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# The Combined Effect of Psychological and Relational Aspects on Cardiac Patient Activation

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## Abstract

The literature assumes that activating patients in the treatment is associated with positive health-related outcomes, such as clinical indicators in the normal range, high medication adherence, and low emergency department utilization. In the cardiac population, patient activation, that is the patient's knowledge, skills, confidence, and behaviors needed for managing one's own health and health care, has been less investigated. In addition, limited attention has been given to the role of the partner as an informal caregiver. However, the patient in the care process is rarely alone, and the partner may play a key role in this process. The goal of this dyadic study ($N=100$ heterosexual couples with one partner suffering from an acute cardiac event) is to analyze how individual factors (patients' anxiety, depression, medication adherence, pessimistic perception of illness) and the couple's relationship functioning (e.g., different kinds of partner support and dyadic coping) are associated with patient activation. The results showed that patient activation is not a mere question of age. It is positively related to medication adherence and to the partner's support patient activation. It is negatively correlated with the patient's psychological distress, pessimistic perception of illness, and to the partner's hostility. The need for a dyadic approach to both research and intervention with this population is discussed.

**Keywords** Cardiac illness · Couple relationship · Partner support · Distress · Dyadic coping · Patient activation

## Introduction

A cardiac illness may be an interruption in daily life, because sometimes it imposes significant changes in people's lives. In order to prevent the high risk of recurrence after an acute coronary event, the patients are required to take life-saving medications, follow and be adherent to the clinician's prescriptions, get regular check-ups, assume healthy dietary attitudes, and conduct physical exercise. Despite the importance of these recommendations, non-adherence tends to be high in the cardiac population, because the changes in health behaviors that are required are demanding and could complicate the patient's psychological situation (DiMatteo, 2004; Molloy, Perkins-Porras, Strike, & Steptoe, 2008).

An important role in the patient's health care process is played by patient activation, that is the patient's knowledge, skills, confidence, and behaviors needed for managing one's own health and health care (Hibbard, Stockard, Mahoney, & Tusler, 2004). When patients participate knowledgeably and actively in their health care process, they report higher adherence to medical treatment, better disease self-management, and greater satisfaction (Hibbard, Mahoney, Stock, & Tusler, 2007; Mosen et al., 2007). Hence, it is not enough to improve patient compliance, but it also is important to encourage patients to become active members of the care team, in order to enhance their care experience and to gain improved health outcomes and lower healthcare costs (Barello et al., 2015). In this study, we seek to contribute to the literature on patient activation by examining both individual and relational factors associated with patient activation. To do this, it is not only necessary to investigate the

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quality of care provided by the doctor, but also the quality of care provided by the caregiver.

Patient self-management of health care is particularly important in the context of cardiac illness because of the complexity of the therapeutic regimen (i.e., regular exercise, low fat and low salt diet, reading food labels, checking blood pressure, taking medications for managing hypertension and cholesterol, stress management).

The course of the disease is complex, because, besides these behavioral changes, it is connected with psychological factors, such as the perception of illness (French, Cooper, & Weinman, 2006; Rajpura & Nayak, 2014) and the patient's psychological level of well-being, including his/her degree of stress, anxiety, and depression (Chauvet-Gelinier & Bonin, 2017; Le Grande, Jackson, Murphy, & Thomason, 2016). Evidence indicates the need to investigate patient's status, as well as confidence in his/her abilities to overcome barriers to adherence and achieve life-style modifications in the long term (Castelnuovo et al., 2014).

