Dyadic and mediation analyses of coping with cardiovascular disease

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Abstract

The purpose of this study was to investigate the relationship between attachment security and health outcomes of cardiac patients and their spouses. Dyadic coping and relationship quality were proposed to mediate this relationship. Participants were 72 couples in which one member of the couple was participating in cardiac rehabilitation. Results showed that participants with higher attachment avoidance perceived their general and mental health worse and were less likely to exercise. Patients with higher attachment avoidance perceived their partner as less supportive and this was negatively associated with their general and mental health. Spouses’ positive support and marital happiness partially mediated the relationship between their attachment anxiety and mental health. Patients with spouses with higher attachment anxiety exercised more; whereas spouses of patients with higher attachment anxiety exercised less.

Keywords: Couples; coping; attachment security; cardiovascular disease; health outcomes.

1. Introduction

Growing number of studies have begun to focus on the role of couple relationships in the prognosis of chronic health conditions. Especially findings from epidemiological studies showing lower morbidity and mortality rates for the married, compared to the unmarried, called attention to the association between marital variables and health (Kiecolt-Glaser & Newton, 2001). Studies with cardiac patients have shown that some couple variables may aid recovery through partners’ support and impact on treatment adherence and health promoting behaviors (DiMatteo, 2004; Franks et al., 2006). On the other hand, variables such as poor marital quality and hostility were found to have negative consequences (Coyne et al., 2001; Orth-Gomer et al., 2000). Fewer studies have examined the diseases’ impact on the caregivers. In several studies spouses of cardiac patients have reported high degrees of psychological distress, especially during the initial phase and up to one year after a cardiac event (Coyne & Smith, 1991). One of the most persistent variables predicting spouses’ distress was their retrospective reports of the quality of marital...
relationship. Thus, marital quality appears to be a significant factor in managing the impact of CVD for the spouses as well as the patients.

As a chronic illness that affects and is affected by the couple relationship, we examined coping with CVD as a couple process. We used an attachment theory lens to provide an interpersonal framework to coping. Attachment theory suggests that individuals are born with an innate tendency to seek out and maintain proximity to caring others (attachment figures) especially in times of distress (Bowlby, 1988). During such times, the availability, sensitivity, and responsiveness of the attachment figure fosters the development of mental representations of self, relationship partners, and close relationships; guiding emotional functioning in relationships throughout adulthood. Closely related to these mental representations are attachment styles that reflect persons’ patterns of expectations, needs, emotions, and behaviors (Milkulincer & Shaver, 2007). Attachment styles can be classified by the two dimensions of anxiety and avoidance (Brennan, Clark, & Shaver, 1998). “Attachment anxiety” represents an excessive desire for closeness, worry over relationships, and fear of abandonment and rejection; whereas “attachment avoidance” represents discomfort with closeness and excessive self-reliance. Individuals low on both dimensions are considered securely attached. “Attachment security” is associated with trust in relationship partners, expectations of partners’ availability and responsiveness, comfort with closeness and constructive coping with threats and stressors (Milkulincer & Shaver, 2007). Attachment has been linked to physical health in several ways. Bowlby (1988) indicated that attachment behaviors (i.e., proximity seeking) are most evident when the person is frightened, tired, or sick. So, ill-health as a threat to wellbeing is expected to motivate individuals to engage in attachment behaviors parallel with their attachment styles (Feeney, 2000). Furthermore, attachment has been associated with health variables through its link with stress and affect regulation systems (Maunder & Hunter, 2001). Studies showed differences in acute stress responses (i.e., cardiovascular and cortisol responses) among different attachment styles (Luecken, 1998). Moreover, studies have shown that attachment security has implications for health behaviors such as symptom reporting (Bartholomew & Horowitz, 1991), professional help seeking (Feeney & Ryan, 1994), treatment adherence and patient self-care (Ciechanowski, Wayne, Russo, & Edward, 2001).

