Wang D, Guo F. Beyond the Heart: Psychological Distress and Caregiver Burden in Heart Failure. *Health Psychology Research.* 2026;14(1):e81240071.
https://doi.org/10.14440/hpr.0448

Review

Beyond the Heart: Psychological Distress and Caregiver Burden in Heart Failure

Di Wang[1], Fengjie Guo[2]*

[1]Department of Oncology, Loudi Central Hospital, Loudi 417000, China

[2]School of Medicine, South China University of Technology, Guangzhou 510006, Guangdong, China

Keywords: Heart failure, Psychological distress, Caregiver burden, Coping strategies, Dyadic care

Health Psychology Research
Vol. 14, 2026

Background

Heart failure (HF) is a life-limiting syndrome with high morbidity. Although biomedical care has advanced, psychological distress in patients and burden among informal caregivers remain underassessed and undertreated.

Objective

This review synthesizes evidence on: (i) prevalence, predictors, and trajectories of psychological distress in HF; (ii) the scope and determinants of caregiver burden; (iii) adaptive and maladaptive coping strategies; and (iv) implications for integrated clinical care and policy.

Methods

A systematic search of PubMed, Scopus, PsycINFO, and Web of Science was conducted using combined terms for HF, psychological distress, caregiver burden, coping, and quality of life. Data extraction and thematic synthesis aligned with review objectives.

Results

Psychological distress is common in HF. Pooled depression estimates typically range from 20% to 42%, and pooled estimates of anxiety from 15% to 30%, with several reviews reporting wider ranges depending on measurement and setting. Distress is consistently associated with advanced disease severity (New York Heart Association Class III–IV), high symptom burden, and social isolation. Informal caregivers experience significant emotional, physical, social, and financial strain. Higher burden is associated with greater patient severity/depression, caregiver female sex and spousal status, and limited support. Adaptive coping (problem-solving, social support) links to better outcomes; maladaptive strategies (avoidance, rumination) correlate with greater distress and burnout.

Conclusion

Heart failure care should integrate routine psychosocial assessment, dyadic interventions, and caregiver support. Implementing structured mental health screening, collaborative care models, and respite and navigation services can improve outcomes, enhance quality of life, and sustain caregiving capacity.

1. INTRODUCTION

Heart failure (HF) is a global health crisis affecting over 64 million people worldwide, imposing significant clinical, economic, and psychosocial burdens that extend far beyond cardiac physiology.[1-3] This global health challenge is defined by the heart's inability to maintain adequate circulation, leading to a progressive trajectory marked by high symptom burden, functional decline, and recurrent, often debilitating, hospitalizations, which disrupt patients' lives and

***Corresponding author:**
Fengjie Guo
School of Medicine, South China University of Technology, Guangzhou 510006, Guangdong, China.
Email: guofengjie@scut.edu.cn

strain healthcare systems.[4] While monumental strides have been made in pharmacologic and device-based therapies, significantly improving survival rates and slowing disease progression, the psychosocial dimensions of HF experience remain inadequately addressed within standard clinical pathways and routine care models.[5-7] This represents a critical gap in holistic patient management.

Psychological distress, manifesting as symptoms of depression, anxiety, and post-traumatic stress, is not merely an incidental comorbidity but a core component of the HF illness experience.[8-13] This distress is robustly associated with a cascade of adverse outcomes, including poorer adherence to complex medical regimens, decreased engagement in self-care behaviors, increased rates of hospital readmission, elevated healthcare utilization costs, and a higher risk of mortality. Parallel to the patient's struggle is the often-invisible burden shouldered by informal caregivers—typically family members or close friends—who provide essential, unpaid day-to-day support. These caregivers experience high rates of emotional strain, chronic physical exhaustion, profound social restriction, and substantial financial challenges, all of which compromise their own health and well-being.[14-17]

Critically, patient and caregiver well-being are not independent; they are tightly interdependent within a dyadic system.[18,19] The psychological state of one directly influences the health behaviors and outcomes of the other. For instance, a patient's depression can lead to poor self-care, triggering a clinical decompensation that exponentially increases caregiver stress. Conversely, a burned-out caregiver may provide suboptimal support, exacerbating the patient's anxiety and worsening disease management. Despite this intricate interdependence, most contemporary HF care models remain siloed, focusing predominantly on the individual patient's biomedical parameters and failing to systematically assess, acknowledge, or treat this dyadic burden.

Therefore, this review deliberately adopts an integrated biopsychosocial perspective. It moves beyond viewing psychological distress and caregiver burden as isolated individual responses to a chronic medical condition. Instead, it conceptualizes them as interconnected outcomes that are dynamically shaped by a complex interplay of factors: the underlying biological severity and trajectory of the heart disease itself; the individual psychological makeup and coping resources of both patient and caregiver; the interpersonal dynamics, communication patterns, and quality of the relationship within the dyad; the structure, accessibility, and responsiveness of formal healthcare and support systems; and the broader socioeconomic context, including financial resources, social capital, and cultural norms surrounding illness and caregiving. This systemic lens is essential for developing effective, person- and family-centered interventions.

1.1. OBJECTIVES

Despite a growing body of literature and increased clinical recognition of psychosocial contributors to HF outcomes, a comprehensive synthesis of the interplay between patient psychological distress and caregiver burden remains relatively limited. This review aims to bridge this gap by providing a holistic synthesis. Its specific objectives are to: (i) synthesize the current evidence on the epidemiology, key predictors, and clinical correlates of psychological distress in adults with HF; (ii) characterize the multifaceted nature, measurable magnitude, and primary domains (emotional, physical, social, financial) of burden experienced by their informal caregivers; (iii) examine the spectrum of coping mechanisms—both adaptive and maladaptive—employed by patients and caregivers, and evaluate how these strategies mitigate or exacerbate distress within the dyad; and (iv) translate these findings into a set of clear, actionable, and evidence-informed recommendations aimed at clinicians, healthcare systems, and policymakers to foster the integration of comprehensive psychosocial care into standard HF management.

1.2. SIGNIFICANCE OF THE RESEARCH

Heart failure management stands at a pivotal crossroads. Holistic, effective, and sustainable care necessitates a fundamental paradigm shift from an exclusively organ-centric, biomedical model to a comprehensive biopsychosocial model that explicitly acknowledges and addresses the psychological and social dimensions of illness.[20-23] The persistent failure to integrate this perspective into routine care has tangible, negative consequences: it compromises patient clinical outcomes and quality of life, jeopardizes the physical and mental health (termed as specific, measurable manifestations of distress) of the essential informal caregiver workforce, and ultimately threatens the economic and practical sustainability of home-based care, which is the cornerstone of HF management.[24-26] This review plays a crucial role by integrating, critiquing, and synthesizing existing evidence on patient suffering, caregiver burden, and their mediating coping processes. It aims to inform and educate clinicians—including cardiologists, primary care physicians, nurses, and mental health professionals—about the critical psychosocial facets of HF. It seeks to guide researchers by identifying persistent gaps in the literature and proposing prioritized directions for future inquiry. Furthermore, it intends to provide policymakers and healthcare administrators with a consolidated evidence base to advocate for and design system-level changes, such as revised payment models and integrated care pathways. Ultimately, the goal is to accelerate the implementation of truly person- and family-centered interventions that can improve outcomes, enhance quality of life for both patients and caregivers, and build more resilient care dyads and families facing the challenges of HF.

2. METHODS

This review employed a narrative review methodology to synthesize current evidence on psychological distress and caregiver burden in HF. This methodological approach was selected as the most appropriate for the review's aims. It combines the rigor and reproducibility of a systematic literature search strategy with the flexible, integrative thematic synthesis characteristic of narrative reviews. This is particularly suitable for examining a complex, multidisciplinary field like psychosocial oncology, where evidence originates from heterogeneous study designs (e.g., randomized trials, longitudinal cohorts, cross-sectional surveys, qualitative studies), utilizes a wide array of measurement tools, and involves diverse patient populations and healthcare contexts. A formal meta-analysis, while valuable for generating precise pooled statistical estimates, was deliberately not conducted. This decision was based on the anticipated and observed high degree of methodological heterogeneity across studies—particularly in the instruments used to measure psychological constructs (e.g., different depression scales with varying cut-offs), the characteristics of sampled populations (varying in age, HF etiology, comorbidity, and cultural background), and the settings of care (primary, secondary, tertiary; different countries and health systems). Such heterogeneity would significantly limit the clinical interpretability and validity of any single pooled estimate, making a narrative synthesis a more robust and insightful approach for this comprehensive overview.

A systematic literature search was conducted in the following electronic databases: PubMed, Scopus, PsycINFO, and Web of Science. The search strategy utilized the keywords: "heart failure," "cardiac failure," "psychological distress," "depression," "anxiety," "caregiver burden," "family caregiver," "informal care," "coping," "resilience," and "quality of life." The search was restricted to studies on human adults and published in English. For the purposes of this review, conceptual clarity is paramount. Therefore, "psychological distress" is operationally defined and used as an umbrella term encompassing the commonly co-occurring symptoms of depression (e.g., low mood, anhedonia), anxiety (e.g., excessive worry, nervousness), and post-traumatic stress (e.g., hyperarousal, intrusion related to cardiac events). "Caregiver burden" is defined as the multidimensional strain—encompassing emotional (e.g., stress, depression), physical (e.g., fatigue, health decline), social (e.g., role strain, isolation), and financial (e.g., out-of-pocket costs, lost income) domains—experienced by an informal caregiver as a direct result of their caregiving responsibilities. Inclusion criteria were: (i) focus on adult populations (⩾ 18 years) related to HF (patients/caregivers); (ii) inclusion of patient and/or caregiver psychosocial outcomes; (iii) original research articles, systematic reviews, or meta-analyses published in peer-reviewed academic journals. Exclusion criteria included: (i) studies focusing exclusively on acute HF without a chronic HF context; (ii) studies involving pediatric populations (<18 years); (iii) editorials and conference abstracts (due to lack of peer-reviewed detail); and (iv) studies not published in English. Titles and abstracts were screened for relevance by the primary author, followed by a full-text review of potentially eligible articles against the inclusion/exclusion criteria. Data extraction focused on the study design, sample characteristics, key findings on distress/burden prevalence, predictors, coping strategies, and intervention outcomes. The synthesis was not a simple aggregation of findings but was structured thematically to align with the study objectives, enabling the integration of evidence across study types to build a coherent narrative.

