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Review

Psychological interventions targeting partners of cancer patients: A systematic review

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ABSTRACT

Purpose: Cancer patients' intimate partners often experience levels of psychological burden that are comparable to or even exceed that of the patients, making it imperative that they too be provided with appropriate psychological support. This review aimed to present the content and the effects of interventions delivered to caregiving partners of cancer patients on both partners and patients. Furthermore, we provide information about the acceptability of the interventions and study quality.

Methods: An initial search in Web of Science, PsycINFO, and PubMed databases was conducted. We included RCTs as well as pre-post studies that focused on enhancing partners' wellbeing or diminishing partners' distress. To be included, interventions had to have been offered to partners either only or predominantly. We included studies published until December 2017. The methodological quality of the trials was assessed with the EPHP assessment tool.

Results: Nine studies met the inclusion criteria. Intervention topics included social support, short-term problem solving, the marital relationship quality, role expectations, emotional resilience, and coping strategies. Positive intervention effects were found with regard to social support, emotional distress, improved communication, posttraumatic growth, self-efficacy, and coping. Despite considerably low response rates, the interventions were generally well accepted. Most of the studies suffer limitations because of methodological flaws, the lack of randomization, and small sample sizes.

Conclusion: Interventions delivered to partners of cancer patients may have positive effects on both partners and patients. We derive several implications for future research: Intervention programs should be tailored to the specific needs of caregiving partners with regard to the cancer trajectory and gender. Effort has to be made to increase sample sizes as well as to include particularly burdened individuals. Selected measurement instruments should be sensitive to specific intervention effects. Finally, information on both statistical as well as clinical relevance of research findings should be provided.

1. Introduction

Almost half a million people in Germany are diagnosed with cancer each year and have to deal with the overwhelming consequences of the illness (Robert Koch-Institut [RKI], 2016). Suffering from cancer not only confronts patients with a variety of psychosocial challenges but also has a huge impact on their social environment. Families and intimate partners in particular experience levels of psychological burden that are comparable to or even exceed that of patients, making cancer a “we-disease” (Carlson et al., 2008; Kayser et al., 2007; Stenberg et al., 2010).

Partners or spouses typically become the primary caregivers and the most important source of support for cancer patients (McLean and Jones, 2007; Pitceathly and Maguire, 2003). This role entails intense challenges: in addition to dealing with feelings of uncertainty and anxiety arising from the cancer diagnosis, caretaking partners also have to adjust to profound changes that affect almost all aspects of their lives. Following a cancer diagnosis, they are usually expected to autonomously perform necessary organizational and formal tasks as well as offering significant levels of emotional support to their ill partner, a dynamic which often results in them suppressing their own feelings for

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long periods of time (Stenberg et al., 2010). This burdensome situation frequently leads to a high vulnerability to psychological stress or even mental illness: research suggests that between 10 and 50% of caregivers suffer from psychiatric disorders, whereby higher rates are seen among caregivers of patients with advanced or palliative stage cancer (Pitceathly and Maguire, 2003). More specifically, caring for a cancer patient increases the likelihood of suffering from depression, anxiety, hopelessness, social isolation, various somatic symptoms, and work-related and financial difficulties (Arno et al., 1999; Bevans and Sternberg, 2012; Braun et al., 2007; Girgis et al., 2013; Grunfeld, 2004; Pitceathly and Maguire, 2003).

However, despite these circumstances, partners' or spouses' specific burdens often remain invisible. Northouse et al. (2010) suggest this may be due to the fact that caregiving partners often do not make their needs for support known. Moreover, others (including health care professionals) perceive them as caregivers rather than care recipients. For these reasons, caregiving partners currently receive less social, health care-related, and psychological support than patients (Blum and Sherman, 2010; Given et al., 2004; Jensen and Given, 1991; Schubart et al., 2008). Because the majority of caring partners' unmet needs are related to coping with psychological or emotional distress (Lambert et al., 2012) it is imperative that this particular population be provided appropriate psychosocial interventions.

