Exploring the Mediating Effect of Emotional Intelligence on Perceived Stress and Interpersonal Relationships Among Nursing Students

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Abstract

The aims of this study were twofold: 1. exploring the relationships of perceived stress (includes three types of emotions: stress, depression, and anxiety), emotional intelligence, and interpersonal relationships among nursing students, and 2. examining the mediating effect of emotional intelligence in perceived stress (stress, depression, and anxiety) on the interpersonal relationships of nursing students. The study was a cross-sectional design. There were 313 nursing students participating in the study and they were recruited from a university in northern Taiwan. The data were self-administrated by participants and collected from four scales: the Emotional Intelligence Scale, the Social Relationship Scale, the Depression Anxiety Stress Scale, and the demographic instrument. The main findings of this study were as follows: (1) Stress perception was significantly positively correlated with depression and anxiety. Emotional intelligence was positively correlated with interpersonal relationships. All the perceived stress, anxiety, and depression significantly negatively correlated with emotional intelligence and interpersonal relationships. (2) The results concluded that the impact of perceived stress on interpersonal relationships was significantly mediated by emotional intelligence. In conclusion, this study confirmed that emotional intelligence is one of the most important mediators, which can mediate the negative impacts from perceived stress to interpersonal relationships. For nursing education, the result provides a new direction in improving the emotional intelligence and ability of nursing students to help students manage stress and build interpersonal and professional relationships.

Keywords: perceived stress, interpersonal relationships, emotional intelligence, nursing student

1. Introduction

Being a nursing student is essential to the learning process of becoming a nurse practitioner. During this stage of learning, students face challenges and reactions to high physical, mental and social pressures through their contact with patients and providing of care. These stresses not only affect nursing students' learning outcomes but also their overall health and relationships with people (Nightingale et al., 2018). Nurses need to have high emotional intelligence to be able to adjust to their own pressures or those they care for (Rakhshani et al., 2018). Emotional intelligence (EI) is most often defined as the ability to perceive, and generate emotions to assist, and enhance thinking, understand emotions, reflectively regulate, and promote emotional and intellectual growth (Mayer & Salovey, 1997; Mayer et al., 2016). Studies indicated that people with high emotional intelligence have greater mental health, job performance, and leadership skills. Emotional intelligence also reflects abilities to join intelligence, empathy, and emotions to enhance thought and understanding of interpersonal dynamics (Goleman, 1995; Kunnanatt, 2004; Mayer, 2016; Zhu et al., 2016; Kikanloo et al., 2019). Some scholars emphasize EI importance for nursing practice (Bulmer-Smith et al., 2009; Cadman & Brewer, 2001), and the empirical study reported that nursing performance was significantly correlated with emotional intelligence (Mansel & Einion, 2019). In addition, the ability of EI affects nurses' ability to establish a rapport with patients, manage nurses' emotions, and empathize with patients and is essential to providing quality care (Evans & Allen, 2002).

Nursing students need to have high emotional intelligence to help themselves and their care recipients cope with

various problems and stresses and enhance their learning outcomes, health, and life adaptation (Foster et al., 2018). Nursing education also needs to pay attention to the stress of nursing students in the learning process, to explore the effect of emotional intelligence in adjusting students' stress and help students to adapt to workplace challenges and become healthy nursing professionals (Mousa et al., 2017).

However, most nursing educators teaching nursing students focus on the knowledge and skills of nursing practice in nursing education or courses. Nursing educators fail to fully teach students to understand the attributes and elements of emotional intelligence or guide students to use emotional intelligence as a necessary nursing skill. This study emphasizes that EI is the ability of nursing students to adjust their learning and live stressful events. Nursing students' lack of understanding of emotional intelligence; or whether emotional intelligence can affect students' stress and coping outcomes, still needs to be further explored.