The main objectives of the present study were to examine the impact of attachment security on cardiac patients’ and their partners’ health outcomes and to examine the mechanisms underlying this link. Relationship quality and dyadic coping were proposed to mediate this link. Dyadic coping is a form of interpersonal coping initiated by the dyadic stress experienced by both partners and that leads them to conjoint problem-solving (Bodenmann & Cina, 2005). This process may take negative or positive forms. Negative dyadic coping is characterized by ambivalent (i.e., unwilling support), hostile (i.e., disparagement, distancing), and superficial coping efforts of the dyad (i.e., support that lacks empathy). Positive forms of dyadic coping include supportive dyadic coping (i.e., empathic understanding, practical advice), common dyadic coping (i.e., joint problem-solving), and delegated dyadic coping (i.e., new division of tasks; Bodenmann & Cina, 2005). Overall, we hypothesized that patients’ and spouses’ high attachment avoidance and attachment anxiety would be negatively associated with their own and their partners’ perceived health outcomes; and dyadic coping and relationship quality would partially mediate this relationship.

2. Method

2.1. Participants

Sixty-three couples and nine individuals in an intimate relationship in which one member of the couple was participating in cardiac rehabilitation participated in the study. All the couples in the study were married except for one cohabiting couple. There were 72 patients (53%) and 63 spouses (47%) and 63 matched couple surveys. Majority of patients were male (71%) and majority of spouses were female (75%). Participants’ ages ranged between 35 and 86 (SD = 9.69) with a mean of 66 years. Education level of participants varied: 47% were high school graduates, 26% completed some college, 17% obtained bachelor’s degrees, 4% had master’s degrees, and 5% doctoral degrees. The couples have been in a relationship for a minimum of 6 and maximum of 69 years (SD = 14.28) and for 41 years on average. Majority of the participants were White-American (97%), one participant was African-American (1%), one was Asian-American (1%), and two identified themselves as “other” (2%). Most patients (77%) defined their major heart problem as coronary artery disease/blockages, 10% had myocardial infarction, 9% had valve disease, 3% had heart failure, and 2% had stroke. In terms of treatment 4% of patients...
reported use of medication, 40% had coronary artery bypass surgery, 51% had stents/angioplasty and 4% had valve replacement.

2.2. Measures

Data on health outcomes were collected through the second version of Short Form 36 (SF-36v2; Ware & Sherbourne, 1992) and Exercise Stages of Change Short Form (Marcus, Selby, Niaura, & Rossi, 1992). SF-36v2 is a generic health survey with 36 items and eight scales. In this study, general health (GH) and mental health (MH) subscales were used to measure perceived general health, health compared to a year ago, and mental health of participants. Exercise Stages of Change - Short Form describes exercise behavior with five-items that reflect five stages of change: precontemplation, contemplation, preparation, action, and maintenance. The Experiences in Close Relationships-Revised (ECR-R; Fraley, Niels, & Brennan, 2000) was used to measure the attachment security of participants. ECR-R is a 36 item measure designed to assess the two dimensions of attachment; attachment-related avoidance and attachment-related anxiety. Dyadic coping was measured using the 37-item Dyadic Coping Inventory (DCI; Bodenmann, 2007) in which respondents rate their perceptions of dyadic coping by themselves and by their partner on a 5-point scale. Four of the DCI subscales (supportive dyadic coping by oneself, and by partner, negative dyadic coping by oneself, and by partner) were used and were renamed as “giving positive support,” “receiving positive support,” “giving negative support,” and “receiving negative support.” Relationship satisfaction and marital happiness were measured with the 6-item Quality Marriage Index (QMI; Norton, 1983). Finally, patients also completed a Health Information Form about their major heart problem, treatment, and surgery.