3. RESULTS

3.1. PREVALENCE OF PSYCHOLOGICAL DISTRESS IN PATIENTS WITH HEART FAILURE

Patients with HF consistently exhibit markedly elevated rates of depression and anxiety when compared to age-matched populations.[27-30] The sheer prevalence of these conditions underscores their significance. Pooled estimates suggest that clinically significant depressive symptoms affect approximately 20% to 42% of HF patients, while anxiety symptoms are prevalent in about 15% to 30% of this population.[31-37] It is crucial to note, however, that these are typical ranges; some meta-analyses report even wider variations, a discrepancy primarily attributable to methodological heterogeneity. This heterogeneity includes the use of different screening and diagnostic instruments, varying severity thresholds for defining a "case," differences in sample characteristics, and cultural factors influencing the reporting of psychological symptoms. Post-traumatic stress symptoms, often related to traumatic experiences, such as sudden cardiac arrest, implantable cardioverter-defibrillator (ICD) shocks, or intensive care unit admissions, are reported in roughly 10% of patients and have been associated with increased HF hospitalizations.[38] Beyond these core disorders, sleep disorders (including insomnia and sleep-disordered breathing) and severely impaired health-related quality of life are nearly ubiquitous and show strong, bidirectional correlations with psychological distress. It is therefore imperative to interpret any single prevalence figure with caution, recognizing that the true burden is influenced by a complex interplay among disease factors, measurement approaches, and clinical and cultural settings.

The development and persistence of psychological distress in HF are not random but are linked to a constellation of identifiable factors, which can be broadly categorized:

- Disease-related factors: Higher New York Heart Association (NYHA) class (III–IV), frequent hospitalizations (⩾2/year), reduced functional capacity, ICD shocks, and multimorbidity (e.g., chronic obstructive pulmonary disease, renal disease).[39-48]
- Psychosocial factors: Social isolation, low perceived social support, socioeconomic disadvantage, and a history of mental health disorders.[49-53]
- Symptom burden: Dyspnea, fatigue, pain, and sleep disturbances show strong, dose–response associations with depressive and anxious symptoms.[54-57]

Figure 1 illustrates the prevalence of key psychological symptoms among HF patients, synthesized from recent analyses.[1,9,31,58-62] In summary, psychological distress is a prevalent comorbidity in HF, closely tied to both biomedical disease markers and psychosocial vulnerability factors. Addressing distress in HF patients requires a comprehensive approach that targets not only the underlying cardiac disease but also the psychological, social, and behavioral factors that contribute to emotional suffering.

3.2. CAREGIVER BURDEN AMONG CAREGIVERS OF PATIENTS WITH HEART FAILURE

The role of the informal caregiver is universally acknowledged as pivotal to the successful management of HF at home, yet this essential role is associated with a significant and multifaceted burden.[63-66] Caregivers, who are usually spouses or adult children with a mean age often over 60 years, report high levels of strain across several distinct but interrelated domains:

- Emotional burden (defined as caregivers' subjective distress from caregiving tasks): Feelings of stress, helplessness, constant worry about the patient's condition, anxiety, and clinically significant depression are common.[67,68] Quantitatively, studies indicate that up to 78% of HF caregivers report experiencing notable stress, and approximately 40% exhibit symptoms meeting thresholds for depression—a rate comparable to, or sometimes even higher than, that observed in the patients themselves.[69,70]
- Physical burden: Chronic sleep deprivation due to

caregiving duties (e.g., nighttime symptom monitoring), persistent fatigue that impairs their own daily functioning, body aches, and general deterioration of personal health are frequently reported.[71,72]

- Social burden: Caregiving responsibilities consume time and energy, often leading to strained relationships with the patient (e.g., conflict over illness management), reduced contact with friends, and withdrawal from social and recreational activities, affecting over 50% of caregivers and fostering profound isolation.[73]
- Financial burden: Costs related to care, including travel, medications, and specialized dietary needs, as well as lost income from reduced work hours, create significant financial strain.[74-76] Financial burden is particularly acute for low-income caregivers and those without health insurance, who may struggle to afford essential care supplies or forego their own medical care to prioritize the patient.

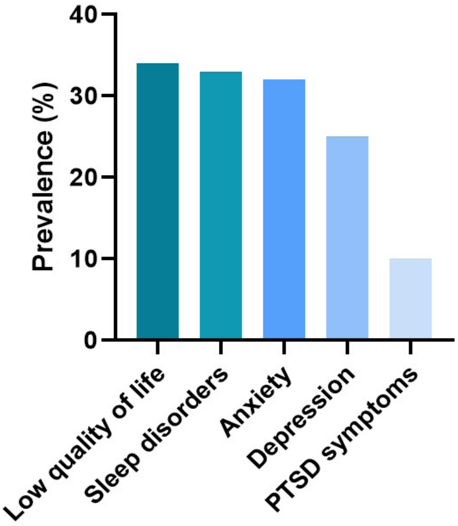

Figure 1. Prevalence of psychological symptoms in patients with heart failure (HF) (%). This figure synthesizes pooled prevalence rates of common psychological symptoms reported in the HF literature, highlighting that impaired health-related quality of life and sleep disturbances are the most prevalent, followed by clinically significant anxiety and depression. These data underscore the high psychosocial burden in HF, which often coexists with physical symptoms and warrants integrated assessment in clinical practice. Abbreviation: PTSD: Post-traumatic stress disorder.

Caregiver burden is not static; it dynamically intensifies in tandem with increased patient illness severity, functional decline, and the frequency of health crises.[77] Its impact, however, is moderated by several key factors. Caregivers who are female, in a spousal relationship with the patient, caring for patients with advanced disease or cognitive impairment, and those who report low levels of perceived support—whether from other family members, friends, or the formal healthcare systems—consistently report higher levels of burden and worse mental health outcomes.[78-81] The determinants of caregiver depressive symptoms themselves are multifactorial and complex. One illustrative study found that 54% of the variance in these symptoms could be explained by a combination of factors: the method of payment for the patient's treatment, recent patient hospital readmissions (⩽3 months), caregiving duration, overall burden levels, and the use of both adaptive and maladaptive coping strategies.[82] This underscores that burden is not a simple function of patient health but is filtered through the caregiver's resources and responses. Furthermore, a worsening patient's NYHA functional class is directly associated with measurable increases in caregiver burden across all domains—physical, emotional, and social.[83] Caregivers identified through screening as "high-risk"—often based on low social support, high initial burden, or poor coping skills—report greater subsequent levels of burden and depression, highlighting a subgroup in urgent need of targeted intervention.[84,85]

Crucially, caregiver mental health is not an isolated outcome; it is a strong predictor of patient outcomes. Studies demonstrate that caregiver depression and burden are associated with worse patient medication adherence, poorer diet compliance, and higher rates of emergency department visits and unplanned hospitalizations.[86-88] This dyadic linkage is quantified in previous studies. For example, one study reported that elevated caregiver burden correlates with significantly worse patient physical health outcomes (64.5% vs. 35.5%).[89] Figure 2 outlines the primary domains and reported prevalence of burden among HF caregivers as synthesized from the associated analyses.[69,74,89] Taken together, caregiver burden in HF is a multidimensional construct that escalates predictably with patient disease progression. It is deeply intertwined with, and can be exacerbated or buffered by, the caregiver's own psychosocial resources, coping capacities, and the support systems (or lack thereof) surrounding them. This establishes the care dyad, not the individual patient, as a critical unit for clinical assessment and intervention.

3.3. COPING STRATEGIES OF PATIENTS AND CAREGIVERS

Coping processes—the cognitive and behavioral efforts used to manage external and internal demands appraised as taxing or exceeding one's resources—substantially modulate the impact of HF-related stress for both patients and informal caregivers.[90-92] Consistent with the influential transactional model of stress and coping, coping strategies are commonly grouped into problem-focused strategies (aimed at managing or altering the stressor itself), emotion-focused strategies (aimed at regulating the emotional response to the stressor), and avoidance-focused strategies (aimed at evading the stressor or its associated feelings).[93,94] Importantly, coping in the context of a chronic illness like HF is dynamic, context-dependent, and dyadic-oriented. The strategies employed by one member of the dyad (e.g., a patient denying symptoms) can directly influence the stress appraisal, coping choices, and well-being of the other (e.g., increasing caregiver frustration and anxiety), creating a reciprocal feedback loop within the care partnership.

3.3.1. ADAPTIVE COPING STRATEGIES

Adaptive coping strategies support effective illness management and emotional regulation, reducing the negative impact of heart failure on both patients and caregivers.

- Problem-focused coping: Includes active, instrumental engagement with the illness. For patients, this includes vigilant symptom monitoring and management, strict adherence to medications and diet, timely medical care-seeking during exacerbations, proactive information-seeking about HF, engaging in advance care planning, and establishing structured self-care routines.[95-100] For caregivers, it involves learning caregiving skills, efficiently managing appointments and medications, and problem-solving daily challenges. Across numerous studies, greater use of problem-focused coping is consistently associated with lower levels of depressive symptoms, improved health-related quality of life, enhanced self-care confidence and maintenance, and fewer HF-related hospitalizations for patients.[101-103]

- Emotion-focused coping: Includes efforts to manage the emotional distress caused by HF. This includes practices like mindfulness meditation and acceptance-based therapies, relaxation training (e.g., deep breathing), positive reappraisal (finding meaning or silver linings), spiritual or religious engagement, and actively seeking emotional support from family, peers, or clinicians.[49,104-106] These strategies are generally linked to reduced anxiety and depressive symptoms, better dyadic adjustment (improved relationship quality and teamwork), and significantly improved caregiver well-being and sense of competence.[107-109] A key dyadic insight is that adaptive coping in one member can benefit both; for example, a caregiver's use of mindfulness may reduce their own reactivity, allowing them to provide calmer, more effective support, which in turn lowers the patient's distress.

