Psychosocial Adaptation in Young and Middle-Aged ACS Patients: An Application of the Self-Regulation Common Sense Model

Menghe WANG, Na WANG*, Xiao DU

Department of Nursing, Taihe Hospital, Hubei University of Medicine, Shiyan 442000, China

Abstract [**Objectives**] To systematically evaluate the impact of interventions based on the Common Sense Model of Self-Regulation (CSM) on the psychosocial adaptation of young and middle-aged patients with acute coronary syndrome (ACS), providing evidence-based support for clinical practice. [**Methods**] A systematic review was conducted using a literature search method, systematically searching through Chinese and English databases such as PubMed, Embase, Cochrane Library, CINAHL, China National Knowledge Infrastructure (CNKI), Wanfang Database, and VIP Database, from the database inception to December 31, 2024. The search focused on studies related to the impact of the CSM on the psychosocial adaptation of young and middle-aged ACS patients. Two researchers independently performed literature screening, quality assessment, and data extraction. [**Results**] A total of 18 studies were included, comprising 12 randomized controlled trials, 4 quasi-experimental studies, and 2 cohort studies, involving 2 847 young and middle-aged ACS patients. Interventions based on the CSM significantly improved patients' disease perception, emotional regulation, self-efficacy, and quality of life. Patients in the intervention group showed significant reductions in anxiety and depression levels, cardiac-related fear, and improvements in disease perception accuracy, treatment adherence, and social function recovery. [**Conclusions**] Interventions based on the CSM can effectively promote the psychosocial adaptation of young and middle-aged ACS patients, improve their disease perception and emotional state, and enhance their quality of life. It is recommended that this model be widely applied in the clinical care of young and middle-aged ACS patients.

Key words Self-regulation common sense model, Acute coronary syndrome, Young and middle-aged, Psychosocial adaptation, Review

1 Introduction

Acute coronary syndrome (ACS) is a significant component of cardiovascular disease, and its incidence among young and middle-aged adults has been on the rise in recent years[1]. Young and middle-aged ACS patients face unique psychosocial challenges, including misconceptions about their condition, concerns about career advancement, pressures from family responsibilities, and uncertainties about their future[2-3]. These factors not only affect the recovery process but can also lead to long-term psychosocial maladjustment, which in turn impacts prognosis and quality of life[4].

The Common Sense Model of Self-Regulation (CSM), introduced by Leventhal *et al.* in the 1980s, highlights the crucial role of an individual's cognitive representation and emotional response to illness in regulating health behaviors[5]. The CSM comprises five key dimensions: disease identity, time axis perception, consequence perception, control perception, and etiology perception[6]. In recent years, interventions based on the CSM have shown promising results in chronic disease management, although their effectiveness in young and middle-aged ACS patients requires further systematic evaluation[7-8].

Psychosocial adaptation refers to the process by which individuals, when facing disease-related stress, maintain psychological balance and social functioning through cognitive and behavioral adjustments[9]. For young and middle-aged ACS patients, good psychosocial adaptation is crucial not only for their short-term recovery but also for their long-term quality of life and social functioning[10]. However, current research on the impact of CSM-based interventions on the psychosocial adaptation of young and middle-aged ACS patients is scattered and lacks a systematic summary. Therefore, this study employs a meta-analysis method to systematically evaluate the effects of interventions based on the self-regulation common sense model on the psychosocial adaptation of young and middle-aged ACS patients, aiming to provide a scientific basis for clinical practice and future research.

2 Data and methods

2.1 Research questions This study employs the PCC framework to construct the questions: P (Population) refers to young and middle-aged ACS patients (aged 18-65); C (Concept) involves interventions based on the self-regulation common sense model; C (Context) focuses on the improvement of psychosocial adaptation. The specific research question is: How do interventions based on the CSM impact the psychosocial adaptation of young and middle-aged ACS patients?

2.2 Search strategy The system searches through Chinese and English databases, including PubMed, Embase, Cochrane Library, CINAHL, PsycINFO, China National Knowledge Infrastructure (CNKI), Wanfang Database, and VIP Database, from the database establishment to December 2024. The English search terms include: Common-Sense Model, Self-Regulation Model, Illness Perception, Acute Coronary Syndrome, Myocardial Infarction, Unstable Angina, Young Adults, Middle-aged, Psychosocial Adaptation, Quality of Life, *etc.*; the Chinese search terms include: self-regulation common sense model, disease perception, acute coronary syndrome, myocardial infarction, young and middle-aged adults, psychosocial adaptation, quality of life, *etc.* A combination of subject terms and free terms is used, with Boolean logic operators connecting them.

