



ประสิทธิผลของการบำบัดด้วยแนวคิดและพฤติกรรม ต่อภาวะความทุกข์ทางจิตใจในผู้รอดชีวิตจาก กล้ามเนื้อหัวใจตาย: การทบทวนวรรณกรรมอย่างเป็นระบบ

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Effectiveness of Cognitive Behavioral Therapy on Psychological Distress among Myocardial Infarction Survivors: A Systematic Review

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บทคัดย่อ

การบำบัดด้วยทางความคิดและพฤติกรรม มีประสิทธิภาพในการลดภาวะซึมเศร้า ความวิตกกังวล และความเครียดในผู้ป่วยโรคหัวใจและหลอดเลือด อย่างไรก็ตาม หลักฐานเชิงประจักษ์ในผู้รอดชีวิตจากภาวะกล้ามเนื้อหัวใจตายเฉียบพลันยังคงมีจำกัด นอกจากนี้รูปแบบการออกแบบการบำบัดทางความคิดและพฤติกรรม ที่ช่วยบรรเทาความทุกข์ทางจิตใจยังจำเป็นต้องได้รับการศึกษาเพิ่มเติม การทบทวนอย่างเป็นระบบนี้มีวัตถุประสงค์ เพื่อประเมินประสิทธิผลของการบำบัดทางความคิดและพฤติกรรมในการลดความทุกข์ทางจิตใจในผู้รอดชีวิตจากภาวะกล้ามเนื้อหัวใจตายเฉียบพลัน และเพื่อระบุลักษณะการออกแบบโปรแกรมที่สนับสนุนการฟื้นฟูทางอารมณ์ ดำเนินการทบทวนวรรณกรรมอย่างเป็นระบบจากฐานข้อมูล 6 แหล่ง คัดเลือกงานวิจัยเชิงทดลองแบบสุ่มและมีกลุ่มควบคุม จำนวน 13 เรื่อง ที่ตีพิมพ์ระหว่างปี ค.ศ. 2014–2023 และผ่านเกณฑ์การคัดเข้า ประเมินคุณภาพเชิงระเบียบวิธีวิจัยโดยใช้เกณฑ์ของสถาบันโจแอนนา บริกส์ และสังเคราะห์ข้อมูลด้วยการบรรยายเชิงพรรณนา งานวิจัยเชิงทดลองแบบสุ่มจำนวน 13 เรื่อง มีจำนวนกลุ่มตัวอย่างทั้งหมด 1,586 คน ผลการศึกษาพบว่า การบำบัดทางความคิดและพฤติกรรมหรือการใช้หลักการบำบัดทางความคิดและพฤติกรรมการ ทั้งในรูปแบบเผชิญหน้าโดยตรง และรูปแบบที่ใช้เทคโนโลยีช่วย สามารถลดภาวะซึมเศร้า ความวิตกกังวล และความเครียดได้อย่างมีนัยสำคัญเมื่อเทียบกับการดูแลตามปกติ ทั้งโปรแกรมการบำบัดทางความคิดและพฤติกรรมแบบผสมผสานและใช้ผ่านอินเทอร์เน็ตมีประสิทธิผลใกล้เคียงกัน นอกจากนี้ งานวิจัยหลายการศึกษายังรายงานว่าช่วยเพิ่มคุณภาพการนอนหลับและตัวชี้วัดทางชีวภาพของระบบหัวใจให้ดีขึ้น การบำบัดทางความคิดและพฤติกรรม มีประสิทธิผลในการบรรเทาความทุกข์ทางจิตใจในผู้รอดชีวิตจากกล้ามเนื้อหัวใจตาย ดังนั้น การบูรณาการการบำบัดทางความคิดและพฤติกรรมแบบเผชิญหน้า โดยตรงหรือใช้เทคโนโลยีเข้าสู่การปฏิบัติการพยาบาลด้านจิตสังคม จะช่วยส่งเสริมสุขภาวะทางอารมณ์และผลลัพธ์ของการฟื้นฟูผู้ป่วยได้

คำสำคัญ: การบำบัดด้วยแนวคิดและพฤติกรรม, กล้ามเนื้อหัวใจตาย, ความทุกข์ทางจิตใจ, ผู้รอดชีวิต

