

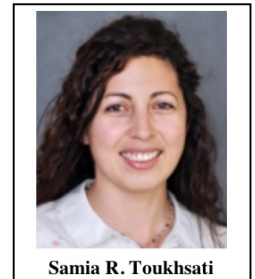
## REVIEW ARTICLE

# Towards Optimal Heart Failure Care: Couples-Oriented Strategies to Improve Patient Adherence and Health Outcomes

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**Abstract:** Psychosocial factors play an important role in the development and progression of cardiovascular diseases (CVD), such as chronic heart failure (CHF). In particular, psycho-cognitive disturbance is common in CHF, which presents additional challenges to secondary prevention and management strategies. This review provides a summary of the contemporary psycho-cardiology literature, including coverage of common mood and cognitive symptoms, and explores some of the pathophysiologic evidence linking psycho-cognition to CHF, with particular emphasis on sympathetic nervous system activation and neuroendocrine functioning. Social support is identified as a strategy by which to reduce depressive symptoms, manage cognitive impairment and to, potentially, improve health outcomes through improved patient self care and adherence. Recent research outcomes suggest that the integration of family caregivers into CHF psycho-educational disease management programs, as providers and recipients of support, may achieve best outcomes. In this regard, couples-oriented strategies that promote communication, emotional attachment and support may enhance health-promoting behaviours in patients and their partners.



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## 1. PSYCHO-CARDIOLOGY

Chronic heart failure (CHF) is a debilitating, progressive disease with a heavy disease burden. There are over 23 million people living with CHF worldwide (approximately 300,000 Australians), with 10% increase in new cases annually. CHF is usually secondary to cardiovascular disease (CVD) or hypertension, less commonly attributable to valvular disease, genetic, idiopathic or life style factors (such as alcoholism) [1]. The prevalence of CHF increases with age [2] and it is the most common cause of hospital admissions. Healthcare professionals attribute over 10% of readmissions to poor patient adherence to CHF medication regimens [3].

Depression is common in CVD, even more so in CHF [4], and is typically characterized by a combination of affective, cognitive and somatic features. Stressors, such as socio-economic disadvantage, disease burden, and family conflict, increase the risk of depression [5]. For example, worsening functional capacity in CHF is related to increased rates of depression, with approximately 10% of asymptomatic patients showing evidence of depression compared to 40% of patients with severe CHF [6].

Depression is a significant, independent risk marker for mortality and morbidity in CHF [7], via several, probably synergistic, physiologic and behavioural pathways [4, 5]. Given that 15-20% of CHF patients show evidence of depression [6], coupled with the progressive and worsening illness trajectory for CHF patients, it is clear that this population requires careful psychosocial management.

Cognitive impairment is also common in this patient population and may be a precursor, symptom, or unrelated to depression. Although mechanisms linking the two remain unclear, depression combined with cognitive dysfunction (ie., psycho-cognitive disturbance) undermines a patient's willingness and capacity to adhere to medication and behavioural regimens.

### 1.1. Stress and CHF

Psycho-cognitive appraisals of stressors initiate a cascade of autonomic, endocrine and behavioural responses that promote harm minimisation to enhance survival. However, sometimes the stress-response system becomes maladaptive, whereby homeostatic control is compromised [8]. For example, reports of an increased rate of myocardial infarctions and CVD related deaths following sudden life-changing events and acute psychological stress are not uncommon [9-11].

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Much research effort has been invested to examine the association between maladaptive responses to stress, either heightened or blunted, and subsequent risk of CVD [8, 12]. For example, blood pressure (BP) reactivity to mental stress has been prospectively linked with future resting BP in adolescents [13, 14], although less so in adults [15]. While cardiovascular stress reactivity appears to predict the development of some prodromal states, such as elevated BP, and new events in existing hypertension and CVD settings, these are intersected by hereditary disease risk factors, disease status, and levels of psychosocial stress exposure [15]. To date, while empirical work that has examined stress reactivity and new CVD is limited and inconsistent, there is coherent evidence to suggest that patients with existing hypertension or CVD are more vulnerable to the deleterious effects of stress [16].

