

Dyadic Coping Among Couples with COPD: A Pilot Study

Caroline Meier · Guy Bodenmann ·
Hanspeter Moergeli · Melanie Peter-Wight ·
Mike Martin · Stefan Buechi · Josef Jenewein

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Abstract COPD (chronic obstructive pulmonary disease) is associated with psychological distress for patients as well as their partners. Dyadic coping can be negatively impacted by stressors. This study's objective was to compare the dyadic coping of couples in which one partner suffered from COPD with healthy couples of the same age. A total of 43 complete couples with COPD and 138 healthy couples participated in this pilot study. The surveys were sent by mail. The response rate of the COPD sample was 24.3%. In order to analyze the effect of gender and role (patient vs. partner) on dyadic coping, linear mixed models were calculated. To analyze the effect of gender and group (COPD group vs. normative comparison group) on dyadic coping, two-way analyses of variance were calculated for independent samples. COPD patients and their partners indicated that the patients received more support and were less able to provide support to their partners. This difference was also evident in comparison with the normative comparison group. In addition, couples with COPD perceived higher levels of negative coping and provided a considerably lower assessment of their positive dyadic coping. The dyadic coping of couples with COPD is unbalanced and more negative when compared to that of healthy couples. Interventions aimed at supporting COPD

couples should seek to improve couples' dyadic coping in addition to individual coping strategies.

Keywords COPD · Dyadic coping · Partner study

Introduction

Like many chronic diseases, COPD (chronic obstructive pulmonary disease) has a considerable impact not only on the mental health of the affected individual, but also on their social environment, particularly on the patient's partner (Ashmore, Emery, Hauck, & MacIntyre, 2005; Cannon & Cavanaugh, 1998; Hamacher, Linnemann, Baumhäkel, Bernardy, & Schönhöfer, 2007; Meier, Moergeli, Buechi, Bodenmann, Witzemann, & Jenewein, 2011).

The way in which the couple deals with the chronic disease can be analyzed either on an individual level—from the separate points of view of patient and partner—or as a dyadic process that considers both partners' (patient and partner) mutual influence on each other, according to their ways of dealing with stress individually and in relation to each other (Bodenmann, 1997). A couple's ability to cope with stress depends on each partner's emotion regulation and way of handling difficult situations. Dyadic coping aims to maintain or restore individual and dyadic homeostasis, both partners' well-being, and the couple's functioning (Bodenmann, 1997). Observing the distress or coping efforts of one member of a couple is not enough—their effects on the other partner and the relationship must be taken into account. The well-being and happiness of one partner are dependent on those of the other partner (Blumenthal et al., 2009; Bodenmann, 2005). Individuals who provide adequate supportive dyadic coping to their partner may themselves benefit and dyadic coping improves mutual

C. Meier (✉) · H. Moergeli · J. Jenewein
Department of Psychiatry and Psychotherapy, University
Hospital Zurich, Raemistrasse 100, 8091 Zurich, Switzerland
e-mail: caro2579@yahoo.com

G. Bodenmann · M. Peter-Wight · M. Martin
Institute of Psychology, University of Zurich, Zurich,
Switzerland

S. Buechi
Private Clinic Hohenegg, Meilen, Switzerland

trust, security, and intimacy, exerting a positive influence on the relationship and benefiting both partners (Bodenmann, 2000).

A number of studies have shown that the extent and quality of couples' dyadic coping are associated with psychological distress, well-being, and quality of the relationship (Bodenmann, 2000; Martin, Peter-Wight, Braun, Hornung, & Scholz, 2009). Ambivalent or hostile dyadic coping has been shown to be more frequent among distressed couples or in the context of mental disorders or chronic illness (Bodenmann, Widmer, Charvoz, & Brandbury, 2004). However, positive dyadic coping can also reduce the negative impacts of stress on a relationship (Martin et al., 2009).

COPD is a considerable source of psychological distress for patients and their partners. In comparison with patients suffering from other chronic diseases, COPD patients exhibit high levels of psychological distress (Büchi, Brändli, Klingler, Klaghofer, & Buddeberg, 2000; van Manen et al., 2002). Common psychological symptoms associated with COPD include anxiety, depression, and alcohol abuse (Cannon & Cavanaugh, 1998; Ehlert, 2002; Köhl, Schurmann, & Rief, 2008; Maurer et al., 2008; Meier et al., 2011). Despite the high prevalence of psychological strains among COPD patients, these symptoms usually go untreated (Kunik et al., 2005; Pinnock et al., 2011).