In recent years, many studies on the stress of nursing students have indicated that students experience higher levels of stress than other non-healthcare professional students (Benavente & Costa, 2011). Nursing students also felt more stress in nursing classrooms or clinical learning situations than medical students (Hafer & Graf et al., 2006). Nursing students under stress not only perceive stressful symptoms but also experience mild mental problems or psychosocial distress such as depression, anxiety, and low self-esteem. A higher level of psychosocial distress may also affect low learning and global health outcomes (Benavente & Costa, 2011; Labrague et al., 2017).

In the process of professional learning, nursing students need to enter the laboratory and clinical scenario to learn and make contact with the real nursing environment for preparing to provide nursing care for patients. Although these experiences are important for nursing professional education and nursing ability, the learning activities may be extremely challenging or threaten the body and mental balance of students. Therefore, nursing educators need to pay attention to assessing and assisting in the ability of nursing students to cope with stress.

Previous research reported that the source of stress for nursing students is related to heavy study workloads, complicated situational exams, and academic requirements related to writing correct reports and papers. The source of stress for nursing students is also affected by various aspects of life influenced by interpersonal relationships, such as: making new friends, often needing to work with people they don't know, conflict with learning counselors, or not getting support from family members, etc.(Karimi et al., 2013; Mousa et al., 2017; Labrague et al.,2017).

Students may have limited time arrangements and learning resources, which affect students who have difficulty in fully performing work tasks, inefficient learning outcomes, interpersonal conflicts, and even economic-financial problems. According to the information above, the stressors of nursing students involve multiple elements, not only the challenges of learning but also the stressors of personal life and growth tasks (Mousa et al., 2017; Lewis et al., 2017).

Nursing professionals believe that nursing students face stress as an inevitable experience and problem in the nursing learning process. Therefore, nursing educators should incorporate stress awareness, expressing stress related emotions, and coping strategies into nursing curricula and the learning processes. Nursing education should help students experience emotional reactions under stress, express emotions of stress, and increase the ability of emotional regulation to adapt to stress (Kikanloo et al., 2019; Nightingale et al., 2018).

The term emotional intelligence was first coined by Mayer and Salovey in 1991 to describe a type of intelligence that includes, ''the ability to understand and regulate one's own emotions and those of others, and to use this understanding to guide one's own thinking and actions''. Goleman (1995) expanded the concept of emotional intelligence into the realms of education, business leadership, and health care. EI consists of two concepts: (1) as a cognitive ability related to emotion, and (2) as a behavioral disposition and self-perception of an individual's ability to identify and understand emotions (Petrides & Furnham, 2003; Petrides et al, 2007; Mayer et al., 2016). Mayer and scholars emphasized EI as competencies, which include: emotion perception and expression; use of emotion to influence thinking; emotion understanding; and emotion management. Goleman (1995) also emphasized that emotional intelligence is the ability to identify and understand personal emotions and other people's emotions. He defined social intelligence as the ability to work with others and to have them cooperate together. Social intelligence is a concept born out of emotional intelligence. Social intelligence takes it one step further and refers to how these are then used to carry out social functions and manage social relationships within a group or society (Golemen, 2013).

Emotional intelligence is a cognitive ability, and the connotation of emotional intelligence includes the awareness of one's own and others' emotions, the use of emotions to promote the ability to make decisions, the understanding of emotions, and the regulation of one's own and others' emotions. Goleman (1998) considers

emotional intelligence as a kind of personal competence and skill. He discusses emotional intelligence from the perspective of cognition and personality, and divides emotional intelligence into five main abilities, including: recognizing one's emotions, properly managing one's emotions, self-motivation, recognition of others' emotions and empathy and management of interpersonal relationships; the first three are self-emotional management, and the latter two are emotional management of others. Bar-On (2006) believes that emotional intelligence is a set of traits and abilities, and social emotional learning and emotional social intelligence can be taught and applied in school or social situations. Emotional intelligence has also been shown to contribute to positive school spirit and social behavior. Barchard (2003) and Boyatzis et al. (2012) believed that the level of emotional intelligence will affect individual academic achievement and job achievement.