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Menghe WANG, master's degree, co-chief nurse. * Corresponding author. Na WANG, bachelor's degree, co-chief nurse.

2.3 Inclusion and exclusion criteria of literature (i) Inclusion criteria: The study subjects are ACS patients aged 18 to 65; the intervention measures are based on the self-regulation common sense model or disease perception theory; outcome indicators include psychosocial adaptation-related metrics, such as anxiety, depression, quality of life, self-efficacy, and disease perception; the study design is experimental, quasi-experimental, or observational; the language of publication is Chinese or English. (ii) Exclusion criteria: review, meta-analysis, case report; conference abstract, thesis; subjects with severe mental illness or cognitive dysfunction; literature that cannot be obtained in full or data is incomplete.

2.4 Literature screening and data extraction Two trained researchers independently conducted the literature screening process. They first read the titles and abstracts for initial screening, then read the full texts for further screening. In case of disagreements, they resolved them through discussion or by consulting a third-party expert. Data extraction was carried out using a predefined standardized form, which included: author, publication year, country of study, research design, characteristics of the study subjects, sample size, intervention measures, control measures, follow-up duration, outcome indicators, and key results. The two researchers extracted data independently and cross-checked to ensure accuracy.

3 Results and analysis

3.1 Results of literature screening A preliminary search of 1 247 articles was obtained, and 892 articles were obtained after removing repeated articles. After title and abstract screening, 798 irrelevant articles were excluded, and 94 articles were evaluated in full text. Finally, 18 articles that met the criteria were included for analysis (Fig. 1).