In studies that address the partners of COPD patients, psychological symptoms that the partners are suffering from like fear, depression and helplessness are described (Booth, Silvester, & Todd, 2003; Cannon & Cavanaugh, 1998; Köhl et al., 2008; Maurer et al., 2008; Meier et al., 2011). Patients' breathing problems are usually very stressful for partners. The partner experiences anxiety and helplessness when seeing the patient's breathing difficulties and feels unable to reduce this suffering (Booth et al., 2003; Gysels & Higginson, 2009). Patients' dyspnea reduces their vitality, increases their dependency, and decreases their feelings of self-worth. The division of roles within the relationship changes as a result of the illness and partners often take responsibility for tasks that patients used to do themselves, such as looking after the household, being responsible for finances, or physical care (Ashmore et al., 2005; Cannon & Cavanaugh, 1998; Hayman et al., 2001). If the partner underestimates the patient and takes on all the responsibilities, this can lead to a drop in the patient's feeling of self-efficacy (Cannon & Cavanaugh, 1998). Additionally, overprotective behavior by the partner towards the patient can lead to the partner becoming overburdened and therefore be linked to hostile behavior towards the patient (Fiske, Coyne, & Smith, 1991). If the partner hides his or her own emotions, concerns, and individual needs, always seeking to please the patient in order to prevent the patient getting stressed and thereby

possibly exacerbating the symptoms associated with shortness of breath, this can lead to increased levels of stress in the couple (see protective buffering) (Coyne & Smith, 1991; Fiske et al., 1991; Langer, Brown, & Syrjala, 2009; Manne & Badr, 2008; Revenson, Abraido-Lanza, Majerovitz, & Jordan, 2005; Schokker, Links, Luttk, & Hagedoorn, 2010; Sexton & Munro, 1985). The patient can also become angry if the things that he or she is still capable of doing are taken away. Over-protective behavior by the partner can also be linked to a drop in the patient's feelings of self-worth and to a feeling of loss of control (Hagedoorn et al., 2000). Such behavior may lead to a more negative assessment of dyadic coping by both sides.

Stressors in the relationship often have a negative impact on interactions between the patient and the partner (criticism of one another, disrespect, irritability or withdrawal) (Gottmann, 1994). The extra support the patient receives can also come in a disparaging, irritable or patronizing form, which confers a hostile, ambivalent or superficial character to the dyadic coping (Bodenmann, 1997; Dakof & Taylor, 1990; Hagedoorn et al., 2000). The patient's oxygen demands limit the mobility of the patient and, accordingly, the partner as well, which leads to social isolation and the loss of an important resource. This isolation is also compounded by the patient trying to avoid as many activities as possible that might lead to shortness of breath (Burr & Klein, 1994).

It has been shown to be important that the partners of patients with COPD be incorporated into the patients' treatment. In dealing with the illness, it has seemed relevant to provide the pair with professional assistance in order to reduce the sense of isolation so that the responsibilities within the couple's relationship are not borne solely by the partner, but rather intentionally divided (Gysels & Higginson, 2009). Important elements in improving the handling of the illness include relaxation exercises, psychoeducation, cognitive restructuring, drafting an emergency plan in case of breathing difficulties and breathing/gymnastic exercises (Blumenthal et al., 2009; Jassem et al., 2010).

In past studies, it has been found that female COPD partners receive more support from friends and other family members than male COPD partners (Sexton & Munro, 1985). The same holds true for patients: female patients indicate that they receive more support from friends than male patients do (Cannon & Cavanaugh, 1998). In addition, female COPD partners more frequently stated that the relationship had grown closer due to the illness. Female COPD patients are more likely than male COPD patients to apply the coping strategies of "active cognitive coping", "information-seeking", "logical analysis" and "active behavioral coping" (Cannon & Cavanaugh, 1998).

Even if, according to Sexton and Munro (1985), the female partners of COPD patients receive more support from friends and other family members, support from one's partner is of special importance to the patient as well as the partner irrespective of gender (Bodenmann, 1997, 2000; Hagedoorn et al., 2000). Mutual support is particularly important in relationships among older couples, the demographic that makes up the majority of people suffering from COPD. The social networks of older people are often limited due to retirement, declining health, and the deaths of friends and family members. This, in turn, makes the partner more important as a source of social support (Gagnon, Hersen, Kabacoff, & Van Hasselt, 1999). Additionally, many older people value the familiarity of their partners and prefer the predictable reactions of their counterparts (Carstensen, 1992). In the case of a chronic disease, caregiving for the rest of the ailing partner's life, means a considerable practical and emotional burden (Revenson et al., 2005). Thus, the quality of the partners' support in addition to the partners' well-being play a decisive role for the patients (Blumenthal et al., 2009; Dakof & Taylor, 1990).

While there have been studies that have looked at how couples handle such diseases to the best of our knowledge, no studies exist that examined dyadic coping—as described by Bodenmann (1997)—among COPD patients, meaning that our study explores new territory. Since dyadic coping can be negatively impacted by stress and COPD is often linked to the previously mentioned strains, it was expected that COPD couples apply fewer positive and more negative coping strategies than a healthy normative comparison group.

Methods

Procedure

COPD Group

Quantitative data from COPD patients and their partners were analyzed using a cross-sectional design. The patients were all in contact with the Zurich Lung League, a community organisation, that provides assistance and advice to people suffering from breathing problems and lung diseases (including COPD) and represents their concerns in the public forum. For this reason, the Lung League was able to provide us with a patient list and we were able to take into account a number of the inclusion criteria from the very beginning. As a result, the only people contacted were patients who regularly received assistance from the Lung League, used an oxygen apparatus or inhalator, and were between the ages of 40 and 85. Data were collected

using questionnaires. 550 COPD patients received a patient questionnaire and a partner questionnaire by mail. These questionnaires were accompanied by a cover letter in which the patient as well as the partner were asked to independently fill out and send back the questionnaires and guaranteed anonymity. In addition, the patients were informed that they would receive no financial remuneration. If the patient did not have a partner, he or she was asked to only fill out and return the patient questionnaire. By signing the attached declaration of consent, the patient and their partner agreed to the conditions of the study. If the questionnaires had not been returned within 28 days, the patient was sent a reminder letter.