3. Results

According to paired sample t-test results, patients and spouses did not show significant differences in their attachment variables, GH, MH, relationship satisfaction, and marital happiness. However, they differed significantly in two dyadic coping variables. When compared to the spouses ($M = 18.46$), patients ($M = 20.05$) reported higher levels of receiving positive support from their partners [$t(62) = 2.42, p < .05$]; and compared to the patients ($M = 1.89$), spouses ($M = 2.10$) perceived their partners as giving negative support more [$t(62) = -2.99, p < .005$]. Patients and spouses also differed significantly in their health compared to a year ago in which patients ($M = 71.61$) perceived their health to be better than the spouses did [$M = 60.95; t(61), p < .05$]. For their current exercise behavior, compared to spouses ($M = 3.60$), patients ($M = 4.13$) also reported being at higher stages of exercise [$t(59) = 2.66, p < .05$].

3.1. Dyadic Analyses

Dyadic data were analyzed with the “Actor-Partner Interdependence Model” (APIM) to examine the relationship between attachment security and the health outcomes of couples. APIM allows retaining the individual unit measures but treats them as nested within dyads which allows measuring the interdependence of observations as in couples data (Cook & Kenny, 2005). In the main-effects models, “self attachment anxiety” and “self attachment avoidance” are actor effects estimating the degree to which a person’s level of attachment anxiety/avoidance affects his or her own outcome score. “Partner attachment anxiety” and “partner attachment avoidance” are partner effects estimating the degree to which a person’s level of attachment anxiety/avoidance affects his or her partner’s outcome. In the GH main-effects model, there was a significant actor effect for attachment avoidance ($b = -3.12, t(99.2) = -2.00, p < .05$); however partner effects for attachment anxiety and avoidance and as well as the actor effect for attachment anxiety were not significant. A significant partner effect was found for attachment avoidance on health compared to a year ago ($b = 4.42, t(109) = .03, p < .05$). Acto effects for attachment anxiety and avoidance, partner attachment anxiety were not significant in this model. In the MH main-effects model, there was a significant actor effect for attachment avoidance ($b = -5.34, t(104) = -3.47, p < .05$). Self attachment anxiety, partner effects for attachment anxiety and avoidance were not significant. In the exercise stage main-effects model, there was a marginally significant actor effect for attachment avoidance ($b = -.21, t(104) = .05, p < .10$). Self attachment avoidance, partner effects for attachment anxiety and avoidance were not significant in this model. In addition, there was a significant interaction effect for the interaction between partner attachment anxiety and patient status in
relation to exercise stage \([b = .53, t(104) = 2.06, p < .05]\). This interaction shows that the relationship between an individual’s exercise stage and his or her partner’s attachment anxiety is different for patients and spouses.

### 3.2. Mediating Effects for Patient Variables and Spouse Variables

Patient attachment avoidance had a significant relationship with patient GH. Separate regression analyses with each mediator as the outcome variable showed that attachment avoidance was a significant predictor for all of the mediators. Examining the relationships between the mediators and GH, perceived negative support \([b = -25.66, t(1) = -2.69, p < .05]\) was the only mediator that was a significant predictor of GH while controlling for attachment avoidance. In the bootstrapping approach, if the confidence interval does not include zero, the mediating effect is considered significant at the .05 level (Shrout & Bolger, 2002). The bias corrected 95% confidence interval for the mediated effect did not include zero and the mediating effect of perceived negative support was significant at the .05 level. Patient attachment avoidance was a significant predictor of patient MH as well. Patient perceived negative support \([b = -28.72, t(1) = -3.16, p < .05]\) was the only mediator that was a significant predictor of MH while controlling for attachment avoidance. The bias corrected 95% confidence interval for the mediating effect did not include zero and the mediating effect was significant at the .05 level. Neither one of the attachment variables significantly predicted patient health compared to a year ago or relationship quality. So, the mediation was not established for these outcome variables.

