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

Cristina Zarbo¹,*, Angelo Compare¹, Elena Baldassari¹, Alberto Bonardi¹ and Claudia Romagnoni²

¹Department of Human and Social Sciences, University of Bergamo, Bergamo, Italy
²Cardiovascular Division, "L. Sacco" University General Hospital, University of Milan, Milano, Italy

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.

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
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 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 who have 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 affiliative 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
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.

### REFERENCES

[1] WHO. World Health Report 2002: reducing risks promoting healthy life. 2002 [cited 2003 30 October]; Available at: www.who.int/whr/2002/en/

[2] Aldana SG, Whitemer WR, Greenlaw R. Effect of intense lifestyle modification and cardiac rehabilitation on psychosocial cardiovascular disease risk factors and quality of life. Behav Modif 2006; 30(4): 507-25.

[3] Fukuoka Y, Lindgren TG, Rankin SH, Cooper BA, Carroll DL. Cluster analysis: a useful technique to identify elderly cardiac patients at risk for poor quality of life. Qual Life Res 2007; 16(10): 1655-63.

[4] Rozanski A, Blumenthal JA, Davidson KW, Saah PG, Kubzansky L. The epidemiology, pathophysiology, and management of psychosocial risk factors in cardiac practice: the emerging field of behavioral cardiology. J Am Coll Cardiol 2005; 45(5): 637-51.

[5] Claesson M, Burell G, Birgander LS, Lindahl B, Asplund K. Psychosocial distress and impaired quality of life—targets neglected in the secondary prevention in women with ischemic heart disease. Eur J Cardiovase Prev Rehabil 2003; 10(4): 258-66.

[6] Rozanski A, Blumenthal JA, Kaplan J. Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy. Circulation 1999; 99(16): 2192-217.

[7] Compare A, Germani E, Proietti R, Janeway D. Clinical psychology and cardiovascular disease: An up-to-date clinical practice review for assessment and treatment of anxiety and depression. Clin Pract Epidemiol Ment Health 2011; 7: 148-56.

[8] Compare A, Zorbo C, Manzoni GM. Social support, depression, and heart disease: a ten year literature review. Front Psychol 2013; 4: 384.

[9] Compare A, Bigi R, Orrego PS, Proietti R, Grossi E, Steptoe A. Type D personality is associated with the development of stress cardiomyopathy following emotional triggers. Ann Behav Med 2013; 45(3): 299-307.

[10] Compare A, Proietti R, Del Forno D. Vulnerable personality and Takotsubo cardiomyopathy consequent to emotional stressful events: a clinical case report. Monaldi Arch Chest Dis 2011; 76(1): 217.

[11] Compare A, Molinari E. Depression and cardiovascular rehabilitation outcome in MI patients: the mediation role of quality of couple relationship. Psychol Health 2004; 19(1): 33-34.

[12] Idler EL, Kasl SV. Religion among disabled and nondisabled persons I: cross-sectional patterns in health practices, social activities, and well-being. J Gerontol B Psychol Sci Soc Sci 1997; 52(6): S294-305.

[13] Frasure-Smith N, Lesperance F, Talajic M. The impact of negative emotions on prognosis following myocardial infarction: is it more than depression? Health Psychol 1995; 14(5): 388-98.
[14] Knox SS, Uvnas-Moberg K. Social isolation and cardiovascular disease: an atherosclerotic pathway? Psychoneuroendocrinology 1998; 23(8): 877-90.

[15] Knox SS, Siegmond KD, Weidner G, Ellison RC, Adelman A, Paton C. Hostility, social support, and coronary heart disease in the National Heart, Lung, and Blood Institute Family Heart Study. Am J Cardiol 1998; 82(10): 1192-6.

[16] Kawachi I, Colditz GA, Ascherio A, et al. A prospective study of social networks in relation to total mortality and cardiovascular disease in men in the USA. J Epidemiol Comm Health 1996; 50(3): 245-51.

[17] Orth-Gomer K, Johnson JV. Social network interaction and mortality. A six year follow-up study of a random sample of the Swedish population. J Chronic Dis 1987; 40(10): 949-57.

[18] Kaplan GA, Salonen JT, Cohen RD, Brand RJ, Syme SL, Puska P. Social connections and mortality from all causes and from cardiovascular disease: prospective evidence from eastern Finland. Am J Epidemiol 1988; 128(2): 370-80.