In order to participate in the study, the patients had to meet the following inclusion criteria: COPD diagnosis, receiving treatment from the Zurich Lung League, at least 40 years of age [in order to reduce the probability of incorrectly including asthma patients (Ehlert, 2002)] and at most 85 years of age, German language skills adequate to fill out the questionnaire, sufficient health to independently fill out the survey, and the patient had to be living in a committed relationship.

Of 550 patients contacted, it was necessary to exclude 151 due to the above-listed inclusion criteria. Reasons for exclusion from the study included insufficient data available ($n = 36$), patient's health levels were too low to independently complete the questionnaire ($n = 34$), patient did not speak German ($n = 31$), patient had already passed away ($n = 22$), patient stated that he or she did not have COPD ($n = 12$), patient had a serious visual impairment ($n = 7$), address was incorrect ($n = 5$), patient was suffering from Alzheimer's ($n = 2$), patient required the support of a legal guardian ($n = 1$), or patient was suffering from schizophrenia ($n = 1$).

Of the 399 remaining patients, 97 participated in the pilot study. In addition, 54 partners mailed back completed partner questionnaires. This resulted in a total of 43 complete couples. For the patients, this corresponds to a response rate of 24.3%.

Normative Comparison Group

The normative comparison group included 138 married, healthy couples ($n = 276$). Participants were recruited newspaper advertisements, presentations at the university for seniors in Zurich, an existing list of older adults willing to participate in research studies, and by word of mouth. Inclusion criteria were age of both partners between 40 and 85 years, German as their first language, the absence of severe health problems as indicated by the SF-36 (Kirchberger, 2000), and living in a committed relationship in the same household. As the inclusion criteria were communicated beforehand, none of the volunteers had to be

excluded. Participants received 20 Swiss Francs for their participation after agreeing to participate. The questionnaires were sent to couples' home and couples were asked to answer them individually and return them anonymously by mail. The return rate was 100% based on the strict inclusion criteria and obviously highly motivated participants.

This study was approved and accepted by the local ethics committee of the Canton of Zurich.

Measures

Dyadic Coping Inventory

This 37-item questionnaire (range 1 “very rarely” to 5 “very often”) assesses stress communication and dyadic coping as perceived by (1) each partner about their own coping (What I do when I am stressed and what I do when my partner is

stressed) (2) each partner's perception of the other's coping (What my partner does, when he/she is stressed and what my partner does, when I am stressed) and (3) each partner's view of how they cope as a couple (What we do, when we are stressed as a couple). The DCI sub-scales and overarching scales are presented in Table 1. The values of the scales represent the sum values of the respective items. The reliability (internal consistency) of the individual DCI scales for the normative sample of Bodenmann (2008) ranged between .71 and .92. The internal consistency for the scales of the patient questionnaires was between .64 and .97. For the patient questionnaire, the alpha of the “stress communication of the partner” was .67 [in Bodenmann's (2008) normative sample $\alpha = .79$ for women and $\alpha = .76$ for men]. For the partner questionnaire, alpha was between .71 and .97. The scale with the lowest internal consistency was the “own supportive dyadic coping” with $\alpha = .71$ [in Bodenmann's (2008) normative sample $\alpha = .82$ for women and

Table 1 Subscales of the DCI

Subscales	Example items	Positive/negative ^a
Own stress communication	I let my partner know that I appreciate his/her practical support, advice or help.	Positive
Stress communication of partner	My partner tells me openly how he/she feels and that he/she would appreciate my support.	Positive
Own supportive coping	I show empathy and understanding to my partner.	Positive
Supportive coping of partner	My partner expresses that he/she is on my side.	Positive
Own negative coping	I blame my partner for not coping well enough with stress.	Negative
Negative coping of partner	My partner does not take my stress seriously.	Negative
Own delegated dyadic coping	I take on things that my partner would normally do in order to help him/her out.	Positive
Delegated dyadic coping of partner	When I am stressed, my partner tends to withdraw.	Positive
Problem-focused common coping	We engage in a serious discussion about the problem and think through what has to be done.	Positive
Emotion-focused common coping	We help each other relax with such things as massage, taking a bath together, or listening to music together.	Positive
Evaluation of dyadic coping	I am satisfied with the support I receive from my partner and the way we deal with stress together.	Positive
Overarching scales	Description	
Own dyadic coping	Covers all items that measure one's own dyadic coping (including re-pooled own negative coping items).	Positive
Dyadic coping of partner	Covers all items that measure the partner's dyadic coping (including re-pooled negative partner coping items).	Positive
Common dyadic coping	Covers problem-focused common coping and emotion-focused common coping.	Positive
Total dyadic coping excluding evaluation	Contains all items except Evaluation of dyadic coping (including re-pooled negative dyadic coping items).	Positive

^a *positive* = a high value indicates more positive coping; *negative* = a high value indicates more negative coping

men]. In our normative comparison group, the internal consistency values lied between .67 and .92. The scales for “own negative coping” had an alpha of .67 (in Bodenmann’s normative sample $\alpha = .72$ for women and $\alpha = .74$ for men) and the scale “common dyadic coping” had an alpha of .67 too [in Bodenmann’s (2008) normative sample $\alpha = .80$ for women and $\alpha = .74$ for men].

