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In Sickness and in Health: a Literature Review about Function of Social Support within Anxiety and Heart Disease Association

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Abstract: A narrative review of the major evidence concerning the relationship between anxiety, social support and cardiac disease was conducted. Literature demonstrates that a strict relationship between anxiety, social support and cardiac disease outcomes subsists. However, the function of social support within anxiety and heart disease association remains unclear and needs to further researches to be established. Moreover evidence suggests that it's the quality of close relationships to play an important role in affecting psychological and physiological health status. The main components that the literature suggests for a better quality of social support and close relationship, and the main assessment measure are presented. Evidence about cardiac rehabilitation programs and the need to assess and intervene on psychological and psychosocial factors is discussed.

Keywords: Anxiety, social support, quality of relationship, cardiac disease, psychocardiology

INTRODUCTION

The World Health Organization [1] has reported that coronary heart disease causes approximately 7.2 million deaths every year. Literature has suggested that several psychosocial factors - such as distress, anxiety, trait personality, depression, loneliness, social support - may influence cardiac disease morbidity and prognosis [2-11]. Literature suggests that one of the most important cardioprotective factor is social support. Social support has been in fact related to lower anxiety among cardiac patients [12, 13] and to reduced cardiac disease risk [14-22]. Evidence have shown that a lack of social support may lead to negative psychological states like anxiety or depression which, in turn, may influence health through direct effects on physiological processes or through adverse health behaviors [6]. Social support can be defined as a buffering factor that typically reflects people in an individual's life (family, friends, neighbors, community members) that can provide resources in times of need, such as emotional support (someone with whom to communicate), companionship (someone with whom to spend time and share activities), and instrumental aid (financial and material resources) [23].

The purposes of this narrative review are (1) to appraise the empirical evidence about the multivariate relationship between anxiety, social support, and cardiac disease outcomes; (2) to establish the possible function of social support within anxiety and heart disease association.

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ANXIETY AND CARDIAC DISEASE

Evidence has suggested that anxiety can increase the risk of a Coronary Heart Disease (CHD) by 26%, increasing the risk of heart disease by 48% [24]. Moreover, the rate of prevalence of anxiety in patients who suffer from an acute cardiac episode is estimated to be very high, approximately 70-80% [25]. Anxiety can produce several direct and indirect pathophysiological mechanisms in patients with heart disease (See Fig. **1**). Anxiety activates the sympathetic nervous system (SNS) [10, 26], causing the release of epinephrine, norepinephrine and producing arrhythmias [27]. Anxious subjects respond to stressors with greater psychophysiological arousal in terms of sympathetic nervous system (SNS) and hypothalamic-pituitary-adrenal (HPA) activation [28] that, in turn, are associated with elevated catecholamine levels, leading to vasoconstriction, platelet aggregation and elevated heart rate [29]. Also indirect mechanisms may affect health through unhealthy lifestyles [7] and maladaptive coping behaviors (such as cigarette smoking, proper diet, adherence to medication, adequate physical activity) [30]. Evidence suggests that maladaptive behaviors and lifestyle are in turn associated with increased cardiac disease incidence and developments [31]. Moreover, patients who are too anxious frequently are unable to learn or act upon new information about necessary life-style changes [32].

SOCIAL SUPPORT AND CARDIAC DISEASE

One of the most psychosocial risk factor for cardiac disease morbidity and mortality is low or no social support [19, 22, 33, 34]. Literature has in fact demonstrated that social isolation and aversive social relations are associated with morbidity and mortality from cardiovascular disease (CVD), whereas the presence of satisfying social contacts tends to be

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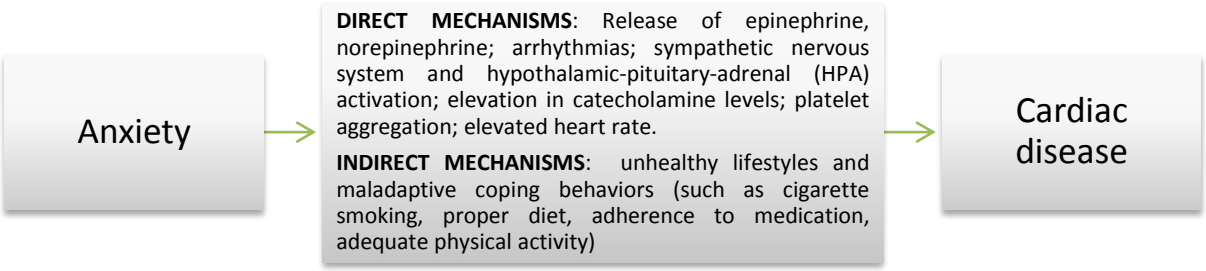

Fig. (1). Direct and indirect mechanisms of anxiety on cardiac disease.