## 1.2. Pathophysiology of CHF

Heart failure is characterised by a chronic, maladaptive neurohumoral response, partially mediated by the central nervous system (CNS), which exceeds the homeostatic requirements for compensating low cardiac output [17]. Correspondingly, persistent elevation of neuro-peptides (vasopressin), neurohormones (angiotensin, norepinephrine, aldosterone), and proinflammatory cytokines in CHF have poor prognostic implications [18]. Thomas and Marks [19], were among the first to identify a positive association between plasma norepinephrine levels and the extent of left ventricular dysfunction in CHF. Pharmacotherapy for the treatment of CHF targets suppression of the sympathetic nervous system (SNS) (through beta-blockade) and renin-angiotensin aldosterone (RAAS) inhibition.

Alongside their cardiovascular (including metabolic and haemodynamic) benefits, CHF treatments have psychocognitive implications. For example, angiotensin converting enzyme (ACE) inhibition has been shown to protect against [20] and reverse [21] cognitive impairment in CHF. Sympatholytics, such as beta-blockers, may also benefit cognitive function [22], although more data is needed [23]. For instance, three week exposure to the  $\beta$ -1 selective beta-blocker, nebivolol, at 1mg/kg/day significantly reduced the development of amyloid neuropathology in an Alzheimer's Disease mouse model [24]. This raises the possibility that the nitric oxide releasing effects that are specific to nebivolol might be important. In this context, the downstream vasodilating and endothelial effects of third generation beta-blockers, such as nebivolol, could conceivably improve cognitive functioning in CHF. Of course these hypotheses require further testing. Nonetheless, given that up to 60% of CHF patients do not adhere to their medical regimens at some point [25], it is important to consider the psycho-cognitive correlates of CHF pathophysiology [26].

### 1.2.1. SNS Hyper-Activation and Psycho-Cognitive Functioning

CHF and depression are both characterised by hyperactivation of the sympathetic arm of the autonomic nervous system (ANS), parasympathetic hypo-activation and, correspondingly, heightened plasma neuroendocrine hormone levels [27, 28]. ANS dysfunction may explain the greater

vulnerability to stressors and increased mortality risk in depressed CHF patients [29].

The risk of cognitive impairment in CHF settings is increasingly recognised [26, 30]. While there are many candidate mechanisms implicated (e.g. those involving the cerebral vasculature), prolonged homeostatic distress (such as chronic stimulation of the RAAS) in CHF appears to offer one explanatory avenue. Chronic elevation of neurohormones causes neuronal atrophy in the hippocampus and pre-frontal cortex; regions of the brain essential for memory, attention and executive functioning [31]. Cognitive deficits, such as impaired memory and decision making, undermine patient self care and compliance with heart failure regimens [20, 32]. Alongside impaired cognitive functioning, depression may further undermine motivation to enact health-promoting behaviours. These psycho-cognitive characteristics must be taken into consideration for effective treatment, management and care planning in CHF.

## 1.3. Chronic Disease Management in CHF

At the point of diagnosis, many CHF patients will be physically and psychologically compromised, some of whom will also have subtle features of cognitive impairment. Capacity and willingness to self-care may, therefore, be compromised in these patients, particularly if their motivation, memory, and decision making capabilities are impaired [33]. Moreover, CHF patients frequently have comorbid conditions, such as diabetes and renal failure, and are likely to be adding to an already complex medical regimen. Families play a vital role in maintaining and optimising the health outcomes of CHF patients [34, 35], but may feel ill-equipped to manage the demands of care-giving (see Section 2.1.1). For many patients and their families, this is the psycho-social context in which they are introduced to chronic disease management programs (CDMP) for CHF.