Spouse attachment avoidance had a significant relationship with spouse GH. Separate regression analyses with each mediator as the outcome variable showed that attachment avoidance was a significant predictor of all of them. However, none of the mediating variables was a significant predictor of GH when controlled for attachment avoidance. So, potential mediation was not established for GH. However, spouse attachment anxiety and avoidance were significant predictors of spouse MH. Separate regression analyses showed that attachment anxiety was a significant predictor of all the mediating variables. None of the mediating variables had a significant relationship with MH when attachment avoidance was controlled for in these models. So, attachment avoidance did not meet the condition to establish a potential partial mediation through the mediating variables. However, both giving positive support \([b = -1.85, t(1) = -2.45, p < .05]\) and marital happiness \([b = 3.80, t(1) = 2.24, p < .05]\) were significant predictors of MH when attachment anxiety was controlled for. When the mediating effect of spouse giving positive support in the relationship between spouse attachment anxiety and spouse MH was examined, the bias corrected 95% confidence interval for the mediating effect did not include zero and the mediating effect was significant at the .05 level. In addition, when the mediating effect of spouse marital happiness in the relationship between spouse attachment anxiety and spouse MH was examined, the bias corrected 95% confidence interval for this mediating effect also did not include zero and was significant at the .05 level. When the two mediators, spouse giving positive support and spouse marital happiness were simultaneously tested for mediating effects in the relationship between spouse attachment anxiety and MH, the bias corrected 95% confidence interval did include zero (-8.387, 5.165) so it was non-significant. Neither one of the attachment variables significantly predicted spouse health compared to a year ago or exercise stage. So, the mediation was not established for these outcome variables.

### 4. Conclusion

Our findings suggested that, overall; patients might be at an advantage compared to the spouses in receiving more positive and less negative support from their spouses. Patients also perceived their health to be better compared to a year ago more than the spouses. Patients and spouses with higher attachment avoidance perceived their GH and MH to be worse and they were also at lower stages of exercise as hypothesized. With patient variables, perceived negative support from spouse mediated the relationship between attachment avoidance and GH and MH. Mediation analyses with spouse variables showed a partial indirect effect of giving positive support as well as marital happiness on the relationship between spouse attachment anxiety and spouse MH. Our finding concerning the partner effect of attachment avoidance on health compared to a year ago was contrary to our hypothesis. The results showed that one’s partner’s attachment avoidance had a positive relationship with one’s health compared to a year ago. The interaction effects showed that partners’ attachment anxiety had a different impact on the exercise behavior of patients and spouses. If patients had spouses with high attachment anxiety, the patients were at higher stages of exercise; whereas if spouses were with patients with attachment anxiety, the spouses were at lower levels of exercise.
stage. This difference in the effect of having a partner with attachment anxiety for patients versus partners may constitute an example of the impact of the relationship context on couples’ health behaviors.

A major strength of this study was the inclusion of the perspectives of both members of a couple coping with CVD. Majority of the literature on coping with physical illness is based on individuals’ perspectives. Furthermore, fewer studies examined the impact of the disease on the caregivers. Use of the APIM method was another strength of this study, since it allows the dyad to be considered as the unit of analysis. In addition, the APIM allowed us to examine the interaction effects in which we examined the effect of a moderator variable on the size of another independent variable’s effect on the outcome variable. Furthermore, through mediation analyses, the current study provided some unique explanations to the observed effects of attachment security on the health outcomes via the dyadic coping and relationship quality variables. A limitation of the study was its cross-sectional design. Elapse of time after receiving the CVD diagnosis might play a role in the amount of psychological distress experienced by the patients or spouses as well as their perceptions of their GH. In addition, since we do not have data collected prior to CVD diagnosis, we are not able to compare whether the couples’ dyadic coping variables or their relationship quality changed after the diagnosis. Furthermore, the current sample was comprised of patients attending cardiac rehabilitation programs. Studies reported that approximately one third of heart attack patients participate in formal cardiac rehabilitation in the United States (Center for Disease Control, 2008). So, the patients in our study might be individuals who are more likely to adhere to treatment, feel motivated to make the necessary life style changes, and in turn cope better with the illness.

References