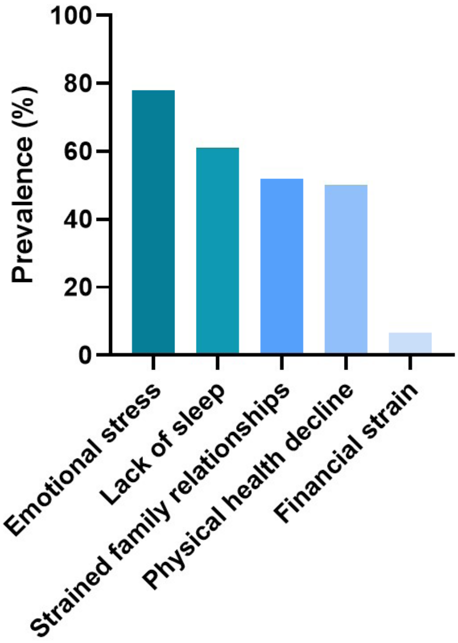

Figure 2. Domains and relative prevalence of burden among informal caregivers of heart failure (HF) patients. This bar chart illustrates both the multidimensional nature and the relative frequency of burden experienced by HF caregivers. Emotional exhaustion emerges as the most widespread domain, reflecting the chronic emotional toll of caregiving. These findings emphasize that caregiver burden is not only common but also multifaceted, necessitating support strategies that address emotional, physical, social, and financial strains.

3.3.2. MALADAPTIVE COPING STRATEGIES

In contrast, maladaptive coping strategies exacerbate stress and are associated with worse psychological health and disease outcomes.

- Avoidance and behavioral disengagement: Examples include patients delaying or avoiding necessary medical appointments, skipping medications, or psychologically denying the severity of their illness. Caregivers may avoid discussing prognosis or future care needs. These strategies are strongly associated with poorer overall disease management, more frequent clinical exacerbations, and higher levels of psychological distress.[110-113]
- Rumination: Repetitive negative thinking about symptoms, disease prognosis, or caregiving challenges is another maladaptive pattern. It strongly correlates with elevated anxiety and depression and is a known precursor to caregiver burnout, a state of emotional, physical, and mental exhaustion.[114-116]
- Self-blame and substance use: Patients or caregivers engaging in self-reproach for the illness or reliance on alcohol/sedatives to manage distress experience worse mood symptoms, poorer quality of life, and reduced treatment adherence.[117-119]

3.3.3. MODERATORS AND CONTEXTUAL CONSIDERATIONS

The use and effectiveness of coping strategies are shaped by multiple demographic, relational, and contextual factors.

- Gender differences: Several studies suggest women (both as patients and caregivers) may report more rumination and emotion-focused strategies like seeking support, while men may show greater behavioral disengagement. These patterns are likely influenced by deeply ingrained societal role expectations and the specific context of the caregiving relationship.[120-122]
- Caregiver risk profiles: High-risk caregivers report lower social support, weaker problem-solving skills and family functioning, and greater burden.[84] Caring specifically for patients with advanced HF symptoms is independently associated with increased caregiver strain and poorer physical health, underscoring the need for stage-specific, targeted support interventions.[123]
- Coping style correlates: An anxious preoccupation coping style, characterized by hypervigilance and catastrophic thinking, is linked to poorer psychosocial and spiritual outcomes for the caregiver.[124]
- Rurality: Geographic isolation and limited access to specialized medical services, support groups, and respite care in rural areas significantly worsen caregiver outcomes. Here, technology-mediated solutions, such as telehealth consultation networks, digital peer support, and mobile health applications, show promise in mitigating these geographic and access barriers.[125]

Figure 3 summarizes the common adaptive and maladaptive coping strategies and their general associations with outcomes for HF patients and caregivers. Overall, coping is a critical mediator and potentially modifiable target in the HF stress process. Adaptive strategies serve as vital protective factors, fostering resilience and better dyadic management, while maladaptive strategies act as potent exacerbating

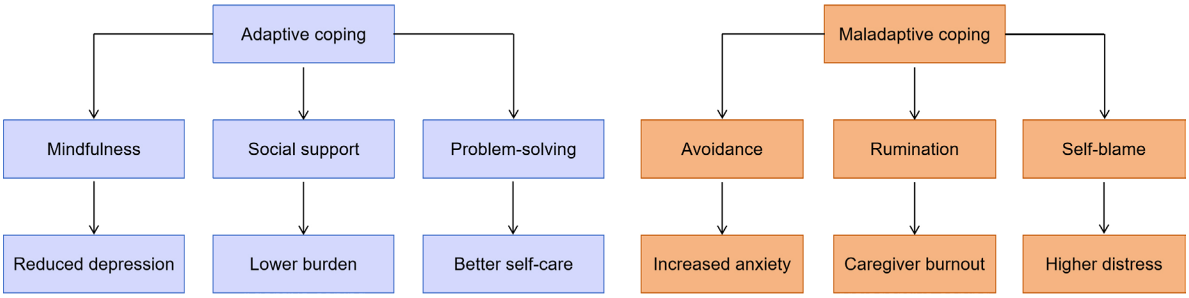

Figure 3. Adaptive and maladaptive coping strategies in heart failure dyads and their associated outcomes. This comparative table summarizes how different coping approaches are generally associated with psychosocial and health outcomes in patients and caregivers. Adaptive strategies (e.g., problem-solving, mindfulness) are associated with better emotional regulation and self-care, whereas maladaptive strategies (e.g., avoidance, rumination) correlate with heightened distress and poorer illness management. The contrast reinforces the importance of promoting adaptive coping within dyadic interventions.

factors, deepening distress and dysfunction for both members of the care partnership. This underscores the importance of interventions that build coping skills.

3.4. THE ROLE OF ORGANIZATIONAL AND SOCIAL SUPPORT

Beyond individual and dyadic coping, the perception and reality of support from external systems play a decisive role in buffering psychological distress for patients and alleviating caregiver burden.[126-128] Perceived support from empathetic, communicative healthcare providers and a well-coordinated health system can itself be therapeutic. Evidence-informed organizational supports that have demonstrated benefit include:

- Structured caregiver education and skills training programs, which systematically teach disease management, symptom recognition, and care techniques, leading to increased caregiver self-efficacy, competence, and reduced subjective burden.[129,130]
- Access to respite care services, which provide planned, temporary relief from caregiving duties, is crucial for preventing burnout, allowing caregivers to attend to their own health, and helping to sustain long-term caregiving capacity.[131-133]
- Integrated care models that embed mental health professionals (e.g., psychologists, social workers) directly within cardiology or HF management teams are highly effective. These models facilitate the co-management of psychosocial and cardiac needs through regular team communication, shared care plans, and warm handoffs, breaking down the traditional mind-body care divide.[134-136]
- Telehealth and digital interventions—such as remote patient monitoring systems with integrated psychosocial check-ins, supportive mobile applications for symptom tracking and education, and virtual peer support groups—are expanding access to support. They are particularly valuable for reaching populations in rural or underserved settings where in-person services are scarce.[137-139] For example, a telehealth early palliative care intervention for family caregivers of patients with advanced HF has been shown to significantly improve caregiver quality of life and mood.

Conversely, systemic barriers actively contribute to distress and burden. Fragmented care, poor communication, and lack of care coordination among different healthcare providers and teams, and the systemic failure to recognize, document, or valorize the essential contributions of informal caregivers are all associated with higher levels of frustration, anxiety, and strain for the dyad.[140,141] At the more intimate interpersonal level, perceived social support from family and friends, while generally reported as high, tends to be lower among specific vulnerable subgroups: male caregivers, individuals living alone with limited natural networks, those under significant financial strain, and those caring for patients with more severe heart disease, who may also withdraw socially.[142,143] This highlights that both formal system design and informal social network strength are critical, modifiable determinants of the dyad's psychosocial well-being.

4. DISCUSSION

This study indicates that psychological distress in patients and the multidimensional burden on their informal caregivers are not peripheral or secondary concerns in HF; they are core, defining features of the illness experience for millions of families worldwide.[144] Both phenomena are consistently associated with a triad of negative consequences: problems with adherence to life-sustaining treatments, increased utilization of high-cost healthcare services (especially hospitalizations), and worse long-term clinical outcomes, including higher mortality. The relationship is fundamentally bidirectional and dyadic. It is important to frame this cautiously: while the evidence for association is strong, the predominance of cross-sectional data in the literature limits its definitive causal conclusions. Nevertheless, the logical and observed pathways are clear. Patient depression and anxiety can directly undermine the motivation, energy, and cognitive clarity needed for effective self-care (e.g., fluid restriction, daily weighing), precipitating avoidable clinical deterioration and hospitalizations, which in turn dramatically heightens caregiver strain and worry. In a reciprocal cycle, a caregiver who is emotionally exhausted, depressed, or overwhelmed may become less patient, less attentive, or less effective in providing the practical and emotional support the patient needs, inadvertently further compromising patient outcomes. This vicious cycle underscores the clinical and ethical imperative for care models that move beyond the individual patient to incorporate routine dyadic assessment and family-centered care.

4.1. A DYADIC INTERACTION FRAMEWORK FOR HEART FAILURE PATIENTS AND CAREGIVERS

A deeper synthesis of the evidence reveals that patient and caregiver experiences are not merely parallel tracks running side-by-side; they are fundamentally interwoven within a single, dynamic dyadic system, best understood through a biopsychosocial systems lens. Beyond psychosocial processes, emerging multilevel models further conceptualize distress and burden as embedded within interacting neurobiological and physiological systems (e.g., stress-response axes, neural circuits of empathy and regulation), which reciprocally influence behavioral and health outcomes across the dyad. Patient factors (biological: NYHA class IV; psychological: anxiety) directly impact caregiver factors (emotional burden: worry; social role: constant vigilance), which in turn feed back to influence patient factors (biological: reduced adherence worsens cardiac function). For instance, a patient's use of avoidance coping (e.g., denying worsening edema) may lead to missed medications and delayed care-seeking, triggering a severe health crisis (acute pulmonary edema) that overwhelms the caregiver's capacity, inducing a crisis of confidence and burnout. Conversely, a caregiver experiencing burnout may emotionally withdraw or become irritable, reducing the quality of instrumental and emotional support, which exacerbates the patient's feelings of depression, loneliness, and helplessness, creating an environment hostile to effective self-management. This interdependency powerfully underscores the fundamental limitation of interventions that target only the patient or the caregiver in isolation. A systems perspective emphasizes that distress and burden are not simply individual deficits or weaknesses. They are context-dependent processes that emerge from and are sustained by multiple interconnected factors: the biological disease process, the psychological resources of two individuals, the dyadic relationship dynamics, the structure of the healthcare system they navigate, and the socioeconomic resources available to them. Future care models must therefore explicitly conceptualize the "HF dyad" as the essential unit of intervention. This requires assessing their shared stressors, improving their communication and collaborative problem-solving skills, and providing support that acknowledges their intertwined fates.