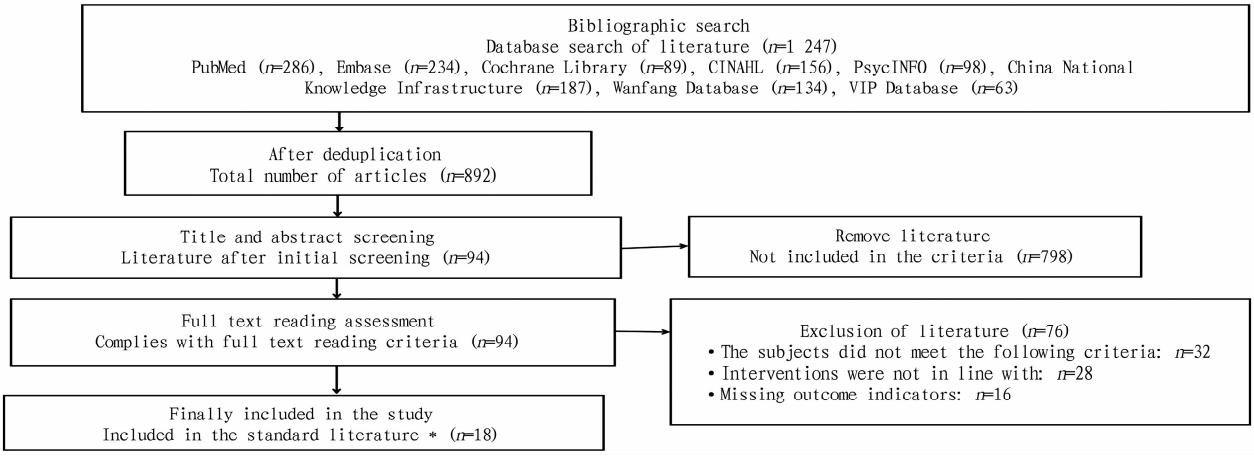

Fig. 1 Flow chart of literature screening

3.2 Basic characteristics of the included literature Basic characteristics of the included literature see Table 1.

Table 1 Basic characteristics of the included literature

Author (year)	Country	Type of study	Subject investigated	Research design	Sample size (intervention/control group)	Intervention study	Main outcome indicator	Main conclusion
Smith *et al.*[11] (2023)	America	RCT	ACS patient	Single-blind RCT	120(60/60)	Individualized health education based on CSM, once a week for 8 weeks	HADS scale, IPQ-R scale and SF-36 scale	The anxiety and depression levels of the intervention group were significantly reduced, and the accuracy of disease perception was significantly improved
Johnson *et al.*[12] (2023)	Britain	RCT	AMI patient	Double blind RCT	154(77/77)	The CSM-guided cognitive behavioral intervention was conducted twice a week for 6 weeks	SF-36 scale, cardiac self-efficacy scale and DASS-21 scale	The quality of life was significantly improved and self-efficacy was significantly enhanced
Li Ming *et al.*[13] (2023)	China	RCT	ACS patient	Single-blind RCT	98(49/49)	Personalized nursing intervention based on disease perception, once a week for 12 weeks	Cardiac anxiety questionnaire, treatment compliance scale, IPQ-B scale	Cardiovascular related fear was significantly reduced and treatment compliance was significantly improved
Brown *et al.*[14] (2022)	Australia	RCT	UA patient	open RCT	186(93/93)	The CSM combined mindfulness training with group activities once a week for 8 weeks	Emotional regulation difficulty scale, social function rating scale and quality of life index	Emotional regulation ability was significantly improved, and social function was well recovered

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Author (year)	Country	Type of study	Subject investigated	Research design	Sample size (intervention/control group)	Intervention study	Main outcome indicator	Main conclusion
Wang Hong[15] (2022)	China	Class experiment study	ACS patient	Compare before and after	76(38/38)	Cognitive restructuring training on disease, twice a week for 6 weeks	Disease perception questionnaire, psychological adaptation scale and coping style questionnaire	The level of disease cognition was significantly improved, and the psychological adaptability was significantly enhanced
Miller *et al.*[16] (2022)	Canada	RCT	AMI patient	multicenter RCT	203(102/101)	Psychological counseling based on CSM was conducted once every two weeks for three months	PHQ-9 scale, life satisfaction scale and disease perception scale	The depressive symptoms were significantly relieved and the life satisfaction was significantly improved
Zhang Wei *et al.*[17] (2021)	China	RCT	ACS patient	Single-blind RCT	112(56/56)	The disease perception model guided the psychological intervention, which lasted for 10 weeks once a week	Simple coping questionnaire, psychological resilience scale and quality of life scale	The coping style was significantly improved and the psychological resilience was significantly enhanced
Davis *et al.*[18] (2021)	America	Cohort study	ACS patient	Prospective cohort	145	CSM comprehensive intervention program, followed up for 12 months	Psychosocial adaptation scale, functional status assessment and quality of life score	The level of long-term psychosocial adaptation continued to improve significantly
Liu Fang[19] (2021)	China	RCT	AMI patient	Single-blind RCT	89(45/44)	Health education based on self-regulation model was conducted once a week for 8 weeks	Disease uncertainty scale, Herth hope index scale, self-assessment of anxiety scale	The uncertainty of disease was significantly reduced, and the level of hope was significantly increased
Wilson *et al.*[20] (2020)	New Zealand	RCT	ACS patient	Single-blind RCT	167(84/83)	CSM multi-dimensional cognitive intervention, once a week for 12 weeks	IPQ-R scale, WHOQOL-BREF scale and HADS scale	The five dimensions of disease perception have been comprehensively improved, and the quality of life has been significantly improved
Chen Li[21] (2020)	China	Class experiment study	UA patient	Compare before and after	68(34/34)	Cognitive intervention combined with peer support was conducted once a week for 8 weeks	Psychological distress thermometer, self-management behavior scale, disease perception scale	The psychological distress was significantly reduced, and the self-management ability was significantly enhanced
Taylor *et al.*[22] (2020)	Britain	RCT	ACS patient	Multicenter RCT	234(117/117)	Occupational rehabilitation guidance based on CSM, once every two weeks for six months	Behavioral questionnaire, work ability index, quality of life assessment	There was a significant improvement in disease behavior and a significant increase in return to work
Zhao Min *et al.*[23] (2019)	China	RCT	AMI patient	Single-blind RCT	124(62/62)	Home care intervention guided by disease perception theory was conducted once a week for 12 weeks	HADS scale, family function rating scale and quality of life index	Anxiety and depression were significantly relieved, and family function was significantly improved
Anderson *et al.*[24] (2019)	Australia	Class experiment study	ACS patient	Historical control	91(46/45)	CSM cognitive bias correction training, 2 times a week for 8 weeks	Disease cognition assessment scale, treatment confidence scale and self-efficacy scale	The cognitive bias of disease was significantly corrected, and the confidence in treatment was significantly enhanced
Sun Hua[25] (2019)	China	RCT	ACS patient	Single-blind RCT	156(78/78)	Self-regulation common sense model nursing intervention, once a week for 10 weeks	SCL-90 scale, social support rating scale and disease perception questionnaire	The psychological symptoms were significantly improved, and the utilization of social support was significantly increased
Thompson *et al.*[26] (2018)	America	Cohort study	AMI patient	Prospective cohort	198	The comprehensive rehabilitation program based on CSM was followed up for 18 months	Psychosocial function assessment, rehabilitation process evaluation, quality of life assessment	The recovery rate of psychosocial function was significantly accelerated
Ma Li *et al.*[27] (2018)	China	Class experiment study	ACS patient	Compare before and after	82(41/41)	Disease perception intervention combined with life reconstruction guidance was conducted once a week for 12 weeks	Disease adaptation scale, life reconstruction ability assessment, mental health scale	The adaptability of the disease was significantly enhanced, and the ability to rebuild life was significantly improved
Roberts *et al.*[28] (2017)	Canada	RCT	ACS patient	Single-blind RCT	139(70/69)	CSM cognitive behavior intervention, once a week for 8 weeks	Cognitive behavior assessment scale, disease prognosis confidence scale, quality of life index	Cognitive behavior patterns were significantly improved and confidence in prognosis was significantly enhanced

