



Marital satisfaction and depression among couples following men's acute coronary syndrome: Testing dyadic dynamics in a longitudinal design

Rachel Dekel¹, Noa Vilchinsky¹, Gabriel Liberman²,
Morton Leibowitz³, Abed Khaskia³ and Morris Mosseri³

¹School of Social Work and Department of Psychology, Bar-Ilan University, Ramat Gan, Israel

²Data-Graph, Research and Statistical Consulting, Holon, Israel

³Department of Cardiology, Meir Medical Center, Kefar Saba, Israel

Objectives. The current study examined the contribution of marital satisfaction to symptoms of depression among patients with acute coronary syndrome (ACS) and their partners.

Method. The sample comprised of 91 ACS male patients and their female partners. Data were collected at the time of initial hospitalization and 6 months later. Patients' and partners' assessments of marital satisfaction were measured using the ENRICH scale. Symptoms of depression were measured using the Brief Symptoms Inventory (BSI). Dyadic analysis applying the Actor–Partner Inter-dependence Model (APIM) was used.

Results. Different patterns emerged for the two phases. In the acute phase, only the Actor effect was significant: for both patients and partners, one's greater marital satisfaction was associated with one's lower levels of depression. In the chronic phase, both Actor and Partner effects were significant, while different trends were found for patients and partners. Partners' marital satisfaction was associated with their own and the patients' decreased depression symptoms, whereas among patients, higher levels of marital satisfaction were associated with elevated levels of depression both for themselves and for their partners.

Conclusions. A dyadic perspective and phases of illness have to be taken into account in understanding adjustment and developing interventions following ACS.

Statement of contribution

What is already known on this subject?

- The contribution of marital satisfaction to psychological adjustment following cardiac illness has been explored, but mainly from the perspective of one partner only.

*Correspondence should be addressed to Rachel Dekel, School of Social Work, Bar-Ilan University, Ramat Gan, Israel (e-mail: Rachel.dekel@biu.ac.il).

- Different phases of an illness present different challenges for both patients and family members.

What does this study add?

- A dyadic perspective on recovery from cardiac illness.
- The partner's contribution during the different phases of the illness.

Major depressive disorder is considerably more prevalent among patients with coronary heart disease (15–40%) than in the general population (2.3–9.3%, Kop & Plumhoff, 2011; Poole, Dickens, & Steptoe, 2011). The presence of depression has been found to increase the risk of cardiac morbidity and mortality, as well as other severe clinical outcomes (Lett, Sherwood, Watkins, & Blumenthal, 2007). Moreover, the symptoms of depression are not limited to the patients, and the evidence suggests that caregivers also suffer from high levels of distress in general and symptoms of depression in particular (Randall, Molloy, & Steptoe, 2009).

One factor that has a strong impact on distress following illness in general and cardiac illness in particular is the marital relationship. Studies have found that a positive marital relationship buffers the effects of patient and caregiver distress, whereas negative marital relationships do not (Walts, Badura, Pfaff, & Schott, 1988). However, despite the established importance of the caregiver in promoting the patient's psychological well-being and the accumulated knowledge regarding the distress of the caregiver (Randall *et al.*, 2009), research in the field of illness has tended to neglect the fact that couples react as units or systems (Coyne & Smith, 1991) and has overlooked the dyadic nature of the recovery process (Bennett & Connell, 1999; Revenson & DeLongis, 2011).

In addition, notwithstanding the research showing that different phases of an illness present different challenges for both patient and family members (Rolland, 1994; Stanton, Revenson, & Tennen, 2007), only a few studies have actually taken these different phases into account. The current study examined the contribution of marital satisfaction to male cardiac patients' and their female partners' depressive symptoms during the illness's acute and chronic phases.

The contribution of marital satisfaction to post-event psychological distress

The marital discord model of depression (Beach, Sandeen, & O'Leary, 1990) suggests that the marital relationship plays a powerful role in the development and maintenance of depression. Specifically, the model proposes that supportive aspects of relationships such as couple cohesion, mutual respect and intimacy are less available in distressed marriages. Marital distress introduces additional stress on the marriage as well, through verbal and physical conflict, threats of separation and divorce (Beach & O'Leary, 1993). Taken together, the increase in stressors on the one hand and the decrease in available support on the other are believed to create the link between marital distress and depression. Indeed, there is a strong link between marital distress and depression in both clinical and community samples of married couples (Dehle & Weiss, 1998).

Most of the research, among patients and partners, which examined marital satisfaction following a cardiac event, has focused on patients' marital satisfaction as a predictor of their post-event psychosocial distress. These studies have found that a positive marital relationship buffers the effects of patients' and caregivers' distress, whereas negative marital relationships do not (Burman & Margolin, 1992; Randall *et al.*, 2009).

Other studies have focused on the role of the partner's marital satisfaction in reducing the psychological distress experienced by the patient. For example, Beach *et al.* (1992) found a positive association between partners' marital satisfaction and patients' recovery 3 months after a myocardial infarction (MI). In a longitudinal study that examined recovery from MI among a national sample of male cardiac patients, the level of intimacy provided by the partner was inversely related to the patient's level of depression (Waltz *et al.*, 1988).

Several authors suggest that the response of couples to illness in general and to cardiac illness in particular should be viewed as a systematic transactional response by both partners and suggest that recovery should be conceptualized as a dyadic rather than an individual process (Bennett & Connell, 1999; Coyne & Smith, 1991; Revenson & DeLongis, 2011; Revenson, Kayser, & Bodermann, 2005). However, only a limited number of studies have investigated how family members cope with the stressors they face as a couple or how the partners' relationship satisfaction mutually influences each other (Revenson & DeLongis, 2011).

In a seminal work conducted among congestive heart failure patients, a composite score of patients' and spouses' marital functioning was found to predict patients' survival rates 4 and 8 years later (Coyne *et al.*, 2001). This composite score was predictive to a much greater extent than patients' individual scores (Rohrbaugh, Shoham, & Coyne, 2006). This analysis, however, did not take into account the couples' inter-dependence, that is, their mutual influence in terms of both predictors and outcomes.