Coping with illness is not only an individual matter. The patient is rarely alone in the care process and the partner as an informal caregiver in promoting physical and psychological well-being should be valued and promoted as well (Italian Consensus Conference on Patient Engagement; Graffigna et al., 2017). Although research on patient activation, and on the related, though wider concept of patient engagement, has increased in the past 10 years, studies on the role of the couple relationship in promoting activation in cardiac patients is surprisingly scant (Bertoni, Donato, Acquati, & Rapelli, 2017; Donato & Bertoni, 2018). The role of the partner as a caregiver has been for a long time viewed within an individual perspective, considering only the physical, psychological, and emotional effects of the caregiving burden (Saunders, 2008), and not the reciprocal influences in the dyad. More recently, a call for a dyadic perspective has been made in the health literature (Vellone et al., 2014). A recent study (Bertoni, Donato, Graffigna, Barello, & Parise, 2015) showed that patients with a partner, compared to single patients, are more likely to be engaged in their own health care. Other studies conducted with healthy couples previously clarified the central role of the spouse in promoting the well-being of their partner (Bertoni & Bodenmann, 2010; Donato, Pagani, Parise, Bertoni, & Iafrate, 2014; Donato et al., 2015; Pagani et al., 2015; Parise, Manzi, Donato, & Iafrate, 2017; Schoebi, Pagani, Luginbuehl, & Bradbury, 2015). No study to date has analyzed how partner support is provided and how a partner can improve or worsen patient activation. However, the literature on adherence, a measurable healthy behavior of which the patient activation is a strong precursor (Graffigna, Barello, Bonanomi, & Lozza, 2015), has shown that social support, in addition to individual predictors, such as low self-efficacy, depression, and lack of motivation (Baroletti & Dell'Orfano, 2010; DiMatteo, Lepper, & Croghan, 2000; Maeda, Shen, Schwarz, Farrell, & Mallon, 2013), is particularly important for promoting patients' compliance with their treatment in the cardiac population. There is evidence that social support affects participation in behaviors that help to reduce cardiovascular risk factors and mortality rates (Leifheit-Limson et al., 2012; Molloy et al., 2008; Uchino, 2006). Social support plays this protective role in the progression of diagnosed cardiovascular disease through its stress-buffering properties (Uchino, 2006). In fact, the positive association between social support and well-being may be due to the fact that social support buffers people from the potentially adverse influence of stressful events day by day, also on the physiological level, for example, reducing blood pressure in cardiovascular patients (Uchino, 2006). While existing studies are consistent with a link between social support and adherence, the ways through which social support (and more specifically partner support) may affect patient activation in the cardiac population remain insufficiently explained.

Past studies documented the negative effects of unsupportive partner behaviors, like overprotection and hostility, on patient psychological well-being and patient self-efficacy (Coyne & Smith, 1994; Fiske, Coyne, & Smith, 1991), but less is known about the link between such behaviors and the capacity of the patient to actively engage in his/her care. In addition, the positive and supportive behaviors that a partner can enact to help the patient to overcome the numerous stressors and challenges of cardiac illness management have not been addressed by the research on cardiac illness. In particular, dyadic coping (Bodenmann, 1997, 2005; Leuchtmann & Bodenmann, 2018; Pagani, Donato, Parise, Bertoni, et al., 2019) that is the process through which partners manage their everyday stress as a couple by supporting each other along stressful circumstances has shown its predictive power on psychological well-being (Bodenmann, Meuwly, & Kayser, 2011). Nonetheless, the link between dyadic coping responses, as a specific form of partner support, and patient activation has never been explored.

This study aims to add a dyadic perspective for understanding the factors helping the patient to become an active protagonist in his/her care management. We focus specifically on barriers to and facilitators of patient activation, particularly concerning the individual demographic characteristic of the patient (e.g., age, sex, level of education), the patient's individual factors (e.g., psychological state, medication adherence, illness perception), and the couple's relationship functioning (e.g., quality of partner support and dyadic coping).

From an individual point of view, we expect higher levels of patient anxiety and depression to be correlated with lower patient activation, given that previous research has shown that psychological distress is related to poorer adherence and fewer health behaviors (Chauvet-Gelinier & Bonin, 2017; Goldstein, Gathright, & Garcia, 2017; Le Grande et al., 2016). We predict that medication adherence will be positively correlated with patient activation, though we also expect this correlation to be low-to-moderate in size, given the differences between the two constructs; in fact, patient activation overcomes the singular setting of treatment management and relates to a wider kind of relation-exchange between an individual and the entire health care system during his/her illness (Graffigna et al., 2017). We expect a more pessimistic illness perception to be negatively correlated to patient activation, because of the documented negative effects on health of such a pessimistic outlook (Scheier, Carver, & Bridges, 2001).

Based on the literature on stress in close relationships (Bertoni, Donato, & Molgora, 2018; Bodenmann, 1997, 2005; Hilpert et al., 2016), we assumed that not only individual aspects, but also the way the partner is supportive or unsupportive toward the patient can be associated to the level of patient activation in the treatment. In addition, this study analyzes the role of different forms of partner support, both positive and negative. The partner, in fact, can also unintentionally provide inadequate support. To this aim, we included three different types of partner-reported support: Overprotection (unrequired and unskillful partner support that interferes with the patient's behaviors and decisions, comprises devaluation of the patient's autonomous abilities, and a tendency to treat the patient like a child), hostility (partner's openly hostile attitude toward the patient with criticism, coldness, and blame), and partner support for patient activation (partner support to the patient's autonomy, awareness, responsibility, and confidence in his/her care). We expect overprotection and hostility to be negatively correlated with patient activation, because overprotective partners tend to substitute for the patient and this action can be detrimental for patient autonomy. Hostile partners can also have negative effects on the patient's motivation or autonomous efforts. We expect partner support for patient activation to be positively linked with patient activation because this support can improve the patient's capacity to be actively involved in disease management. We also examine the role of dyadic coping. We aim to analyze different levels of dyadic coping after a cardiac event and their association with patient activation. We expect high levels of dyadic coping to be positively related to patient activation, because sharing a stressful situation with a partner is protective for one's own psychological well-being and for one's own disease management (Acitelli & Badr, 2005; Bodenmann, 1997).