During the past few years, an increasing number of psychosocial interventions for cancer patients and their caregivers have been developed and evaluated (see Carlson et al., 2000; Ferrell and Wittenberg, 2017; Frambes et al., 2017; O'Toole et al., 2017 for current reviews).

However, as far as we know, only one review of interventions solely aimed at improving caretaking partners' outcomes has been published to date. Carlson et al. (2000) identified seven studies published between 1986 and 2000 that evaluated counseling or therapy sessions offered to partners of cancer patients. Only two of the five studies that included a comparison group yielded positive intervention effects. The provision of psychosocial support to caregivers of cancer patients has gained some attention over the past decades and recent research findings have shown beneficial effects of psychological interventions for partners of cancer patients, for example, with regard to perceived and received social support (Senneseth et al., 2017) or emotional well-being (Lewis et al., 2008). Thus, we deemed it necessary to provide a comprehensive overview of the literature published on this topic so far. The main focus of our review lies on the intervention characteristics and effects on caring spouses. However, researchers have argued that emotionally supportive care delivered to partners may improve both the partners' and the patients' emotional well-being (e.g., Carlson et al., 2017). Moreover, some interventions offered to spouses of cancer patients focus on increasing their self-efficacy and caregiver skills, thus helping them to become better caregivers, which likely alleviates the patients' emotional distress (e.g., Duggleby et al., 2017; Jones et al., 2013). Accordingly, we provide information about the effectiveness of different interventions for both participating partners and not-participating patients. Moreover, since this review is intended to serve as practical guidance for the development of future intervention studies, we provide an overview of variables and instruments used as well as the acceptability of each intervention conducted (i.e., dropout and compliance rates and reasons for dropout). Furthermore, by providing information about the studies' methodological quality we enable researchers and practitioners to critically evaluate the research findings of the studies included in our review. With these aims in mind we derived the following research questions:

- (1) Assessed variables and instruments
How were the intervention outcomes measured?
- (2) Intervention approaches
Which kinds of (evaluated) psychological interventions for partners of cancer patients have been conducted so far (until December 2017)?

- (3) Intervention effects
 - a) Which intervention effects were reported for caretaking partners?
 - b) Which (if any) intervention effects were reported for cancer patients?
- (4) Acceptability of the intervention
 - a) How many of the participants dropped out from the intervention?
 - b) What were common reasons for dropping out?
 - c) How compliant were participants with the intervention (i.e. treatment adherence rates)?
- (5) Study quality
How appropriate were the studies (in terms of risk of bias) for drawing conclusions about the efficacy of the interventions (according to the Quality Assessment Tool for Quantitative Studies developed by the Effective Public Health Practice Project (EPHPP; Effective Public Health Practice Project (1998))?

2. Methods

We formulated a review protocol on the basis of the PRISMA statement in accordance with the PICOS elements for a review protocol (Liberati et al., 2009). We pre-registered the review in August 2017 at "PROSPERO International prospective register of systematic reviews" (CRD42017073481).

2.1. Eligibility criteria

Eligibility criteria are detailed according to the PICOS framework (Liberati et al., 2009) as follows.

2.1.1. Participants²

The participants were spouses or partners (married or unmarried)² of cancer patients aged 18 years or older. The patients had to have been formally diagnosed with a cancer of any type (solid or hematologic), at any tumor stage, and at any time point since diagnosis. We excluded studies with mixed chronic disease samples (incl. cancer) and post-be-reavement interventions.

2.1.2. Interventions

For inclusion in this review, the psychological interventions had to be aimed at improving the well-being of cancer patients' intimate partners, and they had to be offered either solely or predominantly to the partners. That means we included studies in case other people (e.g., the patient, friends, or family members) took part in the intervention sessions, but the main aim of the intervention was to improve the partner's well-being and the partners took part in every session that was offered. On the other hand, we excluded studies that focused on the outcome of the cancer patients, as well as couple-based interventions. The interventions had to have made use of psychological techniques such as: education, coping skills training, psychotherapy, discussion groups, and relaxation or mindfulness training, either singly or in combination. We included all individual or group interventions provided or supervised by health-care professionals as well as self-administered online interventions. We included interventions irrespective of their setting, duration, and frequency.

