Understanding the Influence of Social Support on Junior High School Students' Stress Perception: The Intermediary Role of Friendship Network

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Abstract: Objective: Research on the perceived social support, stress perception, and friendship networks among junior high school students. Method: A convenient cluster sampling method was adopted to select 484 junior high school students (grades 7- 9) from a middle school in Linxiang City, Hunan Province. The Perceived Social Support Scale (PSSS), the Lovers Social Network Scale (LSNS), and the Chinese Perceived Stress Scale (CPSS) were distributed to each class for data analysis. Result: (1) Junior high school students' perceived social support(t=30.53) and the friendship network (t=19.64) were higher than the average level (p<0.001); the stress perception (t=-50.14, p<0.001) was lower than the average level. (2) There are significant differences in perceived social support and stress perception among junior high school students by gender (p<0.05) and grade (p<0.01, p<0.001). There are significant differences in stress perception (p<0.01) and friendship network (p<0.05) among junior high school students depending on whether they were only children. (3) Perceived social support, friendship network, and stress perception were significantly correlated with each other (r=-0.36, -0.34, p<0.01). (4) The total effect value of perceived social support on stress perception among junior high school students was -0.17, and the mediating effect value through friendship network was -0.05, with a mediating effect proportion of 29.41%, and the mediating effect was significant (p<0.001). Conclusion: Perceived social support directly affects stress perception, and also indirectly affects stress perception through friendship networks. This is of great significance for future psychological intervention of stress perception among junior high school students.

Keywords: comprehend social support; stress perception; friendship network; junior high school students

1. Introduction

The junior high school stage is a transitional period when individuals move from immaturity to maturity, and it is also a critical and crisis-ridden phase in individual development. During this period, junior high school students not only face significant physical and psychological changes but also encounter pressures from various aspects such as school, family, and society [1]. Research found that perceived social support among junior high school students is an important resource for individuals when confronting stress; it helps them perceive stress correctly, adapt to society better, and promote self-development and growth [2]. With the enhancement of self-awareness, junior high school students also begin to think independently and explore their own identities. Their need for social interaction gradually increases, and they are eager to establish friendships through interactions with peers. The establishment of friendship networks can not only provide emotional support for junior high school students and enhance their self-identity but also help them reduce stress and better meet challenges [3]. In summary, there is a close relationship among perceived social support, stress perception, and friendship networks. However,

existing studies have only explored the relationships between a single variable or two of these variables. This study aims to analyze the current status of junior high school students' perceived social support, friendship networks, and stress perception, and further investigate the relationships among the three. It focuses on the impact of perceived social support on junior high school students' stress perception and explores the mediating effect of friendship networks between perceived social support and junior high school students' stress perception [4].

The findings of this study are expected to provide a relevant theoretical basis for educators, parents of junior high school students, social workers, and other relevant parties in terms of junior high school students' stress management. Additionally, it is anticipated to offer insights for them to adopt effective multi-perspective and multi-approach intervention strategies, ultimately improving the mental health level of junior high school students [5].

2. Problem Statement

2.1. Problem Statement

By reviewing previous research literature on perceived social support, perceived stress, and friendship networks, it has been found that there is a close connection among these three factors. Perceived social support, as an influencing factor of perceived stress, is closely related to individuals' coping behaviors under stress. A significant amount of existing research confirms that a high level of friendship networks can influence an individual's level of perceived stress, as well as the predictive role of perceived social support on perceived stress. When faced with stressful events and life difficulties, individuals tend to unconsciously avoid and respond negatively, especially middle school students who are in the period of identity confusion. Negative coping methods for stress can evoke a strong sense of helplessness and lead to an increase in perceived stress levels, preventing them from adapting normally to their living environment, which affects their physical and mental health development. If individuals continue to adopt negative coping methods when dealing with stressful life events, and at the same time have low levels of perceived social support, it will not only have a significant negative impact on the physical and mental health of middle school students, but will also hinder their future learning, living, and social adaptation. Thus, this study aims to build upon previous research by focusing on middle school students to further explore the impact of perceived social support on perceived stress and to investigate the mediating role of friendship networks in the relationship between perceived social support and perceived stress. Under conditions of high perceived social support and a high-level friendship network, middle school students' levels of perceived stress are expected to decrease.

2.2. Research Hypotheses

Hypothesis 1: There are partial demographic differences in perceived social support, friendship networks, and stress perception among junior high school students.

Hypothesis 2: There is a positive correlation between perceived social support and friendship networks of junior high school students, and both can negatively predict stress perception.

