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The mediating effects of resilience in the relationship between social support and posttraumatic growth in patients with acute coronary syndrome in China

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Abstract

Background: Posttraumatic growth has a positive impact on patients diagnosed with acute coronary syndrome (ACS). Patients with acute coronary syndrome in China report low to moderate levels of posttraumatic growth. Additionally, there is a dearth of research exploring the associations between resilience, social support, and posttraumatic growth in this specific patient population.

Objective: This study examined whether resilience serves as a mediator between social support and posttraumatic growth in patients with acute coronary syndrome who had been discharged for 1 to 6 months and were being followed up in clinics.

Methods: A descriptive correlational study design was utilized. A systematic sampling technique was used to recruit 121 patients with acute coronary syndrome who had been discharged for 1 to 6 months from cardiovascular clinics of a tertiary care hospital in Jiangsu Province, China. The research instruments included the demographic characteristics questionnaire, the Connor-Davidson Resilience Scale, the Multidimensional Scale of Perceived Social Support, and the Posttraumatic Growth Inventory. The data were collected between August 2022 and November 2022 and were analyzed using descriptive statistics and regression analyses to determine the mediating effects.

Results: The level of posttraumatic growth among patients with acute coronary syndrome attending follow-up clinic visits was moderate (Mean = 60.58, SD = 14.13). Resilience had a direct and positive impact on posttraumatic growth (β = 0.361, p <0.001). Moreover, resilience fully mediated the relationship between social support and posttraumatic growth (indirect effect = 0.203, 95% CI [0.076, 0.331]; direct effect = 0.162, p = 0.101).

Conclusion: Patients with acute coronary syndrome in China experience moderate posttraumatic growth after discharge. Resilience mediates the relationship between social support and posttraumatic growth. Therefore, nursing interventions focusing on promoting social support and resilience should be developed to encourage posttraumatic growth in patients with acute coronary syndrome.

Keywords

China; acute coronary syndrome; posttraumatic growth; resilience; social support

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Background

In 2020, cardiovascular disease ranked as the leading cause of mortality in China, above tumors and other diseases (Ma et al., 2023). Mortality caused by acute coronary syndrome (ACS) steadily increased from 2002 to 2020 in China (The Writing Committee of the Report on Cardiovascular Health and Diseases in China, 2023). Drug therapy, percutaneous coronary intervention (PCI), and coronary artery bypass grafting are common treatments for ACS (Zhang et al., 2019). However, prolonged therapy with antiplatelet and thrombolytic medications can result in bleeding and thrombus recurrence in patients with ACS (Liu & Ren, 2023). Moreover, PCI is associated with coronary artery injury, bleeding, and infection (Ferreira et al., 2018). Previous studies have also shown that patients with ACS report depression (Leong et al., 2021; Ren et al., 2023), decreased quality of life (Beska et al., 2022), and low self-care (Amiri et al., 2023; Feng et al., 2021) after intervention and medication use. Thus, patients with ACS also experience both physical and mental health issues following treatment.

Under the influence of traumatic events (Tedeschi et al., 2018) and treatment, posttraumatic growth has been observed in patients with acute coronary syndrome. Posttraumatic Growth (PTG) refers to the positive psychological changes individuals experience as a result of struggling with traumatic

events (Tedeschi & Calhoun, 1996). PTG comprises appreciation of life, relating to others, personal strength, new possibilities, and spiritual change. Higher PTG is associated with increased physical activity (Chen et al., 2020), reduced negative emotions (Chen, 2018), more proactive self-management behaviors (Chen, 2020), and a higher quality of life (Martz et al., 2018). Studies in China have found that most patients undergoing percutaneous coronary intervention (PCI) experience low to moderate PTG (Huang et al., 2021; Luo et al., 2021; Zhou et al., 2023), primarily focusing on inpatients with ACS. According to a qualitative study (Liao, 2023), patients who had experienced myocardial infarction exhibited high anxiety and stress for up to six months post-discharge. During this period, their progress in areas such as relating to others, personal strength, and new possibilities was notably gradual. Therefore, it is crucial to assess PTG in post-discharge patients with acute coronary syndrome and analyze its influencing factors.