Mayer and his colleagues (2016) postulates that three element of intelligence—emotional intelligence, personal intelligence, and social intelligence involve human cognitive reasoning of an equally sophisticated nature. Each intelligence comparable complexity, and all three elements of intelligence concern understanding the human world. EI can help a person understand the meaning of emotions and their implications for behavior as well as manage emotions in oneself and others. Social intelligence (SI) includes an understanding of intra and inter group relations. Moreover, EI helps to think about its relationship with personal intelligence (PI) and social intelligence (SI).

As mentioned above, this study hypothesized the EI could play a mediator role between stress and interpersonal relationships. There were two aims in this study: 1. exploring the relationships of perceived stress, depression, anxiety, emotional intelligence, and interpersonal relationships among nursing students and 2. examining the mediating effect of emotional intelligence in perceived stress, depression and anxiety on the interpersonal relationships of nursing students.

2. Method

2.1 Design and Methods

This research is a cross-sectional study, using the questionnaire survey method. Convenience sampling was conducted among nursing students aged 16 to 18 in a School of Nursing in a University of Taiwan. To confirm the adequacy of the sample size for the regression analysis, we used G*Power (version 3.1.9.4) designed by Faul et al. The number of predictors was set to four, and the other statistical parameters were set at their defaults (a medium effect size of 0.15, α level of 0.05, and high power of 0.80). The a priori sample size was computed to be 125, which is lower than the actual sample size of this study (N = 313). This study was approved by the institutional review board (IRB) committee of a medical institution (NTU-REC No.202001ES018). After obtaining written informed consent, a questionnaire survey was conducted with an average completion time of 20–30 min.

2.2 Measures

The measurement tools of this study all have good reliability and validity. The assessment tools were described below.

2.2.1 Sociodemographic Questionnaire

The demographic characteristics examined in this study were age and gender.

2.2.2 Depression Anxiety Stress Scale (DASS)

Stress, depression and anxiety were measured by the DASS scale (Taouk et al., 2001). There are 21 items on each DASS scale. The scale can effectively measure 3 inclusions, each with 7 items, divided into subscales of stress, depression and anxiety with similar content. The Depression Scale assesses irritability, hopelessness, devaluing life, self -deprecation, lack of interest/involvement, anhedonia, and inertia. The Anxiety Scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and the subjective experience of anxious moods. Stress scales are sensitive to chronic nonspecific levels of arousal. Scores for depression, anxiety and stress were calculated by adding the scores for related items. After adding up 7 items for each subscale, it needs to be multiplied by 2 to get the score of stress, anxiety and depression respectively. The assumption on which DASS-21 was developed and which has been confirmed by research is that the differences between depression, anxiety, and stress experienced by normal subjects and the clinical population are essentially differences in degree. The self-rating scale consists of 21 items, each item is scored from 0 to 3, and the total score is 63 points.

The higher the score, the higher the anxiety, depression or stress index (Taouk et al., 2001). Studies have confirmed that DASS can effectively assess individual depression, anxiety, and stress status. The alpha values in the normative sample are: depression 0.91; Anxiety 0.84; and stress 0.90. The DASS scale has good reliability,

The Cronbach's alpha of the instrument for nursing students in this study were depression 0.88; Anxiety 0.82; stress 0.86.

2.2.3 Emotional Intelligence Scale (EIS)

In this study, the measurement tool for EI was the EI scale developed by Chen, L.C (2008). This EI scale has a total of 50 items. The scale can effectively measure five independent emotional intelligences, including: emotional cognition, emotional expression, positive inspiration, emotional regulation and emotional reflection. Each ability is measured by 10 items. Each item was self-reported by the subjects using a Likert scale ranging from 1 to 4 points. A high score on the EI measure means better emotional regulation. The total EI scale has good reliability, with Cronbach's alpha of 0.94 (Chen, 2008). The Cronbach's alpha of the instrument for nursing students in this study was .95.