Translating this framework into practice is both feasible and strongly warranted. A foundational step is the integration of brief, validated psychosocial screening into every routine HF encounter—at diagnosis, during annual reviews, and especially after major clinical events like hospitalization or an ICD shock. Recommended tools include the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) (or Hospital Anxiety and Depression Scale [HADS]) for patients, and the Zarit Burden Interview or Caregiver Strain Index for caregivers, with stepped responses guided by symptom severity. Tailored interventions should follow screening: for patients, cognitive-behavioral therapy and mindfulness-based approaches show benefit; for caregivers, skills training, peer support, and respite services are key components.[145-147] Embedding these elements within collaborative HF care pathways has demonstrated improved outcomes, enhanced quality of life, and a greater sustainability of the home-based caregiving arrangement.

4.2. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The current evidence base has notable limitations: numerous studies are cross-sectional, limiting causal inference; measurement tools and thresholds vary widely, complicating comparisons; and samples often underrepresent racially/ethnically diverse and socioeconomically disadvantaged populations. This lack of representativeness raises serious concerns about the equity, generalizability, and cultural relevance of current findings and the interventions developed from them. These populations often face compounded barriers to care and may experience unique psychosocial stressors, meaning their needs may be both greater and different. To address these gaps, future research should prioritize:

- Longitudinal, dyadic studies to track the same patient–caregiver pairs over months or years are urgently needed. Such studies can elucidate the co-evolution of patient distress and caregiver burden across the HF trajectory, identify critical transition points (e.g., after first hospitalization), and clarify temporal and causal precedence within the dyadic relationship.
- Randomized controlled trials evaluating integrated, dyadic psychosocial interventions that are pragmatically embedded within real-world HF service delivery. These trials should be powered to detect effects not only on patient clinical outcomes (e.g., hospitalizations, mortality) but equally on caregiver outcomes (burden, depression, quality of life) and should include rigorous cost-effectiveness analyses.
- Qualitative and mixed-methods research focused on capturing the lived experiences, values, and preferences of underserved and minority populations. This research is essential to inform the development of culturally tailored, acceptable, and effective interventions that address specific contextual barriers and strengths.
- Health services research that moves beyond efficacy to assess real-world strategies for scaling up successful psychosocial care models. This includes studying workforce training needs, workflow integration, sustainable financing mechanisms (e.g., through value-based payment), and the use of digital tools to increase reach and fidelity.

5. IMPLICATION AND FURTHER SUGGESTION

5.1. FOR CLINICAL PRACTICE

The growing evidence linking psychological distress to adverse outcomes in heart failure necessitates its integration into routine clinical care. The following recommendations outline key strategies for identifying and addressing the psychosocial needs of both patients and their caregivers.

(i) Implement routine screening for psychological distress in all adults with HF at baseline, at least annually, and after major clinical events (e.g., hospitalization, ICD shocks) using validated tools (e.g., PHQ-9 or HADS for depression/anxiety; GAD-7 for anxiety; brief sleep screening). Use measurement-based care with clear referral and follow-up pathways (strong evidence).[148]

(ii) Routinely assess caregiver burden and well-being during patient visits using brief, validated instruments (e.g., Zarit Burden Interview-Short Form, Caregiver Strain Index, PHQ-2/9, GAD-7). Document caregiver identity and needs in the electronic health record and provide targeted referrals (strong evidence).[54]

(iii) Integrate mental health professionals (e.g., psychologists, clinical social workers) into multidisciplinary HF teams to deliver collaborative, stepped care, including brief cognitive behavioral therapy (CBT)/problem-solving therapy, motivational interviewing, and sleep interventions, with in-person and telehealth options (moderate evidence).[149]

(iv) Develop and deliver structured caregiver education and support programs that include HF self-management, symptom monitoring, medication management, communication skills, stress-management techniques (e.g., CBT, mindfulness), crisis planning, and navigation to respite and community resources. Offer peer support and culturally/linguistically appropriate materials (moderate evidence).[150]

5.2. FOR HEALTH POLICY

Realizing comprehensive psychosocial support for heart failure dyads requires systemic changes that extend beyond individual clinical encounters. Policy-level interventions are essential to create an enabling environment that values, reimburses, and sustains caregiver-inclusive care models.

(i) Align payment models to reimburse psychosocial assessment and interventions for patients and caregivers within HF care bundles and value-based contracts; enable billing for caregiver assessment and education; ensure telehealth parity for behavioral health services (emerging evidence/policy innovation).[151]

(ii) Enact policies that recognize and support informal caregivers, including paid family leave, workplace flexibility, caregiver training benefits, and targeted tax credits or stipends; require caregiver identification and consent-to-contact in health records (policy imperative).[152]

(iii) Fund the development, rigorous evaluation, and dissemination of evidence-based digital and hybrid psychosocial supports for HF dyads, with standards for accessibility, multilingual content, privacy, and interoperability with clinical systems (research and development priority).

5.3. FOR RESEARCH

Despite significant advances in understanding the psychosocial dimensions of heart failure, critical knowledge gaps remain. Future research must prioritize rigorous, dyadic-focused investigations to establish the efficacy, implementation strategies, and economic value of integrated psychosocial interventions.

1. Conduct large, multicenter randomized and pragmatic trials of dyadic interventions (e.g., collaborative care, CBT/problem-solving, mindfulness-based approaches, caregiver skills training), powered for patient outcomes (health-related quality of life, adherence, hospitalizations, mortality), caregiver outcomes (burden, mood, quality of life), and cost-effectiveness (high priority).[153]
2. Investigate the long-term economic impact of integrating psychosocial care on utilization and costs (e.g., hospital readmissions, emergency visits), including budget impact and return-on-investment analyses across diverse care settings (high priority).[154]
3. Develop, validate, and implement brief dyadic assessment tools suitable for busy clinics and remote monitoring; establish psychometric properties, actionable cut-points, and minimal clinically important differences; integrate tools into electronic health records with decision support (methodological priority).[155]

6. CONCLUSION

In summary, HF care must adopt a biopsychosocial model that addresses both the "heart and mind." Psychological distress and caregiver burden should be understood not as unfortunate add-ons but as system-level phenomena that emerge from dynamic, reciprocal interactions among biological disease processes, individual psychological and cognitive responses, dyadic interpersonal regulation and communication, and the broader societal and healthcare support structures (or lack thereof) surrounding the patient-caregiver unit. Coordinated action by clinicians, health systems, and policymakers is essential. This action must focus on systematically recognizing, routinely assessing, and effectively treating psychological distress and caregiver burden as standard components of high-quality HF care. By doing so, we can meaningfully improve clinical and person-centered outcomes, enhance the quality of life, and safeguard the sustainability of informal care.

ACKNOWLEDGMENTS

None.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no competing interests.

AUTHOR CONTRIBUTIONS

Conceptualization: Fengjie Guo
Data curation: Di Wang, Fengjie Guo
Formal analysis: Di Wang
Investigation: Di Wang
Methodology: Di Wang, Fengjie Guo
Resources: Fengjie Guo
Writing–original draft: Di Wang, Fengjie Guo
Writing–review & editing: Di Wang, Fengjie Guo

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Not applicable.

DATA AVAILABILITY STATEMENT

Data availability is not applicable to this article as no new data were created or analyzed.

Submitted: 22 December 2025; Revision received: 10 February 2026; Accepted: 13 February 2026; Published: 31 March 2026

REFERENCES

1. Savarese G, Becher PM, Lund LH, Seferovic P, Rosano GMC, Coats AJS. Global burden of heart failure: a comprehensive and updated review of epidemiology. *Cardiovasc Res*. 2023;118(17):3272-3287. doi: 10.1093/cvr/cvac013

2. Martin SS, Aday AW, Almarzooq ZI, *et al*. 2024 Heart Disease and Stroke Statistics: A Report of US and Global Data From the American Heart Association. *Circulation*. 2024;149(8):e347-e913. doi: 10.1161/CIR.0000000000001209

3. Arndt MB, Abate YH, Abbasi-Kangevari M, *et al*. Global, regional, and national progress towards the 2030 global nutrition targets and forecasts to 2050: a systematic analysis for the Global Burden of Disease Study 2021. *The Lancet*. 2024;404(10471):2543-2583. doi: 10.1016/s0140-6736(24)01821-x

4. Heidenreich PA, Bozkurt B, Aguilar D, *et al*. 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation*. 2022;145(18):e895-e1032. doi: 10.1161/CIR.0000000000001063

5. Shi J, Yu X, Liu Z. A Review of New-Onset Ventricular Arrhythmia after Left Ventricular Assist Device Implantation. *Cardiology*. 2022;147(3):315-327. doi: 10.1159/000524779

6. Levine GN, Carney RM, Cohen BE, *et al*. Post-Myocardial Infarction Psychological Distress: A Scientific Statement From the American Heart Association. *Circulation*. 2025;152(16):e298-e310. doi: 10.1161/CIR.0000000000001381

7. Han Y, Sun W, Han J, Li S, Zhou Y. Effects of six traditional Chinese mind-body exercise therapies on vascular health and cardiac function in middle-aged and elderly hypertensive patients: A network meta-analysis of 48 randomized controlled trials. *Ageing Res Rev*. 2025;115:103007. doi: 10.1016/j.arr.2025.103007

8. Wan B, Wang Y, Lv Q, *et al*. Conjoint trajectories of anxiety and depression in patients with heart failure and their caregivers within 3 months post-discharge: exploring their interconnections with dyadic burdens using network analysis. *Eur J Cardiovasc Nurs*. 2025;24(8):1287-1296. doi: 10.1093/eurjcn/zvaf126

9. Yingnan Z, Shulin Z, Minxia L, Qiao Z, Xiaoqing S. Patient and informal caregiver-centered nursing interventions for adults with heart failure: A systematic review and meta-analysis. *Intensive Crit Care Nurs*. 2025;88:103943. doi: 10.1016/j.iccn.2025.103943