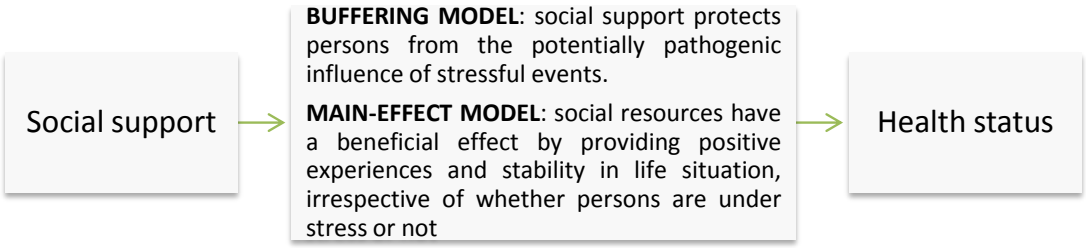

Fig. (2). Models of social support function proposed by Cohen and Wills (1985).

associated with better cardiovascular health and a lower probability of premature death from CVD [35, 36]. High levels of social support can be in fact cardioprotective [37].

Social support may contribute to health status in several ways. Two are the most important models, proposed by Cohen and Wills [23]. The so-called buffering model posits that social support protects persons from the potentially pathogenic influence of stressful events. The alternative model, the so-called main-effect model, suggest that social resources have a beneficial effect by providing positive experiences and stability in life situation, irrespective of whether persons are under stress or not (See Fig. **2**). Evidence has suggested the validity of both models, in particular structural social support was found to work mainly in a direct way (main effect), whereas functional social support was especially helpful in stressful situations (buffering model). Studies have focused in particular on one of the most important close relationship, that with an in intimate partner, and have found that patients' survival depend highly on supportive ties to his partner [38-41]. Poor marital quality is an important prognostic factor for myocardial infarction (MI) [42], for congestive heart failure [43] and for mortality [42, 44, 45]. Satisfaction has been found to be one of the most important component of the close relationship to predict outcome on psychological and physical health. Literature has in fact shown that high satisfaction with the marriage correlates with low depression scores and positive adjustment [46-48] and lower probability to have a metabolic syndrome [49]. Moreover, partner's overprotective behaviors have been related to negative effect of marital support [50], whereas positive effects have been associated with adherence to medical regimens, psychosocial well-being and quality of life [46, 51].

SOCIAL SUPPORT AND ANXIETY

Anxiety can be defined as a negative affective state resulting from an individual's perception of threat, characterized by a perceived inability to predict, control or gain the preferred results in given situations [52]. Evidence has suggested that this condition may be moderated by perceived social support [53, 54]. Studies have in fact found that behavioral expressions of threat and anxiety are significantly moderated by the perceived availability of social support [53] and that social support from friends attenuates self-rated anxiety in people when they are confronted with a stressor [54].

In contrary, literature has suggested that those who suffer from certain psychiatric disorders, such as anxiety, do so in response to interpersonal disturbances or that the disorder is maintained by interpersonal problems [55, 56]. Evidence suggests that improving the individual's ability to utilize social support networks and managing interpersonal deficits are important factors to improve anxiety symptomatology [57, 58].

THE FUNCTION OF SOCIAL SUPPORT WITHIN THE LINK BETWEEN ANXIETY AND HEART DISEASE

Very few studies have focused on the function of social support within the link between anxiety and heart disease. Moreover these studies have found different results. Closa Leon *et al.* [59] have conducted an observational study on one hundred and one patients scheduled for elective coronary angiography and have found, as expected, that participants who reported lower levels of social support were more anxious about undergoing surgery and reported more cardiac symptoms [59]. Findings of this study suggest so that patients awaiting angiography who have more social support from family and friends experience lower levels of anxiety concerning the anticipated medical procedure and report fewer cardiac symptoms, than their more socially isolated counterparts. Data of this study didn't support the hypothesis that social support may moderate the relationship between anxiety and cardiac symptoms. Authors have then suggested

the existence of a mechanism concerning a direct impact of support upon both anxiety and symptoms [59].

