model. The mediating effects of anger rumination and the moderating effects of self-esteem were also tested based on the recommendations of Hayes (2022) and Hair et al. (2022).

Ethical Considerations

The present study was conducted in accordance with the ethical principles of behavioral science research. Participation in the study was completely voluntary, and all participants provided informed consent before entering the research process. Participants were also assured that their information would remain confidential and that the results would be reported only in aggregate form and for scientific purposes. Observing confidentiality, ensuring the right to withdraw from the study at any time, and preserving the human dignity of participants were among the most important ethical considerations of this study.

Results

Descriptive Findings

The present study was conducted with the participation of 325 students from universities in Salah al-Din Province, Iraq, who were selected through convenience sampling. After data collection, the data were analyzed using SPSS version 26 and SmartPLS version 3.

In the first stage, descriptive indices of the research variables, including mean, standard deviation, minimum scores, and maximum scores, were calculated. In addition, the statistical assumptions required for conducting structural equation modeling were examined, including normality of data distribution, correlations among variables, reliability, and construct validity. The results of the

Kolmogorov–Smirnov test indicated that the distribution of the data was within an acceptable range, making it possible to conduct structural analyses. Furthermore, Cronbach’s alpha coefficients, composite reliability (CR), and average variance extracted (AVE) indicated that the research instruments had appropriate reliability and validity.

Evaluation of the Measurement Model

To examine the adequacy of the measurement model, factor loadings of the indicators, construct reliability, and convergent validity were evaluated. The results showed that all research constructs had satisfactory internal reliability, and the values of Cronbach’s alpha and composite reliability were within an acceptable range. In addition, the average variance extracted values for all variables exceeded the recommended threshold, confirming the convergent validity of the model. Moreover, the structural model fit indices indicated an acceptable fit between the conceptual model of the study and the empirical data.

Inferential Findings and Hypothesis Testing

First Hypothesis

The first hypothesis stated that there is a significant relationship between competitive styles and students’ interpersonal problems. The results of the structural model analysis showed that the direct path from competitive styles to interpersonal problems was positive and significant. Therefore, the first hypothesis of the study was confirmed. This finding indicates that an increase in students’ competitive tendencies is associated with an increase in difficulties in social and interpersonal interactions.

Second Hypothesis

The second hypothesis examined the relationship between emotional aggression and interpersonal problems. The results of the structural model showed that emotional aggression had a positive and significant direct effect on interpersonal problems. Therefore, the second hypothesis was confirmed.

Third Hypothesis

The third hypothesis stated that there is a significant relationship between anger rumination and interpersonal problems. The results of the structural path analysis showed that anger rumination had a positive and significant effect on students’ interpersonal problems. Therefore, the third hypothesis was also confirmed.

Fourth Hypothesis

The fourth hypothesis examined the relationship between competitive styles and anger rumination. The results showed that competitive styles had a positive and significant relationship with anger rumination. Therefore, the fourth hypothesis was confirmed.

Fifth Hypothesis

The fifth hypothesis stated that there is a significant relationship between emotional aggression and anger rumination. The results of the path analysis showed that emotional aggression positively and significantly predicted anger rumination. Therefore, this hypothesis was also confirmed.

Testing the Mediation Hypotheses**Sixth Hypothesis**

The sixth hypothesis examined the mediating role of anger rumination in the relationship between competitive styles and interpersonal problems. The results of the indirect effects analysis showed that the indirect effect of competitive styles on interpersonal problems through anger rumination was significant ($p \leq 0.05$). Therefore, the mediating role of anger rumination in this relationship was confirmed.

Seventh Hypothesis

The seventh hypothesis examined the mediating role of anger rumination in the relationship between emotional aggression and interpersonal problems. The results showed that the indirect effect of emotional aggression on interpersonal problems through anger rumination was significant ($p \leq 0.05$). Therefore, the seventh hypothesis was also confirmed.

Testing the Moderation Hypotheses**Eighth Hypothesis**

The eighth hypothesis examined the moderating role of self-esteem in the relationship between competitive styles and interpersonal problems. The results of the interaction effects analysis showed that the interaction between competitive styles and self-esteem had a significant effect on interpersonal problems ($p \leq 0.05$). Therefore, self-esteem played a significant moderating role in this relationship, and the eighth hypothesis was confirmed.

Ninth Hypothesis

The ninth hypothesis examined the moderating role of self-esteem in the relationship between emotional aggression and interpersonal problems. The results showed that the interaction effect of

emotional aggression and self-esteem on interpersonal problems was significant ($p \leq 0.05$). Consequently, the ninth hypothesis was also confirmed.

Summary of the Structural Model Results

The final results of the structural model indicated that all research hypotheses were confirmed. The findings showed that competitive styles, emotional aggression, and anger rumination had positive and significant relationships with students' interpersonal problems. In addition, anger rumination played a mediating role in the relationships between the predictor variables and interpersonal problems, while self-esteem was also effective as a moderating variable in these relationships. Furthermore, all T-statistics related to the direct, indirect, and interaction paths exceeded the critical value of 1.96, confirming the statistical significance of the model.