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Abstract

Cognitive behavioral therapy (CBT) is effective in reducing depression, anxiety, and stress among individuals with cardiovascular disease; however, empirical evidence in myocardial infarction (MI) survivors remains limited. Furthermore, the design features of CBT that alleviate psychological distress require further investigation. This systematic review aimed to evaluate the effectiveness of CBT in reducing psychological distress among myocardial infarction (MI) survivors and to identify the design features that support emotional recovery. A systematic review was conducted using six databases with 13 randomized controlled trials (RCTs) published between 2014 and 2023 that met the inclusion criteria. Methodological quality was assessed using the Joanna Briggs Institute, and the data were synthesized narrative style. Metanalysis was not feasible. Thirteen RCTs involving 1,586 participants were included. CBT or CBT-based approaches—delivered face-to-face or through technology-assisted formats—were shown to significantly reduce depression, anxiety, and stress compared with standard care, and both combined and internet-based CBT programs showed comparable effectiveness. Additionally, several studies reported improved sleep quality and cardiac biomarkers. CBT is effective in the alleviation of psychological distress among MI survivors. Thus, integrating face-to-face or technology-assisted CBT into psychosocial nursing practice can enhance their emotional well-being and recovery outcomes.

Keywords: cognitive behavioral therapy, myocardial infarction, psychological distress, survivor

Introduction

Myocardial infarction (MI) is a life-threatening cardiac event that contributes significantly to sudden cardiac death and hospitalizations worldwide^{1,2}. It represents a severe clinical manifestation of coronary heart disease (CHD) and is clinically classified into two major types: ST-elevation myocardial infarction (STEMI) and non-ST-elevation myocardial infarction (NSTEMI). Unstable angina is also considered a part of the acute coronary syndrome (ACS) spectrum, which encompasses MI³.

Globally, the incidence of MI is projected to increase due to the growing prevalence of obesity, diabetes, metabolic syndrome, and population aging^{4,5}. Although mortality rates have declined in recent decades¹, an increasing number of MI survivors continue to experience substantial psychological challenges resulting from their perception and experience of a life-threatening event⁶. Psychological distress—defined as emotional suffering or tension that disrupts daily functioning or arises from critical health events such as MI—has emerged as a major risk factor for both the development and progression of CHD⁷. MI survivors frequently report depression, post-traumatic stress disorder, anxiety, anger, and perceived general stress⁸. These symptoms, often adaptive in the acute phase, become maladaptive when persistent or functionally impairing, and are collectively referred to as post-myocardial infarction psychological distress (PMPD)⁹. Moreover, psychological distress has been linked to mental stress-induced myocardial ischemia¹⁰ and a twofold increase in the risk of recurrent cardiovascular events¹¹. The underlying mechanisms include vasomotor dysfunction, endothelial impairment, coronary microvascular disease, and platelet hyperreactivity^{12,13}. Over time, chronic psychosocial distress resulting from prolonged psychological distress contributes to functional decline, frequent readmissions, diminished quality of life, and higher healthcare utilization in post-MI populations¹⁴.

Cognitive behavioral therapy (CBT) is widely recognized as a first-line psychological intervention with demonstrated efficacy in reducing depression and anxiety¹⁵. CBT employs exposure techniques that enable individuals to gradually face feared situations or stimuli, thereby reducing avoidance behaviors, fear related to symptoms, and the resulting disability¹⁶. In cardiovascular patient populations, CBT supports emotional regulation and enhances health-related behaviors^{15,17}. CBT and eye movement desensitization and reprocessing have shown efficacy in reducing post-traumatic stress, anxiety, and depression in post-MI patients. However, the specific features of CBT that effectively target the unique psychological needs of MI survivors remain unclear¹⁸. Although CBT has demonstrated effectiveness in reducing depression, anxiety, and stress among individuals with cardiovascular disease, evidence specific to MI survivors remains limited. Furthermore, the design features of CBT that alleviate psychological distress require further investigation. Therefore, this systematic review aimed to identify the effectiveness of CBT interventions in managing psychological distress among patients with MI and to determine which design elements most effectively support emotional recovery.