The re-test reliability of the individual scales exhibited values between $r = .52$ and $r = .80$ after two weeks.

For verifying the convergent construct validity, communication questionnaires and questionnaires to identify partnership quality were used. Medium level correlations were recorded. Concerning the divergent validity, it was assumed that dyadic coping was a separate construct from individual coping. Correlations ranged between .10 and .30. For criteria validity, it was determined whether dyadic coping would play a role in state of health and familial variables. Medium level correlations were recorded.

FEV-1

Lung function was measured in a standardized manner using spirometry. This method enables calculation of the FEV1 score (FEV1 = Forced Expiratory Volume in 1 s). The FEV1 score represents the amount (volume) of air exhaled in the first second of the FEV measurement. This value is the most important parameter of lung function testing. In order to assess the severity of patients’ COPD according to GOLD (Global Initiative for Chronic Obstructive Lung Disease [GOLD], 2006) their respective attending physician was contacted and asked to provide the patient’s most recent measurement of lung function. According to GOLD, COPD is divided into four stages. In the mildest form of COPD, Stage 1, the FEV-1 is over 80% of the nominal value. For patients with Stage 2, the FEV-1 is between 50 and 80%, Stage 3 is between 30 and 50% and Stage 4 is under 30% (GOLD, 2006). Oxygen patients’ lung functioning must be measured at least once per year in order to determine their oxygen needs and adjust their equipment accordingly. For the sake of our study, patients’ most recent FEV1 score was used, measured no more than one year prior to our survey.

Statistical Analysis

The description of the sample in terms of socio-demographic data was carried out using descriptive statistics. Based on the given socio-demographic information, participants and non-participants, patients and partners, and COPD pair volunteers and the normative comparison group were analyzed by using t -tests and χ^2 -tests.

In order to analyze the effect of gender and role (patient vs. partner) on dyadic coping, linear mixed models were

calculated. For this study and its dependent data (repetition within pairs), linear mixed models have the advantage over regular analyses of variance that they can analyze both the factors of gender and role as well as their interaction all at the same time. This makes it possible to obtain information about whether there are differences between women and men depending on their roles as patients or partners.

To analyze the effect of gender and group (COPD group vs. normative comparison group) on dyadic coping, two two-way analyses of variance were calculated for independent samples. In the first two-way analysis of variance, a comparison was made between the patients and the normative comparison group. In the second two-way analysis of variance, the comparison was between the partners and the normative comparison group.

Results

Sample

COPD Group

Of the 97 patients who returned the questionnaire, the study only included the 43 whose partners also participated. In terms of the severity of the illness (FEV1), there was no difference between the participating patients and the rest of the sample ($t = .17$, $df = 236$, $p = .876$).

The most important socio-demographic data are summarized in Table 2. The patients’ ages ($M = 68.21$, $SD = 9.23$) varied from 46 to 83 years old and the partners’ ages ($M = 66.58$, $SD = 11.08$) from 43 to 85 years old. The difference in average age of patients and partners was not significant ($t = 1.75$, $df = 42$, $p = .088$).

Normative Comparison Group

The age of the volunteers in the comparative sample ranged from 60 to 84 years with an average age of 68.10 years ($SD = 5.71$). There was no significant difference within the normative comparison group in terms of the COPD couples’ age ($t = .62$, $df = 101.95$, $p = .539$). Likewise, there was no significant difference ($t = -1.43$, $df = 19.66$, $p = .163$) between the length of the relationships among the COPD couples ($M = 37.60$, $SD = 13.11$) and the normative comparison group ($M = 41.82$, $SD = 6.45$). In terms of level of education, there was a significant difference between the COPD couples and the normative comparison group ($\chi^2 = 33.20$, $df = 3$, $p < .001$), with the normative comparison group having a higher level of education than the COPD couples.

Table 2 Socio-demographic data of patients and partners ($n = 43$ couples) and individuals of the normative comparison group ($n = 138$ couples)

	Patients		Partners		Normative comparison group		<i>p</i> -values
	<i>M</i>	SD	<i>M</i>	SD	<i>M</i>	SD	
Age in years	68.21	9.23	66.58	11.08	68.10	5.71	.539 ^a
Length of relationship	37.60	13.11	37.60	13.11	41.82	6.45	.163 ^a
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Sex							
Female	14	32.6	29	67.4	140	50	
Male	29	67.4	14	32.6	140	50	
School/professional training							
Apprenticeship/Swiss matura	31	77.5	33	86.8	116	53.7	<.001 ^b
Technical college	7	17.5	5	13.2	50	23.1	
University	2	5	0	0	60	27.8	

^a Comparison of ages and length of relationship of COPD pairs and normative comparison pairs using the *t*-test

^b Comparison of educational level among COPD pairs and normative comparison pairs using the Chi-square test

Information on Illness and Treatment

Table 3 shows the most important data about the illness and patient treatment. Three-fourths of the patients received oxygen treatment and the average FEV1 was 39.42%. The FEV1 values were only available for patients receiving oxygen treatment. Since the FEV1 values were used for classifying the disease stages according to GOLD, it was only possible to classify these patients.