A recent study among patients with heart failure and their partners (Chung, Moser, Lennie, & Rayens, 2009) found that whereas partners' emotional distress predicted a poor quality of life for the patients, the patients' depression did not predict their partners' quality of life. The above-mentioned finding highlighted the direct (on oneself) and crossover (on one's partner) contributions of each partner. However, it investigated these dynamics only at one point during the illness trajectory and did not take into account the different illness phases.

The illness phases

According to Stanton *et al.* (2007), illness-related stressors are both continuous and changing, as patients and partners go through different stages along the illness trajectory. Rolland (1994) claims that too often illness is conceived of as a static state and the dynamic unfolding of the illness process over time is therefore neglected. According to Rolland (1994), it is only when the acute, chronic and terminal phases of illness are differentiated that the unique psychosocial demands of each phase can be recognized. In the current study, we examined both the acute and the chronic phase following acute coronary syndrome (ACS, which is defined as a heart attack or new onset chest pain requiring hospitalization for stabilization).

The acute phase is characterized by the realization that the patient has a life-threatening illness. This realization can generate a sense of powerlessness and helplessness (Roberts, Kiselica, & Fredrickson, 2002) as well as high levels of anxiety among patients and their partners. There is a great deal of uncertainty regarding the future, and at this point, a substantial amount of care is provided by physicians, nurses and allied health professionals (Cameron & Gignac, 2008).

After the patient is discharged from the hospital and the acute phase is over, family members – especially partners – serve as the main caregivers and must face the practical and emotional demands of the chronic phase. In this phase, the couple's ongoing, long-term relationship is challenged and therefore may influence the psychological adjustment

of both partners. During this adjustment period, partners might be concerned more than ever with the stability of their relationship and with their partners' feelings towards them. The patients might worry that their partners will withdraw from the marital relationship because of their debilitating condition (Pruchno, Wilson-Genderson, & Cartwright, 2009). Partners, on the other hand, might be troubled by missing their 'former' partners. They struggle with the new asymmetry in their intimate relationship and might need to adapt to their partners' changes in sexual and intimate needs (Arenhall, Kristofferzon, Fridlund, & Nilsson, 2011).

The current study

To better understand the dyadic nature of psychological recovery following ACS, the present study examined the contribution of both partners' marital satisfaction to both partners' symptoms of depression, applying the Actor-Partner Inter-dependence Model (APIM; Kenny, Kashy, & Cook, 2006). In this model, the dyad is the unit of analysis, and each person's score is an independent variable that can influence not only his/her own score of the outcome variable but also the partner's score. In the current context, we examined: a. the contribution of an individual's own marital satisfaction to his/her own depressive symptoms (Actor effects); and b. the contribution of one's partner's marital satisfaction to the *other partner's* depression (Partner effects). In the current study, all patients were men, and all partners were women, so no interactions could be examined (hereafter, we will refer to patients and partners only).

Applying a longitudinal research design, we examined whether marital satisfaction as reported by patients and partners would predict their own symptoms of depression as well as the symptoms of their partners, both at the onset of the illness and during its chronic phase. Based on the changing demands that characterize each phase of the illness, we expected that in the acute phase, when joint efforts had not yet stabilized and individuals still had to rely mostly on their own resources, we would detect an Actor effect only, that is, each partner's marital satisfaction would contribute only to his/her own distress. In contrast, during the chronic phase one's emotional make-up is assumed to be especially susceptible to one's partner's feelings towards the relationship. Therefore, we expected the Partner effect, that is, the contribution of one partner's marital satisfaction to the other's depression, to be more salient.

Method

Participants and procedure

The current study was part of a large-scale longitudinal prospective research project investigating personal and dyadic adjustment to heart disease (see Vilchinsky *et al.*, 2010). The target population comprised of married or cohabiting men diagnosed with their first ACS, whose female partners also agreed to participate in the study. The rationale behind solely targeting men was that the average female cardiac patient is older and therefore more likely to be widowed (Lemos, Suls, Jenson, Lounsbury, & Gordon, 2003). In addition, patients with a history of a previous cardiac event, patients over 75 years of age, patients with a diagnosis other than ACS, patients who had comorbid conditions (e.g., psychiatric illness, neoplasia), and patients or their spouses who could not be interviewed in Hebrew were excluded.

The patients had been admitted between March 2005 and July 2007 to the Cardiac Care Unit (CCU) of Meir Medical Center, located in the central region of Israel. At baseline,

while the patients were hospitalized in the CCU, all of those eligible for the study and their partners were approached by the research team. Upon agreement, they were given the study's questionnaire. A research assistant was available to answer their questions and offer assistance. Six months later, patients and partners were interviewed again. The study was approved by the Meir Medical Center Institutional Review Board.

Measures

Marital satisfaction

We used the 10-item Hebrew version (Lavee, 1995) of the ENRICH scale (Fowers & Olson, 1993; Olson, Fournier, & Druckman, 1986) to measure marital satisfaction. The Hebrew version was found to be valid in numerous studies (Lavee & Katz, 2002; Lavee & Mey-Dan, 2003). Items were answered on a 7-point Likert scale ranging alternately from 1 ('I totally agree') to 7 ('I totally disagree') (for example: 'I am satisfied with how we share the responsibilities of raising our children'). Scores were recoded and averaged so that higher scores represent a higher level of marital satisfaction. In the present study, Cronbach's α for the total sample was .82. This instrument was administered to both partners at baseline, during hospitalization.

Depression

Patients' and partners' depression levels were measured using the appropriate subscale of the Brief Symptoms Inventory (BSI; Derogatis & Melisaratos, 1983). Each participant was asked to rank the degree of each depressive symptom during the previous month, on a scale ranging from 1 ('not at all') to 4 ('very much'). We used the Hebrew translation (Gilbar & Ben-Zur, 2002), and scores were averaged so that a higher score represents higher levels of depression. This instrument was administered to both members of the couple twice: at baseline, that is, during index hospitalization (acute phase), and at follow-up, that is, 6 months after the index hospitalization (chronic phase). The Cronbach's alpha reliabilities of the patients' questionnaires were .72 and .88 for baseline and 6-month follow-up levels of depression, respectively. The Cronbach's alpha reliabilities of the partners' questionnaires were .75 and .85 for baseline and 6-month follow-up levels of depression, respectively.