Volz *et al.* [60] have conducted a 3 years prospective cohort study on one hundred eleven patients having participated in an exercise based ambulatory cardiac rehabilitation program and have found that social support weakens the impact of severe anxiety on cardiac related readmission, suggesting the possible protective effect of social support in cardiac patients, that might be investigated in future studies [60].

Turner *et al.* [61], instead, have conducted an observational study on 389 records for cardiac rehabilitation outpatients and have found that social support was not associated with anxiety or depression scores and did not play a moderating role between depression or anxiety and admissions and length of stay [61]. Results have revealed instead that higher levels of anxiety symptoms were associated with younger age, female gender, those who worked outside the home (versus retired or self-employed), and current smokers. However these negative findings concerning the role of social support may be due to the proxy measures used to assess social support (Married: Yes/No; Lives alone: Yes/No), that didn't evaluate the quality of the social support [61].

SPECIFIC COMPONENTS OF SOCIAL SUPPORT RELATED TO PSYCHOLOGICAL AND PHYSIOLOGICAL HEALTH OUTCOMES

Evidence suggests that receiving beneficial support is associated with better mental and physical health [62]. Despite that, literature has suggested that the mental and physical health benefits of close relationships are moderated by their affilliative quality [63-65], suggesting that not all relationships contribute to positive physical and mental health. We then present below the main components that the literature suggests for a better quality of social support and close relationships.

EMPATHY

Empathy has been defined as a cognitive phenomenon in which one person attempts to understand the internal state of another person [66]. Evidence has suggested that both its cognitive and affective facets are associated with important social behaviors [67], such as acting in less aggressive ways [68], experiencing less interpersonal conflict [69], and being more helpful to those in need [70], and engaging in greater self-disclosure. Empathy has important implication so for physical and mental health. Literature has in fact show that exists a curvilinear relationship between cardiac activation and emotional empathy, with heart rate decelerations occurring in mildly distressing situations characterized by other-oriented emotions and heart rate accelerations occurring in highly distressing situations [71].

ATTACHMENT

Bowlby [72-74] has defined the infant attachment as a behaviour that help child to maintain proximity to a caregiver and to promote security and survival. The quality of the attachment relationship has a great impact on child's developing personality and the way people view themselves and the social world [75-78]. Attachment behavioural system then will be activated in adult age in response to stressful or threatening events [74, 79] and will influence the quality of close relationships (e.g. parents, friends, romantic partners), physical health, psychological well-being and dyadic functioning [80-83]. Literature suggests in fact that individuals reporting insecure attachments experience lower self-esteem and emotional wellbeing, lower levels of self-perceived strengths [84, 85], more problems in conflict management, less positive communication in couple relationships [83, 86], greater distress in dyadic relationships [87]; show higher disability levels [88] and negative mental health [89, 90]. Anxious attachment ratings were associated with several worse cardiac conditions involving the cardiovascular system, including stroke, heart attack and high blood pressure [91]. On the contrary, individuals with more secure attachment styles and better integration into their social networks report higher quality relationships, more effective support from their partners, and more positive expectations about partner support [92, 93].

COMMUNICATION

Evidence suggest that optimal communication (i.e. clarity, open emotional expression) and shared decision making during a traumatic event can improve quality of life [94, 95], specially for couples. The way couples communicate has been consistently linked with relationship outcomes, with specially concerning to aspects of couples' discussions : the topic being discussed and how difficult the couple perceives the topic to be [96, 97]. Family communication has been conceptualize as an important component of the adaptive coping mechanisms for managing family tension for chronic patients, including concepts such as listening, speaking, clarity, respect within the family and decision making [98, 99].

INTIMACY

Literature has suggested that intimacy may be beneficial for physical health and psychological well-being [100-104]. Several studies has in fact shown that the lack of intimacy with friends and romantic partners is related to depression [105, 106], higher loneliness and emotional distress [106, 107], more physical symptoms [104], and greater mood disturbance, especially following negative life events [108]. On the contrary, high levels of intimacy, defined in terms of affection and shared thoughts and feelings, may buffered the harmful effects of various stressors [109]. Patients with more intimate attachments to their spouses have been shown to adapt better to myocardial infarctions [45, 110].