Social support includes the resources provided by nonprofessionals through formal support groups and informal helping relationships (Cohen et al., 2000). A consistent finding across a systematic review is the positive correlation between social support and PTG in patients with myocardial infarction (Hegarty et al., 2021). The Revised Model of Posttraumatic Growth (Tedeschi et al., 2018) further emphasizes the role of social support in promoting PTG. Additionally, a meta-analysis confirms that social support has a moderate positive impact on PTG (Ning et al., 2023). These collective findings highlight the significant contribution of social support to the growth experienced by patients after trauma.

Furthermore, previous studies have consistently demonstrated that social support directly and positively influences posttraumatic growth among patients with myocardial infarction (Hosseinigolafshani et al., 2019). Patients with chronic illnesses, cared for by their spouses, often receive intimate emotional support. This support enables patients to appreciate and value their current life with family, representing a positive growth trajectory following trauma (Xu, 2021). Other research indicates that long-term religious support has been found to strengthen the religious beliefs of patients with heart disease. These beliefs serve as a framework for coping with trauma and finding meaning in life, thereby nurturing patients' spiritual well-being/religiosity as a predictor of posttraumatic growth and psychological distress among heart patients: Mediating role of perceived social support (Zahra et al., 2024). Spiritual change is also a manifestation and component of PTG.

According to the Revised Model of Posttraumatic Growth, social support can indirectly influence posttraumatic growth through mediating variables. A study conducted in Turkey revealed that coping mechanisms serve as a mediator in the relationship between social support and PTG in patients with myocardial infarction (Senol-Durak & Ayvasik, 2010). Chinese research has specifically targeted focused on patients who underwent postoperative PCI, with a focus on social support and its impact on PTG. These studies found that illness perception, coping strategies, and sense of coherence serve as mediators in the relationship between social support and PTG (Liu & Lin, 2020; Lu et al., 2019). Some sociological theorists argue that social support networks are crucial in alleviating individual stress and positively influencing mental health (Thoits, 1985). Therefore, it is imperative to explore how social support facilitates posttraumatic growth through psychological factors. However, there is relatively little Chinese research in this area among patients with ACS.

As a positive psychological trait, resilience plays a pivotal role in influencing posttraumatic growth among patients diagnosed with ACS (Henson et al., 2021). Resilience refers to the capacity to "bounce back" or recover quickly from stress, allowing individuals to maintain stable and healthy functioning even after experiencing adverse events (Bonanno, 2008). A Chinese empirical study also highlighted that patients with myocardial infarction who had higher resilience were better equipped to navigate the negative impacts of trauma and adapt to post-illness changes for their own growth (Liu & Song, 2021).

Notably, the indirect effect of social support on posttraumatic growth, mediated by resilience, has been confirmed in patients diagnosed with colorectal cancer (Dong et al., 2017). Research by Babazadeh Namini et al. (2021) indicated that resilience mediated the impact of social support on PTG in patients with breast cancer. Similarly, studies conducted in China have shown that social support not only directly influences PTG but also indirectly affects it through resilience among patients with spinal cord injury or cancer (Wang et al., 2019; Yang & Yang, 2021; Zhang et al., 2021). However, there has been limited research in China exploring the mediating role of resilience in the relationship between social support and posttraumatic growth among patients with ACS who have been discharged.

To fill the gaps identified in prior research, this study aimed to examine the mediating roles of resilience in the relationship between social support and posttraumatic growth in Chinese patients with ACS after discharge. By investigating the interactions among these variables, nurses can gain valuable insights into the roles of social support and resilience in fostering posttraumatic growth among these patients. These findings are crucial as they can guide nurses in developing targeted nursing interventions aimed at promoting positive recovery and facilitating posttraumatic growth in individuals recovering from ACS.