2.1.3. Outcomes

We took all self-reported psychosocial outcome concerning partners' wellbeing or distress into account. We excluded interventions which assessed purely physical outcomes (i.e. pharmaceutical studies).

² In the following, when referring to partners of cancer patients, we mean both unmarried and married partners/spouses of cancer patients.

cancer OR tumor OR tumour OR tumors OR tumours OR carcinoma OR neoplasm OR neoplasms OR malignancy OR malignancies OR oncology OR oncologic OR oncological OR leukemia OR leukaemia OR lymphoma OR sarcoma OR chemotherapy OR chemo-therapy

AND

psychosocial OR psychological OR "psycho oncological" OR psychoeducation OR psychoeducational OR psychotherapy OR behavior OR behaviors OR behaviour OR behaviours OR behavioral OR behavioural OR "cognitive behavioral" OR "cognitive behavioural" OR interpersonal OR supportive

AND

intervention OR training OR therapy OR therapeutical OR treatment OR counsel R "problem solving" OR adjustment

AND

partner OR partners OR spouse OR spouses OR husband OR husbands OR wife OR wives

Fig. 1. Search terms.

2.1.4. Studies

We considered all quantitative and mixed methods studies. In order to be able to interpret the results with regard to change over time we only considered studies which included at least two measurement points in order to detect changes over time. We excluded comments, editorials, case studies, purely qualitative research, posters, dissertation abstracts, and reviews, as well as unpublished study results.

2.2. Information sources

A systematic computer-based literature search was conducted in accordance with the PRISMA-Statement (Liberati et al., 2009). We searched the electronic databases Pubmed, Web of Science, and PsycINFO. We searched in all fields and did not restrict the period of publishing dates and thus searched for any literature that had been published up until August 2017. We searched for studies which were written in either English or German. We additionally screened reference lists of included studies and review articles on related topics. The search was re-run prior to final analysis in December 2017. In the second search, we found one further study that met our inclusion criteria and therefore included it in the analysis as well. The search terms used are shown in Fig. 1.

2.3. Study selection and data extraction

We used the reference management program CITAVI (Swiss Academic Software GmbH) for data management. After eliminating duplicates, the first authors (NH and AK) independently screened all of the titles based on the eligibility criteria. If it was initially unclear whether a selected article might be relevant, it was kept on the list for closer review. Next, the abstracts of potentially relevant articles were analyzed and the selection was narrowed. If all criteria were met after the full article had been read, two reviewers (NH and AK) decided whether or not to include the study in the review.

Information extracted from the study included publication and study details (i.e. year of publication, country of origin, number of participants), sample characteristics (i.e. age range and mean age, sex, type of tumor, time passed since diagnosis, tumor stage), intervention details (i.e. type of intervention, format of intervention [group or individual]), characteristics of the professional who administered the

intervention, duration of the intervention, number of sessions and outcomes (including instruments and variables used to assess the intervention effect), time points of outcome assessment, and narrative reports. Any disagreements between the two reviewers were resolved by discussion.

2.4. Assessment of risk of bias

For assessing the internal validity of the studies, we used the EPHPP developed by the Effective Public Health Project Canada (Armijo-Olivo et al., 2012). The EPHPP is a well-established instrument for the evaluation of the research quality and internal validity of different study designs such as observational, cross sectional, before-and-after studies, and randomized controlled trials (RCTs). It has been reported to have a good test-retest reliability as well as content and construct validity (Jackson and Waters, 2005; Thomas et al., 2004). The quality of a study is classified as "strong", "moderate", or "weak" based on evaluations of the following six domains: (1) *selection bias* (representativeness and participation rate³); (2) *study design*; (3) *confounders*; (4) *blindings*; (5) *data collection method*; and (6) *withdrawals/dropouts*. An overall assessment score was formed on the basis of the evaluation scores for these domains. Additional elements of the EPHPP that were used for the evaluation of the studies' methodological quality, but that were not taken into account for forming the overall score, include adherence rate, possibility of contamination, appropriateness of statistical methods, and whether the analyses were performed based on intervention allocation (Armijo-Olivo et al., 2012). Two reviewers (NH and AK) independently evaluated the methodological quality of each study on the basis of the EPHPP. Any disagreement was resolved by discussion.