Severity of illness

The severity of the patient's illness upon hospitalization was assessed by a senior cardiologist on the basis of two sets of criteria: an echocardiogram, which examines the structure and functioning of the heart, and an angiogram, which examines the status of obstructed arteries and is used to evaluate the risk of future damage. Both scores were measured on a scale ranging from 1 ('normal') to 5 ('extremely severe').

Socio-demographic and medical data

Upon hospitalization, patients were asked to complete a short demographic questionnaire including age, duration (in years) of relationship, number of children, years of education and socio-economic status (SES) as measured on a scale ranging from 1 ('very poor') to 5 ('excellent'). At follow-up patients were asked about the occurrence of

additional coronary events during the previous 6 months (MI, Angioplasty, Coronary Artery Bypass Graft, and CVA).

Statistical analysis

First, the mean differences in the level of depression symptoms between partners and patients and the difference between depression levels at the acute versus the chronic phases were examined using ANOVA (analysis of variance) with repeated measures.

To test the hypothesized models, we followed Kenny *et al.*'s (2006) suggestion and applied the APIM using structural equation modelling (SEM). The first step in conducting an analysis of dyadic data is to examine the degree of independence in the dependent variable (West, Popp, & Kenny, 2008). Independence was assessed by computing the intraclass correlation (Kenny *et al.*, 2006), using the SPSS MIXED syntax. Interclass correlations were found to be significant for depression both during the acute phase (ICC = 0.10) and the chronic phase (ICC = 0.33). Given these nonzero correlations, the data for these sets were considered dependent and were analysed using dyadic analysis.

In the second step, we confirmed that our data consisted of distinguishable dyads, both in the acute and the chronic phases. Dyad members are considered distinguishable if there is a meaningful factor that can be used to differentiate between the two persons (Kenny *et al.*, 2006). In our case, this factor was social role: patients (males) and partners (females). Distinguishability was assessed by constraining for equity between the two social roles in all parameters (means, variances, intercepts, intrapersonal and interpersonal correlations) (Kenny *et al.*, 2006).

The following indexes were computed: the normed fit index (NFI) and the comparative fit index (CFI). These indexes compare the hypothesized model to a null model (or any prior model) and are based on the chi-square value. One should note that these indexes may not provide the expected fit due to the relatively small sample size (Kenny, Kaniskan, & McCoach, 2011) of the current study. We also computed the Tucker–Lewis Index (TLI), which is relatively independent of sample size, despite the fact that it adds a penalty for complexity. Generally, the expected values for the indexes are above 0.9. The IBM AMOS 20.0 software (IBM, Armonk, NY, USA), which uses the maximum likelihood estimate function to compute the estimated coefficients, was applied.

Finally, we compared the following models: the saturated model, the model with only Actor effect, the model with only Partner effect and a combined model consisting of both Actor and Partner effects (see Tables 2 and 3).

Results

Sample characteristics

Of the 306 patients eligible for the study, 27% left either to go to another hospital, another ward or their homes before the interview could take place. In an additional 35%, either the patient or the wife refused to be interviewed, and an additional 2% were found to be non-eligible during the interview due to the wife's severe health problem. Figure 1 describes the flow chart of participation in the study. Overall, 111 patients agreed to participate in the study and were asked to complete the study questionnaires twice: at baseline, that is, during hospitalization; and at follow-up, 6 months after hospitalization. Ten patients refused to continue with the study due to lack of time or interest (attrition rate = 9%). No significant differences were found between the 10 patients who dropped

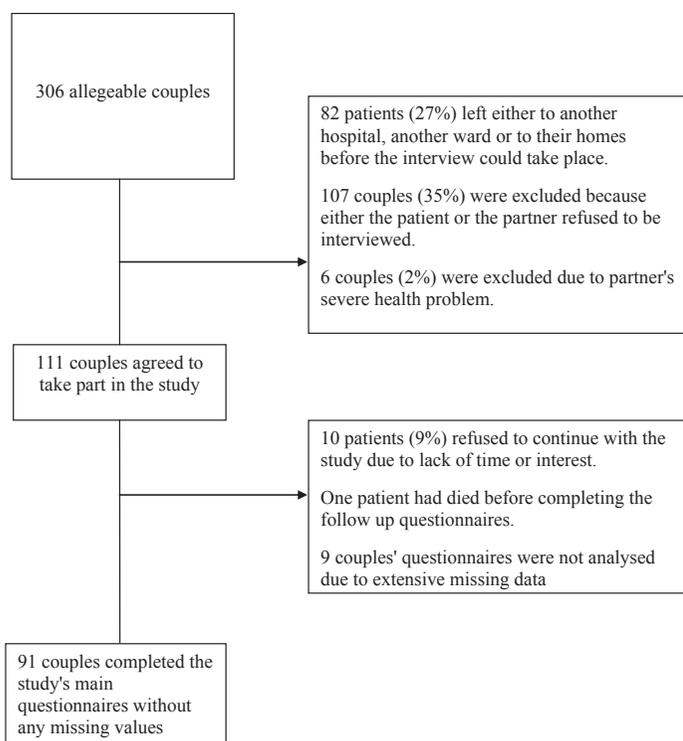


Figure 1. Study participants' flow chart.

out of the study and the remainder of the sample with regard to age, illness severity and socio-economic status. Of the remaining 101 patients, one patient died before completing the follow-up questionnaire and 91 completed the study's main questionnaires without any missing values. The data of nine couples included extensive missing values on behalf of either the patient or the partner (e.g., the dependent variable questionnaire was completely unanswered). According to Enders (2010), data that are deliberately missing, as in this case, limit the use of missing data replacement procedures. Therefore, the data of these nine couples were not further analysed (Enders, 2010).