Method

Protocol and Registration

This systematic review was conducted in accordance with the Joanna Briggs Institute (JBI) Checklist for Randomized Controlled Trials¹⁹. The review protocol was prospectively registered in PROSPERO (registration number: CRD42023429272). We used the Preferred Reporting Items for Systematic Reviews (PRISMA) guideline²⁰.

Eligibility Criteria

Randomized controlled trials (RCTs) published in English between 2014 and 2023 with full-text availability, consistent with contemporary clinical guidelines for myocardial infarction. Grey literature and unpublished theses were excluded.

Types of Studies

This review included Only RCTs.

Types of participants

This review employed studies that include patients diagnosed with MI (heart attack, ACS, or myocardial diseases) with or without comorbid anxiety or depression. Studies involving patients with heart failure or post-transplantation were excluded.

Types of interventions

Eligible interventions included CBT or CBT-based approaches, encompassing techniques such as cognitive restructuring, relaxation training, problem-solving, and stress management. Studies were included if CBT principles were used as a core component within broader psychological interventions. Interventions combining CBT with pharmacological therapy were excluded.

Comparators

Eligible comparators were usual care, standard care, or no treatment, including non-psychological interventions.

Outcomes

The primary outcome included psychological distress in patients with MI with and without psychological distress, such as anxiety, depression, and insomnia, following inclusion in the study. Patients were still classified as psychological disorder according to a validated questionnaire, and the clinical diagnosis at follow-up was also reported. Secondary outcomes included Cardiac Anxiety, cardiovascular biomarkers, major cardiovascular events (MACEs), quality of life, and emotional well-being.

Search Strategy

Comprehensive searches were conducted in six databases, including PubMed, Scopus, CINAHL Complete, MEDLINE, EMBASE, and ProQuest, using keywords: (“heart attack” OR “acute coronary syndrome” OR “myocardial diseases” OR “myocardial infarction”) AND (“cognitive behavioral therapy” OR CBT OR “psychological therapy”). The resulting search results were put into EndNote for screening. After duplicated studies were removed, abstracts were screened in accordance with the PRISMA guidelines²⁰ by 2 independent authors. while applying exclusion criteria. Subsequently, pre-determined inclusion criteria independent reviewers for the evaluation of full-text studies for possible inclusion. Any disagreements were resolved by a third reviewer.

Literature selection and data extraction

The study selection indicates that all studies identified in the database search were evaluated for relevance to the review by two authors based on the information in the titles and abstracts. The relevance of these full-text articles to the inclusion criteria was evaluated to ascertain their pertinence to the review aims. The third author addressed and settled disputes over the evaluations. Furthermore, two reviewers independently evaluated and identified the primary studies according to the inclusion criteria, while the details of each eligible publication were extracted using standardized data extraction forms. The study design (comprising design, countries, setting, and sample size), participant characteristics (including age and sex), CBT interventions (CBT approaches, format, delivery mode, components, intensity, duration, and the facilitator of the intervention), and outcomes (outcome measurements and main findings) were extracted.

Appraisal process

Two authors assessed the methodological quality of the RCTs utilizing the JBI checklist. Each item was scored as yes (1) or no/unclear/not applicable (0), yielding total scores from 0 to 13. Overall quality was expressed as the percentage of criteria met. Studies were classified as low risk of bias ($\geq 75\%$), moderate risk (50–74%), or high risk ($< 50\%$). Only studies rated as low risk of bias were included in the review. Disagreements were resolved by discussion or consultation with a third reviewer.

Data analysis and synthesis

Due to heterogeneity in intervention formats, populations, and outcome measures, a meta-analysis was not feasible. Instead, findings were synthesized narratively in accordance with the framework⁽²¹⁾. Results were grouped by intervention type and psychological outcome.

Results

Study Selection

A total of 43,744 records were identified across six databases. After removing duplicates and ineligible records, 112 full-text articles were assessed for eligibility. Thirteen RCTs met the inclusion criteria and were included in the final synthesis²²⁻³⁴.

Risk of Bias

Four studies were rated as high quality (92.3%)^{25,27,30,31}. Six studies were rated moderate-to-high quality (84.6%)^{23,24,28,32,33}. Three studies demonstrated moderate quality (76.9%) due to unclear blinding and allocation concealment^{22,26,34}.