[19] Williams RB, Barefoot JC, Califf RM, et al. Prognostic importance of social and economic resources among medically treated patients with angiographically documented coronary artery disease. JAMA 1992; 267(4): 520-4.

[20] Ruberman W, Weinblatt E, Goldberg JD, Chaudhary BS. Psychosocial influences on mortality after myocardial infarction. N Engl J Med 1984; 311(19): 552-9.

[21] Berkman LF, Leo-Summers L, Horwitz, Emotional support and survival after myocardial infarction. A prospective, population-based study of the elderly. Ann Intern Med 1992; 117(12): 1003-9.

[22] Case RB, Moss AJ, Case N, McDermott M, Eberly S. Living alone after myocardial infarction. Impact on prognosis. JAMA 1992; 267(4): 515-9.

[23] Cohen S, Wills TA. Stress, social support, and the buffering hypothesis. Psychol Bull 1985; 92(2): 310-57.

[24] Roest AM, Martens EJ, de Jonge P, Denollet J. Anxiety and risk of incident coronary heart disease: a meta-analysis. J Am Coll Cardiol 2010; 56(1): 38-46.

[25] Molinari E, Compare A, Parati G. Mente e Cuore: Clinica Psicologica Della Malattia Cardiaca. Milano: Springer-Verlag 2007.

[26] Compare A, Bigi R, Orrego PS, Proietti R, Grossi E, Steptoe A. Type D personality is associated with the development of stress cardiomyopathy following emotional triggers. Ann Behav Med 2013; 45(3): 299-307.

[27] Middlekauff HR, Mark AL. The treatment of heart failure: the role of neurohumoral activation. Intern Med 1998; 37(2): 112-22.

[28] Krantz DS, Manuck SB. Acute psychophysiological reactivity and risk of cardiovascular disease: a review and methodological critique. Psychol Bull 1984; 96(3): 435-64.

[29] Suls J, Martin R. Heart disease occurs in a biological, psychological, and social matrix: cardiac risk factors, symptom presentation, and recovery as illustrative examples. Ann Behav Med 2011; 41(2): 164-73.

[30] Kubzansky LD, Kawachi I, Weiss ST, Sparrow D. Anxiety and coronary heart disease: a synthesis of epidemiological, psychological, and experimental evidence. Ann Behav Med 1998; 20(2): 47-58.

[31] Buselli EF, Stuart EM. Influence of psychosocial factors and biopsychosocial interventions on outcomes after myocardial infarction. J Cardiovasc Nurs 1999; 13(3): 60-72.

[32] Rose SK, Conn VS, Rodeman BJ. Anxiety and self-care following myocardial infarction. Issues Ment Health Nurs 1994; 15(4): 433-44.

[33] Hemingway H, Marmot M. Evidence based cardiology: psychosocial factors in the aetiology and prognosis of coronary heart disease. Systematic review of prospective cohort studies. BMJ 1999; 318(7196): 1460-7.

[34] Kuper H, Marmot M, Hemingway H. Systematic review of prospective cohort studies of psychosocial factors in the etiology and prognosis of coronary heart disease. Semin Vasc Med 2002; 2(3): 267-314.

[35] Krantz DS, McCeney MK. Effects of psychological and social factors on organic disease: a critical assessment of research on coronary heart disease. Annu Rev Psychol 2002; 53: 341-69.

[36] Smith TW, Ruiz JM. Psychosocial influences on the development and course of coronary heart disease: current status and implications for research and practice. J Consult Clin Psychol 2002; 70(3): 548-68.

[37] Rosengren A, Wilhelmsen L, Orth-Gomer K. Coronary heart disease in relation to social support and social class in Swedish men. A 15 year follow-up in the study of men born in 1933. Eur Heart J 2004; 25(1): 56-63.

[38] Baumann A, Filipiak B, Stieber J, Löwel H. Family status and social integration as predictors of mortality: a 5-year follow-up study of 55- to 74-year-old men and women in the Augsburg area. Z Gerontol Geriatr 1998; 31(3): 184-92.

[39] Berkman LF, Glass T, Brissette I, Seeman T. From social integration to health: Durkheim in the new millennium. Soc Sci Med 2000; 51(6): 843-57.

[40] Berkman LF, Blumenthal J, Burg M, et al. Effects of treating depression and low perceived social support on clinical events after myocardial infarction: the Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD) Randomized Trial. JAMA 2003; 289(23): 3106-16.