Table 1 presents the means and *SDs* of the study socio-demographics. Patients ranged in age from 39 to 74 years. Half of them (52.2%) had over 12 years of formal schooling, and the majority of patients (65%) assessed their economic situation as good to very good. The age of the partners also ranged from 39 to 74 years. More than half (62%) had over 12 years of formal schooling, and almost the same percentage of partners as patients (62%) assessed their economic situation as good to very good.

The majority of patients (86.8%) had experienced an acute myocardial infarction (MI), whereas the remaining 13.2% had been diagnosed with unstable angina and had symptoms identical to those of a heart attack. Participants in both of these groups had undergone a catheterization procedure during hospitalization and had been found to be without severe damage to the heart and without significant obstruction of the arteries. Six months after their first ACS, very few of them had experienced repeat acute coronary events (3.3%) or coronary angioplasty (11%).

Table 1. Frequencies, means and standard deviations of the study variables ($N = 91$)

Characteristics	Patients <i>M (SD)</i>	Partners <i>M (SD)</i>
Age	56.60 (7.58)	55.68 (7.60)
Years of formal schooling	13.91 (3.31)	14.24 (2.99)
Socio-economic status (SES)	3.81 (.72)	3.80 (.76)
Years in relationship		29.34 (10.54)
Number of children		2.92 (1.15)

* $p < .05$; ** $p < .01$; *** $p < .001$.

Depression symptoms: differences between patients and partners

Applying ANOVA with repeated measures revealed a significant social role effect, $F(1,90) = 7.44$, $p = .008$; $\eta_p^2 = .08$. Partners reported higher levels of depression symptoms than patients overall ($M = 1.45$, $SD = .50$; $M = 1.30$, $SD = .45$ for partners and patients, respectively), that is, both in the acute phase ($M = 1.48$, $SD = .45$; $M = 1.29$, $SD = .35$ for partners and patients, respectively) and in the chronic phase ($M = 1.42$, $SD = .56$; $M = 1.31$, $SD = .54$, for partners and patients, respectively). Neither the phase effect, $F(1,90) = .27$, $p = .61$ ($M = 1.38$, $SD = .40$; $M = 1.37$, $SD = .55$, for the acute and chronic phases, respectively), nor the interaction effect between social role and phase, $F(1,90) = 2.26$, $p = .14$, was significant.

Testing the APIM in the acute phase

First, examining distinguishability revealed that the model constraining for equity between the different social roles in all parameters yielded very low fit indexes, indicating that our dyads were distinguishable both in the acute ($\chi^2 = 15.19$, $df = 5$; $p < .01$; NFI = 0.68, CFI = 0.75, RMSEA = 0.15 (90% CI = [0.07, 0.24]) and in the chronic phases ($\chi^2 = 44.90$, $df = 12$; $p < .001$; NFI = 0.74, CFI = 0.79, TLI = 0.73, SRMR = 0.08, RMSEA = 0.18 (90% CI = [0.12, 0.23])).

The hypothesized model of the acute phase consisted of patients' and partners' baseline levels of marital satisfaction as the independent variables and both patients' and partners' depression at baseline as the dependent variables. Table 2 presents the models that were examined: (1a) the structural null model, in which all potential effects equal zero; (2a) the saturated model, in which all potential effects are included; (3a) the Actor effect model; and (4a) the Partner effect model.

From Table 2, it can be seen that the Actor model (Model 3a) fits the data significantly better than the Partner model (Model 4a) (3a: NFI = 0.96, TLI = 1.02, CFI = 1.00; 4a: NFI = 0.70, TLI = 0.11, CFI = 0.70), indicating that each participant's marital satisfaction is associated with his/her own depression symptoms but not with his/her partner's depression symptoms. To assess whether these Actor effects were equal for patients and partners, an additional model (5a) in which the Actor effects were constrained to be equal was compared with the Actor model (3a). No significant differences were found between the two models in the goodness-of-fit measures ($\chi^2_D = 0.4$ (2.1–1.7), $df = 1$; $p = n.s.$). Thus, one can conclude that the Actor effects for both patients and partners are similar. Model 5a was found to be a better model due to the comparative indexes' higher values (NFI = 0.94, TLI = 1.04, CFI = 1.00).

Table 2. Model comparisons for prediction of depression symptoms during the acute phase

Model	Actor effect	Partner effect	χ^2	df	NFI	TLI	CFI	RMSEA	90% CI RMSEA	SRMR
1a Structural null model	–	–	17.1**	4	0.64	0.52	0.68	0.1	[0.10, 0.29]	0.14
2a Saturated model	+	+	0.0	0	1.0	–	1.0	0.34	[0.21, 0.35]	0
3a Actor model	+	–	1.7	2	0.96	1.02	1.00	0.00	[0.0, 0.20]	0.04
4a Partner model	–	+	14.2**	2	0.70	0.11	0.70	0.26	[0.14, 0.40]	0.11
5a Actor (actor effects equal)	+	–	2.1	3	0.96	1.04	1.0	0.0	[0.0, 0.16]	0.05

** $p < .05$; a, acute.

As depression levels were associated with socio-demographic status and years of education, the model was reassessed, controlling for these variables, and the results were identical. For the sake of simplicity, we presented the original model.

To conclude, in the acute phase it seems that only one’s own marital satisfaction is associated with one’s own depression, and this association is similar for both patients and partners. Figure 2 presents the model’s unstandardized coefficients for predicting depression during the acute phase. As can be seen in Figure 2, higher levels of marital satisfaction are associated with lower levels of one’s own depression for both partners.