Hypothesis 3: Friendship networks play a mediating role between perceived social support and stress perception of junior high school students (see Figure 1).
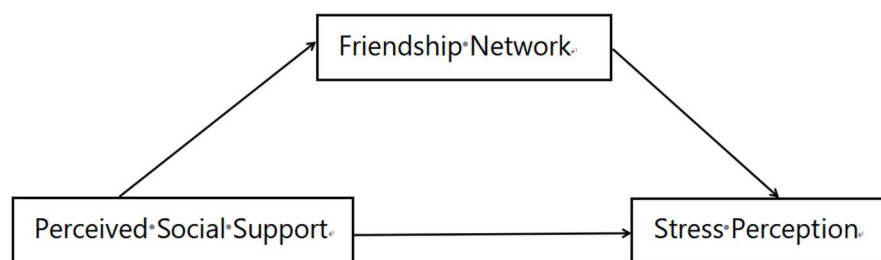
Figure 1. Mediating model of the friendship network in the relationship between perceived social support and stress perception among middle school students.

3. Research Methods

3.1. Participants

This study recruited junior high school students (Grades 7, 8, and 9) from a middle school in Linxiang City, Hunan Province. Questionnaires, including the Perceived Social Support Scale, Social Network Scale, and Perceived Stress Scale, were distributed on a class-by-class basis. A total of 484 questionnaires were distributed. After excluding incomplete or invalid responses, 460 valid questionnaires were collected, yielding an effective response rate of 95.04%. The demographic characteristics of the participants are presented in Table 1.

Table 1. Demographic Characteristics of Participants (N=460).

Characteristic	Category	Number	Percentage (%)
Gender	Male	254	55.2
	Female	206	44.8
Grade	Seventh Grade	197	42.8
	Eighth Grade	116	25.2
	Ninth Grade	147	32.0
Only Child	Yes	36	7.8
	No	424	92.2

Note: This table follows the three-line table format common in academic publishing.

3.2. Research Instruments

3.2.1. Perceived Social Support Scale (PSSS)

The Chinese version of the Perceived Social Support Scale (PSSS), translated and revised by Jiang Qianjin et al., was used in this study. This scale consists of 12 items divided into three dimensions: family support, friend support, and other support, with 4 items in each dimension. Responses are rated on a 7-point Likert scale, ranging from 1 (very strongly disagree) to 7 (very strongly agree). Higher scores indicate a higher level of perceived social support. In this survey, the internal consistency coefficient (Cronbach's α) for the entire scale was 0.96. The internal consistency coefficients for the three subscales were 0.87 (family support), 0.91 (friend support), and 0.92 (other support), respectively.

3.2.2. Social Network Scale (Friends Subscale)

The friends subscale of the Chinese version of the Lubben Social Network Scale-6 (LSNS-6) was employed. The full LSNS-6 includes 6 items, and the friends subscale is constructed from three specific items assessing the size of an individual's active and close network of friends whom they can talk to or seek help from. The friend-related items are: (1) "How many friends do you see or hear from at least once a month?" (2) "How many

friends do you feel close to such that you could call on them for help?" (3) "How many friends do you feel at ease with that you can talk about private matters?" Each item has 6 response options: 0=None, 1=One, 2=Two, 3=Three or Four, 4=Five to Eight, 5=Nine or more. The total score for the friends subscale ranges from 0 to 15. The Chinese version of the LSNS-6 friends subscale demonstrated high internal consistency in this study, with a Cronbach's α coefficient of 0.95.

3.2.3. Perceived Stress Scale (PSS)

The Chinese Perceived Stress Scale (CPSS), revised by Yang Tingzhong and Huang Hanteng (2003), was used to measure subjective stress perception. This 14-item scale assesses two dimensions: tension and loss of control. Items are rated on a 5-point Likert scale from 0 (never) to 4 (very often). Items 4, 5, 6, 7, 9, 10, and 13 belong to the loss of control dimension (e.g., "Ability to successfully handle irritating life hassles") and are reverse-scored. After reversing these items, a total score is calculated by summing all item scores. Higher total scores indicate higher levels of perceived stress. The score can be interpreted as follows: 0-28 represents a normal stress level, 29-42 indicates relatively high stress, and 43-56 suggests high stress. In the present study, the internal consistency coefficient for this scale was 0.811.

3.3. Data Processing

Data were collected through offline questionnaire distribution. Data entry and organization were completed using Microsoft Excel. Statistical analyses were performed using SPSS Statistics version 27.0. Descriptive statistics, independent samples t-tests, and correlation analyses were conducted. Furthermore, mediation analysis was performed using Model 4 in the SPSS macro Process (version 4.1). In this model, perceived social support was set as the independent variable, perceived stress as the dependent variable, and the friendship network score as the mediating variable.