10. Taylor E, Sparks D, Rukavina M, Biddle M, Wells GL. Nurse-led positive psychology intervention is feasible in patients with heart failure. *J Cardiovasc Nurs*. 2021;36(2):131-135. doi: 10.1097/JCN.0000000000000758

11. Ngamvichchukorn T, Ruengorn C, Noppakun K, Thavorn K, Hutton B, Sood MM, Knoll GA, Nochaiwong S. Association Between Pretransplant Dialysis Modality and Kidney Transplant Outcomes: A Systematic Review and Meta-analysis. *JAMA Netw Open*. 2022;5(10):e2237580. doi: 10.1001/jamanetworkopen.2022.37580

12. Huang Y, Zhang Y, Zhang Y, *et al*. Hearing impairment, psychological distress, and incident heart failure: a prospective cohort study. *Heart*. 2025;111(18):877-883. doi: 10.1136/heartjnl-2024-325394

13. IsHak WW, Hamilton MA, Korouri S, *et al*. Comparative effectiveness of psychotherapy vs antidepressants for depression in heart failure: a randomized clinical trial. *JAMA Netw Open*. 2024;7(1):e2352094. doi: 10.1001/jamanetworkopen.2023.52094

14. Celano CM, Golden J, Healy BC, Longley RM, Huffman JC. Predictors of completion and response to a psychological intervention to promote health behavior adherence in heart failure. *Int J Psychiatry Med*. 2022;57(1):21-34. doi: 10.1177/0091217421989830

15. Bajwah S, Oluyase AO, Yi D, *et al*. The effectiveness and cost-effectiveness of hospital-based specialist palliative care for adults with advanced illness and their caregivers. *Cochrane Database Syst Rev*. 2020;9(9):CD012780. doi: 10.1002/14651858.CD012780.pub2

16. Beheshtaeen F, Molazem Z, Kalyani MN, Mohebbi Z, Moshfeghinia R, Rad MG. Caregiver burden in informal caregivers of cardiac patients: a mixed-methods systematic review. *BMC Psychol*. 2026. doi: 10.1186/s40359-026-03973-0

17. Nijskens CM, Schouten AEM, MacNeil-Vroomen JL, Thomas EG, van der Meulen MP, Muller M. Program theory and economic

insights of a comprehensive geriatric assessment for frail heart failure patients. *BMC Geriatr*. 2025;25(1):1006. doi: 10.1186/s12877-025-06718-7

18. Suthershinii G, Tan WA, Lee ARYB, Chen MZ. Behavioral interventions for the patient-caregiver unit in patients with chronic heart failure: a systematic review of caregiver outcomes. *J Multidiscip Healthc*. 2022;15:921-939. doi: 10.2147/JMDH.S357179

19. Graven LJ, Azuero A, Abbott L, Grant JS. Psychosocial factors related to adverse outcomes in heart failure caregivers: a structural equation modeling analysis. *J Cardiovasc Nurs*. 2020;35(2):137-148. doi: 10.1097/JCN.0000000000000634

20. Graven LJ, Kitko L, Abshire Saylor M, *et al*. Palliative care and advanced cardiovascular disease in adults: not just end-of-life care: a scientific statement from the American Heart Association. *Circulation*. 2025;151(21):e1030-e1042. doi: 10.1161/CIR.0000000000001323

21. Khan KR, Khan OA, Chen C, *et al*. Impact of Moderate Aortic Stenosis in Patients With Heart Failure With Reduced Ejection Fraction. *J Am Coll Cardiol*. 2023;81(13):1235-1244. doi: 10.1016/j.jacc.2023.01.032

22. Manolis TA, Manolis AA, Manolis AS. Cognitive Behavioral Therapy in Cardiovascular Disease. *CVP*. 2025;23(2):77-97. doi: 10.2174/0115701611302479241010104240

23. Sukumar S, Flashner L, Logeman JL, O'Shea LK, Warraich HJ. Palliative care for older adults with cardiovascular disease. *Ann Palliat Med*. 2024;13(4):828-841. doi: 10.21037/apm-23-519

24. Garcia R, Gras D, Mansourati J, *et al*. Impact and safety of remote monitoring of heart failure patients managed with the HeartLogic algorithm: the HeartLogic France Cohort Study. *Eur Heart J Digit Health*. 2025;7(2):ztaf133. doi: 10.1093/ehjdh/ztaf133

25. Wang Y, Guo X, Wang Y, Guo N, Yang Q. Quality of relationship, depression, and sleep quality in patients with chronic heart failure and their spouse: an actor-partner interdependence model. *BMC Nurs*. 2025;24(1):1070. doi: 10.1186/s12912-025-03711-8

26. Iyngkaran P, Smith D, McLachlan C, Battersby M, De Courten M, Hanna F. Validation of Psychometric Properties of Partners in Health Scale for Heart Failure. *J Clin Med*. 2024;13(23):7374. doi: 10.3390/jcm13237374

27. Healey EL, Mallen CD, Chew-Graham CA, *et al*. Integrating case-finding and initial management for osteoarthritis, anxiety, and depression into primary care long-term condition reviews: results from the ENHANCE pilot trial. *Fam Pract*. 2022;39(4):592-602. doi: 10.1093/fampra/cmab113

28. Sumaqa YA, Hayajneh FA, Alhamory S, *et al*. Consequences of Psychological Aspects: From Jordanian Heart Failure Patients' Beliefs. *SAGE Open Nurs*. 2023;9:23779608231189128. doi: 10.1177/23779608231189128

29. Lin CY, Dracup K, Pelter MM, Biddle MJ, Moser DK. Association of psychological distress with reasons for delay in seeking medical care in rural patients with worsening heart failure symptoms. *J Rural Health*. 2022;38(4):713-720. doi: 10.1111/jrh.12573

30. Naghavi M, Kyu HH, Bhoomadevi A, *et al*. Global burden of 292 causes of death in 204 countries and territories and 660 subnational locations, 1990–2023: a systematic analysis for the Global Burden of Disease Study 2023. *The Lancet*. 2025;406(10513):1811-1872. doi: 10.1016/s0140-6736(25)01917-8

31. Easton K, Coventry P, Lovell K, Carter LA, Deaton C. Prevalence and measurement of anxiety in samples of patients with heart failure: meta-analysis. *J Cardiovasc Nurs*. 2016;31(4):367-379. doi: 10.1097/JCN.0000000000000265

32. Lee W, Pulbrook M, Sheehan C, *et al*. Clinically Significant Depressive Symptoms Are Prevalent in People With Extremely Short Prognoses-A Systematic Review. *J Pain Symptom Manage*. 2021;61(1):143-166.e2. doi: 10.1016/j.jpainsymman.2020.07.011

33. Sbolli M, Fiuzat M, Cani D, O'Connor CM. Depression and heart failure: the lonely comorbidity. *Eur J Heart Fail*. 2020;22(11):2007-2017. doi: 10.1002/ejhf.1865

34. Freedland KE, Skala JA, Steinmeyer BC, Carney RM, Rich MW. Effects of Depression on Heart Failure Self-Care. *J Card Fail*. 2021;27(5):522-532. doi: 10.1016/j.cardfail.2020.12.015

35. Gottlieb SS, Khatta M, Friedmann E, *et al*. The influence of age, gender, and race on the prevalence of depression in heart failure patients. *J Am Coll Cardiol*. 2004;43(9):1542-1549. doi: 10.1016/j.jacc.2003.10.064

36. Schiffer AA, Pedersen SS, Widdershoven JW, Denollet J. Type D personality and depressive symptoms are independent predictors of impaired health status in chronic heart failure. *Eur J Heart Fail*. 2008;10(8):802-810. doi: 10.1016/j.ejheart.2008.06.012

37. Konstam V, Moser DK, De Jong MJ. Depression and anxiety in heart failure. *J Card Fail*. 2005;11(6):455-463. doi: 10.1016/j.cardfail.2005.03.006

38. Almuwaqqat Z, Liu C, Ko YA, *et al*. Posttraumatic stress disorder and the risk of heart failure hospitalizations among individuals with coronary artery disease. *Circ Cardiovasc Qual Outcomes*. 2024;17(12):e011040. doi: 10.1161/CIRCOUTCOMES.124.011040

39. Gharzeddine R, McCarthy MM, Yu G, Dickson VV. Insomnia and Insomnia Symptoms in Persons With Heart Failure: An Integrative Review. *J Cardiovasc Nurs*. 2021;36(4):374-384. doi: 10.1097/JCN.0000000000000719

40. Luo YT, Ou AZ, Lin DS, *et al*. Status of anxiety and depression among chronic heart failure patients: factors influencing poor fluid restriction adherence. *World J Psychiatry*. 2025;15(6):103765. doi: 10.5498/wjp.v15.i6.103765

41. Gostoli S, Subach R, Guolo F, *et al*. Care manager role for older multimorbid heart failure patients' needs in relation to psychological distress and quality of life: a cross-sectional study. *Front Cardiovasc Med*. 2024;11:1432588. doi: 10.3389/fcvm.2024.1432588

42. Wang J, Cui J, Yang X, *et al*. The effects of frailty, mental health, and cardiac function on quality of life in patients undergoing transcatheter aortic valve replacement. *Sci Rep*. 2025;15(1):22440. doi: 10.1038/s41598-025-04859-8

43. Żółkowska B, Lee CS, Denfeld QE, *et al*. Clinical and psychological factors associated with frailty in patients with heart failure. *J Clin Med*. 2024;13(23):7345. doi: 10.3390/jcm13237345

44. Thotakura B, Vidya S, Sheena KS, Roy DD, Prabhu K, Jones S. A review of contributing factors to heart failure: genetic, lifestyle, and environmental influences. *J Pharm Bioallied Sci*. 2024;16(Suppl 5):S4299-S4305. doi: 10.4103/jpbs.jpbs_1328_24

45. Triposkiadis F, Xanthopoulos A, Parissis J, Butler J, Farmakis D. Pathogenesis of chronic heart failure: cardiovascular aging, risk factors, comorbidities, and disease modifiers. *Heart Fail Rev*. 2022;27(1):337-344. doi: 10.1007/s10741-020-09987-z

46. D'Souza PJJ, Lewis MS, Paramasivam G, *et al*. Factors associated with self-care behavior among heart failure patients in India: a systematic review. *J Educ Health Promot*. 2025;14:344. doi: 10.4103/jehp.jehp_1778_24

