

Reciprocal Influence Between Mental Health and Interpersonal Relationships Among Middle School Students: An Empirical Study Based on MHT and MSPSS Scales

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Abstract

Teacher-student and peer relationships at school, as well as interpersonal relationships within the family, constitute critical components in the construction of middle school students' social networks. Research in clinical psychology has demonstrated that students' mental health issues are often associated with a deficiency in normal social interaction and stable interpersonal relationships. This study employed the Mental Health Test (MHT) and the Multidimensional Scale of Perceived Social Support (MSPSS) as instruments, with 4,228 middle school students in Dazhou City as participants, to investigate the mutual influence between mental health and interpersonal relationships among middle school students. The findings reveal that the quality of middle school students' mental health is closely related to their interpersonal relationships; 76.1% of students exhibited normal mental health in the assessment, yet these students' interpersonal relationships did not necessarily exhibit ideal conditions. A statistically significant correlation exists between students' mental health levels and the quality of their interpersonal relationships, with a correlation coefficient of approximately 0.197, indicating a positive correlation between the two. This study underscores the close connection between mental health and interpersonal relationships among middle school students; positive interpersonal relationships can significantly enhance students' mental health levels, while students with poorer mental health typically struggle to maintain stable interpersonal relationships. Furthermore, a dynamic interaction exists between mental health and interpersonal relationships, emphasizing the importance of continuous improvement in mental health for fostering healthier interpersonal relationships, thereby providing empirical support for school-based mental health education and interpersonal relationship guidance.

Full Text

The Mutual Influence of Mental Health and Interpersonal Relationships Among Middle School Students: An Empirical Study Based on the MHT and MSPSS Scales

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Abstract

The relationships between teachers and students, among peers, and within families constitute key components of middle school students' social networks. Clinical psychology research indicates that students' mental health issues are often linked to a lack of normal social interaction and stable interpersonal relationships. This study employed the Mental Health Test (MHT) and the Multidimensional Scale of Perceived Social Support (MSPSS) to investigate the mutual influence between mental health and interpersonal relationships among 4,228 middle school students in Dazhou City. The results demonstrate a close association between students' mental health status and their interpersonal relationships. While 76.1% of students exhibited normal mental health in the assessment, their interpersonal relationships were not necessarily ideal. A statistically significant positive correlation exists between mental health levels and interpersonal relationship quality, with a correlation coefficient of approximately 0.197. This study underscores the close connection between middle school students' mental health and interpersonal relationships, revealing that good interpersonal relationships can significantly enhance mental health, whereas students with poorer mental health typically struggle to maintain stable relationships. Furthermore, a dynamic interaction exists between mental health and interpersonal relationships, emphasizing the importance of continuous mental health improvement for fostering healthier relationships. These findings provide empirical support for school-based mental health education and interpersonal relationship guidance.

Keywords: middle school student mental health; interpersonal skills; MHT scale; MSPSS scale

Mental health is typically defined as an individual's well-being in emotional, psychological, and social functioning [?]. Good mental health not only signifies the absence of mental illness but also encompasses positive emotional experiences and high functional efficacy. Factors influencing mental health include

genetic predisposition, environmental stress, life events, and social and cultural contexts [?]. The mental health status of middle school students directly affects their academic performance, learning motivation, and relationships with classmates and teachers. Research shows that students with good mental health are more likely to achieve academic success, possess higher self-efficacy, and demonstrate better social adaptability [?]. Interpersonal relationships are crucial for students' emotional support and social development. Good relationships can improve students' social skills, enhance self-confidence, and promote emotional health. Conversely, interpersonal problems may lead to negative psychological states such as loneliness and depression [?].

Psychologist John Bowlby proposed that the quality of early attachment relationships not only influences individuals' interpersonal patterns but also has long-term effects on mental health [?]. Individuals with secure attachment typically exhibit greater confidence and openness in interpersonal interactions, whereas insecure attachment may lead to avoidant or anxious social behaviors that further affect psychological adaptability and emotional states. Additionally, social exchange theory emphasizes equity and reciprocity in interpersonal interactions, noting that when individuals perceive fairness and mutual support in relationships, they are more likely to experience satisfaction and happiness. This reciprocal social exchange not only strengthens social connections but also helps form positive self-concepts and self-esteem, thereby significantly enhancing mental health. Therefore, good interpersonal relationships are not only markers of healthy social functioning but also important pillars of mental health.

This study aims to understand middle school students' mental health levels through the Mental Health Test (MHT), assess the quality of teacher-student, peer, and family relationships using the Multidimensional Scale of Perceived Social Support (MSPSS), analyze the relationship between mental health levels and interpersonal relationship quality to determine whether a statistically significant correlation exists, and provide empirical data for school mental health education and interpersonal relationship guidance, emphasizing the importance of good relationships for improving student mental health.