Final Research Model

The final research model provides a comprehensive representation of the structural relationships among competitive styles, emotional aggression, anger rumination, self-esteem, and interpersonal problems among university students. Based on the results of structural equation modeling, competitive styles and emotional aggression were directly and positively associated with interpersonal problems. This means that increased competitive tendencies and higher levels of emotional aggression are accompanied by intensified communication and social difficulties among students.

Moreover, both competitive styles and emotional aggression also indirectly influenced interpersonal problems through increased anger rumination. This finding indicates the significant mediating role of anger rumination in explaining the cognitive-emotional mechanisms affecting social relationships. In other words, individuals who show a greater tendency toward excessive competitiveness or who experience and express aggressive emotions more strongly are more likely to become involved in continuous and repetitive mental processing related to anger. This negative cognitive process, in turn, creates the conditions for the emergence and persistence of interpersonal problems.

The results also showed that self-esteem, as a moderating variable, influenced the strength of the relationships between competitive styles and interpersonal problems, as well as between emotional aggression and interpersonal problems. Specifically, higher levels of self-esteem may weaken the negative effects of these variables on interpersonal relationships.

Overall, the acceptable fit indices of the model and the significance of all direct, indirect, and interaction paths indicate the theoretical and empirical adequacy of the proposed research model in explaining students' interpersonal problems. The findings suggest that the interaction of personality, emotional, and cognitive factors play a decisive role in the quality of students' social relationships and interpersonal adjustment.

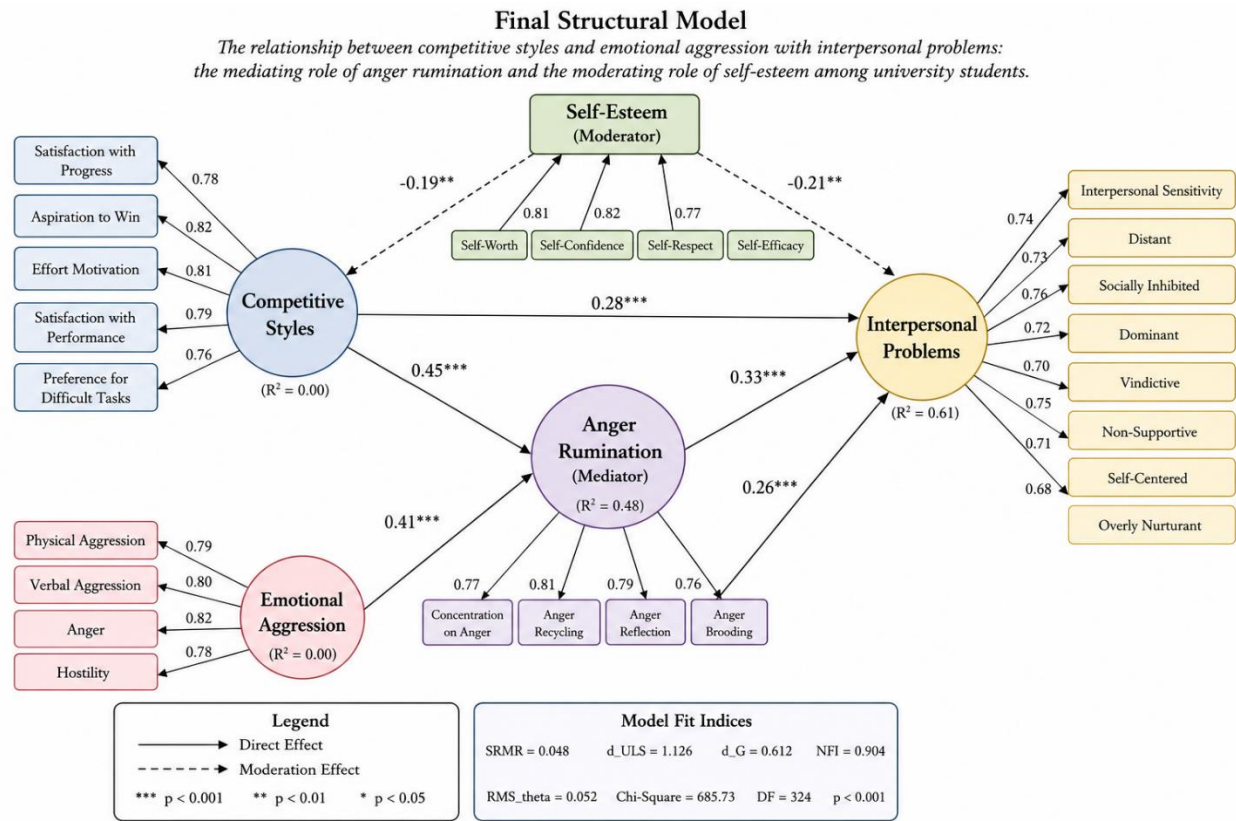


Figure 1. Final Research Model

Discussion

The present study aimed to explain the structural relationships between competitive styles and emotional aggression with interpersonal problems among students at universities in Salah al-Din Province, Iraq, while considering the mediating role of anger rumination and the moderating role of self-esteem. For this purpose, data collected from 325 students were analyzed using partial least squares structural equation modeling. The results of the measurement model evaluation showed

that the research constructs had acceptable reliability and validity, and the model fit indices confirmed the adequacy of the proposed theoretical structure.