ASSESSMENT OF SOCIAL SUPPORT

Given the importance of social support for anxiety and cardiac disease incidence and prognosis, evidence suggests the importance to employ valid and complete assessment tools of it and its quality. The main instruments to evaluate social support or its components are presented below.

SOCIAL NETWORK INDEX (SNI)

The Social Network Index [111] assesses subjects in 12 types of social relationships, including relationships with a spouse, parents, parents-in-law, children, other close family members, close neighbors, friends, workmates, schoolmates, fellow volunteers, members of groups without religious affiliations and members of religious groups. One point is assigned for each type of relationship for which subjects indicate that they speak to someone in that relationship at least once every 2 weeks. The SNI has been used in recent studies and shows high levels of predictive validity for a variety of health outcomes [112, 113].

ENRICHD SOCIAL SUPPORT INSTRUMENT (ESSI)

The ENRICHD Social Support Instrument (ESSI) is a measure derived from questions on the Medical Outcomes Survey and earlier work examining the influences of social support [19, 21, 114]. The ESSI is a seven-item measure that assesses the four defining attributes of social support: emotional, instrumental, informational, and appraisal [115-118]. The ESSI has demonstrated acceptable internal consistency and has shown to correlate positively with other social support instruments and negatively with measures of depression [115]. Moreover, the ESSI appears to be a valid and reliable measure of social support in patients undergoing treatment for coronary artery disease [119]

REVISED ADULT ATTACHMENT SCALE (AAS)

The Adult Attachment Scale [120] consists of 18 items scored on a 5 point likert-type scale ranging from 1 (not at all characteristic) to 5 (very characteristic), assessing the general orientation toward close relationship. The AAS contains three subscales, each composed of six items, assessing close, depend, and anxiety attachment. The close subscale measures the extent to which a person is comfortable with closeness and intimacy. The depend subscale assesses the extent to which a person is comfortable depending on others and believes that people can be relied. The anxiety subscale measures the extent to which a person is worried about being rejected and abandoned by others. Studies have shown that cronbach's alpha coefficients are higher than 0.7 and the discriminatory validity in anxiety and close-dependence dimension is good [121].

CLOSE PERSONS QUESTIONNAIRE (CPQ)

The Close Persons Questionnaire [122] assesses support received from and provided to a maximum of four nominated close persons. Subjectively defined degree of closeness and the social role of the person are the criterion for inclusion as a close person. Subjects are first asked to record the number of persons he/she "feels very close to", and then are asked to specify the first closest person, the role of that person, and their gender. This is repeated for up to four close persons. Fifteen questions assess "qualitative" types of support from and to each of the close persons during the last 12 months, assessing three main components of social support: (1) confiding/emotional support, (2) practical support, and (3) negative aspects of relationships.

UCLA LONELINESS SCALE

The UCLA Loneliness Scale is a measure of one's subjective feelings of loneliness as well as feelings of social isolation. The measure has been revised two times since its first publication; once to create reverse scored items, and once to simplify the wording. Items for the original version of the scale were based on statements used by lonely individuals to describe feelings of loneliness [123]. The questions were all worded in a negative or "lonely" direction, with individuals indicating how often they felt the way described on a four point scale that ranged from "never' to "often." Due to concerns about how the negative wording of the items may have affected scores, a revised version of the scale was developed and published including 10 items worded in a negative or lonely direction and 10 items worded in a positive or non-lonely direction [124]. Recently, Version 3 of the UCLA Loneliness Scale has been published [125]. In this most recent version of the scale, the wording of the items and the response format has been simplified to facilitate administration of the measure to less educated populations, such as the elderly. Scores on the loneliness scale have been found to predict a wide variety of mental and physical health outcomes .