47. Noma S, Kato K, Otsuka T, *et al*. Sex differences in cardiovascular disease-related hospitalization and mortality in Japan: analysis of health records from a nationwide claim-based database, the Japanese Registry of All Cardiac and Vascular Disease (JROAD). *Circ J*. 2024;88(8):1332-1342. doi: 10.1253/circj.CJ-23-0960

48. Ferguson LD, Molenberghs G, Verbeke G, *et al*. Gout and incidence of 12 cardiovascular diseases: a case-control study including 152 663 individuals with gout and 709 981 matched controls. *Lancet Rheumatol*. 2024;6(3):e156-e167. doi: 10.1016/S2665-9913(23)00338-7

49. Smolderen KG, Gillaspy S, Evers AWM, *et al*. The Role of the Clinical Psychologist in the Care of Adults With Cardiovascular Disease. *JACC Adv*. 2024;3(4):100910. doi: 10.1016/j.jacadv.2024.100910

50. Lukas E, Veeneman RR, Smit DJA, *et al*. A genetic exploration of the relationship between post-traumatic stress disorder and cardiovascular diseases. *Transl Psychiatry*. 2025;15(1):1. doi: 10.1038/s41398-024-03197-z

51. Religioni U, Sawicka A, Niegowska W, *et al*. Sociodemographic, disease-related and lifestyle determinants of health-related quality of life among older patients hospitalized with heart failure. *Sci Rep*. 2025;15(1):31040. doi: 10.1038/s41598-025-13881-9

52. Li Y, Xiong X, Wang H, *et al*. Positive psychological experiences in chronic heart failure: a qualitative meta-synthesis. *J Adv Nurs*. 2025;81(12):8564-8578. doi: 10.1111/jan.16824

53. Vigorè M, Granata N, Braga SS, *et al*. Cognitive impairment, frailty and rehabilitation outcome in older cardiorespiratory patients. DEC_FRAinRIAB: Study protocol. *PLoS One*. 2022;17(8):e0272132. doi: 10.1371/journal.pone.0272132

54. Kitko L, McIlvennan CK, Bidwell JT, *et al*. Family caregiving for individuals with heart failure: a scientific statement from the American Heart Association. *Circulation*. 2020;141(22):e864-e878. doi: 10.1161/CIR.0000000000000768

55. Zhang S, Liu C, Wu P, *et al*. Burden and temporal trends of valvular heart disease-related heart failure from 1990 to 2019 and projection up to 2030 in Group of 20 countries: an analysis for the Global Burden of Disease Study 2019. *J Am Heart Assoc*. 2024;13(20):e036462. doi: 10.1161/JAHA.124.036462

56. Li J, Feng L, Shui X, Deng C, Hu A. Relationship between symptom burden and self-management among patients with chronic heart failure: a cross-sectional study. *Patient Prefer Adherence*. 2023;17:1909-1921. doi: 10.2147/PPA.S419796

57. Locatelli G, Iovino P, Pasta A, Jurgens CY, Vellone E, Riegel B. Cluster analysis of heart failure patients based on their psychological and physical symptoms and predictive analysis of cluster membership. *J Adv Nurs*. 2024;80(4):1380-1392. doi: 10.1111/jan.15890

58. Ly R, Karsenty C, Amedro P, *et al*. Health-Related Quality of Life and Its Association With Outcomes in Adults With Congenital Heart Disease and Heart Failure: Insight From FRESH-ACHD Registry. *J Am Heart Assoc*. 2023;12(8):e027819. doi: 10.1161/JAHA.122.027819

59. Fudim M, Cerbin LP, Devaraj S, Ajam T, Rao SV, Kamalesh M. Post-traumatic stress disorder and heart failure in men within the Veteran Affairs health system. *Am J Cardiol*. 2018;122(2):275-278. doi: 10.1016/j.amjcard.2018.04.007

60. Wilson MA, Liberzon I, Lindsey ML, *et al*. Common pathways and communication between the brain and heart: connecting post-traumatic stress disorder and heart failure. *Stress*. 2019;22(5):530-547. doi: 10.1080/10253890.2019.1621283

61. Parati G, Lombardi C, Castagna F, Mattaliano P, Filardi PP, Agostoni P. Heart failure and sleep disorders. *Nat Rev Cardiol*. 2016;13(7):389-403. doi: 10.1038/nrcardio.2016.71

62. Yang M, Chimura M, Lam CSP, *et al*. Finerenone and quality of life assessed using the EuroQol 5-dimension questionnaire level-sum-score in patients with heart failure and mildly reduced or preserved ejection fraction. *JACC Heart Fail*. 2025. doi: 10.1016/j.jchf.2025.102705

63. Durante A, Ahtisham Y, Cuoco A, *et al*. Informal caregivers of people with heart failure and resilience: a convergent mixed methods study. *J Adv Nurs*. 2022;78(1):264-275. doi: 10.1111/jan.15078

64. Freedland KE, Steinmeyer BC, Skala JA, Carney RM, Rich MW. Patient-Reported Social Determinants of Health in Patients With Heart Failure. *J Am Heart Assoc*. 2025;14(10):e041458. doi: 10.1161/JAHA.124.041458

65. Kim KA, Park JS, Seo KW, Choi EY, Ahn JA. Factors affecting the quality of life of family caregivers of patients with heart failure: A cross-sectional study. *Medicine (Baltimore)*. 2022;101(35):e30042. doi: 10.1097/MD.0000000000030042

66. Harrison DJ, Kay J, Jacobsen RM, *et al*. The burden of psychological trauma and post-traumatic stress disorder among adults with congenital heart disease: PTSD in ACHD. *Am J Cardiol*. 2024;219:9-16. doi: 10.1016/j.amjcard.2024.03.007

67. Scott LD. Caregiving and care receiving among a technologically dependent heart failure population. *ANS Adv Nurs Sci*. 2000;23(2):82-97. doi: 10.1097/00012272-200012000-00008

68. Piamjariyakul U, Young S, Smothers A, *et al*. Study protocol of sustaining home palliative care for patients with Heart Failure (HF) and their family caregivers in rural Appalachia: a mixed methods randomized clinical trial. *BMC Palliat Care*. 2025;24(1):56. doi: 10.1186/s12904-025-01680-y

69. Humphrey L, Kulich K, Deschaseaux C, Blackburn S, Maguire L, Strömberg A. The Caregiver Burden Questionnaire for Heart Failure (CBQ-HF): face and content validity. *Health Qual Life Outcomes*. 2013;11:84. doi: 10.1186/1477-7525-11-84

70. Cheung A, Kuti EL, Osenenko KM, Friesen M, Donato BMK. Impact of caring for individuals with heart failure in the United States: a systematic literature review. *J Cardiovasc Nurs*. 2024;39(2):128-141. doi: 10.1097/JCN.0000000000001005

71. Niu Y, Shao Y, Chen L, Zhang X. The Dyadic Relationship of Illness Uncertainty, Social Support, and Coping Styles in Patients with OSA and Their Co-Residents: An Actor-Partner Interdependence Mediation Model Analysis. *Nat Sci Sleep*. 2025;17:2501-2516. doi: 10.2147/NSS.S558190

72. Baik D, McIlvennan CK, Baker C, Coats H. Caregiving experiences of older family caregivers of persons with heart failure: a mixed methods study. *Geriatr Nurs*. 2022;48:51-57. doi: 10.1016/j.gerinurse.2022.08.015

73. Bahrami M, Etemadifar S, Shahriari M, Farsani AK. Caregiver burden among Iranian heart

failure family caregivers: a descriptive, exploratory, qualitative study. *Iran J Nurs Midwifery Res*. 2014;19(1):56-63.

74. Valleggi A, Passino C, Emdin M, Murante AM. Differences in family caregiver experiences and expectations of end-of-life heart failure care across providers and settings: a systematic literature review. *BMC Health Serv Res*. 2023;23(1):429. doi: 10.1186/s12913-023-09241-w
75. Nguyen DD, Spertus JA, Benton MC, *et al*. Association of Patient Reported Outcomes With Caregiver Burden in Older Patients With Advanced Heart Failure: Insights From the SUSTAIN-IT Study. *Circ Heart Fail*. 2024;17(7):e011705. doi: 10.1161/CIRCHEARTFAILURE.124.011705
76. Gilotra NA, Pamboukian SV, Mountis M, *et al*. Caregiver Health-Related Quality of Life, Burden, and Patient Outcomes in Ambulatory Advanced Heart Failure: A Report From REVIVAL. *J Am Heart Assoc*. 2021;10(14):e019901. doi: 10.1161/JAHA.120.019901
77. Suksatan W, Tankumpuan T, Davidson PM. Heart Failure Caregiver Burden and Outcomes: A Systematic Review. *J Prim Care Community Health*. 2022;13:21501319221112584. doi: 10.1177/21501319221112584
78. Thodi M, Bistola V, Lambrinou E, *et al*. A randomized trial of a nurse-led educational intervention in patients with heart failure and their caregivers: impact on caregiver outcomes. *Eur J Cardiovasc Nurs*. 2023;22(7):709-718. doi: 10.1093/eurjcn/zvac118
79. Liu F, Zhang H, Li S, Wang X, Long X, Liu Y. Interventions for reducing caregiver burden in chronic dyspnea: a meta-analysis. *Front Public Health*. 2025;13:1659063. doi: 10.3389/fpubh.2025.1659063
80. Säfström E, Liljeroos M. Personalizing care for informal heart failure caregivers: challenges and practical implications. *Curr Heart Fail Rep*. 2025;22(1):14. doi: 10.1007/s11897-025-00703-2
81. Glickman A, Mikulich-Gilbertson S, Abshire Saylor M, DeGroot L, Bekelman DB. Relationship status and quality are associated with perceived benefits of caregiving for people with heart failure. *J Cardiovasc Nurs*. 2025;40(4):E160-E166. doi: 10.1097/JCN.0000000000001093
82. Hu X, Huang W, Su Y, Qu M, Peng X. Depressive symptoms in Chinese family caregivers of patients with heart failure: a cross-sectional study. *Medicine*. 2017;96(13):e6480. doi: 10.1097/MD.0000000000006480
83. Lahoz R, Proudfoot C, Fonseca AF, *et al*. Caregivers of patients with heart failure: burden and the determinants of health-related quality of life. *Patient Prefer Adherence*. 2021;15:1153-1164. doi: 10.2147/PPA.S297816
84. Graven LJ, Boel-Studt S, Buck HG, Abbott L, Grant JS. Heart failure caregiver self-care: a latent class analysis. *Clin Nurs Res*. 2021;30(5):625-635. doi: 10.1177/1054773820973121
85. Abshire Saylor M, DeGroot L, Pavlovic N, *et al*. The context of caregiving in heart failure: a dyadic, mixed methods analysis. *J Cardiovasc Nurs*. 2023;38(4):370-378. doi: 10.1097/JCN.0000000000000987
86. Freedland KE, Skala JA, Carney RM, Steinmeyer BC, Rubin EH, Rich MW. Sequential Interventions for Major Depression and Heart Failure Self-Care: A Randomized Clinical Trial. *Circ Heart Fail*. 2022;15(8):e009422. doi: 10.1161/CIRCHEARTFAILURE.121.009422
87. Wang Y, Xu X, Lv Q, Zhao Y, Zhang X, Zang X. Network analysis of dyadic burdens, psychological disorders, psychological resilience, and illness- or caregiving-related beliefs in patients with chronic heart failure and their caregivers. *J Cardiovasc Nurs*. 2025;40(4):312-322. doi: 10.1097/JCN.0000000000001098
88. Niitani M, Sawatari H, Takei Y, Yamashita N. Associated factors for quality of life, anxiety, and depression in patients with chronic heart failure and their family caregivers: a cross-sectional study in Japan. *Palliat Med Rep*. 2024;5(1):585-594. doi: 10.1089/pmr.2024.0056
89. Pinquart M, Sörensen S. Correlates of physical health of informal caregivers: A meta-analysis. *J Gerontol B Psychol Sci Soc Sci*. 2007;62(2):P126-P137. doi: 10.1093/geronb/62.2.p126
90. van den Heuvel LM, Sarina T, Sweeting J, *et al*. A prospective longitudinal study of health-related quality of life and psychological wellbeing after an implantable cardioverter-defibrillator in patients with genetic heart diseases. *Heart Rhythm O2*. 2022;3(2):143-151. doi: 10.1016/j.hroo.2022.02.003
91. Voltolini A, Salvato G, Frigerio M, *et al*. Psychological outcomes of left ventricular assist device long-term treatment: a 2-year