[41] Pfiffer D, Hofmann A. Psychosocial predictors of death for low-risk patients after a first myocardial infarction: a 7-year follow-up study. J Cardiopulm Rehabil 2004; 24(2): 87-93.

[42] Orth-Gomér K, Wamala SP, Horsten M, Schenck-Gustafsson K, Schneiderman N, Mittleman MA. Marital stress worsens prognosis in women with coronary heart disease: The Stockholm Female Coronary Risk Study. JAMA 2001; 284(23): 3008-14.

[43] Coyne JC, Roahrbaugh MJ, Shoham V, Sonnega JS, Nicklas JM, Cranford JA. Prognostic importance of marital quality for survival of congestive heart failure. Am J Cardiol 2001; 88(5): 526-9.

[44] Kiecolt-Glaser JK, Newton TL. Marriage and health: his and hers. Psychol Bull 2001; 127(4): 472-503.

[45] Waltz M. Marital context and post-infarction quality of life: is it social support or something more? Soc Sci Med 1986; 22(8): 791-805.

[46] Badura B, Kaufhold G, Lehmann H, et al. Social support and coping with disease—new results from the Oldenburg longitudinal study 4 1/2 years after the first infarction. Psychother Psychosom Med Psychol 1988; 38(1): 48-58.

[47] Brehm ML, Dracup K, Moser DK, Riegel B. The relationship of marital quality and psychosocial adjustment to heart disease. J Cardiovasc Nurs 1994; 9(1): 74-85.

[48] Moser DK, Dracup K. Role of spousal anxiety and depression in patients’ psychosocial recovery after a cardiac event. Psychosom Med 2004; 66(4): 527-32.

[49] Troxel WM, Matthews KA, Gallo LC, Kuller LH. Marital quality and occurrence of the metabolic syndrome in women. Arch Intern Med 2005; 165(9): 1022-7.

[50] Clarke DE, Walker JR, Cuddy TE. The role of perceived overprotectiveness in recovery 3 months after myocardial infarction. J Cardiopulm Rehabil 1996; 16(6): 372-7.

[51] Hilbert GA. Spouse support and myocardial infarction patient compliance. Nurs Res 1985; 34(4): 217-20.

[52] Barlow D. Ed. Anxiety and its disorders. New York: Guilford 1988.

[53] Hyde LW, Gorka A, Manuck SB, Hariri AR. Perceived social support moderates the link between threat-related amygdala reactivity and trait anxiety. Neuropsychology 2011; 49(4): 651-6.

[54] Bowers CA, Gesten EL. Social support as a buffer of anxiety: An experimental analogue. Am J Comm Psychol 1986; 14(4): 451.

[55] Klerman GL, Ed. Interpersonal psychotherapy of depression. New York: Basic Books 1984.

[56] Markowitz JC, Ed. Interpersonal psychotherapy for dysthymic disorder. Washington, DC: American Psychiatric Press 1988.

[57] Fairburn CG. Interpersonal psychotherapy for bulimia nervosa. In: Garner DM, Garfinkel PE, Eds. Handbook of treatment for eating disorders. New York: Guilford Press 1997.

[58] Weissman MM, Markowitz JC, Klerman GL. Comprehensive guide to interpersonal psychotherapy. New York: Basic Books 2000.

[59] León CT, Nouwen A, Sheffield D, Jaundally R, Lip GY. Anger rumination, social support, and cardiac symptoms in patients undergoing angiography. Br J Health Psychol 2010; 15(P 4): 841-57.

[60] Volz A, Schmid JP, Zwahlen M, Kohls S, Saner H, Barth J. Predictors of readmission and health related quality of life in patients with chronic heart failure: a comparison of different psychosocial aspects. J Behav Med 2011; 34(1): 13-22.
In Sickness and in Health: a Literature Review about Function

[61] Turner A, Phillips L, Hambridge JA, Baker AL, Bowman J, Colyvas K. Clinical outcomes associated with depression, anxiety and social support among cardiac rehabilitation attendees. Aust N Z J Psychiatri 2010; 44(7): 658-66.

[62] Cohen S, Gottlieb BH, Underwood LG. Social relationships and health. In: Cohen S, Gottlieb BH, Underwood LG, Eds. Social support measurement and intervention: A guide for health and social scientists. New York: Oxford University Press 2000.