Conceptual Framework

The current study followed the guidelines from the Revised Model of Posttraumatic Growth (Tedeschi et al., 2018), which delineates the psychological mechanisms contributing to posttraumatic growth. According to this model, personality traits and sociocultural factors play significant roles in shaping posttraumatic growth. Personality traits influence how individuals perceive and respond to traumatic events, challenging their core beliefs and initiating cognitive processes. Strong social support networks are crucial in helping individuals cope effectively with trauma and fostering positive cognitive changes. Thus, with adequate social support, positive personality traits can be strengthened, facilitating posttraumatic growth. In this study, social support was considered a sociocultural factor, while resilience represented a personality trait. The conceptual framework proposed for this research is shown in **Figure 1**.

Figure 1 Conceptual framework of social support and resilience on posttraumatic growth of patients with ACS

Two hypotheses were posited in this study. The first hypothesis proposes that social support exerts a direct influence on posttraumatic growth and its dimensions among patients with ACS who have been discharged. The second hypothesis suggests that social support has an indirect effect on posttraumatic growth and its dimensions through resilience among patients with ACS after discharge.

Methods

Study Design

A descriptive correlational study was beneficial for exploring the mechanism by which social support and resilience influenced PTG.

Samples/Participants

The samples were patients diagnosed with ACS and attending follow-up visits within 1 to 6 months after discharge at cardiovascular clinics recruited from a hospital in Yancheng, Jiangsu province, China. Eligible participants were selected using systematic sampling before their scheduled clinic visits. Inclusion criteria required participants to be between 25 and 65 years old, have stable health conditions, be literate in Chinese, and not have cognitive impairments. Patients referred for heart transplantation were excluded. The sample size was determined using G*power 3.1, with parameters set at a significance level (α) of 0.05, power of 0.95, a medium effect size (0.15), and two predictors (Aberson, 2019), suggesting a minimum of 107 participants for multiple regression analysis. Accounting for a 20% dropout rate and excluding seven incomplete questionnaires, 121 participants were included in the study.

Instruments

Four questionnaires were used in this study as follows:

1) Demographic questionnaire: demographic questionnaire was used to collect data on age, sex, level of education, smoking status, physical activity, body mass index (BMI), and time since discharge from the hospital.

2) The Posttraumatic Growth Inventory (PTGI): This instrument was previously translated into Chinese and modified (Wang et al., 2011) based on the work of Tedeschi and Calhoun (1996), which was used to evaluate the degree of posttraumatic growth. The PTGI questionnaire includes 20 items and five dimensions: personal strength, new possibilities, relating to others, spiritual change, and appreciation of life. The questionnaire uses a 6-point Likert scale ranging from “not at all” (0) to “a very great degree” (5). The total score ranges from 0 to 100, with a higher score reflecting greater psychological growth. A total posttraumatic growth score of <60 represents a low level, ≥60 and <66 represents a moderate level, and ≥ 66 represents a high level. In the present study, Cronbach’s α for the PTGI was 0.921.

3) The Multidimensional Scale of Perceived Social Support (MSPSS): This scale has also been translated into Chinese and revised (Jiang, 2001) based on the original version of the MSPSS (Zimet et al., 1988). A study based on the work of Jiang (2001) found that three dimensions are more reasonable than two dimensions (Zhou et al., 2015). The MSPSS consists of 12 items consisting of three dimensions, including friend support, significant other support, and family support. Each item is rated on a 7-point scale ranging from 1 (very strongly disagree) to 7 (very strongly agree), with total scores of 12–36 points, 37–60 points, and 61–84 points representing low, medium, and high social support, respectively (Jiang, 2001). The Cronbach’s α of the MSPSS in the present study was 0.919.