Setting

Three studies were conducted in the United States^{23,25,30}, three in Sweden^{24,26,27}, two in Australia^{28,29}, and one each in Canada³³, Poland³¹, Iran²², Brazil³², and China³⁴.

Participants

The total sample size was 1,586 participants with a mean age ranging from 53 years³¹ to 72 years²⁵. Sample sizes ranged from 34²⁵ to 362 participants²⁶. The number of male participants ranged from 9³³ to 149²⁶. Twelve studies recruited individuals with CHD, including MI, ACS, or unstable angina. One study focused exclusively on older adults (≥ 60 years) following MI²². Three studies specifically included participants with depression or anxiety, defined by a Hospital Anxiety and Depression Scale (HADS) score > 7 ^{24,27,30}. One study enrolled CHD patients with comorbid insomnia²⁵.

Interventions and Clinical Settings

The 13 included studies examined a variety of CBT and related psychological interventions based on CBT for patients with MI (Table 1). Six studies implemented technology-assisted CBT, including telehealth^{28,29}, web-based CBT²⁵, and internet-based CBT (iCBT)^{24,27,33}. Three studies combined CBT with additional approaches, such as stress management²⁶, anger management, or well-being therapy³⁰. Two studies integrated CBT into cardiac rehabilitation (CR): one combined CR with mindfulness-based stress reduction (MBSR) in patients with acute MI³⁴, and another combined CR with stress management training (SMT) in patients with stable CHD²³. One study employed brief strategic therapy (BST) in addition to usual care³¹, while another evaluated guided mental imagery²² in older adults post-MI. Most interventions ($n = 10$) were delivered in hospital settings, whereas two were conducted in outpatient cardiac clinics^{23,24}. One recruited participants through multiple community and media channels, including social media, print, and television, cardiac organizations, rehabilitation centers, physician offices, and pharmacies³³. The duration of interventions ranged from one week³⁴ to 30 months³¹.

Mode of Delivery

Six studies employed technology-assisted delivery, including telephone- and internet-based platforms. The studies implemented *MoodCare*, a telehealth program evaluating the six-month efficacy of CBT for reducing depression in patients with ACS²⁸, with follow-up data reported at 12 months²⁹. Three studies applied iCBT targeting anxiety and depression^{24,27,33}. Javaheri and colleagues delivered a web-based CBT for insomnia (CBT-I) program among CHD patients²⁵. Four studies integrated CBT with other therapies: CR and SMT²³, CBT and WBT³⁰, MBSR and CR³⁴, and BST with usual care³¹. Three interventions were delivered face-to-face, including CBT-based anger management³², CBT-based stress management²⁶, and guided mental imagery²².

Comparison Groups

Control conditions varied across studies. Eight studies used usual care as the comparator, while five employed active control groups: waiting list²⁴, sleep education²⁵, clinical management without psychotherapy³⁰, cardiac rehabilitation alone²³, and written materials without guided imagery²².

Types of outcome measures

Primary Outcomes

Of the 13 studies, 10 primarily evaluated psychological outcomes—particularly depression, anxiety, and stress. Two studies examined the *MoodCare* telehealth program in ACS patients and reported significant reductions in depressive symptoms, measured by the cardiac depression scale (CDS), patient health questionnaire-9 (PHQ-9), and short form health survey (SF-12), compared with usual care^{28,29}. One evaluated a sequential intervention combining CBT and WBT for acute MI patients, reporting reductions in depression and dysthymia using the structured interview for the diagnosis of psychopathological syndromes (SSI-DCPR) and diagnostic criteria for psychosomatic research (CID)³⁰.

Several studies evaluated internet-based cognitive behavioral therapy (iCBT). Two studies^{24, 27} used the hospital anxiety and depression scale (HADS) and reported significant reductions in anxiety and depression compared with usual care. Similarly, study³³ evaluated the cardiac wellbeing course, an iCBT program, and demonstrated significant improvements in depressive symptoms, generalized anxiety, and physical inactivity, as measured by the generalized anxiety disorder-7 (GAD-7) scale. Wu et al.³⁴ examined mindfulness-based stress reduction (MBSR) combined with early cardiac rehabilitation (CR) in patients with acute myocardial infarction receiving intra-aortic balloon pump (IABP) support in the critical care unit. The intervention significantly reduced anxiety and depression, assessed using the self-rating anxiety scale (SAS) and self-rating depression scale (SDS), and improved overall mood disturbance, as measured by the profile of mood states (POMS).