3. Results

3.1. Study selection

8455 records were identified through database searches. After

³ Participation rate refers to the percentage of partners that met the inclusion criteria and agreed to participate before group assignment. Participation rate is not applicable if partners were self-recruited.

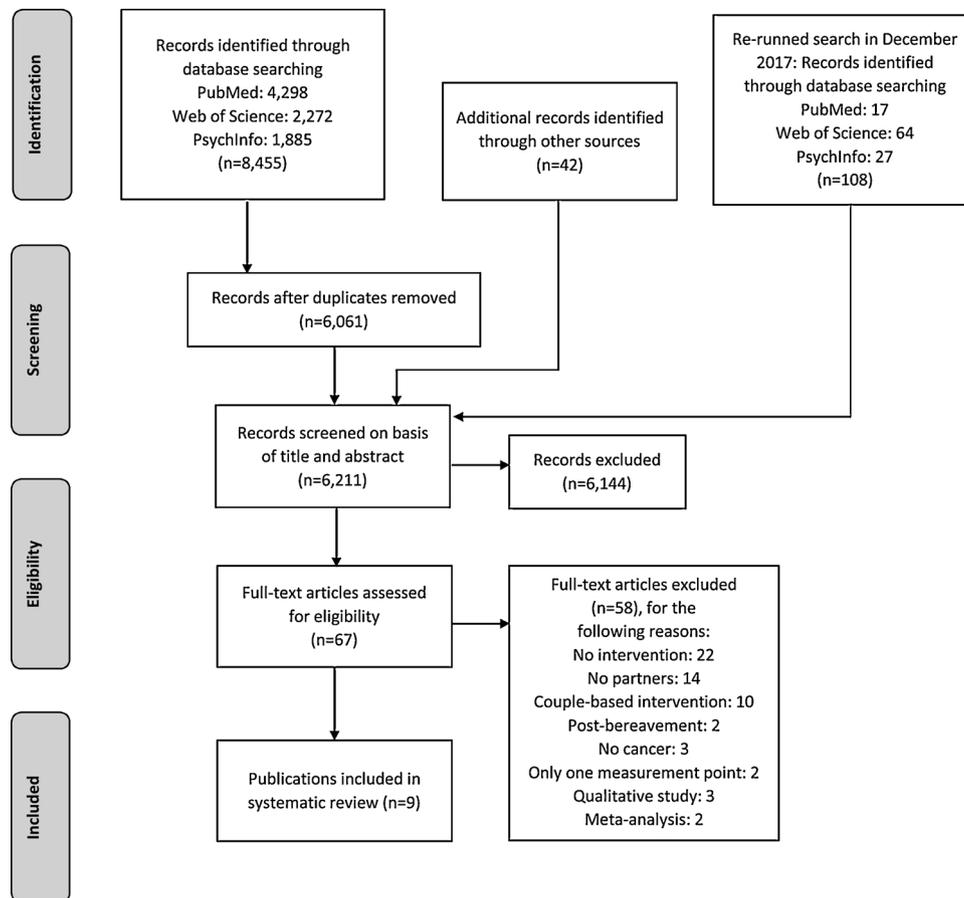


Fig. 2. Flow chart of study selection process.

duplicates were eliminated, the titles and abstracts of 6061 articles were scanned. Another 42 potentially relevant articles were identified by examining the reference lists of existing reviews and related articles. After the second search in December 2017, 108 additional articles were identified as potentially relevant. Thus, 6211 articles were screened on the basis of their title and abstract. Of those, 6144 articles were excluded. Next, the full-texts of 67 articles were assessed for eligibility. 57 publications did not meet the inclusion criteria and were excluded due to the reasons presented in Fig. 2. Ultimately, nine studies were chosen for inclusion.