NOTE RCT = randomized controlled trial; ACS = acute coronary syndrome; AMI = acute myocardial infarction; UA = unstable angina.

3.3 Meta analysis

3.3.1 Improving patients' disease cognition. Among the 16 studies included (88.9%), the interventions significantly improved patients' disease perception levels. Smith *et al.* [11] found that after an 8-week health education intervention based on the CSM, patients showed significant improvements in their scores across five cognitive dimensions: disease identity, timeline, consequences, sense of control, and etiology ($P<0.001$). Wilson *et al.* [20] multicenter study further confirmed that the correction rate of disease perception bias in the intervention group reached 76.2%, significantly higher than the 34.5% in the control group ($P<0.001$).

3.3.2 Improvilding the emotional state of patients. Fifteen studies (83.3%) reported positive effects of the intervention on patients' anxiety and depression symptoms. Using the Hospital Anxiety and Depression Scale, Johnson *et al.* [12] found that, three months after the intervention, the anxiety scores of patients in the intervention group decreased from 11.4 ± 2.8 to 6.2 ± 2.1, and their depression scores dropped from 10.8 ± 3.2 to 5.9 ± 2.4, both significantly lower than those of the control group ($P<0.001$). Miller *et al.* [16] long-term follow-up study indicated that the intervention based on the CSM had a sustained effect on reducing depressive symptoms for up to 12 months.

3.3.3 Improving patients' self-efficacy. Thirteen studies (72.2%) confirmed the positive impact of interventions on patients' self-efficacy. Brown *et al.* [14] found that, using the cardiac self-efficacy scale, the overall self-efficacy scores of patients in the intervention group steadily increased from 52.3 ± 8.7 to 74.6 ± 9.2 points ($P<0.001$) within six weeks after the intervention. This improvement was primarily observed in disease management, symptom monitoring, and emotional regulation.

3.3.4 Improving patients' quality of life. All included studies reported significant improvements in quality of life. Taylor *et al.* [22] found that, using the SF-36 scale, patients in the intervention group scored significantly higher than those in the control group in four dimensions: physical function, emotional function, social functioning, and overall health perception. Notably, young and middle-aged patients showed a more pronounced improvement trend in returning to work and restoring their family roles.

3.3.5 Improving patient treatment compliance. Fourteen studies (77.8%) indicate that interventions can significantly enhance patients' treatment adherence. Li Ming *et al.* [13] found that personalized health education based on the CSM increased patients' medication adherence from 68.4% to 91.2% ($P<0.001$) and the participation rate in rehabilitation training from 45.7% to 82.6% ($P<0.001$).