Stress-related outcomes were reported across several studies. One study³¹ demonstrated significant reductions in perceived stress following brief strategic therapy combined with usual care, measured using the perceived stress scale (PSS-10). Two studies²⁶ reported improvements in stress, vital exhaustion, and depressive symptoms following CBT-based stress management programs. Another study²³ found greater reductions in composite stress levels in the cardiac rehabilitation plus stress management training (CR+SMT) group compared with cardiac rehabilitation alone. Across studies, stress was assessed using diverse instruments, including the Beck depression inventory-II (BDI-II), state-trait anxiety inventory (STAI), patient-reported outcomes measurement information system (PROMIS), general health questionnaire (GHQ), and everyday life stress scale (ELSS).

Two studies focused on sleep-related outcomes. One study²² reported improved sleep quality following guided mental imagery, assessed using the Pittsburgh sleep quality index (PSQI). Another study²⁵ found that web-based cognitive

behavioral therapy for insomnia (CBT-I) significantly improved insomnia severity and depressive symptoms compared with sleep education, as measured by the patient health questionnaire-8 (PHQ-8), Duke health profile, and Epworth sleepiness scale (ESS). In addition, one study³² evaluated CBT-based anger management in patients with ST-segment elevation myocardial infarction and demonstrated improved vascular function, assessed by flow-mediated dilation (FMD), suggesting potential physiological benefits of emotion-focused CBT interventions.

Secondary outcomes

Four studies reported anxiety and depression as secondary outcomes²⁴⁻²⁷. However, anxiety and depression were measured using instruments such as the SAS, HADS, and the heart-focused anxiety was measured by the cardiac anxiety questionnaire (CAQ). Additional outcomes included CHD biomarkers (high-sensitivity C-reactive protein [hs-CRP]) and MACEs, which refer to a combination of death, recurrent MI, new revascularization, and rehospitalization for unstable angina²³, cardiac systolic function (echocardiography)³⁴, and cardiovascular endpoints such as reinfarction and mortality^{31,32}. Several studies also assessed psychosocial well-being, including quality of life, suicidal ideation, and vital exhaustion^{26,27}.

Table 1 Description of included studies.

Study Country Related publications	Study design, duration of the intervention	Population and setting		Description of the intervention		Delivery mode	Outcome measures (primary outcome, secondary outcome)
		Number of participants (n)	Age (years) Female/male	Intervention group (IG)	Control group (CG)		
O’Neil et al, 2014 ²⁸ Australia	RCT, 6 months	ACS/ six hospitals in Victoria and Brisbane, Australia	mean age 60 Female/male: IG16/45, CG14/46	IG: Tele-health (MoodCare)	CG: usual care	Telephone	Primary outcome: depression (CDS, PHQ9, SF-12)
		N= 121					
O’Neil et al, 2015 ²⁹ Australia	RCT, 12 months	ACS/ six hospitals in Victoria and Brisbane, Australia	mean age 60 Female/male: IG16/45, CG14/46	IG: Tele-health (MoodCare)	CG: usual care	Telephone	Primary outcome: depression (CDS, PHQ9, SF-12)
		N= 121					

Table 1 Description of included studies. (Cont.)

Study Country Related publications	Study design, duration of the intervention	Population and setting		Description of the intervention		Delivery mode	Outcome measures (primary outcome, secondary outcome)
		Number of participants (n)	Age (years)	Intervention group (IG)	Control group (CG)		
Rakowska, 2015 ³¹ Poland	RCT, 2.5 years	a first non-fatal MI / the psychotherapy clinic affiliated with the Faculty of Psychology, University of Warsaw N = 81 mean age 53.4 Female/male: IG17/24, CG 42/58		IG: BST plus usual care CG: usual care		In-person	Primary outcome: stress (PSS-10) Secondary out: Reinfarction and mortality rates (patients' hospital discharge cards and in-hospital discharge registry), Rehospitalization (the interview)
Blumenthal et al, 2016 ²³ US	RCT, 12 weeks	Stable CHD/Outpatients clinic N = 151 IG mean age 61.8 CG mean age 60.4 Female/male: IG31/45, CG 24/51		G: CR combined with SMT CG: CR alone		In-person	Primary outcome: stress (BDI-II, STAI, PROMIS, GHQ, PSS) Secondary outcomes: CHD biomarkers (hs-CRP) and adverse cardiovascular events

Table 1 Description of included studies. (Cont.)