3.2. Study and sample characteristics

Table 1 presents a summary of those nine publications, all of which were published between 1986 and 2017. Most of the studies were conducted in the United States ($k = 5$), in Canada ($k = 3$), and Norway ($k = 1$). Six of the studies were RCTs, three were pretest-posttest studies. Two of the pretest–posttest studies and one of the RCTs were pilot studies. The studies' samples comprised a total of 391 participants at first post-intervention measurement. The average sample size was 43. Participants were between 32 and 67 years old, the mean age was 54 years. The largest number of studies included interventions for partners of patients with breast cancer ($k = 5$), followed by those of patients with prostate cancer ($k = 2$). The other studies either included patients with a variety of tumor entities ($k = 1$) or they did not identify the tumor entities ($k = 1$). The selection of certain cancer types in a large proportion of the included studies led to gender homogenous samples for most of the trials. For the rest of the trials ($k = 2$), about equal numbers of male and female caregivers were included. In sum, 44% of all of the partners were female. Most of the samples were heterogenous

with regard to the phase of the cancer trajectory: Partners of patients suffering from stage 0 to stage IV cancer were included and time since diagnosis ranged from 4 to 29 months, with an average of 11 months. Some studies reached a higher degree of homogeneity with regard to the cancer trajectory by including partners of patients suffering exclusively from cancer stages I–II (Bultz et al., 2000) or I–III (Duggleby et al., 2017), as well as patients diagnosed within six (Lewis et al., 2008) or 18 months before recruitment and non-metastatic cancer (Carlson et al., 2017). To assess intervention dosage, we calculated the total number of hours the intervention was provided (mean 7.1; range 3–10.5), the number of sessions (mean 5.6; range 1–10), and the duration of the intervention (mean 46.5 days; range 1–70 days). Duggleby et al. (2017), who provided an online intervention, did not specify the number of hours the intervention was provided nor the number of sessions conducted. Therefore, we calculated the average values using the data that was available. Control group participants received treatment as usual. In two studies information about the care for control group participants was not available (Blanchard et al., 1996; Senneseth et al., 2017)

3.3. Assessed variables and instruments

For a better overview, we classified groups of outcome variables with the respective measurement instruments as depicted in Table 2. Different kinds of general or cancer-related emotional distress (e.g., depression, anxiety) were measured in all of the studies. The assessment of skills ranged from caregiving skills (i.e., how to be a better caregiver for the patient) to communication, coping, and self-care skills. Seven studies analyzed the effect of the intervention on the caregiver's relationships with others (i.e., social support and marital satisfaction).

Table 1
Summary of included studies.

| Randomized controlled trials | | | | | | | | | | | |
|------------------------------|---------|------------------------|---|--|--|-------------------------|----------------------|---|-------------------------------|--|--|
| Study | Country | Type of intervention | Intervention period, duration of each session | Measurement points, period of follow-up in brackets | Number of participants recruited/at post-intervention/at follow-up | Mean age (SD or range) | Percent female in IG | Inclusion criteria | Treatment control group | Measurements and instruments | Results |
| | | | | | | | | | | Partners | Patients |
| Blanchard et al. (1996) | USA | Individual counseling | Six sessions, on a weekly basis, 60 min | t0: baseline t1: post-intervention t2: follow-up (six months) | 86/78/66 | 55 ^b | 60% ^b | - Partners of cancer patients (various types) - cancer diagnosed more than three months before recruitment - patient not eligible for hospice program | Not indicated | Depression: CES-D Functioning: SF-20 Social support: HDL (adapted) Marital satisfaction: DAS Anxiety: STAI Burden: ZBI, List of Pressing Problems Coping: CRS Perceived health status: FLIC | - no quantitative effects found - better communication ^a - appreciation of support for spouse ^a |
| Bultz et al. (2000) | Canada | Group intervention | Six sessions, on a weekly basis, 90–120 min | t0: baseline t1: post-intervention t2: follow-up (three months) | 34/34/32 | 51 (32–67) ^b | 0% | - Partners of breast cancer patients - patient diagnosed within one year before recruitment - cancer stages I-II | Treatment as usual, wait list | General emotional distress: POMS Marital satisfaction: IMS Social support: FSSS Mental adjustment to cancer: MAC | - reduced emotional distress compared to CG at t2 (p = 0.07) - improved communication, experience of normalization ^a |
| Carlson et al. (2017) | Canada | Group intervention | six sessions, on a weekly basis, 90 min | t0: baseline t1: post-intervention t2: follow-up (three months) t3: second follow-up (six months) | 76/63/56/60 | 61.7 (8.7) | 100% | - Partners of prostate cancer patients - patient diagnosed within 18 months before recruitment - non-metastatic cancer | Treatment as usual, wait list | General emotional distress: POMS Anxiety: STAI Social support: SSS Marital satisfaction: IMS | - no quantitative effects found |
| Duggleby et al. (2017) | Canada | Web-based intervention | six sessions, four weeks, self-administered | t0: baseline t1: during intervention t2: post-intervention t3: follow-up (two months) | 57/47/44/40 | 53.7 ^b | 0% | - Partners of breast cancer patients - cancer stages I-III | Treatment as usual | Caregiver guilt: CGQ Hope: HHI Quality of life: COOL-C Self-efficacy: GSES | - no quantitative effects found - half of the participants agreed or strongly agreed that the intervention increased their ability to deal with changes caused by the cancer ^a |