## Method

### Participants and Procedure

One hundred heterosexual dyads agreed to participate in the study. Participants were contacted and interviewed during the patient's hospitalization for an acute cardiac event. A set of 2 questionnaires (one for the patient and one for the partner) was administered 2 days before discharge.

Signed informed consent was obtained from all participants. Criteria for study inclusion were as follows: (1) admission for acute cardiac illness (e.g., Ischemic heart diseases like myocardial infarction and acute coronary syndrome, angina pectoris, heart failure, and comorbidity); (2) no mental disability, assessed with a short version of the Mini Mental State Examination (MMSE); (3) ability to understand Italian and complete the questionnaire autonomously. The demographic and clinical characteristics of study participants are described in Table 1.

### Analytical Strategy

Data were analyzed using the software IBM SPSS version 22.0 (SPSS Inc. Chicago IL, USA). Significance threshold was set at $\alpha = .05$. In particular, descriptive statistics were used to summarize the sample characteristics, and paired-sample $t$ tests were used to analyze differences between patients and partners when the same measures were administered to both. Pearson's linear correlations were used to test the associations between the study variables. Subsequently, the correlated variables were included in a stepwise multivariate regression analysis for testing the best-fitting model for patient activation. This analysis was chosen to find a reduced model that best explains the data, removing predictors from the model without having a substantial effect on how well the model fits the observed data. Moreover, the backward method is preferable to the forward method, because of suppressor effects. The forward method runs a higher risk of making a Type II error.

## Measures

### Demographic and Clinical Data

Patients and partners completed separately a demographic questionnaire assessing age, sex, marital status, education level, and employment status. Clinical data including diagnosis were retrieved from the participants' medical records.

### Patient-Reported Measures

#### Patient Activation

The patient's knowledge, skill, and confidence in playing an active role in managing his/her own health care were measured by the Patient Activation Measure (PAM13) (Hibbard et al., 2004; Graffigna et al., 2015). It consists of 13 items with a 4-point Likert-type scale ranging from 1 = strongly

**Table 1** Demographic and clinical characteristics of the sample

| | Patient ($N = 100$) | Partner ($N = 100$) | Paired-sample *t* test |
|---|---|---|---|
| Male sex (%) | 86.7% | 13.3% | |
| Age (mean; SD) | 63.58 (13.51) | 59.00 (10.93) | |
| Level of education | | | |
| Elementary school | 28.4% | 21.4% | |
| Junior high school | 33.1% | 32.0% | |
| High school | 31.9% | 37.9% | |
| Degree | 5.3% | 6.8% | |
| Diagnosis | | | |
| Ischemic heart disease (%) | 50% | | |
| Angina pectoris (%) | 22.5% | | |
| Heart failure (%) | 10% | | |
| Comorbidity (%) | 17.5% | | |
| NYHA class[a] | | | |
| I | 64.1% | | |
| II | 26.9% | | |
| III | 8.3% | | |
| IV | .7% | | |
| Patient activation (mean; SD) | 2.23 (1.19) | | |
| Medication adherence (mean; SD) | 7.22 (2.42) | | |
| Pessimistic illness perception (Mean; SD) | 2.89 (.66) | 2.98 (.59) | $t_{(100)} = -1.491; p = .14$ |
| Psychological distress | | | |
| Anxiety (mean; SD) | 1.82 (.64) | 1.82 (.58) | $t_{(101)} = -1.231; p = .22$ |
| Depression (mean; SD) | 1.69 (.56) | 1.66 (.53) | $t_{(102)} = .115; p = .91$ |
| Dyadic coping (mean; SD) | 113.92 (22.01) | 109.83 (19.86) | $t_{(97)} = -2.32; p < .05$ |
| Partner support | | | |
| Overprotection (mean; SD) | | 2.83 (.81) | |
| Hostility (mean; SD) | | 2.15 (.78) | |
| Partner support for patient activation (mean; SD) | | 3.82 (.51) | |

[a] New York Heart Association Functional Classification

disagree to 4 = strongly agree (e.g., *I know the characteristics of my illness and what caused it; When all is said and done; I am the person who is responsible for managing my health condition*). The total score of the scale is computed by averaging the 13 items: A higher score of PAM13 indicates a high level of patient activation The Italian validated version of the scale (Graffigna et al., 2015) found a Cronbach's alpha equal to .88 and a Person Separation Index of .89. The Cronbach's alpha for the current study was .98.