4) The Connor-Davidson Resilience Scale (CD- RISC): This scale has also been translated into Chinese and modified (Yu & Zhang, 2007) based on the original scale developed by Connor and Davidson (2003), was used to measure the ability of people to recover from the negative experience and adapt to the external environment. This CD-RISC comprises 25 items across three subcategories: tenacity, strength, and optimism. Each item is measured on a 5-point Likert scale, with a higher score reflecting greater resilience. The response scale ranges from 0 to 4, with 0 representing “not true at all” and 4 representing “true all the time.” The total score ranges from 0 to 100, with a higher score reflecting greater resilience. The Cronbach’s α value for the CD-RISC in the present study was 0.948.

The Chinese versions of the abovementioned three scales have previously been used in the Chinese population, demonstrating good validity and reliability. Permission to utilize the CD-RISC, PTGI, and MSPSS in this study was granted by the original developers.

Data Collection

Data collection occurred between August 2022 and November 2022 at tertiary care hospitals in Jiangsu Province, China. The researchers and a research assistant administered questionnaires and took informed consent at the cardiovascular clinic during regular working hours from 8:30 AM to 4:30 PM. Patients who participated in the study were provided detailed explanations regarding the purpose, methods, risks, ethical considerations, right to withdraw without consequence, and confidentiality. Upon signing consent forms, participants received and completed the questionnaires. Subsequently, the researchers and an assistant collected the completed questionnaires from participants at the clinic after their follow-up visits.

Data Analysis

SPSS 26.0 Statistical package was used to analyze the data. Descriptive statistics, independent *t*-test, and ANOVA were used to analyze the characteristics of the participants and the distribution of posttraumatic growth. Pearson correlation coefficients assessed the relationships between variables. The mediating effect was analyzed using regression analysis and PROCESS macro procedure (Model 4) (Hayes, 2017). Bootstrap sampling aims to calculate the mediation effect via PROCESS v4.2 (by Andrew F. Hayes) with 5000 bootstrap samples and 95% CI around the standardized estimate. If the 95% CI for indirect effect did not include zero, it suggested the

mediating effect of resilience was statistically significant. The significant level was set at *p*-value <0.05.

Ethical Considerations

The Institutional Review Board of a hospital in Yancheng, Jiangsu province, China (2022-(K-046)) approved the research. All patients who volunteered to participate were informed about the research objectives, methods, confidentiality measures, and rights. All voluntary samples signed informed consent forms. The instruments also do not involve items that cause psychological harm to participants. The participants were allowed to exit the study after the data analysis was concluded without loss of benefits after obtaining informed consent.

Results

Participants Characteristics

Table 1 presents the demographic characteristics of the participants. The majority of participants in the study were male (67.8%), had completed junior high school or higher education (78.5%), and reported never smoking (51.2%). The mean age of the 121 participants was 51.87 years (SD = 10.52). Approximately 52.9% of patients engaged in less than 250 minutes of physical activity per week, and 52.1% were overweight (BMI ≥24 kg/m^2). The largest proportion of patients (41.3%) had been discharged from the hospital within 1-2 months prior to the study.

Table 1 Demographic characteristics of the samples (*N* =121)

Characteristics	*n*	%	Mean ± SD
Age (years old)			51.87 ± 10.52
25-40	21	17.4	
41-55	49	40.5	
56-65	51	42.1	
Sex			
Male	82	67.8	
Female	39	32.2	
Education level			
Primary school and below	26	21.5	
Junior high school	39	32.2	
High school	29	24.0	
College degree and above	27	22.3	
Smoking status			
Never smoking	62	51.2	
Still smoking now	22	18.2	
Quitting smoking now	37	30.6	
Physical activity per week			312.31 ± 270.47
0-250 minutes	64	52.9	
251-500 minutes	34	28.1	
>500 minutes	23	19.0	
Time since discharge (months)			3.31 ± 1.83
1-2	50	41.3	
3-4	34	28.10	
5-6	37	30.6	
Body Mass Index (BMI) (kg/m^2)			24.50 ± 3.47
BMI <18.5	5	4.1	
18.5 ≤ BMI <24	53	43.8	
24 ≤ BMI <28	44	36.4	
BMI ≥28	19	15.7	