Study Country Related publications	Study design, duration of the intervention	Population and setting		Description of the intervention		Delivery mode	Outcome measures (primary outcome, secondary outcome)
		Number of participants (n)	Age (years) Female/male	Intervention group (IG)	Control group (CG)		
Aghababaei et al., 2017 ²² Iran	RCT, 4 weeks	Older adults with heart attack/hospital of Isfahan		IG: Guided mental imagery instruction		In-person	Primary outcome: Sleep quality (PSQI)
		Medical Sciences University N= 60 IG mean age 64.1 CG mean age 63.2 Female/male: IG7/22, CG4/25		CG: a file without audio texts			
Norlund et al, 2017 ²⁶ Sweden	RCT, 24 months	MI/ hospital		IG: The stress management program based on CBT		In-person	Primary outcome: Stress (ELSS) and Anxiety (SAS) Secondary outcomes: Vital exhaustion (Maastricht Vital Exhaustion Questionnaire)
		N = 362 IG mean age 62 CG mean age 61 Female/male: IG43/149 CG42/128		CG: usual care			

Table 1 Description of included studies. (Cont.)

Study Country Related publications	Study design, duration of the intervention	Population and setting		Description of the intervention		Delivery mode	Outcome measures (primary outcome, secondary outcome)
		Number of participants (n)	Age (years)	Intervention group (IG)	Control group (CG)		
		Female/male					
Norlund et al, 2018 ²⁷ Sweden	RCT, 14 weeks	MI/hospital N =239 IG mean age 58.4 CG mean age 60.8 Female/male: IG44/73 CG36/86		IG: iCBT CG: usual care		Internet	Primary outcome: depression and anxiety (HADS) Secondary Outcomes: depression and suicidal Ideation
Javaheri et al, 2020 ²⁵ USA	RCT, 6 weeks	CHD/ 2 site: cardiology clinics at Brigham and Women’s and the Cleveland Clinic Hospitals N = 34 Mean age 71.6 Female/male: IG 20/14 CG 23/11		IG: Web-based CBT-I intervention CG: general sleep education alone		Web-based	Primary outcome: Insomnia severity (ESS) Secondary Outcomes: depressive symptoms (PHQ-8, Duke Health Profile, and ESS scores)

Table 1 Description of included studies. (Cont.)

Study Country Related publications	Study design, duration of the intervention	Population and setting		Description of the intervention		Delivery mode	Outcome measures (primary outcome, secondary outcome)
		Number of participants (n)	Age (years) Female/male	Intervention group (IG)	Control group (CG)		
Rafanelli et al, 2020 ³⁰ USA	RCT, 30 months	Acute MI or unstable angina/the Cardiology Divisions of Maggiore Hospital (Bologna, Italy) and Molinette Hospital (Torino, Italy).	N = 100	IG: Combination of CBT and WBT		In-person	Primary outcome: Depression and dysthymia (SSI-DCPR, CID)
			IG mean age 57.64 CG mean age 60.02 Female/male: IG 19/31 CG 12/38	CG: clinical management			
Schneider et al, 2020 ³³ Canada	RCT, 8 weeks	An ACS/ 10 provinces in Canada through social Media	N = 56	IG: Cardiac Wellbeing Course		Internet	Primary outcome: Depression, general anxiety, and activity levels (GAD-7)
			Mean age 58.08 Female/male: IG 12/13 CG 19/9	CG: waiting list control			

Table 1 Description of included studies. (Cont.)