Testing the APIM in the chronic phase

In the chronic phase model, patients’ and partners’ baseline levels of marital satisfaction were the independent variables, and baseline levels of depression for both patients and partners were entered as covariates. Depression levels for both at follow-up were the dependent variables. Table 3 presents the models that were examined: (1c) the structural null model, in which all potential effects equal zero; (2c) the saturated model, in which all potential effects are included; (3c) the Actor model, which includes the effect of one’s own marital satisfaction at baseline on one’s own depression at follow-up; (4c) the Partner model, which includes the effect of one’s own marital satisfaction at baseline on one’s

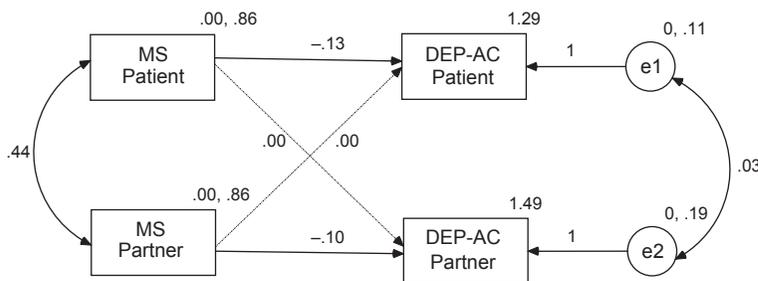


Figure 2. Unstandardized coefficients of the acute phase model. Note: MS, marital satisfaction; DEP-AC, depression during the acute phase. Significant paths are presented in bold lines, and non-significant paths are presented in broken lines.

Table 3. Model comparisons for prediction of depression symptoms during the chronic phase

Model	Actor effect	Partner effect	Actor baseline depression	Partner baseline depression	χ^2	df	NFI	TLI	CFI	RMSEA	90% CI RMSEA	SRMR
1c	–	–	–	–	111.7***	8	0.34	–0.26	0.33	0.38	[0.32, 0.44]	0.22
2c	+	+	+	+	0.0	0	1.0	–	1.0	0.34	[0.29, 0.39]	0.0
3c	+	–	+	–	10.4*	4	0.94	0.85	0.96	0.16	[0.03, 0.24]	0.05
4c	–	+	+	+	8.4	4	0.95	0.89	0.97	0.11	[0.0, 0.22]	0.05
5c	+	+	+	–	1.1	2	0.99	1.04	1.0	0.0	[0.0, 0.17]	0.02

* $p < .05$; ** $p < .01$; *** $p < .001$; c, chronic.

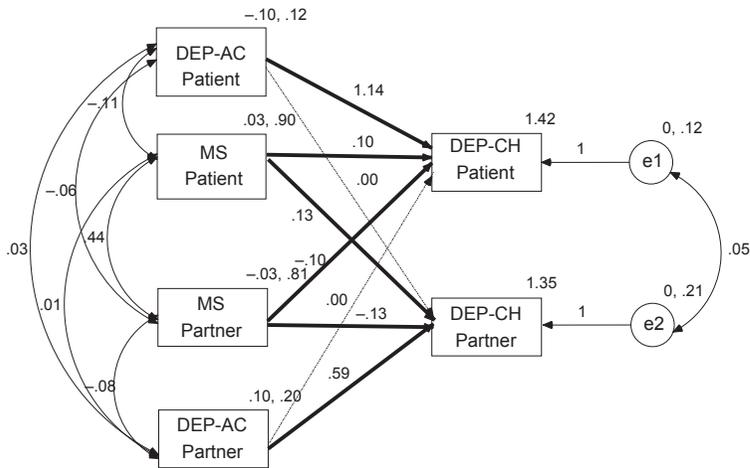


Figure 3. Unstandardized coefficients of the chronic phase model. Note: MS, marital satisfaction; DEP-AC, depression during the acute phase; DEP-CH, depression during the chronic phase. Significant paths are presented in bold lines, and non-significant paths are presented in broken lines.

partner’s depression level at follow-up; and (5c) the Partner and Actor model, which includes the effect of one’s own marital satisfaction at baseline on one’s own depression at follow-up and the effect of one’s own marital satisfaction at baseline on one’s partner’s depression level at follow-up.

As can be seen in Table 3, the Partner and Actor model (5c) fits the data significantly better than the other models (5c: NFI = 0.99, TLI = 1.04, CFI = 1.00), indicating that each participant’s baseline marital satisfaction levels were associated with his/her own depression levels at follow-up and also with his/her partner’s depression levels at follow-up.

Figure 3 presents the model’s unstandardized coefficients for predicting depression during the chronic phase. As can be seen in Figure 3, different trends were found among patients and partners. Whereas partners’ baseline levels of marital satisfaction were associated with lower depression levels – both of their own as well as of the patients at follow-up – patients’ marital satisfaction seemed to be associated with higher levels of their own depression – as well as their partners – at follow-up. As earlier, this model was reassessed, controlling for socio-demographic status and years of education, and the results came out identical. Therefore, we presented the original model for the sake of simplicity.

Discussion

The current study examined the contribution of marital satisfaction to symptoms of depression among ACS patients and their partners. The relationships between these variables were examined in the acute phase and in the chronic phase of the illness, that is, during the patients’ first hospitalization for ACS and 6 months later.

Applying the APIM to examine dyadic dynamics during the acute phase revealed only an Actor effect for both patients and partners. For both, a higher level of one’s own marital satisfaction was associated with a lower level of one’s own depression. This finding is consistent with the results of previous studies conducted among ACS patients (see Randall

et al., 2009; Yates, 1995) as well as studies conducted among patients with other illnesses such as diabetes (Trief *et al.*, 2006) and cancer (Hagedoorn *et al.*, 2000). All of these studies have revealed the role played by one's own perceived marital satisfaction in lowering distress. As predicted, no significant Partner effect was found during the acute phase. It seems that at this point in the illness, one's distress is less associated with one's partner's level of marital satisfaction and more with one's own level of satisfaction.

In the chronic phase, however, a more complex dyadic pattern emerged, revealing both Actor and Partner effects, a dynamic which was different for patients than it was for partners. First, consistent with findings in the acute phase, one's own marital satisfaction was also associated with one's own well-being in the chronic phase. This finding is consistent with the findings obtained in many previous studies (Randall *et al.*, 2009). The contribution of the current study is that it provides evidence that this association is consistent along the entire illness timeline.

As hypothesized, after 6 months of mutual coping with the illness, both partners' and patients' depression was associated not only with their own level of marital satisfaction but also with their spouses' marital satisfaction, which either served as a resource or, surprisingly, as an impediment, depending on the participants' social role. Whereas partners' marital satisfaction was negatively associated with both their own distress as well as the patients', patients' marital satisfaction was positively associated with both their own distress and that of their partners.