Table 3 Information on patient's disease and treatment at the time of the survey ($n = 43$ patients)

	Patients	SD
	<i>M</i>	
FEV1 ^a	39.42%	11.58
	<i>n</i>	%
Therapy		
Oxygen	32	74.4
Inhalation	11	25.6
GOLD stage		
Stage 2	6	19.4
Stage 3	21	67.7
Stage 4	4	12.9
Current smoker		
Yes	4	9.3
No	35	81.4

^a FEV1 (Forced Expiratory Volume per second) scores were only available for patients who received oxygen treatment. Since distinctions of disease stage were made according to GOLD using FEV1 scores, it was only possible to classify patients for whom such scores were available

Results on Dyadic Coping

Differences Between Dyadic Coping of Patients and Partners

In the analysis of the impact of gender and role on dyadic coping, there were significant results across four scales (Table 4). Patients rated their own stress communication significantly higher than their partners did ($F = 4.82$, $df = 1$, 40.35 , $p < .05$). When participants were asked to assess the stress communication of their counterparts, patients rated the stress communication of their partners significantly lower than the partners rated that of the patients ($F = 9.29$, $df = 1$, 39.99 , $p < .01$). So patients and partners agreed: patients rated their own stress communication higher and their partners' lower, and partners also rated their own stress communication lower and the patients' stress communication higher.

Patients rated their own delegated dyadic coping ("I assume responsibility for tasks and activities that my partner typically does to take the burden off him/her") significantly lower than their partners did ($F = 24.76$, $df = 1$, 40.96 , $p < .001$). When participants were asked to assess the delegated dyadic coping of their counterparts, patients rated the delegated dyadic coping of their partners significantly higher than the partners rated that of the patients ($F = 18.12$, $df = 1$, 38.12 , $p < .001$). So patients and partners agreed again: patients rated the delegated dyadic coping lower and their partners' higher, and partners also rated their own delegated dyadic coping higher and the patients' delegated dyadic coping lower.

Table 4 Results of mixed models: effect of role (patient vs. partner) ($n = 43$ couples)

	Patient	Partner	F (df1, df2)	p
Own stress communication	12.62	11.01	4.82 (1, 40.35)	.034
Stress communication of partner	11.73	14.19	9.29 (1, 39.99)	.004
Own supportive coping	17.68	18.79	2.30 (1, 37.64)	.138
Supportive coping of partner	17.26	16.13	1.07 (1, 39.83)	.307
Own negative coping	8.50	9.52	2.54 (1, 37.57)	.119
Negative coping of partner	8.18	9.06	1.91 (1, 36.40)	.175
Own delegated dyadic coping	5.90	8.01	24.76 (1, 40.96)	<.001
Delegated dyadic coping of partner	8.03	5.36	18.12 (1, 38.12)	<.001
Problem-focused common coping	10.59	10.23	.45 (1, 37.01)	.506
Emotion-focused common coping	4.53	4.56	.00 (1, 38.50)	.956
Evaluation of dyadic coping	7.33	6.64	2.02 (1, 36.04)	.164
Own dyadic coping	51.48	52.04	.144 (1, 39.56)	.706
Dyadic coping of partner	51.88	50.72	.23 (1, 40.37)	.638
Common dyadic coping	15.15	14.75	.21 (1, 38.22)	.649
Total dyadic coping excluding evaluation	119.96	117.93	.34 (1, 39.23)	.564

Bold text = significant results

In regards to the impact of gender and the interaction (gender \times role) with dyadic coping, no significant effects were identified.

Comparison with the Normative Comparison Group

In the two different two-way analyses of variance (group \times gender), the differences in terms of group were clearly dominant. The results for the main effect of group membership are presented in Table 5 (patients/normative comparison group) and Table 6 (partners/normative comparison group).

In the two-way analysis of variance with the group factor patient/normative comparison group, the following results were recorded in terms of the main effect of group membership: Compared with the normative comparison group, the patients had a lower assessment of their own dyadic coping, partner coping, and common dyadic coping. In terms of their own dyadic coping, the patients evaluated their own supportive coping ($F = 7.67$, $df = 1, 316$, $p < .01$), their own delegated coping ($F = 34.66$, $df = 1, 315$, $p < .001$), and their own dyadic coping ($F = 18.87$,

Table 5 Comparison of patients ($n = 43$) with the normative comparison group ($n = 276$)

	$M_{patient}$	$M_{comparison}$	F (df1, df2)	p
Own stress communication	12.34	12.97	.44 (1, 315)	.510
Stress communication of partner	11.75	12.99	4.88 (1, 313)	.028
Own supportive coping	17.76	19.23	7.67 (1, 316)	.006
Supportive coping of partner	17.64	17.77	.53 (1, 315)	.467
Own negative coping	8.37	6.69	13.29 (1, 314)	<.001
Negative coping of partner	7.98	8.71	1.41 (1, 312)	.235
Own delegated dyadic coping	5.90	7.46	34.66 (1, 315)	<.001
Delegated dyadic coping of partner	8.00	7.18	5.54 (1, 314)	.019
Problem-focused common coping	10.86	12.03	7.44 (1, 313)	.007
Emotion-focused common coping	4.73	5.07	1.35 (1, 310)	.245
Evaluation of dyadic coping	7.63	8.02	3.61 (1, 310)	.059
Own dyadic coping	51.27	56.85	18.87 (1, 317)	<.001
Dyadic coping of partner	52.93	55.30	4.66 (1, 317)	.032
Common dyadic coping	15.61	17.14	6.01 (1, 313)	.015
Total dyadic coping excluding evaluation	120.78	129.38	9.83 (1, 316)	.002