Table 2 The score of study variables among patients with ACS (*N* = 121)

Variable		Items	Mean ± SD	Items Mean ± SD
Posttraumatic Growth	Total	20	60.58 ± 14.13	3.03 ± 0.71
	New possibilities	4	12.31 ± 3.77	3.08 ± 0.94
	Relating to others	3	10.24 ± 2.76	3.41 ± 0.92
	Appreciation of life	6	17.12 ± 6.58	2.85 ± 1.09
	Personal strength	3	9.34 ± 2.65	3.11 ± 0.88
	Spiritual change	4	11.56 ± 3.58	2.89 ± 0.90
Social Support	Total	12	52.76 ± 13.56	4.39 ± 1.13
	Family	4	19.18 ± 5.84	4.80 ± 1.46
	Friends	4	16.14 ± 5.61	4.04 ± 1.40
	Significant Other	4	17.44 ± 5.07	4.36 ± 1.27
Resilience	Total	25	66.38 ± 18.58	2.65 ± 0.74
	Tenacity	13	35.81 ± 10.85	2.75 ± 0.83
	Strength	8	20.67 ± 6.65	2.58 ± 0.83
	Optimism	4	9.98 ± 3.87	2.49 ± 0.97

Characteristics of the Study Variables

Table 2 presents the description of the study variables. The mean posttraumatic growth score of participants was 60.58 (SD = 14.13), which indicated moderate posttraumatic growth. The item average scores of 'new possibilities,' 'relating to others,' 'appreciation of life,' 'personal strength,' and 'spiritual change' dimensions were 3.08 (SD = 0.94), 3.41 (SD = 0.92), 2.85 (SD = 1.09), 3.11 (SD = 0.88), and 2.89 (SD = 0.90), respectively. Meanwhile, the mean score for social support was at a moderate level (Mean = 52.76, SD = 13.56), and the mean score for resilience was 66.38 (SD = 18.58).

Bivariate Correlations Between Variables

Social support and resilience showed significantly positive correlations with posttraumatic growth and its five dimensions, except for the correlation between social support and the dimensions of 'relating to others' and 'personal strength' (Table 3).

Table 3 Bivariate correlations among resilience, social support, and posttraumatic growth (*N* = 121)

Variable	Social support	Resilience	PTG	NP	RTO	AOL	PS	SC
Social support	1							
Resilience	0.486**	1						
PTG	0.399**	0.579**	1					
NP	0.393**	0.502**	0.745**	1				
RTO	-0.002	0.311**	0.539**	0.287**	1			
AOL	0.377**	0.434**	0.835**	0.473**	0.253**	1		
PS	0.061	0.286**	0.549**	0.306**	0.285**	0.295**	1	
SC	0.445**	0.513**	0.799**	0.569**	0.349**	0.564**	0.327**	1

Notes: SC = Spiritual change, RTO = Relating to others, NP = New Possibilities, PS = Personal strength, AOL = Appreciation of life, PTG = Posttraumatic Growth | ** p <0.01

Mediated Effects Analysis

In this study, age, sex, education level, smoking status, physical activity duration, time since discharge, and BMI were included as covariates. Table 4 and Table 5 present the results of the mediating effects. Specifically, social support indirectly impacted posttraumatic growth through resilience (indirect effect = 0.203, bootstrap BC 95% CI [0.076, 0.331]). Additionally, social support had a direct positive effect on posttraumatic growth (direct effect = 0.162), although this direct effect did not reach statistical significance (p = 0.101). Therefore, resilience emerged as a complete mediating factor between social support and posttraumatic growth (Figure 2).