The finding that partners' marital satisfaction was beneficial to the patients only in the chronic phase of the illness may suggest that this effect has to do with the change in the nature of the distress experienced by the patients with respect to the course of their illness. Whereas in the acute phase patients' distress seems to be primarily due to the fear of dying (Randall *et al.*, 2009), in the chronic phase the patients might be preoccupied with different worries, such as the fear of being abandoned by their partners (Pollin & Baird-Kanaan, 1995). Adjusting to the chronic nature of the changes in their abilities might have increased the patients' fears regarding the stability of their relationships. Therefore, anything that might have increased a patient's feeling of emotional security, such as his partner's marital satisfaction, would have been associated with the lessening of his distress.

The finding that patients' marital satisfaction was associated with depression both for themselves as well as their partners was somewhat surprising. Our findings suggest that patients might have experienced heightened depression due to the negative consequences they believed their condition could have on their partners (Pollin & Baird-Kanaan, 1995). According to the cognitive transactional perspective (Lazarus & Folkman, 1984), an individual is more vulnerable to appraisals of stress when events threaten central and meaningful areas of his life. Our findings suggest that a satisfied patient's perceived distress might increase as a result of worries regarding his partner's well-being, including worries about what would happen to her in the event of his death.

As for the partners of satisfied patients, they may become more depressed due to the heavy burden placed on them by the patients' new demands and dependence. Cutrona (1996) claimed that a serious illness such as a cardiac event can impact marital functioning by shifting responsibilities and roles which may alter the reciprocal exchange of social support between spouses, leading to an imbalance within the relationship. Studies show that females, as compared with males, take on a greater burden of caring for the needs of others and provide more physical and emotional support for their partners (Finch & Groves, 1983; Lemos *et al.*, 2003). Keeping in mind that the current sample consisted of only female caregivers, it might be that the female caregiver is more likely to feel distressed

due to issues of burden, inequity and losing herself in the relationship (Revenson, Abraido-Lanza, Majerovits, & Jordan, 2005; Thompson, Medvene, & Freedman, 1995; Ybema, Kuijer, Buunk, DeJong, & Sanderman, 2001), feelings which ironically seem to intensify when her partner is satisfied in the relationship.

A word of caution is necessary here due to the fact that the design of this study makes it difficult to disentangle gender from social role. Therefore, the above-mentioned conclusions may be related to either social role (partner vs. patient) or gender (women vs. men). While several studies among community samples have found that the association between initial marital quality and subsequent symptoms of depression is moderated by gender (Dehle & Weiss, 1998), others did not find such an effect (Beach & O'Leary, 1993). A similar inconsistent picture emerged among clinical samples. Whereas gender differences were found among couples coping with infertility (Benyamini, Gozlan, & Kokia, 2009) and cancer (Tuinstra *et al.*, 2004), a recent study among a mixed gender sample of heart failure patients and their partners (Chung *et al.*, 2009) found that the contribution of the partners' emotional distress to the patients' quality of life was *not* moderated by gender. These results might therefore suggest that the current findings represent a social role effect rather than a gender effect. However, more research is needed to establish conclusive evidence regarding the unique contributions of gender, social role and the interaction between them to the adjustment processes of patients and their partners.

Additional limitations of the current study must also be considered. First, the 36% participation rate may limit the possibility of generalizing from these findings. It is important to note that during the first 2 days after experiencing an acute heart attack, it is extremely difficult to recruit patients – and even more so their partners – to participate in a study. Indeed, other studies in the field of cardiac patients and their partners report similar response rates (e.g., Hong *et al.*, 2005; Joekes, Maes, & Warrens, 2007). In addition, the 75-year age limit for inclusion in the study is a limitation that might lead to a bias in the sample. Indeed, the mean age of patients in the current study (56.6 years) was lower than the mean age for men in Israel (61.6 years \pm 12.08; ACSIS, 2010), although still within one standard deviation of the mean. Although the current study was longitudinal, it was still an observational one, and therefore, any causal inferences should be made cautiously. Also, the study focused only on the participants' emotional state as an outcome variable. Finally, in the current study we examined how one partner's reported marital satisfaction was associated with the other partner's reported distress. Future studies may look at this dynamic from an additional perspective by assessing, for example, the congruence in couples' perceptions of their marital satisfaction, as has been previously done in dyadic coping studies (e.g., Iafate, Bertoni, Margola, Cigoli, & Acitelli, 2012).

Despite these limitations, the current study has unique strengths and makes several contributions to the field. The dyadic perspective allowed the emergence of divergent patterns of the contribution of marital satisfaction to the distress of both patients and partners. Consistent with other studies on couples coping with heart disease, the findings indicate that merely asking one member of the dyad about his/her marital satisfaction may not provide a comprehensive enough insight into the dyadic dynamics. In addition, the longitudinal design enabled us to explore the role of marital satisfaction during different phases of the illness.

Based on the current findings, clinicians are advised to assess *both* patients' and partners' perceptions of marital satisfaction, even from as early on as the patient's hospitalization. This early assessment of the most crucial resource couples hold may enable practitioners to identify those who are at greater risk of feeling depressed.

Support for including family members in a patient's care comes from a meta-analytic review of randomized studies comparing interventions for the patient's closest family member – or for both the patient and the family member – with the standard medical care. The findings suggest that among patients, interventions had a positive effect on depression – and, in some cases, even on the patient's mortality – when the spouse was included. Among family members, positive effects were found for caregiving burden, depression and anxiety (Martire, Lustig, & Schulz, 2004).

The current findings strengthen the need for future studies to be designed longitudinally in an attempt to provide a broader perspective on dyadic dynamics in times of illness. Future studies could also investigate the unique fears and needs of each partner in the dyad along the illness timeline. Equipped with this knowledge, clinicians might be better able to help patients and their partners cope when facing a major stressor such as ACS.