2.1 Study Participants

This study employed stratified random sampling to test 4,228 middle school students from 8 schools in Dazhou City. A total of 4,253 questionnaires were distributed to middle school students, with 4,228 valid questionnaires returned, yielding a validity rate of 99.41%. After discarding any questionnaires with missing responses, 3,303 valid data points were collected. All subsequent analyses are based on these valid samples.

2.2 Research Instruments

This study utilized the Mental Health Test (MHT) scale revised by Zhou Bucheng of the Psychology Department at East China Normal University,

originally adapted from Japan's Suzuki Kiyoshi and colleagues' "Anxiety Tendency Diagnostic Test," as well as the Multidimensional Scale of Perceived Social Support (MSPSS). The MHT includes Chinese norms and comprises eight content subscales: learning anxiety, interpersonal anxiety, loneliness tendency, self-blame tendency, hypersensitivity, physical symptoms, terror tendency, and impulse tendency. The test contains 100 items, eight content subscales, and one validity scale (a lie detection scale). The total score of the content subscales indicates general anxiety tendency, with higher scores reflecting poorer mental health status. The scale features moderate item quantity, broad coverage, high screening efficiency, and strong reliability and validity.

The MSPSS questionnaire contains 12 items measuring individuals' perceived support from family, friends, and significant others, using a 7-point scoring method (1 = strongly disagree, 7 = strongly agree). The total social support score is the sum of all items, with higher scores indicating better perceived social support. The questionnaire covers multiple interpersonal interactions in students' school and daily life, with an appropriate number of items for middle school students that is neither excessive nor insufficient, enabling effective screening and assessment of students' interpersonal relationships. As the most widely used self-report scale, it demonstrates high reliability and validity. The correlation between each item and the total score ranges from 0.479 to 0.771, with significant differences between high and low scoring groups on all items. Exploratory factor analysis revealed three factors with a cumulative contribution rate of 65.454%, while confirmatory factor analysis showed good data fit. The scale's total score and three factors are significantly positively correlated with self-esteem ($r = 0.348-0.417$). The internal consistency coefficient is 0.890, with split-half and test-retest coefficients both at 0.859. These results indicate that the Chinese version of the MSPSS demonstrates good reliability and validity and is suitable for Chinese middle school student populations.

2.3 Data Analysis

To examine potential common method bias across all items in both scales, Harman's single-factor test was employed. Data analysis utilized SPSS 22.0 statistical software for descriptive statistics and Pearson bivariate correlation analysis. Following Hayes' proposed testing method [?], SPSS macro program PROCESS Model 5 was used for analysis, employing bias-corrected percentile Bootstrap methods with 3,000 bootstrap samples to estimate parameter standard errors and confidence intervals.

3. Research Results

3.1 Mental Health Status of Middle School Students

Based on MHT assessment results from 3,303 middle school students, total scores ranged from 0 to 100, with a mean of 50.52 ± 19.15 . Using 65 points as

the cutoff for mental health problems, 1,010 students exceeded this threshold, yielding a detection rate of 23.89%. The mental health problem detection rate for girls (27.73%) was significantly higher than for boys (20.30%) (see Figure 1 [Figure 1: see original paper]). These results indicate that while most students exhibited normal mental health, approximately one-quarter experienced mental health problems, with girls showing particularly elevated risk.

3.2 Correlation Analysis Between Interpersonal Relationship Quality and Mental Health

Pearson correlation analysis between interpersonal relationship quality (based on MSPSS) and mental health status revealed a significant positive correlation, with $r = 0.197$ ($p < 0.05$). This suggests that good interpersonal relationships contribute to improved mental health, while students with poorer mental health demonstrate lower quality interpersonal interactions. Specifically, among the three dimensions of family, peer, and teacher-student relationships, family support showed the strongest correlation with mental health ($r = 0.256$, $p < 0.01$), indicating that family emotional support plays a crucial role in maintaining student mental health. Peer support demonstrated a correlation of $r = 0.193$ ($p < 0.05$), showing that peer relationships also significantly impact mental health, particularly through positive interactions and emotional exchanges that help alleviate student anxiety and loneliness. Teacher-student relationship correlation was relatively weaker but still significant ($r = 0.156$, $p < 0.05$), suggesting that good teacher-student interactions can reduce psychological stress and enhance school belongingness and academic motivation (see Figure 2 [Figure 2: see original paper]).

3.3 Common Method Bias Test

Harman's single-factor test results revealed six factors with eigenvalues greater than 1. After rotation, the largest common factor explained 25.33% of total variance, below the 40% threshold proposed by Podsakoff et al. [?]. Therefore, the study results were not significantly affected by common method bias (see Table 1).

3.4 Moderated Mediation Model Test

Using Hayes' PROCESS macro Model 5, we examined the mediating role of self-regulation ability and the moderating role of interpersonal relationships. As shown in Table 2 , after controlling for grade and gender, the interaction between self-regulation ability and interpersonal relationships in predicting mental health was significant ($\beta = 0.13$, $t = 3.56$, $p < 0.05$), with a Bootstrap 95% confidence interval of [0.05, 0.24] that did not include zero. This confirms that interpersonal relationships moderate the path from self-regulated learning to mental health (see Table 2).