Bold text = significant results

$M_{patient}$ Mean score of patients; $M_{comparison}$ Mean score of normative comparison group

$df = 1, 317$, $p < .001$) overall lower than the people in the normative comparison group. On the other hand, the assessment of their own negative coping ($F = 13.29$, $df = 1, 314$, $p < .001$) was higher than in the normative comparison group. In regard to the patients' assessment of partners' dyadic coping, patients assessed the stress communication of the partner ($F = 4.88$, $df = 1, 313$, $p < .05$) and the dyadic coping of the partner ($F = 4.66$; $df = 1, 317$, $p < .05$) lower than the normative comparison group did. The patients also ranked the delegated dyadic coping of the partner ($F = 5.54$, $df = 1, 314$, $p < .05$) higher than the normative comparison group. Lower estimations were given, in comparison with the normative comparison group, for the problem-focused common dyadic coping ($F = 7.44$, $df = 1, 313$, $p < .01$), the overall common dyadic coping ($F = 6.01$, $df = 1, 313$, $p < .05$), and the total value of dyadic coping ($F = 9.83$, $df = 1, 316$, $p < .01$).

Table 6 Comparison of partners ($n = 43$) with the normative comparison group ($n = 276$)

	M_{partner}	$M_{\text{comparison}}$	F (df1, df2)	p
Own stress communication	11.27	12.97	12.86 (1, 315)	<.001
Stress communication of partner	13.71	12.99	4.11 (1, 315)	.043
Own supportive coping	18.67	19.23	.45 (1, 318)	.505
Supportive coping of partner	16.48	17.77	4.87 (1, 315)	.028
Own negative coping	9.23	6.79	32.96 (1, 315)	<.001
Negative coping of partner	8.78	8.71	.82 (1, 311)	.365
Own delegated dyadic coping	7.88	7.46	4.03 (1, 315)	.046
Delegated dyadic coping of partner	5.43	7.18	31.30 (1, 315)	<.001
Problem-focused common coping	10.51	12.03	15.11 (1, 316)	<.001
Emotion-focused common coping	4.77	5.07	1.54 (1, 312)	.216
Evaluation of dyadic coping	6.92	8.02	19.03 (1, 314)	<.001
Own dyadic coping	52.46	56.85	15.34 (1, 317)	<.001
Dyadic coping of partner	50.77	55.30	7.89 (1, 317)	.005
Common dyadic coping	15.27	17.14	11.20 (1, 316)	.001
Total dyadic coping excluding evaluation	118.87	129.38	13.00 (1, 316)	<.001

Bold text = significant results

M_{partner} Mean score of partners; $M_{\text{comparison}}$ Mean score of normative comparison group

The main effect of gender was also significant on a number of scales. The women ($M = 13.56$, $SD = 2.80$) showed a significantly higher own stress communication than the men ($M = 12.28$, $SD = 3.11$, $F = 6.66$, $df = 1, 315$, $p < .05$). Furthermore, the women assessed the negative coping of the partner ($M = 8.93$, $SD = 2.08$) significantly higher than men rated the negative coping of their partner ($M = 8.34$, $SD = 2.21$, $F = 5.16$, $df = 1, 312$, $p < .05$). In addition, the women evaluated the positive coping of the partner ($M = 53.76$, $SD = 9.79$) lower overall than men rated the positive dyadic coping of their partners ($M = 56.12$, $SD = 8.05$, $F = 6.26$, $df = 1, 317$, $p < .05$). There were no interactions in this two-way analysis of variance.

For the second two-way analysis of variance with the group factor COPD-partner/normative comparison group, significant results were found in the analysis of the main

effect of group membership (Table 6), particularly in the overall assessments of dyadic coping. This held for the own dyadic coping ($F = 15.34$, $df = 1, 317$, $p < .001$), the partner's dyadic coping ($F = 7.89$, $df = 1, 317$, $p < .01$) as well as for the assessment of common dyadic coping (problem-focused common dyadic coping: $F = 15.11$, $df = 1, 316$, $p < .001$; common dyadic coping overall: $F = 11.20$, $df = 1, 316$, $p < .01$) and dyadic coping overall (evaluation of dyadic coping: $F = 19.03$, $df = 1, 314$, $p < .001$; total dyadic coping: $F = 13.00$, $df = 1, 316$, $p < .001$). Furthermore, the own stress communication ($F = 12.86$, $df = 1, 315$, $p < .01$), the delegated dyadic coping of the partner ($F = 31.30$, $df = 1, 315$, $p < .001$) and the supportive coping of the partner ($F = 4.87$, $df = 1, 315$, $p < .05$) were ranked lower in comparison with the normative comparison group and the own negative coping ($F = 32.96$, $df = 1, 315$, $p < .001$) and the own delegated dyadic coping ($F = 4.03$, $df = 1, 315$, $p < .05$) was ranked higher.