(continued on next page)

Table 1 (continued)

| Randomized controlled trials | | | | | | | | | | | | |
|------------------------------|---------|----------------------|---|---|--|-------------------------|----------------------|---|-------------------------|---|---|--|
| Study | Country | Type of intervention | Intervention period, duration of each session | Measurement points, period of follow-up in brackets | Number of participants recruited/at post-intervention/at follow-up | Mean age (SD or range) | Percent female in IG | Inclusion criteria | Treatment control group | Measurements and instruments | Results | |
| Manne et al. (2004) | USA | Group intervention | six sessions, on a weekly basis, 60 min | t0: baseline t1: post-intervention (one month) | 68/60 | 59.6 (9.3) | 100% | - Partners of prostate cancer patients | Treatment as usual | Partners | Patients | |
| | | | | | | | | | | Emotional distress: psychological distress subscale of MHI Cancer-specific distress: IES Coping: COPE, EACS Post-traumatic growth: PTGI Communication: 3 subscales from CPQ (adapted) | Not assessed | - improved coping on the subscales positive reappraisal and growth, and denial compared to CG - improved post-traumatic growth compared to CG |
| Senneseth et al. (2017) | Norway | Group intervention | One session, 180 min | t0: baseline t1: post-intervention (three months) | 35/24 | 44.3 ^b (7.4) | 53% ^b | - Partners of cancer patients - living with the patient - patient diagnosed within 5 years before recruitment - parenting children under the age of 18 | Not indicated | Partners | Patients | |
| | | | | | | | | | | General emotional distress: GHQ-12 Quality of life: QOLSN Social Support: CSS, MSPSS | Not assessed | - improved received social support - improved perceived social support |
| Pretest-posttest trials | | | | | | | | | | | | |
| Jones et al. (2013) | USA | Group intervention | Five sessions on a weekly basis, 90 min | t0: baseline t1: post-intervention t2: follow-up (3 months) | 54/42/41 | 53 | 0% | - Partners of breast cancer patients currently receiving treatment | | Partners | Patients | |
| | | | | | | | | | | Depression: CES-D Marital satisfaction: DAS-R, MIS | - improved support and self-care skills at t1 and t2 - improved communication ^b | - improved depression at t2 - improved communication ^b |
| | | | | | | | | | | Support and self-care skills: SSC, CASE-S | - better communication, better understanding of wife, mutual support in group ^a | |

(continued on next page)