Table 4 Intermediary effect test of control variables

Content	Posttraumatic Growth			Posttraumatic Growth			Resilience		
	β	*t*	*p*	β	*t*	*p*	β	*t*	*p*
Age	1.338	0.787	0.433	2.901	1.564	0.121	4.327	1.911	0.059
Sex	0.169	0.060	0.952	-1.026	-0.331	0.741	-3.307	-0.875	0.384
Education level	-0.237	-0.211	0.833	-0.344	-0.277	0.783	-0.298	-0.196	0.845
Smoking status	0.146	0.098	0.922	-0.931	-0.568	0.571	-2.983	-1.490	0.139
Physical activity	0.596	0.409	0.683	0.774	0.479	0.633	0.493	0.250	0.803
Time since discharge	0.437	0.284	0.777	1.714	1.017	0.311	3.536	1.718	0.910
BMI	0.952	0.676	0.499	0.875	0.560	0.576	-0.215	-0.113	0.910
Social support	0.162	1.652	0.101	0.364	3.663	<0.001	0.561	4.619	<0.001
Resilience	0.361	5.180	<0.001						
Fit indices									
R^2	0.364			0.211			0.320		
F	7.067			3.735			6.576		
p	<0.001			<0.001			<0.001		

Table 5 Direct effect, indirect effect, and total effect of study variables

Items	Effect (β)	Boot SE	LLCI	ULCI
Direct effect	0.162	0.098	-0.032	0.356
Indirect effect	0.203	0.065	0.076	0.331
Total effect	0.364	0.100	0.167	0.561

Notes: Abbreviations: SE= standard error; ULCI= upper limit confidence interval; LLCI= lower limit confidence interval

Resilience played various roles as a mediator in the connection between social support and distinct dimensions of posttraumatic growth. Specifically, resilience partially mediated the relationship for 'new possibilities,' explaining 44.76% of the total effect. The effect of social support on 'relating to others' was fully mediated by resilience (BC 95% CI [0.011, 0.058]). In terms of 'appreciation of life,' resilience had a partial mediation effect. Resilience acted as a full mediator in the relationship between 'personal strength' and social support (indirect effect = 0.025, bootstrap BC 95% CI [0.007, 0.047]). Moreover, the influence of social support on 'spiritual change' was partially mediated by resilience, accounting for 38.18% of the total effect. These findings are shown in Table 6.

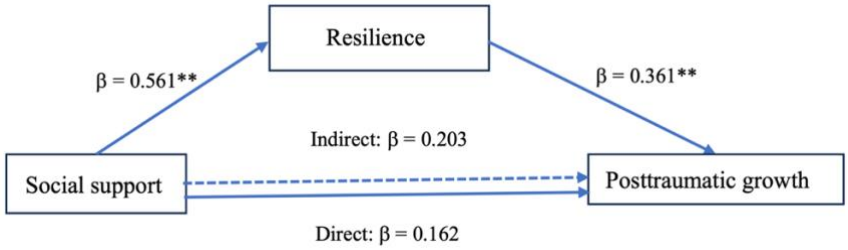

Figure 2 Mediating effect of resilience between two variables

Note: ** *p* <0.001

Table 6 The links among social support, resilience, and subscales of posttraumatic growth

Path	Direct Effect	Indirect Effect	Total Effect	BC 95%CI	
				Lower	Upper
Social support → Resilience → NP	0.058*	0.047	0.105**	0.015	0.086
Social support → Resilience → RTO	-0.041	0.033	-0.008	0.011	0.058
Social support → Resilience → AOL	0.100*	0.055	0.156**	0.013	0.105
Social support → Resilience → PS	-0.020	0.025	0.005	0.007	0.047
Social support → Resilience → SC	0.067**	0.042	0.110**	0.014	0.076

Notes: * *p* <0.05; ** *p* <0.01 | SC = Spiritual change, RTO = Relating to others, NP = New Possibilities, PS = Personal strength, AOL = Appreciation of life