4. Research Findings

4.1. Common Method Bias Analysis

The data for this study were completely obtained through self-reports from participants, collected solely via questionnaires. To reduce the impact of common method bias, some scales were designed using both direct and reverse scoring methods, and the questionnaire administration phase emphasized the confidentiality of the data. Harman's single-factor test method was used to examine common method bias, and the results showed that six factors with eigenvalues greater than 1 were extracted, with the variance explained by the first factor being 26.543% (which is <40%). This confirms that the data from this study does not present a significant common method bias issue and allows for subsequent statistical analysis.

4.2. A General Description of Middle School Students' Understanding of Social Support, Perceived Stress, and Friendship Networks

As shown in Table 2, the average score of middle school students' perception of social support is 4.97, which is significantly higher than the theoretical value of 3.5 (t=30.53, p<0.001), indicating a higher level; the mean score of middle school students' perceived stress is 1.53, which is significantly lower than the theoretical average value of 2.5 on a Likert 5-point scale (t=-50.14, p<0.001), indicating a lower level; the mean score of middle school students' friendship network is 8.63, which is significantly higher than the theoretical average value of 6 (t=19.64, p<0.001), indicating a higher level.

Table 2. Overall description of middle school students' understanding of social support, perceived stress, and friendship networks (N=460).

	Min	Max	equally divided	M	SD
Family Support	4	28	5.00	20.01	5.10
Friend Support	5	28	5.02	20.08	4.55
Other Support	4	28	4.90	19.58	4.77
Feeling out of control	0	14	1.30	9.1	2.86
Sense of tension	0	26	1.76	12.29	4.69
Understand social support	23	84	4.97	59.67	12.42
Perception of stress	0	36	1.53	21.39	5.82
Friendship Network	1	15	2.88	8.63	2.87

4.3. Analysis of the Relationship between Middle School Students' Perceived Social Support, Stress Perception, and Friendship Networks

According to Table 3, there are correlations among the three variables. Specifically, perceived social support and friendship networks have a significant negative correlation with stress perception (r=-0.360, r=-0.339, p<0.01). Additionally, there is a significant positive correlation between perceived social support and friendship networks (r=0.499, p<0.01).

Table 3. Correlation analysis results of middle school students' understanding of social support, perceived stress, and friendship networks (M±SD).

	1	2	3	4	5	6	7	8
Family Support	1							
Friend Support	0.506**	1						
Other Support	0.610**	0.727**	1					
Feeling out of control	-0.082	-0.150**	-0.143**	1				
Sense of tension	-0.328**	-0.269**	-0.330**	0.139**	1			
Understand social support	0.830**	0.853**	0.901**	-0.143**	-0.360**	1		
Perception of stress	-0.304**	-0.290**	-0.336**	0.604**	0.873**	-0.360**	1	
Friendship Network	0.353**	0.484**	0.459**	-0.191**	-0.304**	0.499**	-0.339**	1

Note: 1 = family support, 2 = friend support, 3 = other support, 4 = sense of loss of control, 5 = feeling of tension, 6 = awareness of social support, 7 = perception of stress, 8 = friendship network.

4.4. Examination of the Mediating Effects of Friendship Networks among Middle School Students, Social Support, and Perceived Stress
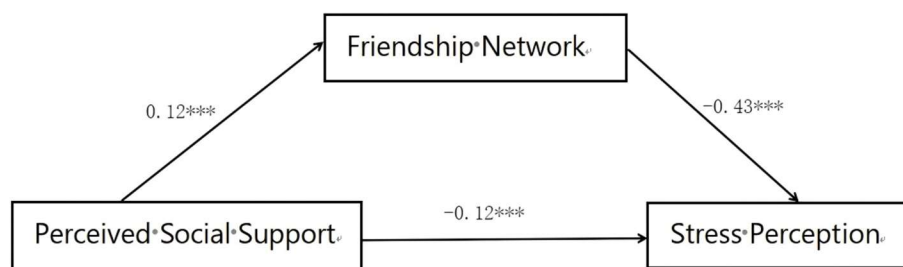
Based on the mediation effect theory proposed by scholars such as Wen Zhonglin, this study uses Model 4 from the SPSS macro program Process and employs the Bootstrap sampling method to examine the mediation effects among variables. To enhance the accuracy of the research, gender, grade, and whether the student is an only child were included as control variables during the analysis, with a 95% confidence interval set. According to the regression analysis results presented in Table 4 (see next page), perceived social support significantly negatively predicts middle school students' stress perception (β=-0.336, p<0.001); perceived social support significantly positively predicts friendship networks (β=0.494, p<0.001); friendship networks significantly negatively predict stress perception (β=-0.324, p<0.001).