Table 1 (continued)

| Randomized controlled trials | | | | | | | | | | | |
|------------------------------|---------|-----------------------|---|---|--|------------------------|----------------------|--|-------------------------|--|--|
| Study | Country | Type of intervention | Intervention period, duration of each session | Measurement points, period of follow-up in brackets | Number of participants recruited/at post-intervention/at follow-up | Mean age (SD or range) | Percent female in IG | Inclusion criteria | Treatment control group | Measurements and instruments | Results |
| Lewis et al. (2008) | USA | Individual counseling | Five sessions on a biweekly basis, 60 min | t0: baseline t1: post-intervention | 26/20 | 53 | 0% | - Partners of breast cancer patients - married or co-habiting - local or regional breast cancer - cancer stages 0-III - patient diagnosed within 6 months before recruitment | control group | <p><u>Partners</u></p> <p>Depression: CES-D Anxiety: STAI-Y Support and self-care skills; SSC; CASE-S <u>Marital satisfaction:</u> DAS, MIS</p> <p>Not assessed</p> | <p><u>Partners</u></p> <p>- improved anxiety^{***} and depression^{**} - improved support and self-care skills^{***} - improved marital satisfaction on affectional expression subscale[*] - better relationship strength, communication, understanding of wife^o</p> |
| Sabo et al. (1986) | USA | Group intervention | Ten sessions on a weekly basis, 60 min | t0: baseline t1: post-intervention | 24/23 | Not reported | 0% | - Partners of breast cancer patients | control group | <p><u>Partners</u></p> <p>Emotional distress: Study-specific scale Communication <u>about mastectomy:</u> Study-specific scale Support skills; Study-specific scale Self-esteem: Study-specific scale Gender role <u>expectations:</u> AMR <u>Marital satisfaction:</u> LMAT</p> <p>Not assessed</p> | <p><u>Partners</u></p> <p>- improved communication about mastectomy^{**} - improved verbal communication^o</p> <p>Not assessed</p> |

Notes: AMR, The attitudes toward the male role scale; CAS, Caregiving Appraisal Scale; CASE-S, Cancer Self-Efficacy Scale - Spouse; CES-D, Center for Epidemiologic Studies-Depression Scale; CG, control group; CGQ, Caregiver QUILT Questionnaire; CPP, Cancer-PEPSONE program; CPQ, Communication Patterns Questionnaire; COOL-C, Caregiver Quality of Life Index - Cancer; CRS, Coping Response Scale; CSS, Crisis Support Scale; CWC, Coping With Cancer; DAS, Dyadic Adjustment Scale; DAS-R, Revised Dyadic Adjustment Scale; EACS, Emotional approach coping scale; FACT-B, Functional Assessment of Cancer Breast; FLIC, Functional Living Index-Cancer; FSSS, Functional Social Support Scale; GHQ-12, General Health Questionnaire 12-item version; GSES, General Self-Efficacy Scale; HDL, Health and Daily Living Scale; HHH, Helping Her Heal; HHH-G, Helping Her Heal - group approach; HHL, Herth Hope Index; HSCI, Help Seeking Coping Index; ICR, Index of Coping Responses; IES, Impact of Events Scale; IG, intervention group; IMS, Index of Marital Satisfaction; LMAT, Locke's Marital Adjustment Test; MAC, Mental Adjustment to Cancer Scale; MaTT, Male Transition Toolkit; MBBS, Montgomery and Borgotta Burden Scale; MBSR, Mindfulness-Based Stress Reduction; MHI, Mental Health Inventory; MIS, Mutuality and Interpersonal Sensitivity Scale; MSPSS, Multidimensional Scale of Perceived Social Support; PCS, Personal Change Scale; POMS, Profile of Mood States; PTGI, Post-traumatic Growth Inventory; QOLS-N, Norwegian version of the Quality of Life Scale (QOL); SD, Standard Deviation; SF-20, 20-Item Short Form Health Survey; SFT, supportive expressive therapy; SSC, Spouse Skills Checklist; SSS, Social Support Survey; STAI, State-Trait Anxiety Inventory; STAI-Y, State-Trait Anxiety Inventory - state anxiety subscale; TMS, Total Mood Disturbance Score; ZBI, Zarit Burden Inventory.

^a Qualitative information.
^b information referring to intervention group.
^{*} $p < .05$.
^{**} $p < .01$.
^{***} $p < .001$.