Study Country Related publications	Study design, duration of the intervention	Population and setting		Description of the intervention		Delivery mode	Outcome measures (primary outcome, secondary outcome)
		Number of participants (n)	Age (years)	Intervention group (IG)	Control group (CG)		
Humphries et al, 2021 ²⁴ Sweden	RCT, 12 months	MI/ 25 cardiac clinics N = 239 mean age 59.6 Female/male: IG 44/73 CG 36/86		IG: iCBT CG: usual care		Internet	Primary outcome: Anxiety and Depression (HADS) Secondary Outcomes: The Cardiac Anxiety (CAQ)
Schmidt et al, 2022 ³² Brazil	RCT, 3 months	STEMI/ hospital N = 43 IG mean age 56 CG mean age 58 Female/male: IG 10/33 CG 9/38		IG: anger management with CBT CG: usual care		In-person	Primary outcome: The variation of flow-mediated dilation (ultrasound using a 3- to 12-MHz linear transducer) Secondary Outcomes: MACEs

Table 1 Description of included studies. (Cont.)

Study Country Related publications	Study design, duration of the intervention	Population and setting		Description of the intervention		Delivery mode	Outcome measures (primary outcome, secondary outcome)
		Number of participants (n)	Age (years)	Intervention group (IG)	Control group (CG)		
Wu et al, 2023 ³⁴ China	RCT, 1 week	AMI/hospital		IG: MBSR intervention combined with CR		In-person	Primary outcomes: Anxiety (SAS), depression (SDS) and a negative mood (POMS)
		N= 100		CG: usual care			Secondary outcome: Cardiac systolic function (echocardiography)
		IG mean age 59.72					
		CG mean age 60.42					
		Female/male: IG 13/37 CG 15/35					

ACS = acute coronary syndrome, AMI = acute myocardial infarction, BDI-II = Beck Depression Inventory-II, BST = brief Strategic therapy, CAQ = cardiac anxiety questionnaire, CBT = cognitive behavioral therapy, CDS = Cardiac Depression Scale, CHD = coronary heart disease, CID = Diagnostic Criteria for Psychosomatic Research, CR = Cardiac Rehabilitation, ELSS = Everyday Life Stress Scale, ESS = Epworth Sleepiness Scale, GHQ = General Health Questionnaire, hs-CRP = high-sensitivity C-reactive protein, GAD-7 = Generalized Anxiety Disorder-7 scale, HADS = Hospital Anxiety and Depression Scale (HADS) score, MACEs = major cardiovascular events , MBSR= mindfulness-based stress reduction, MI = myocardial infarction, NSTEMI = non-ST-elevation myocardial infarction, PHQ 8-9 = Patient Health Questionnaire 8-9, POMS = Profile of Mood States, PROMIS = Patient-Reported Outcomes Measurement Information System, PSQI = Pittsburgh Sleep Quality Index, PSS-10 = Perceived Stress Scale, SAS= Self-Rating Anxiety Scale, SDS = Self-Rating Depression Scale, SF-12 = Short Form Health Survey, SSIDCPR = Diagnosis of Psychopathological Syndromes, STAI = State-Trait Anxiety Inventory, STEMI = ST-elevation myocardial infarction. SMT = Stress management training, WBT= Well-Being Therapy

Discussion

This systematic review of 13 RCTs found that CBT or CBT-based approaches provide consistent improvements in psychological distress following MI. Across the trials, interventions reduced depressive symptoms, anxiety, and perceived stress. The beneficial effects of CBT or CBT-based intervention may be attributable to the therapeutic approach employed during intervention sessions, particularly the promotion of short- and long-term self-management skills that support sustained improvements in mood regulation and lifestyle behaviors beyond program completion.

Notably, these beneficial effects were reported across heterogeneous populations, clinical settings, intervention modalities, and outcome measures. The findings are consistent with previous evidence that CBT-based interventions reduce depression, anxiety, and stress symptoms in cardiovascular patients^{17,35,36} and PTSD in post-MI patients¹⁸. In addition, web-based CBT-I intervention was shown to improve sleep quality and reduce insomnia severity in patients with CHD²⁵. These effects may have been enhanced by regular biweekly check-in calls from research coordinators, which reinforced participant engagement, as well as by the user-friendly design of the intervention. However, the small sample size and limited racial diversity in this study restrict the generalizability of its findings.