[63] Coyne JC, Ellard JH, Smith DE. Unsupportive relationships, interdependence, and unhappiness changes, In: Sarason IG, Sarason BR, Pierce G, Eds. Social Support: An Interational View, New York: Wiley 1990.

[64] Cohen S. Measuring the functional components of social support. In: Sarason IG, Sarason BR, Eds. Social Support: Theory, Research, and Applications. Boston, MA: Martinus Nijhoff Publishers 1985.

[65] Lyons R. Close Relationships Through Chronic Health and Illness. New York: Sage 1995.

[66] Hogan R. Development of an empathy scale. J Consult Clin Psychol 1969; 33(3): 307-16.

[67] Davis MH. Empathy: Negotiating the border between self and other. In: Tiedens LZ, Leach CW, Eds. The social life of emotions, Cambridge: Cambridge University Press 2004.

[68] Richardson DR. Empathy as a cognitive inhibitor of interpersonal aggression. Aggress Behav 1994; 20: 275-90.

[69] Davis MH, Kraus LA. Dispositional empathy and social relationships. Advances in personal relationships, In: Jones WH, Perlman D, Eds. Advances in Personal relationships London: Kingsley 1991.

[70] Underwood B, Moore B. Perspective-taking and altruism. Psychol Psycho 1982; 91: 143-73.

[71] Eisenberg N, Fabes RA. Prosocial development. Handbook Child Psychol 1998; 3: 701-78.

[72] Bowlby J. Attachment and loss: Separation, anxiety, and anger. New York: Basic Books 1973; Vol. 2.

[73] Bowlby J. Attachment and loss: Loss. New York: Basic Books 1980; Vol. 3.

[74] Bowlby J. Attachment and loss: Attachment. New York: Basic Books 1982; Vol L

[75] Carnelley K, Janoff-Bulman R. Optimism about love relationships: General vs. specific lessons from one's personal experiences. J Soc Pers Relat 1992; 9: 5-2.

[76] Collins NL, Read SJ. Adult attachment, working models, and relationship quality in dating couples. J Pers Soc Psychol 1990; 58(4): 644-63.

[77] Feeney JA, Noller P. Attachment styles as a predictor of adult romantic relationships. J Pers Soc Psychol 1990; 55: 281-91.

[78] Hazan C, Shaver P. Romantic love conceptualized as an attachment process. J Pers Soc Psychol 1987; 52: 511-24.

[79] Bretherton I. Attachment theory: Retrospect and prospect. In: Fehr B, Eds. The development of intimate relationships, in: Perlman D, Duck S, Eds. Sage: Newbury Park, CA 1987.

[80] Reis HT, Shaver P Intimacy as an interpersonal process, in: Handobook of interpersonal relationships. In: DUCK S, Ed: Wiley: Chichester, UK 1988.

[81] Hazan C, Shaver P. Romantic love conceptualized as an attachment process. J Pers Soc Psychol 1987; 52: 511-24.

[82] Bretherton I. Attachment theory: Retrospect and prospect. In: Fehr B, Eds. The development of intimate relationships, in: Perlman D, Duck S, Eds. Sage: Newbury Park, CA 1987.

[83] George C, West M. Developmental vs. social personality models of adult attachment and mental ill health. Br J Med Psychol 1999; 72: 285-303.

[84] Kafetsios K, Sideridis GD. Attachment, social support and well-being in young and older adults. J Health Psycho 2006; 11(6): 863-75.

[85] Lafortune MF, Be’langer C, Gagnon C. Comparisons of close relationships: An evaluation of relationship quality and patterns of attachment to parents, friends, and romantic partners in young adults support seeking, caregiving, and conflict management: evidence from an observational study with couples. Eur J Psychol 2009; 3: 9-24.

[86] Bureau JF, Easterbrooks MA, Lyons-Ruth K. Maternal depressive symptoms in infancy: unique contribution to children's depressive symptoms in childhood and adolescence? Dev Psychopathol 2009; 21(2): 519-37.

[87] Raja SN, McGee R, Stanton WR. Perceived attachments to parents and peers and psychological well-being in adolescence. J Youth Adoles 1992; 21: 471-85.

Clinical Practice & Epidemiology in Mental Health, 2013, Volume 9

[88] Brashard A, Shaver PR, Lussier Y. Attachment, sexual experience, and sexual pressure in romantic relationships: A dyadic approach. Pers Relationships 2007; 14: 475-93.