2.2.4 Interpersonal Relationships Scale (IRS)

In this study, the Interpersonal Relationship was measured by the Interpersonal Relationship Scale (Lin, 2016). There are 21 questions in this questionnaire that were self-reported by the subjects using a Likert scale ranging from 1 to 5 points. A high score means better interpersonal relationships. The scale can effectively measure four dimensions, including: classmates, friends, family, and teacher-student relationships .This Interpersonal Relationship scale has good reliability, the total scale with Cronbach's alpha of .93 (Lin, 2016). In this current study, the IRS with Cronbach's alpha was .90.

2.3 Statistical Analysis

Based on the aims of the study, first, we calculated the descriptive statistics and bivariate correlations among variables of interest using SPSS v24.0 (IBM, Armonk, NY, USA). A two-tailed p-value less than 0.05 indicated statistical significance. Second, Model 4 was used for the mediation analysis. The mediation model proposed by Hayes (Hayes, 2012) was used to determine the mediating roles of EI on the relationship between stress, anxiety, depression, and interpersonal relationships. Based on the aims of the study, SPSS 24.0 was used to descriptive statistical analysis and was performed to examine the nursing students' demographic variables.

3. Results

3.1 Characteristic of Nursing Students

There were 313 nursing students participating in this study, of which 282 (90.1 %) were female, 90 % of subjects' age between 17 and 18 years, and 70 % of subjects' parents were married; 45.4 % of subjects were the first child in their family.

3.2 Descriptive Statistics of Main Variables

The mean score of emotional intelligence was 156.68 (SD=20.77), the mean score of interpersonal relationships was 77.64 (SD=12.18), the mean score of DASS was 34.77 (SD=8.92), the mean score of anxiety was 10.71 (SD=8.23), the mean score of depression was 9.92 (SD=8.92), and the mean score of stress was 14.15 (SD=9.02).

Table 1. Mean Analysis between main variables (*N*=313)

Variable		Mean	SD	Max	Min
IR		77.64	12.18	105.00	29.00
EI		156.68	20.77	199.00	97.00
DASS		34.77	24.24	120.00	0.00
	Stress	14.15	9.02	40.00	0.00
	Depression	9.92	8.92	40.00	0.00
	Anxiety	10.71	8.23	42.00	0.00

Notes: IR = Interpersonal Relationship, EI = Emotional Intelligence, DASS=the total score of stress, depression and anxiety

3.3 Descriptive Statistics of Participants' Perceived Stress, Anxiety, and Depression

Depression, anxiety, and stress are all negative feelings. Among the nursing students, the mean scores of stress or

anxiety were out of the normal range. Comparing the mean score of the nursing students with that reported from DASS, the current study shows that the average level of stress was 14.15, and the average score for anxiety was 10.71 (see Table 1). That is, the students of this study reported higher levels of stress and anxiety than that of other people. In addition, more than 50% of nursing students have moderate or severe anxiety, and more than 30% of students have moderate to severe stress and depression (see Table 2). The findings further illustrate the urgency of the need for nursing students to learn to cope with stress and regulate their negative emotions.

Table 2. Percentage Analysis different levels of stress, anxiety, depression score (*N*=313)

Range	Stress score	n.	%	Anxiety score	n.	%	Depression score	n	%
Normal	0~10	116	37	0~6	124	40	0~9	171	55
Mild	11~18	111	35	7~9	27	9	10~12	47	15
Moderate	19~26	58	19	10~14	80	26	13~20	57	18
Severe	27~34	20	6	15~19	27	9	21~27	19	6
Extreme	35~42	8	3	20~42	55	18	28~42	19	6
Total		313	100		313	100		313	100

Notes: Extreme= Extreme Severe

3.4 Correlations Among Study Variables

The variables included in the study were significantly associated with each other (more detailed results are shown in Table 3). The results showed that interpersonal relationships was significantly positively correlated with emotional intelligence, and significantly negatively correlated with stress, anxiety and depression. Emotional intelligence was negatively correlated with stress, anxiety and depression.