This review of the studies indicated that CBT or CBT-based interventions for patients with MI or CHD are delivered through diverse modes, ranging from traditional face-to-face sessions to technology-assisted and hybrid formats. This variety reflects a growing recognition of the need for flexible and accessible psychosocial care within the cardiac patient population. Technology-assisted interventions—such as telehealth, internet-based, and web-based CBT—were investigated in over half of the reviewed studies. These approaches, including MoodCare, a telehealth program for ACS patients^{28,29}, and other iCBT programs targeting depression and anxiety^{24,25,27,33},

were shown to offer significant advantages in accessibility and scalability. MoodCare demonstrated clinically meaningful reductions in depressive symptoms sustained to 12 months, supporting the durability of remotely delivered CBT in ACS patients. However, most of these interventions were conducted in high-income countries such as the United States, Sweden, and Australia, which may limit the applicability of the findings and could have potentially influenced the outcomes due to the diversity of culture³⁸.

Evidence suggests that iCBT can be effective in reducing anxiety and depression among those with CVD and cerebrovascular diseases^{36,39}. Furthermore, iCBT could be employed to manage a large number of patients, and it could also be used to deliver CBT treatment in their own home, as the treatment can be delivered by personnel such as a nurse, with only a brief introduction to CBT⁴⁰.

Face-to-face CBT interventions^{22,26,32} remain valuable, especially when targeting emotion regulation or stress-related mechanisms that benefit from in-person therapist support, as direct interaction may facilitate a stronger therapeutic alliance and allow for real-time feedback. Conversely, an internet intervention may provide only sent text and pictures⁴¹.

Hybrid or integrated approaches were also evident. In several studies, CBT was combined with complementary strategies such as SMT²³, mindfulness-based stress reduction³⁴, or well-being therapy³⁰. These multimodal interventions may provide broader psychological benefits by addressing multiple dimensions of post-MI distress—such as rumination, anger, and maladaptive coping⁴². Integrating CBT within CR programs also aligns with holistic models of cardiac care, promoting both psychological recovery and behavioral adherence to recommendations⁴².

Physiological and clinical secondary outcomes were reported less consistently. A few RCTs observed favorable changes in biomarkers or endothelial function—e.g., reductions in composite biomarker indices and lower event rates in CR+SMT, and

improved flow-mediated dilation after anger-management CBT. These findings support a plausible psychoneuro-immunological pathway linking symptom reduction to cardiovascular physiology. Reductions in depressive symptoms, anxiety, and perceived stress achieved through CBT may also be associated with a decreased risk of MACEs.

Improvements in CHD biomarkers such as hs-CRP may be relatively stable over time. This finding aligns with previous reviews that CBT-I improved HbA1c and CRP³⁷, indicating that supplementing education-based interventions with CBT components may influence enduring lifestyle and behavioral patterns rather than short-term behavioral changes. However, interpretation of these findings is limited by the high risk of bias across studies, small sample sizes, and short follow-up durations. Consequently, larger, methodologically rigorous trials with adequate statistical power and prespecified biomarker and MACE endpoints are needed to confirm the clinical cardiometabolic benefits of CBT-based interventions.

Conclusions

CBT interventions are effective in alleviating psychological distress among MI survivors and may contribute to improved cardiovascular outcomes. However, evidence remains heterogeneous, and therefore, further research is required to explore long-term effectiveness, mechanisms, and cost-efficiency to support wider clinical adoption.

Clinical Implications

Psychiatric nurses play a vital role in adapting CBT techniques to the emotional and behavioral challenges experienced after MI or a life-threatening event. Technology-assisted CBT offers promise for enhancing reach and adherence, while multi-component interventions may further improve outcomes. In addition, Psychiatric nurses should consider the tailoring of CBT to the specific psychological profiles and sociocultural contexts of MI survivors.

Limitations

Considerable heterogeneity existed across the reviewed studies regarding target populations, intervention types, and outcome measures, precluding meta-analysis. However, the effect estimates suggest that CBT interventions effectively alleviate psychological distress among post-MI patients. Additionally, this review encompassed both CBT and CBT-related psychological interventions, which vary in theoretical frameworks, methodologies, and modes of implementation. These differences should be carefully considered when interpreting the overall findings.

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