follow-up study. *Artif Organs*. 2020;44(1):67-71. doi: 10.1111/aor.13531

92. Celano CM, Freedman ME, Harnedy LE, *et al*. Feasibility and preliminary efficacy of a positive psychology-based intervention to promote health behaviors in heart failure: the REACH for Health study. *J Psychosom Res*. 2020;139:110285. doi: 10.1016/j.jpsychores.2020.110285
93. Tang F, Li K, Rauktis ME, Farmer EMZ, McDaniel S. Stress, Coping, and Quality of Life Among Custodial Grandparents. *J Gerontol Soc Work*. 2023;66(3):354-367. doi: 10.1080/01634372.2022.2103764
94. Alanazi MO, Deka P, Given CW, Lehto R, Wyatt G. Coping strategies and health-related quality of life in individuals with heart failure. *J Clin Med*. 2025;14(9):3073. doi: 10.3390/jcm14093073
95. Yan Y, Huang Y, Wang MP, Lau KK, Anderson CS, Lee JJ. Dyadic Interventions for Promoting Healthy Diets in Patients With Cardiovascular Disease: A Systematic Review and Meta-Analysis. *Nurs Health Sci*. 2025;27(3):e70183. doi: 10.1111/nhs.70183
96. Yang Z, Huang H, Xu L, Gao Y, Zhang C, Wang A. From need to action: decoding the role of motivation in adherence to home-based cardiac rehabilitation exercise in chronic heart failure patients. *BMC Nurs*. 2024;23(1):913. doi: 10.1186/s12912-024-02617-1
97. Tang M, Zhao R, Lv Q. Status and influencing factors of frailty in hospitalized patients with chronic heart failure: a cross-sectional study. *J Clin Nurs*. 2025;34(1):194-203. doi: 10.1111/jocn.17324
98. Carrillo A, Belnap BH, Rothenberger SD, Feldman R, Rollman BL, Celano CM. Psychosocial predictors of health behavior adherence in heart-failure patients with comorbid depression: a secondary analysis of the Hopeful Heart trial. *BMC Psychol*. 2024;12(1):328. doi: 10.1186/s40359-024-01816-4
99. Sachdev V, Sharma K, Keteyian SJ, *et al*. Supervised Exercise Training for Chronic Heart Failure With Preserved Ejection Fraction: A Scientific Statement From the American Heart Association and American College of Cardiology. *Circulation*. 2023;147(16):e699-e715. doi: 10.1161/CIR.0000000000001122
100. Brar R, Whitlock RH, Katz A, *et al*. Impact of a Medical Fitness Model on Incident Major Adverse Cardiovascular Events: A Prospective Cohort Study of 11 000 Members. *J Am Heart Assoc*. 2024;13(7):e030028. doi: 10.1161/JAHA.123.030028
101. Taylor RS, Ding C. Importance of health-related quality of gain with exercise training in preserved ejection fraction heart failure. *Eur Heart J Open*. 2024;4(6):oeae091. doi: 10.1093/ehjopen/oeae091
102. Gass F, Halle M, Mueller S. Telemedicine acceptance and efficacy in the context of preventive cardiology interventions: a systematic review. *Digit Health*. 2022;8:205520762211141. doi: 10.1177/20552076221114186
103. Santos GC, Liljeroos M, Dwyer AA, *et al*. Symptom perception in heart failure - Interventions and outcomes: A scoping review. *Int J Nurs Stud*. 2021;116:103524. doi: 10.1016/j.ijnurstu.2020.103524
104. Zhang Y, Zhang H, Zhang Y, *et al*. Effect of MBSR, DBT and CBT on the hypertension patients with depression/anxiety: Protocol of a systematic review and Bayesian network meta-analysis. *PLoS One*. 2023;18(2):e0281469. doi: 10.1371/journal.pone.0281469
105. Wang X, Song C. The impact of gratitude interventions on patients with cardiovascular disease: a systematic review. *Front Psychol*. 2023;14:1243598. doi: 10.3389/fpsyg.2023.1243598
106. Golan M, Vilchinsky N, Wolf H, Abuhazira M, Ben-Gal T, Naimark A. Couples' coping strategies with left ventricular assist device implantation: a qualitative dyadic study. *Qual Health Res*. 2023;33(8-9):741-752. doi: 10.1177/10497323231168580
107. Yu DS, Qiu C, Li PWC, Lau J, Riegel B. Effects of dyadic care interventions for heart failure on patients' and caregivers' outcomes: a systematic review, meta-analysis and meta-regression. *Int J Nurs Stud*. 2024;157:104829. doi: 10.1016/j.ijnurstu.2024.104829
108. Cassidy L, Thompson G, Hill L, *et al*. Co-design and feasibility testing of the heart failure carer support programme (HELP): a convergent, mixed-method study. *Patient Educ Couns*. 2025;136:108760. doi: 10.1016/j.pec.2025.108760
109. Zhou T, Hu Y, Zhu L, *et al*. Effects of home disease management strategies based on the dyadic illness management theory on elderly patients with chronic heart failure and informal caregivers' physical and psychological outcomes: a randomized controlled trial. *Front*

Med. 2025;12:1679743. doi: 10.3389/fmed.2025.1679743

110. Xiang H, Liu L, Su X, *et al*. The association between a stress-is-enhancing mindset and internet gaming disorder was mediated by behavioral disengagement among medical undergraduate students: a multi-center survey in China. *BMC Psychiatry*. 2025;25(1):472. doi: 10.1186/s12888-025-06910-4

111. Prati G, Mancini AD. Social and behavioral consequences of the COVID-19 pandemic: Validation of a Pandemic Disengagement Syndrome Scale (PDSS) in four national contexts. *Psychol Assess*. 2023;35(11):1041-1053. doi: 10.1037/pas0001213

112. Korosec-Serfaty M, Riedl R, Sénécal S, Léger PM. Attentional and Behavioral Disengagement as Coping Responses to Technostress and Financial Stress: An Experiment Based on Psychophysiological, Perceptual, and Behavioral Data. *Front Neurosci*. 2022;16:883431. doi: 10.3389/fnins.2022.883431

113. Wang X, Yang J, He J. Attentional disengagement difficulties toward game-related social reward and avoidance toward real-life social reward among individuals with Internet gaming disorder. *J Psychiatr Res*. 2025;189:244-251. doi: 10.1016/j.jpsychires.2025.05.041

114. Helal SI, Lee G, Evans C, Grealish A. The Efficacy of Psychological Interventions on Health-Related Quality of Life for Patients With Heart Failure and Depression: A Systematic Review. *J Cardiovasc Nurs*. 2022;37(2):134-145. doi: 10.1097/JCN.0000000000000779

115. Wang Y, Fu T, Wang J, Chen S, Sun G. The relationship between self-compassion, coping style, sleep quality, and depression among college students. *Front Psychol*. 2024;15:1378181. doi: 10.3389/fpsyg.2024.1378181

116. Philippi CL, Leutzinger K, Pessin S, *et al*. Neural signal variability relates to maladaptive rumination in depression. *J Psychiatr Res*. 2022;156:570-578. doi: 10.1016/j.jpsychires.2022.10.070

117. Alanazi MO, Given CW, Deka P, Lehto R, Wyatt G. A literature review of coping strategies and health-related quality of life among patients with heart failure. *Eur J Cardiovasc Nurs*. 2023;22(3):236-244. doi: 10.1093/eurjcn/zvac042

118. Andonian C, Beckmann J, Ewert P, *et al*. Assessment of the psychological situation in adults with congenital heart disease. *J Clin Med*. 2020;9(3):779. doi: 10.3390/jcm9030779

119. Lee K, Ota K, Toma T, Toriya M. Perceptions of “Healthy Life Expectancy” of Individuals With Diseases: An Online Survey in Japan. *Health Sci Rep*. 2025;8(12):e71533. doi: 10.1002/hsr2.71533