Table 2: Moderated Mediation Model Test

Variable	Coefficient Significance
Self-regulation ability	0.50, 31.71*
Interpersonal relationships	-4.02*
Self-regulation \times Interpersonal relationships	0.13, 3.56*

Note: Independent variable = self-regulated learning; Dependent variable = mental health; Mediator variable = interpersonal relationships; All variables were standardized before entering the regression equation.

3.5 Gender and Grade Difference Analysis

The study also analyzed differences in interpersonal relationships and mental health across gender and grade levels. Results showed that girls scored slightly higher than boys on overall interpersonal relationship quality (means of 4.58 vs. 4.42), yet their mental health problem detection rate was significantly higher, suggesting that despite perceiving better relationships, girls face greater challenges in emotional regulation and stress coping.

Furthermore, students in different grades showed significant differences in both interpersonal relationship quality and mental health status. As grade level increased (particularly in upper grades), mental health problems showed an upward trend while interpersonal relationship quality declined. This may relate to increased academic pressure and changes in peer relationships, especially in higher grades where peer relationships are susceptible to academic competition, leading to weakened support and consequently affecting mental health (see Figure 3 [Figure 3: see original paper]).

Discussion

As adolescents mature physically and psychologically, their need for interpersonal interaction gradually increases, with relationships playing an increasingly critical role in their lives [?]. Good interpersonal interaction serves not only as a source of emotional expression and social support but also helps students effectively vent emotions and reduce psychological pressure [?]. When students can obtain adequate support and effectively process emotions in interpersonal contexts, they experience significantly reduced psychological distress, which benefits academic performance [?]. Conversely, when students lack interpersonal interaction or encounter setbacks in relationships, they struggle to obtain necessary social support and emotional outlets, potentially leading to adverse effects on academic performance from psychological distress [?].

In this study, all middle school students' MHT total scores ranged from 0 to 100, with a mean of 50.52 (SD = 19.15). Using 65 points as the positive threshold for mental health problems, we found that 23.89% of students exhibited mental health issues, reflecting that a notable proportion of students experience sub-optimal psychological well-being. Significant gender differences emerged, with

girls showing higher positive detection rates than boys (27.73% vs. 20.30%), potentially indicating differential roles of gender in mental health dynamics. Through Harman's single-factor test, we confirmed that our results were not significantly affected by common method bias, as the largest common factor explained only 25.33% of total variance after rotation, far below Podsakoff's 40% threshold. This enhances the reliability of our findings and increases confidence in our data interpretation.

Using Hayes' PROCESS macro Model 5, we examined the mediating role of academic control and the moderating role of interpersonal relationships. Results showed that the interaction between self-regulation ability and interpersonal relationships significantly predicted mental health ($\beta = 0.13$, $p < 0.05$), indicating that interpersonal relationships play an important moderating role in the effect of self-regulated learning on mental health. For students with lower self-regulation ability, good interpersonal relationships are particularly crucial as they provide necessary social support that can improve mental health levels [?]. This study reveals how self-regulated learning, academic control, and interpersonal relationships jointly influence middle school students' mental health.

Despite these valuable findings, future research should explore additional potential mediating and moderating variables, such as emotional regulation ability and psychological capital, to construct a more comprehensive theoretical model [?]. Additionally, the gender differences observed warrant further investigation to understand specific mental health needs and support approaches for different genders. Through such in-depth research, we can better understand and promote healthy mental development among middle school students.

Conclusion

This study reveals that middle school students' mental health status shows wide variation, with an average mental health score of 50.52 (SD = 19.15) and approximately one-quarter exhibiting clear mental health problems. This suggests that schools and educational institutions need to attend to and support this segment of students. Girls' higher mental health problem detection rate may relate to gender-specific psychological development and sociocultural factors, necessitating personalized mental health support designs for different genders. Academic control plays a mediating role between self-regulated learning and mental health, suggesting that enhancing students' academic control can effectively improve their mental health status. Interpersonal relationships significantly impact mental health for students with lower self-regulation ability but have minimal effect on those with higher self-regulation. This underscores the importance of establishing and maintaining good interpersonal relationships in school settings, particularly for students with weaker self-regulation abilities. While the results are illuminating, they also expose issues requiring further exploration, such as other potential mediating and moderating variables (e.g., emotional regulation ability and psychological capital) and how to integrate these into more comprehensive theoretical models. In summary, this study not

only provides empirical data for understanding factors influencing middle school students' mental health but also offers guidance for educational practice, particularly regarding how to support student mental health through improving academic control and optimizing interpersonal relationships. We hope future research will build upon these foundations to develop more effective mental health interventions.

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