Significant results were found on two scales in the analysis of the main effect of gender. The own stress communication was assessed significantly higher by the women ($M = 13.24$, $SD = 2.93$) than the men ($M = 12.21$, $SD = 12.21$, $F = 4.90$, $df = 1, 315$, $p < .05$). Conversely, the women rated the stress communication of their partner ($M = 12.53$, $SD = 3.31$) lower than the men did for their partners ($M = 13.68$, $SD = 3.08$, $F = 7.67$, $df = 1, 315$, $p < .01$). Furthermore, there was a significant interaction in terms of the evaluation of dyadic coping ($F = 5.11$, $df = 1, 314$, $p < .05$). In this case, the female COPD partners ($M = 7.29$, $SD = 2.26$) had a higher estimated evaluation of dyadic coping than the male COPD partners ($M = 6.00$, $SD = 2.72$), while in comparison, there was little difference between men ($M = 8.09$, $SD = 1.45$) and women ($M = 7.95$, $SD = 1.67$) of the normative comparison group in the other direction in terms of the evaluation of dyadic coping.

Discussion

The objective of this pilot study was to analyze dyadic coping among COPD couples and to compare this with healthy couples. As expected, COPD couples overall indicated less positive and more negative dyadic coping, i.e., partners exhibited a significantly higher level of supportive coping (i.e., they took on more of the patients' responsibilities than the other way around) and the patients spoke out more often about the stress than the partners did. Stress communication—the ability to share one's own negative emotions with the partner—is per se a positive coping strategy, is associated with feelings of closeness in the relationship, and eases the application of adaptive

coping strategies. As a result, stressors can be better controlled and resources can be used more efficiently (Burr & Klein, 1994; Corbin & Strauss, 1984). In our pilot study, it was shown that when comparing patients and partners, the patient reported about stress markedly more than the partner and the respective assessments of patients and partners in this regard were in agreement. Interestingly, however, the levels of patients' stress communication did not exceed that in the normative comparison group, but rather remained below these values ($F = 1.56$, $df = 1$, 317 , $p = .212$).

Accordingly, the difference in stress communication between patients and partners did not arise due to the COPD patients demonstrating very high levels of stress communication, but rather that the stress communication of the partners was considerably lower in comparison with the normative comparison group ($F = 12.86$, $df = 1$, 315 , $p < .01$). The fact that the partners are less apt to express their negative feelings to the patients could be due to them wanting to spare their partners from dealing with their own individual problems. Although the partners of COPD patients also suffer from high levels of psychological stress (Booth et al., 2003; Ehlert, 2002; Kühl et al., 2008), they may avoid sharing their negative emotions with the patients in order to prevent the patient getting stressed and thereby possibly exacerbating the symptoms associated with shortness of breath [see protective buffering (Coyne & Smith, 1991; Fiske et al., 1991; Langer et al., 2009; Manne & Badr, 2008; Schokker et al., 2010; Sexton & Munro, 1985)]. The low stress communication of the partner, in particular, could even be linked to the generally lower values of dyadic coping among COPD couples in comparison with the normative comparison group. The imbalance in delegated dyadic coping points in a similar direction. Patients as well as partners indicated that the patient is relieved of more responsibilities by the partner than vice versa. These results support the findings of Cannon and Cavanaugh (1998) and Ashmore et al. (2005), namely, that the illness increases the patient's dependency and leads to a shift in role allocation. The partner often takes on responsibilities that the patient had previously been able to address (Ashmore et al., 2005; Cannon & Cavanaugh, 1998).

In calculating the mixed models using the data from the COPD patients and their partners, no significant results were found in the analysis of the impact of gender on dyadic coping or the interaction (role \times gender). A possible explanation for the lack of gender differences in COPD couples could be the small sample size.

In the comparison of the patients and partners with the normative comparison group, it was shown that overall the patients as well as the partners assessed their positive dyadic coping considerably lower and their negative dyadic coping markedly higher. These results are an indication

that dyadic coping can be negatively impacted by stress (Bodenmann, 2005). Unlike other life-changing events like cancer, which can result in increased closeness within the relationship, (Bodenmann, 2005; Cannon & Cavanaugh, 1998) positive coping is generally ranked lower by COPD couples and negative coping higher.

Furthermore, patients and partners assessed their own negative coping higher than the normative comparison group did. There are a number of findings from other studies, which offer explanations for the increased levels of negative coping among these couples: the extra support the patient receives can also come in a disparaging, irritable or patronizing form, which confers a hostile, ambivalent or superficial character to the dyadic coping (Bodenmann, 1997; Dakof & Taylor, 1990; Hagedoorn et al., 2000). Even if the partner underestimates the patient and takes over too many of their responsibilities, this can lead to the patient activities becoming increasingly limited (Hagedoorn et al., 2000).

The patients and partners seem to be less satisfied in general with the dyadic coping. Both rank the total dyadic coping, the own dyadic coping, the dyadic coping of partner and the common dyadic coping lower than the normative comparison group. The exhaustion felt in most cases by the patient as well as the partner can lead to limitations on effective coping (Small & Graydon, 1992).