References

- ACSIS (2010). *Acute Coronary Syndrome Israeli Survey*. Survey findings and temporal trends 2000–2010. Israel Heart Association, Publication 337 (In Hebrew).
- Arenhall, E., Kristofferzon, M. L., Fridlund, B., & Nilsson, U. (2011). The female partners' experiences of intimate relationship after a first myocardial infarction. *Journal of Clinical Nursing, 20*, 1677–1684. doi:10.1111/j.1365-2702.2010.03312
- Beach, E. K., Maloney, B. H., Plocica, A. R., Sherry, S. E., Weaver, M., Luthringer, L., & Utz, S. (1992). The spouse: A factor in recovery after acute myocardial infarction. *Heart and Lung, 21*, 30–38.
- Beach, S. R. H., & O'Leary, K. D. (1993). Marital discord and dysphoria: For whom does the marital relationship predict depressive symptomatology? *Journal of Social and Personal Relationships, 10*, 405–420. doi:10.1177/0265407593103007
- Beach, S. R. H., Sandeen, E. E., & O'Leary, K. D. (1990). *Depression in marriage*. New York: Guilford Press.
- Bennett, P., & Connell, H. (1999). Dyadic processes in response to myocardial infarction. *Psychology, Health and Medicine, 4*, 45–55. doi:10.1080/135485099106397
- Benyamini, Y., Gozlan, M., & Kokia, E. (2009). Women's and men's perceptions of infertility and their associations with psychological adjustment: A dyadic approach. *British Journal of Health Psychology, 14*, 1–16. doi:10.1348/135910708X279288
- Burman, B., & Margolin, G. (1992). Analysis of the association between marital relationships and health problems: An interactional perspective. *Psychological Bulletin, 112*, 39–63. doi:10.1037/0033-2909.112.1.39
- Cameron, J., & Gignac, M. (2008). "Timing It Right": A conceptual framework for addressing the support needs of family caregivers to stroke survivors from the hospital to the home. *Patient Education and Counseling, 70*, 305–314. doi:10.1016/j.pec.2007.10.020
- Chung, M., Moser, D., Lennie, T., & Rayens, M. (2009). The effects of depressive symptoms and anxiety on quality of life in patients with heart failure and their spouses: Testing dyadic dynamics using actor-partner interdependence model. *Journal of Psychosomatic Research, 67*, 29–35. doi:10.1016/j.jpsychores.2009.01.009
- Coyne, J., Rohrbough, M., Shoham, V., Cranford, J., Nicklas, J., & Sonnega, J. (2001). Prognostic importance of marital quality for survival of congestive heart failure. *American Journal of Cardiology, 88*, 526–529. doi:10.1016/S0002-9149(01)01731-3
- Coyne, J. C., & Smith, D. A. (1991). Couples coping with a myocardial infarction: A contextual perspective on wives' distress. *Journal of Personality & Social Psychology, 61*, 404–412. doi:10.1037//0022-3514.61.3.404
- Cutrona, C. (1996). *Social support in couples*. Thousand Oaks, CA: Sage.
- Dehle, C., & Weiss, R. L. (1998). Sex differences in prospective associations between marital quality and depressed mood. *Journal of Marriage and Family, 60*, 1002–1011. doi:10.2307%2F353641

- Derogatis, L. R., & Melisaratos, N. (1983). The brief symptom inventory: An introductory report. *Psychological Medicine, 13*, 595–605. doi:10.1017/2FS0033291700048017
- Enders, C. K. (2010). *Applied missing data analysis*. New York, NY: The Guilford Press.
- Finch, J., & Groves, D.. (1983). *A labor of love: Women, work and caring*. London, UK: Routledge & Kegan Paul.
- Fowers, B. J., & Olson, D. H. (1993). ENRICH Marital Satisfaction Scale: A brief research and clinical tool. *Journal of Family Psychology, 7*, 176–185. doi:10.1037//0893-3200.7.2.176
- Gilbar, O., & Ben-Zur, H. (2002). Adult Israeli community norms for the Brief Symptom Inventory (BSI). *International Journal of Stress Management, 9*, 1–10. doi:10.1023/A:1013097816238
- Hagedoorn, M., Kuijjer, R., Buunk, B. P., DeJong, M., Wobbes, T., & Sanderman, R. (2000). Marital satisfaction in patients with cancer: Does support from intimate partners benefit those who need it most? *Health Psychology, 19*, 274–282. doi:10.1037%2F0278-6133.19.3.274
- Hong, T. B., Franks, M. M., Gonzalez, R., Keteyian, S. J., Franklin, B. A., & Artinian, N. T. (2005). A dyadic investigation of exercise support between cardiac patients and their spouses. *Health Psychology, 24*, 430–434. doi:10.1037/0278-6133.24.4.430
- Iafate, R., Bertoni, A. M. M., Margola, D., Cigoli, V., & Acitelli, L. K. (2012). The link between perceptual congruence and couple relationship satisfaction in dyadic coping. *European Psychologist, 17*, 73–78. doi:10.1027/1016-9040/a000069
- Joekes, K., Maes, S., & Warrens, M. (2007). Predicting quality of life and self – management from dyadic support and overprotection after myocardial infarction. *British Journal of Health Psychology, 12*, 473–489. doi:10.1348/135910706X118585
- Kenny, D. A., Kaniskan, B., & McCoach, D. B. (2011). *The performance of RMSEA in models with small degrees of freedom*. University of Connecticut: Unpublished paper.
- Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. New York: Guilford Press.
- Kop, W. J., & Plumhoff, J. E. (2011). Depression and coronary heart disease: Diagnosis, predictive value, biobehavioral mechanisms, and intervention. In R. Allan & J. Fisher (Eds.), *Heart and mind: The practice of cardiac psychology* (2nd ed.) (pp. 143–168). Washington, DC: American Psychological Association.
- Lavee, Y.. Psychological Association. (1995). *Marital quality inventory: Research and clinical uses*. Paper presented at the Scientific Conference of the Psychologists Association: Ben-Gurion University, Beer Sheva, Israel.
- Lavee, Y., & Katz, R. (2002). Division of labor, perceived fairness, and marital quality: The effect of gender ideology. *Journal of Marriage and Family, 64*, 27–39.
- Lavee, Y., & Mey-Dan, M. (2003). Patterns of change in marital relationships among parents of children with cancer. *Health in Social Work, 28*, 255–263. doi:10.1111/j.1741-3737.2002.00027.x
- Lazarus, R. S., & Folkman, S.. (1984). *Stress, appraisal and coping*. New York: Springer.
- Lemos, K., Suls, J., Jenson, M., Lounsbury, P., & Gordon, E. I. (2003). How do female and male cardiac patients and their spouses share responsibilities after discharge from the hospital? *Annals of Behavioral Medicine, 25*, 8–15. doi:10.1207/S15324796ABM2501_02
- Lett, H. S., Sherwood, A., Watkins, L., & Blumenthal, J. A. (2007). Depression and prognosis in cardiac patients. In A. Steptoe (Ed.), *Depression and physical illness* (pp. 87–108). Cambridge, UK: Cambridge University Press.
- Martire, L., Lustig, A., & Schulz, R. (2004). Is it beneficial to involve a family member? A meta-analysis of psychosocial interventions for chronic illness. *Health Psychology, 23*, 599–611.
- Olson, D. H., Fournier, D., & Druckman, J. (1986). *PREPARE/ENRICH counselor manual* (2nd ed.). Minneapolis, MN: PREPARE/ENRICH.
- Pollin, I., & Baird-Kanaan, S. (1995). *Medical crisis counseling: short-term therapy for long-term illness*. New York: Norton & Company.
- Poole, L., Dickens, C., & Steptoe, A. (2011). The puzzle of depression and acute coronary syndrome: Reviewing the role of acute inflammation. *Journal of Psychosomatic Research, 71*, 61–68. doi:10.1016/j.jpsychores.2010.12.009