Table 4. Regression Analysis Results of Junior High School Students' Perception of Social Support, Stress Perception, and Friendship Networks.

regression equation		Overall Fit Index			Significance of regression coefficients	
Result Variable	Predictor variable	R	R2	F	β	t
Perception of stress	Understand social support	0.393	0.154	20.741	-0.336	-7.687***
	Gender				0.107	2.447*
	Grade				0.123	2.831**
	Only child				-0.005	-0.114
Perception of stress	Friendship Network	0.382	0.146	19.419	-0.324	-7.351***
	Gender				0.078	1.745
	Grade				0.165	3.788***
	Only child				-0.006	-0.138
Friendship Network	Understand social support	0.522	0.273	42.637	0.494	12.203***
	Gender				-0.142	-3.485**
	Grade				0.054	1.334
	Only child				0.015	0.359

Note: *$p<0.05$; **$p<0.01$; ***$p<0.001$.

To explore the significant negative impact of perceived social support on stress perception and the pathways of this effect, this study introduces friendship networks into the mediation variable model. The path coefficients among perceived social support, friendship networks, and stress perception are shown in Figure 2.

Figure 2. Path coefficient diagram of understanding social support, friendship networks, and perceived stress.

According to Table 5, the direct effect of perceived social support on stress perception and the mediating effect through friendship networks are significant, with the Bootstrap 95% confidence intervals not containing 0. The direct effect value is -0.12, accounting for 70.59% of the total effect (-0.17); the mediating effect value is -0.05, accounting for 29.41% of the total effect, confirming that perceived social support can have a direct impact on stress perception and can also indirectly influence stress perception through friendship networks.

Table 5. Total Effects, Direct Effects, and Mediating Effects Decomposition Table.

	Effect size	Standard error	95% confidence interval		Effect size proportion
			Lower limit	Upper limit	
Total effect	-0.17	0.02	-0.21	-0.13	
Direct effect	-0.12	0.02	-0.17	-0.07	70.59%

Mediation effect	-0.05	0.01	-0.08	-0.02	29.41%

5. Conclusion

(1) In this study, there are significant differences in perceived social support among junior high school students based on their grade levels, with students in the second and third grades having significantly lower levels of perceived social support compared to first-grade students; there are also significant differences in friendship networks based on whether students are only children, with only children scoring slightly higher in friendship networks than non-only children; additionally, there are significant differences in perceived stress among junior high school students based on gender and grade level, where females report higher levels of perceived stress than males, and second and third-grade students report higher stress perceptions than first-grade students.

(2) Perceived social support among junior high school students has a significant positive effect on friendship networks, and there is a significant negative correlation between perceived social support and friendship networks with perceived stress.

(3) Friendship networks partially mediate the relationship between perceived social support and perceived stress among junior high school students.

6. Educational Suggestions

According to the results of this study, the understanding of social support among middle school students can influence their perception of stress through the mediating role of friendship networks. Therefore, middle school students need to enrich and enhance their sources of social support, gaining support and assistance from their friendships, to reduce the negative impacts of stress perception and ultimately achieve the effects of improving friendship networks and lowering levels of stress perception. Firstly, from the perspective of schools, it is crucial to establish a practice-based educational system. Schools should create mental health profiles for every student, actively monitor individuals with high levels of stress, and provide them with regular guidance and documentation. Additionally, schools should employ mental health education teachers, implement mental health education courses, and design curriculum related to stress relief for students of various grades. Corresponding group counseling activities can also be organized, which may include themes such as "intervention on friendship quality" and "stress release," helping students understand and deepen their social circles or manage their stress through regular relaxation training. Secondly, from a family perspective, it is important to actively pay attention to and support children's growth and development. Early adolescents develop self-awareness quickly and, while they yearn for external support and understanding, they also tend to maintain inner privacy. In response, parents should respect their children's personal boundaries while actively showing care and empathetic understanding, allowing for a reasonable amount of psychological and physical space. For children in different grades, parents should also learn to guide them in properly handling successes and failures in their studies and life. A teacher's criticism or a failure in an exam is often just a small stone on the path of life, not a weapon for parents to scold their children. Parents should actively communicate with their children, encourage and guide them, understand and accept them, fostering a warm family atmosphere and enhancing their sense of belonging. Thirdly, at the individual level, middle school students need to enhance their self-regulation abilities. When facing negative emotions or stressful events, middle school students can alleviate their stress by following Wang Fang's SMART-C stress management program. This specifically consists of three steps: "perceiving stress" involves recognizing stress through various physical and emotional signals; "cognitive reappraisal" means confronting the "challenges" and "opportunities" that stress brings with a rational attitude; and finally, "emotional release" refers to expressing emotions

through various ways such as talking to friends and family, listening to music, running, or writing in a journal, to relieve stress.

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