The findings of the study showed that competitive styles were directly and significantly related to students' interpersonal problems. This finding indicates that an increase in excessive competitiveness, continuous social comparison, and overemphasis on individual success can contribute to increased conflicts, reduced empathy, and weakened quality of social relationships. The results also showed that emotional aggression directly and significantly predicted interpersonal problems. This means that students who experience higher levels of anger, hostility, and aggressive behaviors face greater difficulties in their social interactions.

Moreover, anger rumination had a positive and significant relationship with interpersonal problems and was identified as one of the most important cognitive variables affecting social relationships. Regarding the relationships between the predictor variables and the mediating variable, the results showed that competitive styles had a positive and significant relationship with anger rumination. Emotional aggression also significantly predicted increased anger rumination. These findings suggest that individuals with strong competitive tendencies or high levels of emotional aggression are more likely to become involved in repetitive mental processing and continuous cognitive preoccupation with anger-provoking experiences.

One of the most important findings of the study was the confirmation of the mediating role of anger rumination in the relationship between competitive styles and interpersonal problems, as well as in the relationship between emotional aggression and interpersonal problems. The results of the indirect effects analysis showed that part of the effect of competitive styles and emotional aggression on interpersonal problems is transmitted through increased anger rumination. This result indicates that anger rumination is not merely an emotional consequence but also a cognitive mechanism that can intensify the negative effects of personality and emotional characteristics on the quality of social relationships.

In addition, the findings confirmed the moderating role of self-esteem. The results showed that self-esteem played a significant moderating role in the relationship between competitive styles and interpersonal problems, as well as in the relationship between emotional aggression and interpersonal problems. This finding indicates that self-esteem can act as a protective psychological resource and reduce the intensity of the negative effects of excessive

competitiveness and emotional aggression on interpersonal relationships. In other words, students with higher self-esteem, even when experiencing negative emotions or competitive tendencies, have a greater ability to manage conflicts and maintain healthy social relationships.

Overall, the final results of the study showed that students' interpersonal problems result from a complex interaction of personality, emotional, and cognitive factors. Competitive styles and emotional aggression function as risk factors, anger rumination acts as a mediating mechanism, and self-esteem serves as a protective factor in explaining interpersonal problems. Furthermore, the confirmation of all research hypotheses and the significance of all direct, indirect, and interaction paths in the structural model indicate the strong explanatory power of the proposed research model in explaining the mechanisms affecting students' interpersonal relationships.

Therefore, it can be concluded that enhancing self-esteem, reducing anger rumination, and teaching adaptive strategies for emotion and competition management are among the most important psychological interventions for improving the quality of interpersonal relationships and promoting students' mental health.

Research Recommendations

Based on the findings of the study, it is recommended that future studies use longitudinal and experimental designs to examine the causal relationships among competitive styles, emotional aggression, anger rumination, and interpersonal problems with greater precision. In addition, conducting similar studies in different populations, including school students, organizational employees, couples, and other cultural groups, could help increase the generalizability of the proposed model.

Furthermore, it is recommended that the role of other mediating and moderating variables, such as cognitive emotion regulation, resilience, emotional intelligence, self-compassion, and social support, be examined in order to develop more comprehensive explanatory models.

From an applied perspective, the findings highlight the necessity of designing and implementing educational programs and psychological interventions aimed at reducing anger rumination, managing emotional aggression, and enhancing self-esteem. Therefore, it is suggested that university counseling centers prioritize preventive and therapeutic programs based on cognitive-behavioral approaches, emotion regulation skills training, and communication skills development.

Through strengthening students' psychological resources, such programs can help reduce interpersonal problems and improve students' mental health.

Research Limitations

Despite careful attention to the design and implementation of the study, several limitations should be considered when interpreting and generalizing the findings. First, the present study used convenience sampling and was conducted within a population limited to students at universities in Salah al-Din Province, Iraq. Therefore, the generalization of the findings to other age, cultural, and social groups should be done with caution.

In addition, the cross-sectional nature of the study limits the possibility of drawing definitive causal conclusions among the variables under investigation. Therefore, the results should be interpreted only within the framework of structural and correlational relationships among the constructs.

Moreover, the research data were collected using self-report instruments, which may have been influenced by response bias, social desirability, and individual differences in the perception and reporting of emotional experiences. Furthermore, although the research model was able to explain a considerable proportion of the variance in interpersonal problems, other variables such as emotion regulation, perceived social support, personality traits, attachment styles, and psychological flexibility may also contribute to explaining interpersonal problems. These variables were not examined in the present study.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Imam Khomeini International University.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection and analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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