Discussion

Description of Posttraumatic Growth

In this study, patients with ACS had moderate levels of posttraumatic growth after their discharge, aligning with a previous research finding (Zeng et al., 2018). The extent of posttraumatic growth may be influenced by factors such as age, sex, and education. The majority of participants were middle-aged persons. Compared to the elderly, younger patients experienced higher PTG (Paredes & Pereira, 2018). The reason may be that younger persons are more willing to adopt positive coping strategies to cope with traumatic events (Javed & Dawood, 2016). The study predominantly included male patients with ACS. Compared to females, males often demonstrate greater proficiency in rational cognitive strategies and resilience to cope with illness, thereby facilitating their growth (Wang et al., 2016). Approximately half of the participants had completed at least a high school education. Higher education levels contribute to enhancing cognitive understanding, potentially fostering adaptation to disease-related changes and promoting growth (Ting et al., 2016).

Moreover, the "relating to others" subscale in this study exhibited the highest mean score among the five dimensions of PTGI. Interestingly, this finding diverges from the results reported in previous studies (Aflakseir & Manafi, 2018; Hosseinigolafshani et al., 2019). The "relating to others" dimension captures positive changes in interpersonal relationships, including the development of closer bonds with family and friends (Tedeschi et al., 2018). Notably, patients with ACS, after being discharged and returning home, often prioritize spending time with family and relatives or using online platforms to connect with friends. This may encourage patients to openly express their emotions, love, and appreciation towards others. Simultaneously, it facilitates their acceptance of support from family and friends.

The Direct Effect of Social Support on Appreciation of Life, Spiritual Change, and New Possibilities

Social support positively correlated with posttraumatic growth (r = 0.399, p <0.01), consistent with previous findings (Rahimi et al., 2016; Senol-Durak & Ayvasik, 2010). However, this does not imply that social support significantly and directly influences PTG (β = 0.162, p = 0.101). To investigate the specific relationship between posttraumatic growth and social support further, this study examined the connection between social support and the five dimensions of PTG.

Our findings reveal that social support had a direct effect on spiritual change (β = 0.067, p <0.01), appreciation of life (β = 0.100, p <0.05), and new possibilities (β = 0.058, p <0.05), partially supporting Hypothesis 1. The dimension of spiritual change reflects transformations in spirituality, religion, and existential outlook (Tedeschi et al., 2018). Patients recovering from trauma reported that physical and emotional support from family and prayers from loved ones for spiritual blessings contributed to their spiritual growth (Hatamipour et al., 2015). Additionally, informational support received from healthcare providers was positively associated with the dimension of spiritual change in patients with myocardial infarction (Rahimi et al., 2016). These findings suggest that discharged patients with ACS can benefit from increased emotional and informational support from their families, relatives, and healthcare providers to foster spiritual growth.

The "appreciation of life" dimension signifies increased gratitude and value for all aspects of life (Tedeschi et al., 2018). For patients with myocardial infarction, regular social interactions and social support prevent them from dwelling on problems. Specifically, the love and support from family members create a sense of warmth and enhance their appreciation of time spent together (Sepehrian et al., 2020). Csibi and Csibi (2011) also identified a direct association between perceived social support from parents and self-appreciation in individuals who have experienced trauma.

The "new possibilities" dimension refers to individuals recognizing and embracing new opportunities that arise in their lives or exploring new life experiences (Tedeschi et al., 2018). Studies indicate that receiving social support from family, friends, and online resources can benefit myocardial infarction survivors by fostering positive changes in physical activity after a heart attack (Coull & Pugh, 2021; Murray et al., 2013). Increased social support can encourage patients with

myocardial infarction to return to work post-discharge (Sun et al., 2022). It follows that the acquisition of social support can help patients recover from previous activities and make new changes to maintain health and adapt to life.