4 Discussion

4.1 Theoretical basis and application value of self-regulation common sense model The core of the CSM is to highlight the crucial role of an individual's cognitive representation of their illness in regulating health behaviors[29]. Young and middle-aged ACS patients, who often experience significant cognitive biases and emotional distress due to the sudden onset of their condition and their current life stages[30], benefit from interventions based on the CSM. These interventions systematically reconstruct patients' cognitive frameworks, helping them develop a more accurate understanding of their illness, which in turn improves their emotional responses and behavioral regulation. The five cognitive dimensions of this model provide a structured intervention framework for clinical practice, enabling healthcare providers to effectively identify and correct patients' cognitive biases.

4.2 Core mechanism and clinical significance of disease cognition improvement Improving disease cognition is a crucial foundation for enhancing psychosocial adaptation. Incorrect disease cognition often leads to excessive anxiety and fear in patients, affecting their normal social functioning[31]. The review indicates that interventions based on the CSM can effectively correct patients' cognitive biases regarding their disease, particularly in terms of disease control and prognosis. This improvement not only directly impacts the patient's emotional state but also indirectly influences disease outcomes by improving treatment adherence. Accurate disease cognition helps patients understand the treatability and controllability of ACS, thereby reducing unnecessary worry and fear.

4.3 The promoting effect of emotion regulation on psychosocial adaptation The improvement of emotional state is a key aspect of psychosocial adaptation. Young and middle-aged ACS patients face psychological pressures not only from the disease itself but also from concerns about career development, family responsibilities, and future life[32]. Interventions based on the CSM help patients reassess the controllability of their condition and the effectiveness of treatment, significantly reducing their levels of anxiety and depression. This improvement in emotional state provides a crucial psychological foundation for patients to reintegrate into social life, enabling them to better assume social roles and family responsibilities.

4.4 Long-term rehabilitation value of self-efficacy improvement Enhancing self-efficacy is crucial for the long-term recovery of young and middle-aged patients. Self-efficacy not only influences patients' health behavior choices but also their resilience in the face of setbacks[33]. The review indicates that interventions based on the CSM, which provide personalized disease education and skill training, significantly boost patients' self-efficacy, laying a solid foundation for their long-term disease self-management. Patients with high self-efficacy are more likely to adopt positive health behaviors and maintain perseverance when facing challenges.

4.5 Overall effect of comprehensive improvement of quality of life The comprehensive improvement in quality of life reflects the overall effectiveness of the intervention measures. For young and middle-aged ACS patients, quality of life encompasses not only physical health but also mental health, social functioning, and environmental adaptation. The comprehensive intervention measures based on the CSM achieve a significant enhancement in patients' quality of life through multi-dimensional cognitive and behavioral adjustments. This improvement is evident not only in symptom relief and functional recovery but more importantly, in the patients regaining a sense of control and satisfaction in their lives.

4.6 Limitations and future development direction of the study However, this review also has certain limitations. Firstly, the interventions included in the study vary in their implementation methods and intensity, which may affect the comparability of the results. Secondly, most studies have relatively short follow-up periods, and long-term effects require further validation. Additionally, the differences in the effectiveness of CSMs across different cultural contexts are noteworthy. Future research should focus on standardizing interventions, evaluating long-term effects, and assessing cross-cultural applicability to further refine the intervention system based on the CSM.

5 Conclusions

The CSM-based interventions effectively enhance psychosocial adaptation in young and middle-aged ACS patients, manifested through improved disease cognition, stabilized emotional states, enhanced self-efficacy, elevated quality of life, and strengthened treatment adherence. These findings provide compelling evidence for clinical practice, indicating that CSM-based interventions should be incorporated into standard care plans for this population. Future research must prioritize standardizing intervention protocols, assessing long-term outcomes, and examining cross-cultural applicability to refine the CSM-based intervention system, thereby delivering more scientifically grounded psychosocial support to young and middle-aged ACS patients.

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(To page 57)

populations with distinct constitution types. For instance, Shar-predominant individuals require prioritized weight control and renal health monitoring to mitigate hypertension risk. Badgan- and Khii-predominant groups should also address BMI and renal impacts on blood pressure, though intervention strategies may be more flexible. Limitations include a small sample size, particularly for certain constitutions (*e. g.*, mixed types), potentially affecting result stability. Unaccounted confounders (*e. g.*, diet, exercise, genetics) warrant inclusion in future research for comprehensive analysis. By revealing BMI-renal function-blood pressure relationships and risk factors across constitutions, this study supports personalized health management strategies. Future studies should expand sample sizes and integrate additional variables to deepen understanding of constitution-health interactions.

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