### Medication Adherence

Patient adherence to treatment prescriptions was measured by the Medication Adherence Rating Scale (MARS; Thompson, Kulkarni, & Sergejew, 2000), which includes 10 items in a dichotomous response format (yes/no) for each item (e.g., *Do you ever forget to take your medication?*). The total score is a sum of items after reverse coding negatively keyed items: High scores indicate high levels of medication adherence. The MARS was significantly correlated with other self-report measures of compliance and the validation study found a Cronbach's alpha of .75. The Cronbach's alpha for the current study was .51.

### Pessimistic Illness Perception

The patient's perception of the seriousness, consequences, and causes of the illness was measured by the Revised Illness Perception Questionnaire (IPQ-R; Moss-Morris et al., 2002). It consists of 7 items with a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree (e.g., *My illness is a serious condition*). The total score of the scale is computed by averaging the 7 items after reverse coding positively keyed items: High scores indicate high levels of pessimism for his/her illness. The IPQ-R demonstrated good evidence for both the internal reliability and the short (3-week) and longer term (6-month) retest reliability, and good predictive validity. The Cronbach's alpha for the current study was .62.

### Psychological Distress

Patient psychological distress was measured by a 25-item version of the Hopkins Symptom Checklist (HSCL-25; Mattsson, Williams, Rickels, Lipman, & Uhlenhuth, 1969). The scale consists of 25 items measuring symptoms of anxiety and depression. Patients were asked to rate symptoms experienced during the past week as ranging from 1 = never to 4 = often. The total score of the scale is computed by averaging the items for the two subscales: High score implied more psychological distress. The HSCL-25 correlates highly with the standard 58-item version (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974) and shows good predictive and discriminative validity (Coyne & Smith, 1991). The Cronbach's alpha for the current study was .91.

### Dyadic Coping

Both partners' reported and perceived dyadic coping was measured by the Dyadic Coping Questionnaire (DCI; Bodenmann, 1997; Donato et al., 2009). It consists of a 41-item questionnaire that measures dyadic coping responses and stress communication. Items are rated on a 5-point scale ranging from 1 = never to 5 = very often (e.g., *My partner tells me that it is not that bad and helps me to see the situation in a different light*). In the current study, we used both total score and range scores. The total score is computed by averaging the 41 items: High scores represent more supportive dyadic coping responses. The DCI has established cut-off scores to include the following (total score < 111: Dyadic coping below average; between 111 and 145: Dyadic coping in the normal range; total score > 145: Dyadic coping above average; Bodenmann, Jimenez Arista, Walsh, & Randall, 2018). The Italian version of the scale presented good factorial structure assessed with confirmative approach (Donato et al., 2009). The Cronbach's alpha was .94.

### Relationship Satisfaction

Relationship satisfaction was measured by the 6-item Quality of Marriage Index (Norton, 1983). Five items are administered on a 7-point scale (e.g., *The relationship with my partner makes me happy*), whereas the last item, measuring global perception of couple satisfaction, is administered on a 10-point scale. By averaging the first five items, a global index of patient relationship satisfaction was created with higher scores referring to higher satisfaction. The validation study found a Cronbach's alpha of .94. The Cronbach's alpha for the current study was .94.

## Partner-Reported Measures

### Spouse Overprotection

The spouse overprotection was measured by the Spouse Overprotection Scale from the Michigan Family Heart Questionnaire (Fiske et al., 1991). The scale captures the partner's unrequired support and interference with the patient's behaviors and decisions. It consists of 5 items (e.g., *I tend to interfere too much in my partner's life*). All responses were coded on a 5-point Likert-type scale ranging from 1 = never to 5 = very often. The total score of the scale is computed by averaging the 5 items: A high score indicates a high level of overprotection. The coefficient alpha founded in the validation study was .67. The Cronbach's alpha for the current study was .66. The reliability of this scale was modest, even if adequate, largely due to the fact that it was only a four-item scale. Using Nunnally's (1978) correction for test length, we can estimate that if an eight-item scale with similar content was used, it would have an alpha coefficient of .80.

### Spouse Hostility

The spouse hostility was measured by the Spouse Hostility Scale from the Michigan Family Heart Questionnaire (Fiske et al., 1991). The scale captures a hostile critical attitude on the part of the spouse. It consists of 5 items from the partner questionnaire (e.g., *My spouse tends to exaggerate little complaints*). All responses were coded on a 5-point Likert-type scale ranging from 1 = never to 5 = very often. The total score of the scale is computed by averaging the 5 items: A high score indicates a high level of hostility. The coefficient alpha founded in the validation study was .73. The Cronbach's alpha for the current study was .71.