CARDIAC REHABILITATION AND PSYCHOLOGICAL INTERVENTIONS

Cardiac rehabilitation is an evidence-based practice that includes secondary prevention measures involving the modification of lifestyle behaviors and drug intervention to minimize the risk of further cardiac events and to improve symptoms in patients suffering with cardiac disease [126-128]. Evidence suggests that cardiac rehabilitation and effective secondary intervention can reduce coronary events and improve quality of life [126], causing beneficial effects in the following domains: mortality, exercise tolerance, functional capacity, lipid levels, blood pressure, symptoms of angina and dyspnea, weight loss, smoking behavior, stress level and psychosocial functioning [129, 130]. Considering the great importance of psychological factor, such as anxiety and social support, an effective cardiac rehabilitation (CR) might then include psychological interventions. Literature has shown that both anxiety and social support may be addressed by CR and play an important role in CR programs instituted following a coronary event [131-133]. In particular, evidence has suggested that cognitive behavior therapy is one of the most effective intervention for cardiac patients with anxiety [7]. In cognitive behavior therapy, patients are taught to restructure anxiety-provoking thoughts leading to panic attacks, are taught relaxation techniques to counteract stress and anxiety, and are given exposure therapy to desensitize themselves to stressful stimuli. This therapy conveys the message to the patient that it is possible to learn self-management techniques and methods that will most likely allow them to discontinue medications within 6 months to 1 year. However, other forms of psychotherapy, such as psychoanalytic, interpersonal, and supportive therapies, can be effective as adjunctive therapies, but do not carry the wealth of evidence-based research demonstrating their effectiveness in the treatment of anxiety disorders [7]. Latest evidence suggests that complex intervention can be facilitated by the

Table 1. Topic Aspects Emerged by Literature Review

Topic Aspects Emerged by Literature Review
• Anxiety can increase the risk of a coronary heart disease through several direct and indirect pathophysiological mechanisms.
• Social support may contribute to health status through protects persons from the potentially pathogenic influence of stressful events (the buffering model) or by providing positive experiences and stability in life situation (the main-effect model).
• The majority of the studies suggests that social support play an important role on anxiety and cardiac disease outcomes association, but unclear is if: a. it has a direct impact on anxiety and cardiac disease outcomes; b. it weakens the impact of anxiety on cardiac disease outcomes.
• The function of social support is moderated by his quality, sustained by the presence of intimacy, good communication, secure attachment and empathy.
• Social Network Index (SNI), ENRICHD Social Support Instrument (ESSI), Close Persons Questionnaire (CPQ), UCLA Loneliness Scale, Revised Adult Attachment Scale (AAS) are the main assessment tools to evaluate social support.
• Cognitive behavior therapy is one of the most effective intervention for cardiac patients with anxiety.
• Cardiac rehabilitation might then psychological interventions, concerning anxiety and close relationship quality.
• It would be desirable that future research and clinical protocols consider the function of social support within anxiety and cardiac disease association.

use of telemedicine, which allows the remote control of considerable amounts of clinical data (e.g. ICAROS project) [134].

CONCLUSION

In this narrative review, studies that investigated the multivariate relationship between anxiety, social support and cardiac disease outcomes were presented (See Table **1**).

Analyzed literature has shown that a strict relationship between anxiety, social support and cardiac disease outcomes subsists. However, the function of social support within anxiety and heart disease association can't be established, because of the different results emerged by analyzed studies. The majority of the studies suggests that social support play an important role on anxiety and cardiac disease outcomes association, but unclear is if: a. it has a direct impact on anxiety and cardiac disease outcomes, as supported by Closa Leon *et al*. study [59]; b. it weakens the impact of anxiety on cardiac disease outcomes, as supported by Volz *et al.* study [60]. The last analyzed study by Turner *et al.* [61], indeed, hasn't found a specific role of social support within the link between anxiety and cardiac disease, probably because they have utilized a no standardized measure to assess only the presence of a spouse and a cohabitant, leaving out the evaluation of the quality of these close relationships. As literature has suggested, the function of social support is moderated by his quality [63-65], so it is important that future researches include the evaluation of the quality of a close relationship, that may be sustained by the presence of intimacy, good communication, secure attachment and empathy.

In conclusion, very few quantitative studies concerning the function of social support within anxiety and heart disease association were found. However, regarding the positive role of the quality of relationships, it would be desirable that future research and clinical protocols consider the psychological aspects of cardiac patients (Compare *et al.*, 2012; Grossi *et al.*, 2012) and the relational context of the patient as moderating variables.

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