[89] Mikulincer M, Shaver PR. Attachment in adulthood: Structure, dynamics, and change. New York, NY: Guilford Press 2007.

[90] McWilliams LA, Cox BJ, Enns MW. Impact of adult attachment styles on pain and disability associated with arthritis in a nationally representative sample. Clin J Pain 2000; 16(4): 360-4.

[91] Ciechanowski P, Sullivan M, Jensen M, Romano J, Summers H. The relationship of attachment style to depression, catastrophizing and health care utilization in patients with chronic pain. Pain 2003; 104(3): 627-37.

[92] Meredith PJ, Strong J, Feeney JA. Adult attachment variables predict depression before and after treatment for chronic pain. Eur J Pain 2007; 11(2): 164-70.

[93] McWilliams LA, Bailey SJ. Associations between adult attachment ratings and health conditions: evidence from the National Comorbidity Survey Replication. Health Psychol 2010; 29(4): 446-53.

[94] Davila J, Kashy DA. Secure base processes in couples: daily associations between support experiences and attachment security. J Fam Psychol 2009; 23(1): 76-88.

[95] Cobb RJ, Davila J, Bradbury TN. Attachment security and marital satisfaction: The role of positive perceptions and social support. Pers Soc Psychol Bull 2001; 27(9): 1131-43.

[96] Cordova MJ, Cunningham LL, Carlson CR, Andrýkow S. Social constraints, cognitive processing, and adjustment to breast cancer. J Consult Clin Psychol 2001; 69(4): 706-11.

[97] Black K, Lobo M. A conceptual review of family resilience factors. J Fam Nurs 2008; 14(1): 33-55.

[98] Benson LA, McGinn MM, Christensen A. Common principles of couple therapy. Behav Ther 2012; 43(1): 25-35.

[99] Halford WK. Marriage and relationship education: What works and how to provide it. New York, NY: Guilford Press 2011.

[100] Olson DH, Russell CS, Sprenkle DH. Circumplex model of marital and family systems: VI. Theoretical update. Fam Process 1983; 22(1): 69-93.

[101] Hilton BA, Koop PM. Family communication pattern in coping with early breast cancer. West J Nurs Res 1994; 16(4): 366-91.

[102] McAdams DP. Intimacy: The need to be close. New York: Doubleday 1989.

[103] Perlman D, Fehr B. The development of intimate relationships, in: Intimate relationships: Development, dynamics, and deterioration, In: Perlman D, Duck S, Eds. Sage: Newbury Park, CA 1987.

[104] Reis HT, Shaver P Intimacy as an interpersonal process, in: Handobook of interpersonal relationships. In: DUCK S, Ed: Wiley: Chichester, UK 1988.

[105] Myers DG. The pursuit of happiness: Who is happy-and why. New York: William Morrow 1992.

[106] Reis HT, Wheeler L, Keast MH, Spiegel N, Nezlek J. On specificity in the impact of social participation on physical and psychological health. J Pers Soc Psychol 1985; 48(2): 456-71.

[107] Chelune GJ, Waring EM. Nature and assessment of intimacy. In: Advances in psychological assessment. McKernolds P, Chelune GJ, Eds. Jossey-Bass: San Francisco 1984.

[108] Brown GW, Harris T. Social origins of depression. New York: Free Press 1978.

[109] Weiss RS. Loneliness: The experience of emotional and social isolation. Cambridge, MA: MIT Press 1973.

[110] Miller RS, Lefcourt HM. Social intimacy: an important moderator of stressful life events. Am J Commun Psychol 1983; 11(2): 127-39.

[111] Hoberfeld SE, Lerman M. Personal relationships, personal attributes, and stress resistance: mothers' reactions to their child's illness. Am J Commun Psychol 1988; 16(4): 565-89.

[112] Waltz M, Badura B, Pfaff H, Schott T. Marriage and the psychological consequences of a heart attack: a longitudinal study of adaptation to chronic illness after 3 years. Soc Sci Med 1988; 27(2): 149-58.

[113] Cohen S, Doyle WJ, Skoner DP, Rabin BS, Gwaltney JM Jr. Social ties and susceptibility to the common cold. JAMA 1997; 277(24): 1940-4.