## 2. SOCIAL SUPPORT

Families provide the primary source of social support for CHF patients [36]; the type and quality of the support, as perceived by patients, is a critical determinant of patient outcomes [37]. Research has reported a relationship between social support and important CHF life style factors (such as diet, exercise, tobacco and alcohol use) [38]; this relationship may be health-promoting or health-adverse [39]. When social support is perceived as health-promoting, available, and received, it may improve perceived capacity to cope with, and attenuate SNS/neuroendocrine responses to, stressors [34, 35], promote psychological adjustment, and support health-protective behaviours in CHF patients [40, 41].

Support experienced in the context of an 'intimate, confiding relationship' can be a particularly powerful moderator of positive health outcomes in CVD [42]. Coyne *et al.* [43] found that marital quality significantly predicted four-year survival in CHF patients, independent of disease severity. Conversely, family-related 'barriers', such as marital discord and poor familial engagement with CHF life style adjustment requirements, have been reported to undermine patient self-confidence and self-care behaviours [37, 44].

### 2.1.1. Caregiver Burden

The chronicity and unpredictability of CHF can be particularly burdensome for families [45], especially if relationships are already troubled [46]. Many family caregivers feel overwhelmed, isolated, and stifled by their responsibility for CHF patient care and rehabilitation [47]. Partners of CHF patients report unmet informational needs and healthcare support [45]; a situation that is compounded by reduced hospital stays and increased patient self-management and decision-making responsibilities [48]. Partners often feel disregarded by healthcare professionals [45], both in terms of healthcare planning for their relatives and support for their knowledge and emotional needs. As a caregiver of a CHF patient noted, “When they’re having a sleep or when they’re having a bad day, sometimes you just wish you could talk to somebody that understood, that has been there. . . It just all gets a bit much sometimes. You do feel very, very alone” [49, p.10].

The extent to which spouses' feel valued and supported by others (such as friends, family and health care professionals) in their care-giving role is likely to impact their capacity to provide support to the patient [50]. The potential for negative emotion contagion between family caregivers and patients, and the corresponding health and quality of life implications [37, 51, 52], highlight the importance of integrated mental health support for families in CDMP.

### 2.2. Social Support, Adherence and Health Outcomes

Data over many years suggest an association between social support and better health outcomes [53, 54]. Low social connectedness independently predicts increased mortality and morbidity risk in CHF [35], perhaps via increased depression [55]. CVD patients are encouraged to utilise social relationships to achieve secondary health benefits; efforts to engage families of patients in interventions have thus been made [56-61]. To date, the effects of social support, via family or friends, in a diverse array of chronic health and life style settings appear generally promising [59, 62-64].

Informal family caregivers, such as spouses, may be particularly influential drivers of patient health behaviours and outcomes [40], possibly via their involvement in practical aspects of patient care [65, 66] and/or relationship factors [46, 61, 67]. Happ *et al.* [68] found that social support predicted medication and behavioural adherence which was, correspondingly, related to risk of hospital readmission for elderly CHF patients. More recently, Sayers [69] found that social support was associated with CHF patient self care, including medication adherence. Research has also demonstrated the importance of perceived, reciprocal support (i.e., both receiving and giving support) between couples to optimise health-related behaviours [62, 70]. While several physiologic processes are likely implicated in the benefits of social support (i.e., improved neuroendocrine and immune responses through stress reduction), the specific mechanisms remain elusive [67].

Most research to date has tended to focus on the association between perceived social support and health outcomes in patients [71, 72]; while this approach highlights the benefits of family caregivers, their role tends to be as an adjunct to patient-centred therapy, rather than as an integrated con-

tributor and recipient of the therapeutic process [67]. This field remains understudied with few controlled attempts to interrogate couples-oriented, as opposed to patient-centred, approaches to CHF psycho-education. Alongside specialist CHF education, these approaches incorporate the reciprocal relationship needs of couples to achieve individual and dyadic wellbeing, behaviour change and health outcomes [65]. Martire *et al.* [61] suggest that couples-oriented approaches may yield greater, and longer lasting, behaviour change and support maintenance than patient-centred approaches. This acknowledges the relationship as fundamental to outcomes for couples navigating CVD chronic illness; there is much scope for optimising and harnessing this resource.