An explanation for the low values given to common dyadic coping could be linked to the limited sexual activity by the COPD patients. Sexuality and the exchange of carresses represent important aspects of common dyadic coping. COPD patients, however, have coughing and the associated incontinence, high levels of mucus production, and worries about physical changes (for example, high levels of weight loss), which often have a negative impact on sexual functionality and therefore also on the assessment of common dyadic coping. (Ashmore et al., 2005; Bodenmann, 2008).

The gender variance identified in the two-way analysis of variance largely matches past research findings. In past studies, women gave higher values for own stress communication, had a higher assessment of the partner's negative coping and were less satisfied with the partner's coping (Widmer & Bodenmann, 2000). The gender differences in terms of stress communication were confirmed in both two-way analyses of variance (patient/normative comparison group und partner/normative comparison group). The higher levels of dissatisfaction among women with the men's dyadic coping were only found in the analysis of the patient/normative comparison group.

The only unexpected result was the interaction between gender \times group (partner/normative comparison group) on the "evaluation of dyadic coping" scale. The male COPD partners saw the dyadic coping of female COPD patients as less effective than the female COPD partners assessed the

dyadic coping of the COPD patients. A small difference in the other direction was evident in the normative comparison group, whereby men as well as women of the normative comparison group were more satisfied with the dyadic coping of their respective partners than the male and female COPD patients and partners. According to this analysis, the male COPD partners were most dissatisfied with the dyadic coping of the female COPD patients. A possible explanation for this result may be that the female partners of COPD patients indicate that the relationship has become closer due to the illness more frequently than the male COPD partners (Cannon & Cavanaugh, 1998). The male COPD partners also seem to derive fewer positive sides from the situation than the female COPD partners and seem to view the dyadic coping of their partners as less effective. Furthermore, the female COPD partners are more likely to receive support from other family members and friends as well (Cannon & Cavanaugh, 1998; Sexton & Munro, 1985). Other persons close to them therefore cover a certain amount of the needed support, which means that the female COPD partners are possibly less dependent on the positive dyadic coping of the patients or do not have as high of expectations. This would also explain why the expected gender difference—that men assess the dyadic coping of their partner more positively than women—was not found in the two-way analysis of variance with the group factor COPD partner/normative comparative group, because male COPD partners experience the dyadic coping of female COPD patients as particularly unsatisfactory. There are, however, very few studies, which have analysed the gender differences in regard to reciprocal COPD support and additional research is needed before more specific statements can be made (Cannon & Cavanaugh, 1998).

Limitations

The generalizability of these results is limited due to the low response rate of the COPD sample, 24.3%, likely in part due to the “partner study” aspect of this analysis. The sample size can also be considered small, particularly in terms of the number of couples ($n = 43$). In addition, unlike other studies with higher response rates (Kühl et al., 2008), the patients were not contacted personally, but rather in an anonymous fashion by letter and they received no payment or compensation for their participation. In contrast to the volunteers for the COPD sample, the only people who received questionnaires for recruiting the normative comparative sample were those who signed up to participate in the study. Therefore the two response rates are not comparable. Furthermore, the individuals of the normative comparison group received financial remuneration.

A further limitation is posed by the normative comparison group sample exhibiting a significantly higher level of

education than the COPD pairs. COPD, in comparison with the general population, is connected with a lower level of education, since the prevalence of smokers is higher among people with a lower educational level (Leinsalu et al., 2011; Melotti et al., 2011). However, Bodenmann (2000) stated that no assumptions can be made of a notable connection between education and dyadic coping. Based on the differences in dyadic coping among COPD pairs and the normative comparison group, however, the possibility can not be excluded that these effects are influenced by the higher educational level in the normative comparison group and are not linked solely to the COPD factor. In order to clarify these associations, additional studies need to be conducted using matched samples in regard to age and educational level.

In summary, these results point to the partners offering high levels of support to the patients while receiving little support themselves. The patients as well as the partners are in agreement on this point. Despite all the support that the patient receives from his or her partner, dyadic coping is assessed more negatively by patients and their partners than by the normative comparison group.

Based on these results, it seems important that partners of COPD patients are incorporated into the support process. They are exposed to great burdens and represent an important support modality for the patients. Regular screening of patients and partners could help identify highly distressed individuals early on, as the strain of the chronic disease can have a negative effect on couples’ relationship and quality of life. Dyadic coping may be seen as a buffer to that effect. The health and well-being of one partner is linked to the health and well-being of the other. For this reason, the challenge of a chronic illness should also be considered on a couple’s basis and dyadic coping strategies should be strengthened. Therapeutic interventions to improve dyadic coping include: (a) improving stress communication; (b) developing different options for supportive, delegated, and common dyadic coping; (c) installing and stabilizing new forms of dyadic coping (Bodenmann, 1997, 2010). The coping-oriented couple approach proposed by Bodenmann may offer a valuable way to support couples with chronic disease in an attempt to strengthen mutual dyadic coping resources. Perceived imbalances should be addressed and corresponding adjustments to the dyadic coping strategy considered, as these may help safeguard individual and dyadic homeostasis. In dealing with the illness, it is also important that the couples receive professional support in terms of coping with daily life so that the responsibilities within the pair’s relationship do not rest solely on the partner, but are instead spread across the patient, partner and professional.

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