### Partner Support for Patient Activation

Partner support for patient activation in the treatment was measured by ad hoc items. The scale consists of 11 items measuring how the partner helps the patient to be actively involved in his/her treatment with a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree (e.g., *I help my partner to recognize when he/she needs medical care and when he/she can manage the problem on his/her own*). The total score is an average of items after reverse coding negatively keyed items: A high score indicates a high level of support for patient activation by the partner. The Italian validation of the scale is in progress. The Cronbach's alpha was .65.

# Results

## Preliminary Data Analyses

To describe the patient activation, a series of preliminary analyses were conducted to evaluate the patients' age differences, differences in the patients' NYHA Class, differences between male and female patients, differences on patient levels of education, and differences between patients with low and high levels of marital satisfaction. Testing the age differences, the correlational analysis showed that patient activation was not associated with the patient's age ($r = -.02$; $p = .78$). We conducted an independent-sample *t* test only on the first two classes of NYHA Functional Class, because these are the classes with the highest frequencies (64.1% and 26.9%). The results failed to reveal significant differences in patient activation [$t\ (123) = -.91$; $p = .36$]. Moreover, the independent-sample *t* test did not show any significant difference [$t\ (303) = .27$; $p = .78$] between men ($M = 2.25$, $SD = 1.21$) and women ($M = 2.21$, $SD = 1.15$). There were not significant differences in patient education levels [$F(3, 296) = .63$; $p = .70$]. In addition, the differences on patient activation as function of the patient's relationship satisfaction measured with The Quality of the Marriage Index (Norton, 1983) were tested: There were not significant differences [$t\ (173) = -.89$; $p = .37$] between patients with high level of relationship satisfaction ($M = 2.20$, $SD = 1.24$) and patients with low level ($M = 1.88$, $SD = 1.17$).

As shown in Table 1, the patient's activation levels were moderate in the sample ($M = 2.23$, SD = 1.19) as compared to the scale range (range 1–4). The sample was moderately compliant in terms of medication adherence ($M = 7.22$, $SD = 2.42$). With regard to illness perception, patients and partners shared a moderately pessimistic perception of the patient's illness ($M = 2.89$, $SD = .66$ for patients; $M = 2.98$, $SD = .59$ for partners) as compared to the scale range (Range = 1-5). The paired-sample *t* test comparing patients' and partners' perceptions, in fact, was not significant [$t_{(100)} = -1.491$; $p = .14$]. With regard to the patient's psychological distress, levels of anxiety were high and above the cut-off scores of the scale for clinical significance ($M = 1.82$, $SD = .64$); the partners showed the same levels of anxiety as patients ($M = 1.82$, $SD = .58$). The paired-sample *t* test comparing patients' and partners' levels of anxiety, in fact, was not significant [$t_{(100)} = -1.23$; $p = .22$]. The levels of depression were moderate in both patients ($M = 1.69$, $SD = .56$) and partners ($M = 1.66$, $SD = .53$), but below the cut-off score. The paired-sample *t* test comparing patients' and partners' levels of depression was not significant [$t_{(100)} = .12$; $p = .91$]. The patients reported a moderate level of dyadic coping ($M = 113.92$, $SD = 22.01$) as compared to the range scores; the partner's dyadic coping was below average ($M = 109.83$, $SD = 19.86$) and the paired-sample *t* test comparing patients' and partners' levels of dyadic coping showed the patient-reported dyadic coping was significantly different than the partner-reported dyadic coping [$t_{(97)} = -2.32$; $p < .05$]: In particular, the patients perceived a higher level of dyadic coping than their partners. With regard to partner support, spouse overprotection ($M = 2.83$, $SD = .81$) and spouse hostility ($M = 2.15$, $SD = .78$) were moderate in the partner sample as compared to the scale range (range 1–5). The levels of partner support for patient activation were also moderate ($M = 3.82$, $SD = .51$), as compared to the scale range (range 1–5). Finally, we tested with an independent-sample *t* test the differences in partner support depending on the first two classes of patients' NYHA Functional Class. Only for the overprotection, a significant difference was found [$t(41) = -2.14$; $p < .05$]: In particular, for the partners of the patients in NYHA Class II, the results showed a higher level of overprotection than for patients in the first NYHA Class (NYHA Class I: $M = 2.82$, $SD = .63$; NYHA Class II: $M = 3.43$, $SD = 1.22$).

## Testing the Correlation Between Individual Aspects and Patient Activation

Medication adherence was positively associated to patient activation ($r = .18$; $p < .01$). In particular, the higher the patient's medication adherence, the higher the patient's activation. As hypothesized, the size of the correlation was low.