- Pruchno, R., Wilson-Genderson, M., & Cartwright, F. P. (2009). Depressive symptoms and marital satisfaction in the context of chronic disease: A longitudinal dyadic analysis. *Journal of Family Psychology, 23*, 573–584. doi:10.1037/a0015878
- Randall, G., Molloy, G. J., & Steptoe, A. (2009). The impact of an acute cardiac event on the partners of patients: A systematic review. *Health Psychology Review, 3*, 1–84. doi:10.1080/17437190902984919
- Revenson, T. A., Abraido-Lanza, A. F., Majerovits, S. D., & Jordan, C. (2005). Couples coping with chronic illness: What's gender got to do with it? In T. A. Revenson, K. Kayser & G. Bodenmann (Eds.), *Couples coping with stress: Emerging perspective on dyadic coping, decade of behavior* (pp. 137–156). Washington DC, US: American Psychological Association.
- Revenson, T. A., & DeLongis, A. (2011). Couples coping with chronic illness. In S. Folkman (Ed.), *The oxford handbook of stress, health, and coping* (pp. 101–126). New York: Oxford University Press.
- Revenson, T. A., Kayser, K., & Bodermann, G. (2005). *Couples coping with stress: Emerging perspectives on dyadic coping*. Washington, DC: American Psychological Association.
- Roberts, S., Kiselica, M., & Fredrickson, S. (2002). Quality of life of persons with medical illnesses: Counseling's holistic contribution. *Journal of Counseling & Development, 80*, 422–432. doi:10.1002/j.1556-6678.2002.tb00209.x
- Rohrbaugh, M., Shoham, V., & Coyne, J. (2006). Effect of marital quality on eight-year survival of patients with heart failure. *American Journal of Cardiology, 98*, 1069–1072. doi:10.1016/j.amjcard.2006.05.034
- Rolland, J. (1994). *Families, illness, and disability: An integrative treatment model*. New York: Basic Books.
- Stanton, A. L., Revenson, T. A., & Tennen, H. (2007). Health Psychology: Psychological adjustment to chronic disease. *Annual Review of Psychology, 58*, 565–592. doi:10.1146/annurev.psych.58.110405.085615
- Thompson, S., Medvene, L., & Freedman, D. (1995). Caregiving in the close relationships of cardiac patients: Exchange, power and attributional perspectives on caregiver resentment. *Personal Relationships, 2*, 125–142. doi:10.1111/j.1475-6811.1995.tb00081.x
- Trief, P. M., Morin, P. C., Izquierdo, R., Teresi, J., Starren, J., Shea, S., & Weinstock, R. S. (2006). Marital quality and Diabetes outcomes: The IDEATel project. *Families, Systems and Health, 24*, 318–331. doi:10.1037/1091-7527.24.3.318
- Tuinstra, J., Hagedoorn, M., Sonderen, E. V., Ranchor, A. V., Van den Bos, G. A. M., Nijboer, C., & Sanderman, R. (2004). Psychological distress in couples dealing with colorectal cancer: Gender and role differences and intracouple correspondence. *British Journal of Health Psychology, 9*, 465–478. doi:10.1348/1359107042304588
- Vilchinsky, N., Haze-Filderman, L., Leibowitz, M., Reges, O., Khaskia, A., & Mosseri, M. (2010). Spousal support and cardiac patients' Distress: The moderating role of attachment orientation. *Journal of Family Psychology, 24*, 508–512. doi:10.1037/a0020009
- Walt, M., Badura, B., Pfaff, H., & Schott, T. (1988). Marriage and psychological consequences of a heart attack: A longitudinal study of adaption to chronic illness after 3 years. *Social Science & Medicine, 27*, 149–158. doi:10.1016/0277-9536(88)90323-1
- West, T. V., Popp, D., & Kenny, D. A. (2008). A guide for the estimation of gender and sexual orientation effects in dyadic data: An actor partner interdependence model approach. *Personality and Social Psychology Bulletin, 34*, 321–336. doi:10.1177/0146167207311199
- Yates, B. C. (1995). The relationships among social support and short- and long-term recovery outcomes in men with coronary heart disease. *Research in Nursing and Health, 18*, 193–203. doi:10.1002/nur.4770180303
- Ybema, J. F., Kuijter, R. G., Buunk, B. P., DeJong, J. M., & Sanderman, R. (2001). Depression and perceptions of inequity among couples facing cancer. *Personality and Social Psychology Bulletin, 27*, 3–13. doi:10.1177/0146167201271001