[114] Ford ES, Loucks EB, Berkman LF. Social integration and concentrations of C-reactive protein among US adults. Ann Epidemiol 2006; 16(2): 78-94.
[113] Loucks EB, Sullivan LM, D’Agostino RB Sr, Larson MG, Berkman LF, Benjamin EJ. Social networks and inflammatory markers in the Framingham Heart Study. J Biosoc Sci 2006; 38(6): 835-42.
[114] Gorkin L, Schron EB, Brooks MM, et al. Psychosocial predictors of mortality in the Cardiac Arrhythmia Suppression Trial-1 (CAST-1). Am J Cardiol 1993; 71(4): 263-7.
[115] Enhancing recovery in coronary heart disease patients (ENRICHD): study design and methods. The ENRICHD investigators. Am Heart J 2000; 139(1 Pt 1): 1-9.
[116] Enhancing Recovery in Coronary Heart Disease (ENRICHD) study intervention: rationale and design. Psychosom Med 2001; 63(5): 747-55.
[117] Blumenthal JA, Burg MM, Barefoot J, Williams RB, Haney T, Zimet G. Social support, type A behavior, and coronary artery disease. Psychosom Med 1987; 49(4): 331-40.
[118] Beck A, Steer R, Garbin M. Psychometric properties of the depression inventory. Twenty-five years of evaluation. Clin Psychol Rev 1981; 8: 1003-1069.
[119] Vaglio J, Conard M, Poston WS. Testing the performance of the ENRICHD Social Support Instrument in cardiac patients. Health Qual Life Outcomes 2004; 2: 24.
[120] Collins NL. Working models of attachment: implications for explanation, emotion and behavior. J Pers Soc Psychol 1996; 71(4): 810-32.
[121] Wu WL, Zhang W, Liu XH. The reliability and validity of adult attachment scale (AAS-1996 revised edition): a report on its application in China. Sichuan Da Xue Xue Bao Yi Xue Ban 2004; 35(4): 536-8.
[122] Stansfeld S, Marmot M. Deriving a survey measure of social support: the reliability and validity of the Close Persons Questionnaire. Soc Sci Med 1992; 35(8): 1027-35.
[123] Russell D, Peplau LA, Ferguson ML. Developing a measure of loneliness. J Pers Assess 1978; 42(3): 290-4.
[124] Russell D, Peplau LA, Cutrona CE. The revised UCLA Loneliness Scale: concurrent and discriminant validity evidence. J Pers Soc Psychol 1980; 39(3): 472-80.
[125] Russell DW. UCLA Loneliness Scale (Version 3): reliability, validity, and factor structure. J Pers Assess 1996; 66(1): 20-40.
[126] Evans L, Probert H, Shuldham C. Cardiac rehabilitation – Past to Present. J Res Nurs 2009; 14: 223-40.
[127] Hall R, More R, Camm J, et al. Fifth report on the provision of services for patients with heart disease. Heart 2002; 88 Suppl 3: iii1-56.
[128] National Institute for Health and Clinical Excellence. Clinical Guideline 48: MI: Secondary Prevention in Primary and Secondary Care for Patients Following a Myocardial Infarction. 2007. Available from: http://www.nice.org.uk/CG48
[129] Mosca L, Manson JE, Sutherland SE, Langer RD, Manolio T, Barrett-Conner E. Cardiovascular disease in women: a statement for healthcare professionals from the American Heart Association. Writing Group. Circulation 1997; 96(7): 2468-82.
[130] Carhart RL, Jr, Ades PA. Gender differences in cardiac rehabilitation. Cardiol Clin 1998; 16(1): 37-43.
[131] Con AH, Linden W, Thompson JM, Ignaszewski A. The psychology of men and women recovering from coronary artery bypass surgery. J Cardiopulm Rehabil 1999; 19(3): 152-61.
[132] Yoshida T, Kohuzuki M, Yoshida K. Physical and psychological improvements after phase II cardiac rehabilitation in patients with myocardial infarction. Nurs Health Sci 1999; 1(3): 163-70.
[133] Hämäläinen H, Smith R, Puukka P, et al. Social support and physical and psychological recovery one year after myocardial infarction or coronary artery bypass surgery. Scand J Public Health 2000; 28(1): 62-70.
[134] Villani A, Malfatto G, Rosa DF, et al. Disease management for heart failure patients: role of wireless technologies for telemedicine. The ICAROS project. G Ital Cardiol 2007; 8(2): 107-14.