The patient's pessimistic illness perception was negatively associated to patient activation ($r = -.121$; $p < .05$). In particular, the more the patient had a pessimistic illness perception, the less the patient was activated in his/her care process. With regard to the patient's psychological distress, patient anxiety ($r = -.16$; $p < .01$) and patient depression ($r = -.12$; $p < .05$) were negatively correlated to patient activation. The more the patient had anxious and depressive symptoms, the less the patient was actively involved in his/her health care (Table 2).

### Testing the Correlation Between Relational Aspects and Patient Activation

We analyzed the relation between partner support and patient activation. The spouse overprotection did not correlate with patient activation ($r = -.14$; $p = .18$), spouse hostility was negatively correlated to patient activation ($r = -.39$; $p < .001$), and partner support for patient activation was positively linked to patient activation ($r = .33$; $p < .01$). In particular, the more hostile the partner was, the less the patient was actively involved in his/her health care. Conversely, the

**Table 2** Correlations between study variables and patient activation

| Areas | Variables | Patient activation |
|---|---|---|
| Individual general functioning | Patient anxiety | ($r = -.16$; $p < .01$) |
| | Patient depression | ($r = -.12$; $p < .05$) |
| Individual illness-related functioning | Medication adherence | ($r = .18$; $p < .01$) |
| | Patient pessimistic illness perception | ($r = -.121$; $p < .05$) |
| Couple general functioning | Patient dyadic coping | ($r = -.07$; $p = .33$) |
| Couple illness-related functioning | Spouse overprotection | ($r = -.14$; $p = .18$) |
| | Spouse hostility | ($r = -.39$; $p < .001$) |
| | Partner support for patient activation | ($r = .33$; $p < .01$) |

higher the partner's support for patient activation, the higher the patient's activation in his/her health care.

With regard to dyadic coping, the correlational analysis showed that the total score of patient dyadic coping was not associated with patient activation ($r = -.07$; $p = .33$). In addition, to explore possible differences in activation between patients with a low dyadic coping score and patients with a high dyadic coping score, the univariate ANOVA showed significant differences [$F_{(2,202)} = 3.50$; $p < .05$]. As shown in Table 2, patients with a high dyadic coping score had lower patient activation ($M = 2.20$, $SD = 1.17$) compared to patients with low levels of dyadic coping ($M = 1.42$, $SD = 1.04$). Patients with total dyadic coping scores in the normal range showed the highest level of patient activation ($M = 2.35$, $SD = 1.24$).

## Testing the Combined Effect of Individual and Relational Variables on Patient Activation

All the correlated variables were included in a backward stepwise multivariate regression analysis for testing the best-fitting model to predict patient activation.

We included in the saturated model seven potential predictors, both individual and relational as shown in Table 3. After backward elimination, the spouse's hostility and the patient's anxiety remained into the regression equation and were significantly related to patient activation [$F_{(2,92)} = 11.006$; $p < .001$]. The two independent variables together accounted for 19.3% of the variance in patient activation. The other variables included (medication adherence, patient pessimistic illness perception, patient anxiety, patient

**Table 3** Cross-sectional stepwise regression analysis predicting patient activation

| | Predictors | B | $p$ | $R^2$ | $F$ |
|---|---|---|---|---|---|
| Step 1 | Partner support for patient activation | .134 | .234 | .245 | [$F_{(6,88)} = 4.763$; $p < .001$] |
| | Patient depression | −.066 | .649 | | |
| | Partner hostility | −.204 | .085 | | |
| | Patient anxiety | −.224 | .118 | | |
| | Patient pessimistic illness perception | .148 | .125 | | |
| | Medication adherence | .121 | .219 | | |
| Step 2 | Partner support for patient activation | .137 | .222 | .243 | [$F_{(5,89)} = 5.725$; $p < .001$] |
| | Partner hostility | −.216 | .061 | | |
| | Patient anxiety | −.271 | .007 | | |
| | Patient pessimistic illness perception | .149 | .122 | | |
| | Medication adherence | .118 | .226 | | |
| Step 3 | Partner support for patient activation | .145 | .195 | .231 | [$F_{(4,90)} = 6.749$; $p < .001$] |
| | Partner hostility | −.236 | .039 | | |
| | Patient anxiety | −.291 | .003 | | |
| | Patient pessimistic illness perception | .147 | .127 | | |
| Step 4 | Partner hostility | −.317 | .001 | .216 | [$F_{(3,91)} = 8.366$; $p < .001$] |
| | Patient anxiety | −.290 | .004 | | |
| | Patient pessimistic illness perception | .157 | .105 | | |
| Step 5 | Partner hostility | −.315 | .001 | .193 | [$F_{(2,92)} = 11.006$; $p < .001$] |
| | Patient anxiety | −.253 | .010 | | |

$N = 94$ dyads

depression, partner support for patient activation) were removed from the regression analysis in a stepwise fashion.