### 2.3. Couples-Oriented Approaches to CHF Care

Few attempts have been made to examine the effects of psycho-education programs designed for patients and family caregivers [73, 74] and outcomes are mixed. In one of the first controlled attempts to explore these issues, Ågren *et al.* [75] randomised CHF patient-caregiver couples to a brief psycho-education program (comprising three sessions scheduled over three months) or to usual care. The authors found a transient improvement in patient perceived control of their illness at 3, but not at 12, months. No other changes were observed between groups and no benefits were observed in caregivers. In a similar study, Löfvenmark *et al.* [76] also failed to find any benefit of a psycho-education program for CHF patients and their families on psychosocial status and suggested that antecedents of depression and anxiety, such as such as the patient's view of their ability to initiate and control their own behaviour, may be important to address in future programs.

Conversely, Shahriari *et al.* [77] observed a significant improvement in CHF patient self-care following a group caregiver education program, designed to enhance caregivers' knowledge of heart failure and equip them with strategies to support patients, compared to controls. Dunbar *et al.* [78] also identified a benefit of two patient-family programs involving either self-care and monitoring education ('family-patient education') or education combined with psychosocial support ('family partnership') on dietary sodium intake, but not on medication adherence, compared to usual care. In a follow-up sub-study, Stamp *et al.* [79] identified a significant benefit of the family partnership intervention on patient self care confidence and motivation compared to the family-patient education or usual care at 4 months post-baseline.

There is some evidence to suggest that relationship quality supports, and is reinforced by, patient healthcare behaviours. For example, Sher *et al.* [67] identified a significant benefit of the 'Partner for Life' program (which combined Cognitive Behavioural Couples Therapy with strategies to improve support and communication between CVD patients and their family caregivers) compared to patient-only education on physical activity and medication maintenance. Sher *et al.* concluded that marital satisfaction interacts with patient adherence, and that improvements in both may be achieved via couples-oriented therapy. Similarly, Stewart *et al.* [80] found that spouse dyads reported improvements in their relationship, capacity to cope and health-related confidence following a couple-oriented intervention for CVD survivors. Moreover, increased patient self-care had a posi-

tive impact on marital relationships. Taken together, these findings appear to support the utility for couples approaches to CDMP for heart failure; that is, a “dyadic perspective of HF self-care” [73].

Researchers have thus called for investment in “family-focused” interventions to address unmet educational and support needs to optimise outcomes for both patients and caregivers [73, 74, 77, 81]. According to Baucom *et al.* [65], couples-oriented interventions in medical contexts should respond to: i) engage patients and partners in disease-specific psycho-education; ii) provide opportunities for patients and spouses to communicate thoughts and feelings about how CHF may impact the relationship (ie., such as, for example, through real or perceived changes to sexual functioning), and; iii) offer strategies to facilitate reciprocal, positive, and health-promoting support between spouses. In this regard, Emotional Focussed Therapy (EFT) provides a short-term, empirically validated, goal-oriented therapeutic intervention that uses emotions as the agent of change to reduce distress, optimise coping and support, and enhance attachment in intimate relationships [82]. High quality randomised controlled trials are needed to evaluate whether couples-oriented EFT approaches integrated in CDMP for CHF will improve adherence and, corresponding, offer long-term health gains for patients and their caregivers.

## CONCLUSION

Secondary prevention strategies in the treatment and management of CHF have significantly reduced mortality and illness morbidity. However, these advances are counteracted by low adherence to medical and behavioural regimens in a substantial proportion of patients. Recent strategies to reverse these trends recognise the psycho-cognitive and social context for CDMP, drawing on patient social support networks to promote adherence, with growing interest in spousal relationship dynamics. Although research in this field remains inconclusive, better patient outcomes may be achieved by CDMP that offers support to patients and their families. Research that examines the health, adherence and relational impact of well-validated couples-oriented approaches to health interventions, such as EFT, in the setting of CHF is needed.

## CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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