Table 3. Correlation Analysis between main variables (*N*=313)

Variable	IR	EI	DASS	Stress	Depression	Anxiety
IR	1					
EI	.665[**]	1				
DASS	-.352[**]	-.534[**]	1			
Stress	-.308[**]	-.469[**]	.934[**]	1		
Depression	-.384[**]	-.559[**]	.920[**]	.777[**]	1	
Anxiety	-.284[**]	-.455[**]	.926[**]	.813[**]	.774[**]	1

Notes: IR = Interpersonal Relationship, EI = Emotional Intelligence, DASS=the total score of stress, depression and anxiety; * $p<.01$, ** $p<.001$

3.5 Testing the Mediation Role of EI

This study examined the indirect effect of emotional intelligence on perceived stress on interpersonal relationship outcomes. Therefore, the Bootstrap method was adopted in this study, and the Process of SPSS was used to estimate the mediating effect of emotional intelligence in a model. The mediating effect results of the model are shown in Table 4.

The results show that emotional intelligence had a significant mediating effect on interpersonal relationship

outcomes. That is, in the process where the three types of emotions comprehensively affect the outcome of interpersonal relationships, the mediating role of emotional intelligence is established (as shown in Figure 1).

Table 4. The mediating effects of EI analysis

Model	Mediation Path	Effect	Effect size	S.E.	95% CI	
					Low	Up
1	DASS → IR	Total effect	-.18	.027	-.229	-.124
	DASS → IR	Direct effect	.002	.025	-.047	.051
	DASS→ EI→ IR	Indirect effect	-.18	.021	-.222	-.140

Notes: IR = Interpersonal Relationship, EI = Emotional Intelligence, DASS= score of Depression, Anxiety and Stress

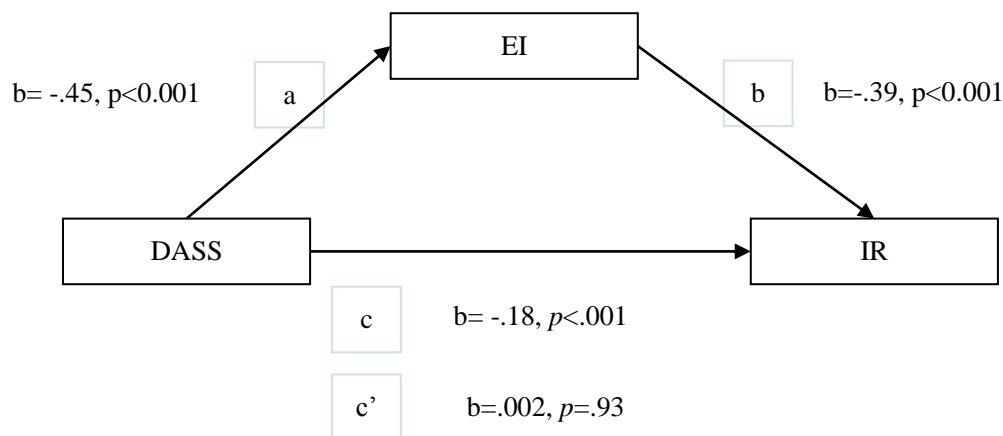
Figure 1. The mediating effects of EI on interpersonal relationship outcomes

4. Discussion

This study explored the relationship between stress perception and interpersonal relationships, depression and anxiety, and emotional intelligence among nursing students, and verified that emotional intelligence can be a predictor of stress perception and interpersonal relationships among nursing students. Comparing the EI scores of nursing students in this study with the results of Chen's (2008) study on EI of Taiwanese young people, there was no significant difference in the degree of EI. The measurement of EI score shows that the higher the score, the better the EI ability. In this study, nursing students' EI scores revealed most of their ability to express and manage emotions.