## Discussion

The cardiac patient adherence has been considered for a long time as a basilar outcome that impacts re-hospitalizations and relapse. In this perspective, the cardiac patient is evaluated by an expert like the clinician for his or her capacity to comply with a standard profile of "a good patient." Although patients understand why it is important to conduct a particular lifestyle, it has been shown that this knowledge is only a small part of the picture for adherence and lifestyle changes; in fact, patients often fail to comply with health recommendations (Leventhal & Cameron, 1987). For these reasons, making patients better informed and more directly responsible for their health and care management represents a key strategy to improve patients' adherence, clinical outcomes, and satisfaction toward the received care and to reduce healthcare costs (Graffigna et al., 2015). Despite the growing consensus about engaging patients as active partners in their health care and about a patient-centered model of care, to our knowledge, no study to date has extensively investigated patient activation as an outcome in the cardiac population. Studying how patients become more actively engaged in the care, focusing on predictors and mediators of such a process, is nonetheless a crucial research agenda. In particular, no study has explained how partner support can hinder or promote patient activation, despite the flourishing literature on partner support in health psychology. According to the partner's support studies, each family member makes a crucial contribution to the well-being of the others (Bertoni & Bodenmann, 2010; Pagani, Parise, Donato, Gable, & Schoebi, 2019; Parise, Donato, Pagani, & Schoebi, 2017; Parise, Donato, Pagani, Ribeiro, & Manzi, 2015; Parise, Pagani, Donato, Iafrate, & Sedikides, 2019), especially when one partner is ill. Indeed, the way in which partners cope together may profoundly shape the nature of the burden imposed on both the patient and his/her family members (Fiske et al., 1991). Moreover, partners often play a major role in the care process by implementing both medical regimens and changes in lifestyle, as well as new responsibilities.

The current study highlighted individual psychological and relational factors related to patient activation. The first aim of the study was to clarify how the patient's individual aspects are associated with patient activation. Results showed that, if patient activation is high, medication adherence also is higher. This suggests that a patient, who has been accurately informed and involved in treatment and diagnostic choices, is more able to self-manage his/her own symptoms/problems and engage in activities that complicate treatment adherence. In a drop-down effect, patients with these characteristics are likely to have better health outcomes. This evidence confirms the theoretical assumption that patient activation is related to adherence of patients in treatment management (Graffigna et al., 2015). Moreover, in line with Leventhal's model of illness representation (Leventhal & Cameron, 1987), how the patient perceives the consequences, the treatment control, and the timeline of his/her illnesses associated with patient activation. The Leventhal's model of illness representation describes the illness perception as a multidimensional concept composed of patients' beliefs and expectations about the illness' consequences, treatment control, and the illness timeline.

In particular in our study, for the patients who expressed a pessimistic illness perception the levels of patient activation were low. When the patient thinks that the illness will be chronic with massive consequences to the self and his/her loved ones, and has a low perception of being able to have a positive impact on his/her health and on the treatment, the patient is less actively engaged in his/her care. The patient may be less actively engaged in the care for many reasons, including the disbelief in the efficacy of treatment and illness severity. In addition, we can assume, trying to create a link between cognitions and behaviors, that a pessimistic patient is less likely to engage in the treatment and will tend to adopt denial and avoidant coping (Conway, 2015). In fact, patient activation might be difficult or impossible for a patient who holds little hope that any of his/her action will be worthwhile. With regard to patient psychological distress, when a patient is anxious and depressed, patient activation is lower. The coexistence of anxiety and depression with medical illness is a topic of considerable clinical and research interest. The fact that anxiety and depression may complicate the treatment adherence is fairly well established (Bauer et al., 2012; McGrady, McGinnis, Badenhop, Bentle, & Rajput, 2009), but the extent of these complications in the patient's disease management is not well understood, particularly in the new patient-centered care model.

For the second aim of the study, relational aspects were taken into account. In particular, we analyzed different kinds of partner support. Firstly, we assessed differences in partner support depending on the patients' NYHA Functional Class. Overprotection was found to be high for patients in Class II. This result underlines that partner support may differ depending on the severity of the illness. In particular, overprotection could be a partner reaction especially when the patient has limited physical activity as a consequence of the cardiac illness. Secondly, the results showed that only spouse hostility and partner support for patient activation were linked to patient activation. When the spouse is hostile, the patient's activation decreases. In the literature, spouse hostility has already been examined as a predictor of worse psychological well-being and self-efficacy of the other partner, both in healthy couples (Brummett et al., 2000) and in couples where a partner is ill (Burns et al., 2013, 2018; Cano & Tankha, 2018; Fiske et al., 1991). On the other hand, when the partner is able to provide adequate support (i.e., not replacing the patient, not speaking with clinicians in the place of the patient, but instead helping him/her to recognize when medical care is needed or when he/she can manage the problem on his/her own), the patient is more activated.