120. Mira Hernandez J, Shen EY, Ko CY, *et al*. Differential sex-dependent susceptibility to diastolic dysfunction and arrhythmia in cardiomyocytes from obese diabetic heart failure with preserved ejection fraction model. *Cardiovasc Res*. 2025;121(2):254-266. doi: 10.1093/cvr/cvae070

121. Lala A, Tayal U, Hamo CE, *et al*. Sex Differences in Heart Failure. *J Card Fail*. 2022;28(3):477-498. doi: 10.1016/j.cardfail.2021.10.006

122. Rosano GMC, Stolfo D, Anderson L, *et al*. Differences in presentation, diagnosis and management of heart failure in women. A scientific statement of the Heart Failure Association of the ESC. *Eur J Heart Fail*. 2024;26(8):1669-1686. doi: 10.1002/ejhf.3284

123. Wang Y, Wang Y, Chen X, *et al*. Trajectories and Co-Occurrence of Perceived Control in Patients With Heart Failure and Self-Efficacy in Their Caregivers: A Three-Month Longitudinal Study of Dual Trajectories. *J Clin Nurs*. 2026;35(3):1244-1257. doi: 10.1111/jocn.70072

124. Vigorè M, Sattin D, Maestri R, *et al*. Beyond the heart: The role of psychological factors and coping strategies in cardiovascular rehabilitation. *Int J Cardiol*. 2025;428:133144. doi: 10.1016/j.ijcard.2025.133144

125. Grant JS, Graven LJ, Schluck G, Abbott L. Psychosocial predictors of adverse outcomes in rural heart failure caregivers. *Rural Remote Health*. 2021;21(3):6497. doi: 10.22605/RRH6497

126. Yan J, Zhou L, Song G, Yuan Y. The chain mediating role of social support and yielding coping style between health literacy and symptom burden in patients with chronic heart failure. *Front Cardiovasc Med*. 2025;12:1518175. doi: 10.3389/fcvm.2025.1518175

127. Xiang L, Wang J, Li W, Ye H. A Study on the Current Situation and Related Factors of Personal Mastery in Patients with Chronic Heart Failure: A Cross-Sectional Study. *Int J Gen Med*. 2024;17:4701-4710. doi: 10.2147/IJGM.S483987

128. Cassidy L, Hill L, Fitzsimons D, McGaughey J. The impact of psychoeducational interventions on the outcomes of caregivers of patients with heart failure: A systematic review and meta-analysis. *Int J Nurs Stud*. 2021;114:103806. doi: 10.1016/j.ijnurstu.2020.103806

129. Locatelli G, Fabrizi D, Ausili D, Vellone E. Dyadic symptom recognition in heart failure. *Eur J Cardiovasc Nurs*. 2025;24(6):873-882. doi: 10.1093/eurjcn/zvaf051

130. Young S, Smith M, Shafique S, Piamjariyakul U. You're not who you used to be: a case report of a family living with heart failure and vascular dementia. *Home Healthc Now*. 2023;41(3):140-148. doi: 10.1097/NHH.0000000000001165

131. O'Donnell A, Gonyea JG, Leff V. Social work involvement in palliative care heart failure research: a review of recent literature. *Curr Opin Support Palliat Care*. 2020;14(1):3-8. doi: 10.1097/SPC.0000000000000482

132. Thermaenius I, Udo C, Alvariza A, Lundberg T, Holm M, Lövgren M. The Family Talk Intervention Among Families Affected by Severe Illness: Hospital Social Workers' Experiences of Facilitators and Barriers to its Use in Clinical Practice. *J Soc Work End Life Palliat Care*. 2024;20(3):235-253. doi: 10.1080/15524256.2024.2364589

133. El-Dassouki N, Pfisterer K, Benmessaoud C, *et al*. The value of technology to support dyadic caregiving for individuals living with heart failure: qualitative descriptive study. *J Med Internet Res*. 2022;24(9):e40108. doi: 10.2196/40108

134. Li Y, Li J, Zhang Y, Ding Y, Hu X. The effectiveness of e-Health interventions on caregiver burden, depression, and quality of life in informal caregivers of patients with cancer: a systematic review and meta-analysis of randomized controlled trials. *Int J Nurs Stud*. 2022;127:104179. doi: 10.1016/j.ijnurstu.2022.104179

135. Sheng A, Yu T, Yu Y, Zhang M, Zeng Y, Ye L. Analysis of the integration of medical and nursing care and its association with depression and anxiety among medical staff in the Jinhua area. *Front Psychiatry*. 2025;16:1616682. doi: 10.3389/fpsyt.2025.1616682

136. Chen Y, Lin Y, Dong X, Xue Y, Wu D. Trajectories and influencing factors of self-care behaviors in Chinese older adults with chronic heart failure: a prospective observational study. *Int J Nurs Stud Adv*. 2025;9:100418. doi: 10.1016/j.ijnsa.2025.100418

137. De Bacquer D, Ueda P, Reiner Ž, De Sutter J, *et al*. Prediction of recurrent event in patients with coronary heart disease: the EUROASPIRE Risk Model. *Eur J Prev Cardiol*. 2022;29(2):328-339. doi: 10.1093/eurjpc/zwaa128

138. Dionne-Odom JN, Ejem DB, Wells R, *et al*. Effects of a telehealth early palliative care intervention for family caregivers of persons with advanced heart failure: the ENABLE CHF-PC randomized clinical trial. *JAMA Netw Open*. 2020;3(4):e202583. doi: 10.1001/jamanetworkopen.2020.2583

139. Locatelli G, Rebora P, Occhino G, *et al*. The Impact of an Intervention to Improve Caregiver Contribution to Heart Failure Self-care on Caregiver Anxiety, Depression, Quality of Life, and Sleep. *J Cardiovasc Nurs*. 2023;38(4):361-369. doi: 10.1097/JCN.0000000000000998

140. Graven LJ, Abbott L, Boel-Studt S, Grant JS, Buck HG. Classifying heart failure caregivers as adequately or inadequately resourced to care: a latent class analysis. *J Palliat Care*. 2023;38(1):62-70. doi: 10.1177/08258597221079244

141. Dalirirad H, Najafi T, Seyedfatemi N. Effect of an Educational Support Programme on Caregiver Burden Among the Family Members of Patients Undergoing Coronary Artery Bypass Graft Surgery. *Sultan Qaboos Univ Med J*. 2021;21(2):e266-e274. doi: 10.18295/squmj.2021.21.02.016

142. Ventoulis I, Kamperidis V, Abraham MR, *et al*. Differences in Health-Related Quality of Life among Patients with Heart Failure. *Medicina (Kaunas)*. 2024;60(1):109. doi: 10.3390/medicina60010109

143. Kubica A, Pietrzykowski Ł, Michalski P. The occurrence of cardiovascular risk factors and functioning in chronic illness in the Polish population of EUROASPIRE V. *Cardiol J*. 2024;31(4):612-620. doi: 10.5603/CJ.a2022.0102

144. Dong X, He D, Zhang Y, Zhao Q, Zhang X, Fan X. Dyadic associations between burden and depressive symptoms among patients with heart failure and their caregivers: the mediating role of perceived stress. *J Cardiovasc Nurs*. 2023;38(6):517-527. doi: 10.1097/JCN.0000000000000974

145. Hay SI, Ong KL, Santomauro DF. Burden of 375 diseases and injuries, risk-attributable burden of 88 risk factors, and healthy life expectancy in 204 countries and territories, including 660 subnational locations, 1990-2023: a systematic analysis for the Global Burden of Disease Study

2023. *Lancet*. 2025;406(10513):1873-1922. doi: 10.1016/S0140-6736(25)01637-X

146. Carleton-Eagleton K, Walker I, Freene N, Gibson D, Gibson D. Meeting support needs for informal caregivers of people with heart failure: a rapid review. *Eur J Cardiovasc Nurs*. 2021;20(5):493-500. doi: 10.1093/eurjcn/zvaa017

147. Mangione CM, Barry MJ, Nicholson WK, *et al*. Behavioral Counseling Interventions to Promote a Healthy Diet and Physical Activity for Cardiovascular Disease Prevention in Adults Without Cardiovascular Disease Risk Factors: US Preventive Services Task Force Recommendation Statement. *JAMA*. 2022;328(4):367-374. doi: 10.1001/jama.2022.10951

148. Wise J. Cognitive behavioural therapy shows promise in heart failure patients with depression. *BMJ*. 2015;351:h5163. doi: 10.1136/bmj.h5163

149. Eberly LA, Tennison A, Morgan L, *et al*. Centering Diné (Navajo) voices: barriers, facilitators, and perceptions of cardiac care among patients with heart failure in rural Navajo Nation. *Circulation*. 2025;152(2):101-112. doi: 10.1161/CIRCULATIONAHA.124.073166

150. Wood M, Walshe C, McCullagh A. What are the digitally enabled psychosocial interventions delivered by trained practitioners being offered to adults with life-shortening illnesses and palliative care needs and their informal and professional caregivers? A scoping review. *Palliat Support Care*. 2023;21(4):727-740. doi: 10.1017/S1478951523000172

151. Piña IL, Allen LA, Desai NR. Policy and payment challenges in the postpandemic treatment of heart failure: value-based care and telehealth. *J Card Fail*. 2022;28(5):835-844. doi: 10.1016/j.cardfail.2021.08.019

152. Giusti A, Pukrittayakamee P, Alarja G, *et al*. Developing a global practice-based framework of person-centred care from primary data: a cross-national qualitative study with patients, caregivers and healthcare professionals. *BMJ Glob Health*. 2022;7(7):e008843. doi: 10.1136/bmjgh-2022-008843

153. Dellafiore F, Ghizzardi G, Vellone E, *et al*. Motivational Interviewing for Enhancing Self-care in Patients With Heart Failure: Protocol for a Randomized Controlled Trial. *JMIR Res Protoc*. 2023;12:e44629. doi: 10.2196/44629

154. Shields GE, Rowlandson A, Dalal G, *et al*. Cost-effectiveness of home-based cardiac rehabilitation: a systematic review. *Heart*. 2023;109(12):913-920. doi: 10.1136/heartjnl-2021-320459

155. Xiong C, Li PWC, Yu DSF, Wong CWY. How the dyads of heart failure patients and their informal caregivers cope with the disease process: a qualitative evidence synthesis. *Int J Nurs Stud*. 2025;167:105065. doi: 10.1016/j.ijnurstu.2025.105065