The Indirect Effect of Social Support on Posttraumatic Growth and Its Five Dimensions through Resilience

This study found that social support indirectly influenced PTG by affecting its five dimensions through resilience, thereby supporting Hypothesis 2. This finding aligns with previous research on other chronic illnesses (Babazadeh Namini et al., 2021; Dong et al., 2017). According to a meta-analysis, while the predictive effect of social support on PTG was insignificant, resilience had a more substantial impact on posttraumatic growth than social support (Liu & Song, 2021). These findings underscore the importance of enhancing individuals' ability to restore psychological equilibrium, such as resilience, in facilitating posttraumatic growth.

The mediating relationship between social support and posttraumatic growth can be attributed to several potential reasons. Firstly, patients recovering from ACS after discharge often benefit from ample resources at home. These resources include emotional support from family, a sense of belonging, and material assistance (Li et al., 2019). By having access to these resources, patients enhance their ability to handle stress (Iovino et al., 2023), fostering self-efficacy and resilience (Liu et al., 2022). Improved resilience empowers individuals to cope effectively with the challenges posed by their illness, reflect on the meaning of their traumatic experience, and facilitate personal growth (Peng et al., 2022). Secondly, higher levels of social support are positively associated with adaptive coping strategies (Chen et al., 2019). Effective coping behaviors contribute to resilience (Macía et al., 2020). Specifically, engaging in supportive relationships with peers, rather than merely receiving general support, significantly enhances and reinforces resilience while mitigating the adverse effects of trauma (Gregory & Prana, 2013).

By further mediating effect analysis, this study preliminarily expounded the psychological mechanism of the effect of social support on new possibilities, relating to others, appreciation of life, personal strength, and spiritual change. It demonstrates that social support influences multidimensional changes in posttraumatic growth through the mediating role of resilience. Therefore, healthcare providers could regulate the positive physical and mental changes of discharged patients with ACS after acute illness through increasing social support resources and positive psychological interventions to improve posttraumatic growth.

Limitations

The findings may lack generalizability due to being conducted at a single hospital. Cross-sectional design limitations also hinder the understanding of variable relationships. Future research should include multiple hospitals and longitudinal analyses to validate and expand these findings.

Implications of This Study for Nursing Practice

Understanding the roles of resilience and social support in the posttraumatic growth of discharged patients with ACS provides a foundation for formulating nursing interventions. Resilience is a factor that directly influences posttraumatic growth. Therefore, community nurses should seek opportunities to collaborate with psychotherapists to regularly provide resilience training and education to patients in the community, such as mindfulness intervention, cognitive behavioral therapy, and psychological health courses (Ludolph et al., 2019). In addition, the findings suggest that social support can foster the development of posttraumatic growth by enhancing individual resilience and cognitive adaptation. Community nurses should encourage patients with ACS to actively seek available social support resources to improve their resilience, such as support from their families, spouses, friends, and neighbors (Sippel et al., 2015). Patient clubs and peer support groups organized by community nurses may also help patients obtain emotional and informational support. The study's results are also important as they may help to refine psychological management within the follow-up guideline for patients with ACS.

Conclusion

Patients with ACS within 1 to 6 months after discharge experienced moderate posttraumatic growth. The current study demonstrated that resilience completely mediated the impact of social support on posttraumatic growth among follow-up patients with ACS. Hence, it is recommended that nurses and medical staff adopt resilience interventions, such as mindfulness training, and establish social support systems that integrate hospital, community, and family cooperation to improve the posttraumatic growth of patients with ACS.

Declaration of Conflicting Interest

No conflict of interest was declared by the authors in this study.

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Authors' Contributions

All authors made significant contributions. TN contributed to the design, data collection, data analysis, and initial manuscript. KM contributed to the conception, review, and finalization of the manuscript. PH contributed to the conception/design of the work, critical review and suggestions, and correction of English writing throughout the entire process from submission to publication. All authors approved the final version of the manuscript.

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Data Availability

The dataset generated during and analyzed during the current study is available from the corresponding author upon reasonable request.

Declaration of Use of AI in Scientific Writing

There is nothing to declare.

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