We also analyzed how different levels of dyadic coping are associated with patient activation: Unexpectedly, higher levels of dyadic coping were associated with lower levels of patient activation. It could be that when the patient counts on his/her partner too much in sharing his/her stress, his/her patient activation in the treatment decreases. This could happen because the presence of a partner, in a stressful situation like illness, can be an expedient to refrain from autonomy and responsibility; consequently, the patient is less engaged in the treatment. Similar unexpected results about the link between negative dyadic coping responses and patient activation suggest the need to monitor the role of dyadic coping and patient outcomes in future research as founded in demands of cardiac disease (Bertoni et al., 2015). Moreover, it is important to note that the patient's dyadic coping scores are higher than those of the partner. This significant discrepancy could be due to the patient's overestimation of dyadic coping together with the partner and sharing the stress, because a patient in a stress situation needs to rely on the partner. On the other hand, the partner's lower perception of dyadic coping could be an underestimation of the couple's capacity to cope with the unknown demands of the cardiac disease.

Finally, with a backward stepwise multivariate regression, we investigated the combined predictive role of both individual and relational factors associated with patient activation. Recently, researchers have begun to stress the importance of studying both person and environment interactions. The results showed that the combined effect of spouse hostility and patient anxiety explained a significant portion of variance in patient activation levels. To date, little is known about the effect of spousal hostility on patient activation, but in previous studies, the wife's hostility demonstrated a strong negative correlation with the patient's ratings of self-efficacy and was positively related to increased patient psychological distress (Fiske et al., 1991). In addition, patients whose spouses scored high on hostility were more prone to relapse (Fiske et al., 1991). In the present study, although hostility was negatively related to the patient activation, we should use some caution in interpreting this result. In a cross-sectional design, the direction of causality cannot be unambiguously resolved. This link between spouse hostility and the patient's activation could suggest either that spouse hostility may lead to less patient activation or, conversely, that the increasing burden of the patient and his/her lack of activation becomes annoying to the spouse and leads to hostility. In fact, this critical and hostile style of communication could be an effect of patients' difficulties, impairments, and demoralizations, rather than the cause of them.

Also, patient anxiety was found to be a predictor of patient activation in combination with partner hostility. In particular, anxiety decreases patient activation. Anxiety, according to the literature, impairs cognitive focus, energy, and motivation and affects patients' willingness and ability to follow through with treatment (Bauer et al., 2012; McGrady et al., 2009). This kind of paralyzing anxiety can prejudice the patient's autonomous efforts and his/her capacity to be an active protagonist of the care. The decrease of patient activation can be the consequence of an anxiety-related avoidance.

Our findings should be considered in light of the limitations of the study that represent a stimulus for future research. Although our sample reflects a cardiac population's characteristics, a more gender-balanced sample would be needed to analyze gender differences in the associations examined. In the present study, the cross-sectional study design prevents us from drawing conclusions about causal arrow for the associations presented: Future research with a longitudinal study design can assess the direction of effects in the link between variables. In addition, in this study, we chose to focus only on partner support, while we did not explore other social network ties. This choice is representative for the cardiac population where the partner is the main caregiver for the patient; in addition, the partner is the most supportive person in times of illness and daily stress.

## Conclusion

This study highlights the importance of integrating both the patient's individual aspects and features of his/her relational context. This integration has proven itself crucial to view the cardiac patient illness as part of a larger dyadic and dynamic pattern where the spouse support also is taken into account. This study supports the importance of integrating partners in cardiac recovery programs, as the partner could be not only a powerful ally in illness management, but also a barrier to it, whereas spouse support is not effective. In addition, the partner could be a specific target of interventions aimed to promote his/her psychological well-being and assist in coping with frustration and resentment of the caregiver's burden, as well as promote the quality of the care provided. In fact, patient-centered care should engage the family in the patient's treatment by providing recommendations for how the family can contribute to their loved one's health. Ultimately, collaboration with the patient and family can reduce hospitalization and improve quality of life.

## Compliance with Ethical Standards

**Conflict of interest** Giada Rapelli, Donato Silvia, Bertoni Anna, Chiara Spatola, Ariela F. Pagani, Miriam Parise, and Castelnuovo Gianluca declare that they have no conflict of interest.

**Human and Animal Rights** All procedures performed involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

**Informed Consent** Informed consent was obtained from all individual participants included.

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