In addition, the findings suggest that EI can modulate negative psychological distress, such as stress, anxiety, and depression, that affects interpersonal relationships. This also suggests that EI is a protective factor for nursing students to cope with stress-related psychological problems, which is consistent with findings from other studies (Moon & Hur, 2011; Mousa et al., 2017).

Scholars and research see EI as a mental ability, but there are few studies that verify that EI has a mediating effect and can modify the negative effects of stress-related psychological problems (Esen-Aygun & Sahin-Taskin, 2017; Fernandes et al., 2020; Kikanloo et al., 2019). In this study, we explored the impact of nursing students' EI ability on their life and studied stress and related psychological problems on the relationship between students and their families, friends, or clients. The results show that EI can completely change the negative impact of nursing students' psychosocial stress on interpersonal relationships. Nursing students having good interpersonal interaction abilities is important in their work performance. In this study, most nursing students experienced psychological distress such as stress, anxiety or depression. If the emotional intelligence ability of nursing students can be improved, it should be able to assist nursing students adjust their emotional stress and have better physical and mental health to learn to be effective nursing professionals and provide care to others.

Individuals who are more emotionally intelligent could cope better with stressful situations such as interpersonal conflicts and work stress. This would reduce psychological distress and promote good psychological and physical health (Moon & Hur, 2011; Zhu et al, 2016). Empirical evidence shows that social-emotional training may improve EI (Goleman, 2013; Hart et al., 2020) decrease stress and psychological distress, and enhance physical and psychological health (Fletcher, 2009; Foster, 2018). Therefore, the findings of this study suggest that it is necessary to launch intervention programs through EI assessment and training that help nursing students have a high level of emotional intelligence.

The findings of this study provide nursing education an impetus to think about how to actively transform emotional intelligence into nursing curricula. In the United States and the United Kingdom, because of Mr. Goleman's vigorous promotion and advocacy, many high schools have emotional intelligence courses or social-emotional learning (SEL) programs (Goleman et al, 2013; Hart et al., 2020; Taylor et al., 2017). Almost all teachers intuitively believe that emotional intelligence courses are very important. It is important to have a good impact on students; therefore, this study suggests that it is time to consider SEL involvement in the nursing education program (Jones et al., 2013; Bahadır-Yılmaz, 2016; Lewis et al., 2017).

5. Conclusion

Psychological theories have proposed that EI can help a person understand the meaning of emotions, and their impacts on behavior, and be used to regulate emotions. However, there is a lack of empirical that support the idea that EI has the ability to mediate negative emotions of individuals. The results of this study can confirm that EI can mediate the effect of negative emotions on adaptation, which means that EI is a skill which can be used to regulate emotions. Emotional intelligence is a cognitive ability, and emotional intelligence includes the awareness of one's own and others' emotions, the use of emotions to promote the ability to make decisions, the understanding of emotions, and the regulation of one's own and others' emotions. Therefore, the result of this support the theory that EI is a cognitive-behavioral skill that nursing students can cultivate and learn to change the impact of negative emotions on interpersonal interactional functions.

EI plays a protective role in stress on interpersonal relationships. The results of this study provide a concrete contribution by showing that EI can adequately mediate stress perception and improve interpersonal adaptation. In the future, we can continue to study the impact of implementing nursing student interventions in emotional intelligence education courses on nursing students' ability to cope with stress. Our study recommends that future study efforts should further elucidate the intervention issues affecting the emotional and overall well-being of nursing students, and develop appropriate interventions to empower EI in nursing students.

6. Limitation

Some limitations should be noted in this study. First, given the cross-sectional study, a causal relationship between variables cannot be established. Data were collected using a self-report method, and respondents may have intentionally or unintentionally concealed their actual responses. Finally, this study was based on a convenient sampling, and the findings may not be representative of all nursing students. Therefore, in the future research design, random sampling can be used to increase the rigor of the research and consider longitudinal studies. The role of EI in nursing students' stress management can be continuously tracked and understood.

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