Table 2
Applied outcome variables and effects of the interventions on the partners.

| Outcome | Blanchard et al. | Bultz et al. | Carlson et al. | Duggleby et al. | Jones et al. | Lewis et al. | Manne et al. | Sabo et al. | Senneseth et al. |
|---|--|--------------------|--------------------|---------------------------|--|-------------------------|--|---|-----------------------------------|
| General emotional distress | | Total mood: POMS ↑ | Total mood: POMS → | | | | Psychological distress: subscale of MHI → | | Psychological distress: GHQ-12 → |
| Depression | CES-D → | | | | CES-D → | CES-D ↑ | | Study-specific scale → | |
| Anxiety | STAI → | | STAI → | | | STAI-Y ↑ | | | |
| Cancer-related emotional distress | Burden: ZBI, List of pressing problems → | | | Caregiver guilt: CGQ → | | | Cancer-specific distress: IES → | Gender role expectations: AMR → | |
| Quality of life and overall functioning | Functioning: SF-20 → | | | Quality of life: CQOL-C → | | | Coping: COPE (reappraisal and growth ↑, denial coping ↑, acceptance →, emotional approach) → | Supportive attitude (study-specific scale) → | Quality of life: QOLS-N → |
| Self-efficacy and skills | CRS → | | | Self-efficacy: GSES → | Self-efficacy: CASE-S ↑ | Self-efficacy: CASE-S ↑ | Communication skills: CPQ → | Frequency of verbal communication about mastectomy (study-specific scale) ↑ | |
| Hope | | | | | | | | | |
| Posttraumatic growth | | | | | | | | | |
| Self-esteem | | | | | | | | | |
| Social support | HDL → | FSSS → | SSS → | HHI → | | | PTGI ↑ | Study-specific scale → | Received social support: CSS† |
| Marital satisfaction | Dyadic adjustment: DAS → | IMS → | IMS → | | Dyadic adjustment: DAS (Affectional expression ↑, consensus →, cohesion →, satisfaction →) | | | | Perceived social support: MSPSS ↑ |
| | | | | | Marital quality: MIS → | | | Sexual compatibility: LMAT → | |
| | | | | | | | | Marital happiness: LMAT → | |

Notes. AMR, The attitudes toward the male role scale; CASE-S, Cancer Self-Efficacy Scale - Spouse; CES-D, Center for Epidemiologic Studies-Depression Scale; CGQ, Caregiver Guilt Questionnaire; CPQ, Communication Patterns Questionnaire; CQOL-C, Caregiver Quality of Life Index - Cancer; CRS, Coping Response Scale; CSS, Crisis Support Scale; DAS, Dyadic Adjustment Scale; DAS-R, Revised Dyadic Adjustment Scale; EACS, Emotional approach coping scale; FSSS, Functional Social Support Scale; GHQ-12, General Health Questionnaire 12-item version; GSES, General Self-Efficacy Scale; HDL, Health and Daily Living Scale; HHI, Herth Hope Index; IES, Impact of Events Scale; IMS, Index of Marital Satisfaction; LMAT, Locke's Marital Adjustment Test; MHI, Mental Health Inventory; MIS, Mutuality and Interpersonal Sensitivity Scale; MSPSS, Multidimensional Scale of Perceived Social Support; POMS, Profile of Mood States; PTGI, Post-traumatic Growth Inventory; QOLS-N, Norwegian version of the Quality of Life Scale (QOL); SF-20, 20-Item Short Form Health Survey; SSS, Social Support Survey; STAI, State-Trait Anxiety Inventory; STAI-Y, State-Trait Anxiety Inventory - state anxiety subscale; ZBI, Zarit Burden Inventory.

→ no change after intervention, † improvement after intervention.

3.4. Intervention goals, approaches, and effects

We organized our findings according to the topic or focus of each intervention. That is, we considered both the main goal of the intervention and the intervention approach or strategy used to pursue this goal. On this basis, we assigned labels denoting the topic of each intervention. Specifically, we identified six topics (building up social support, short-term problem solving, improving the marital relationship quality, overcoming role expectations, building up emotional resilience, developing coping strategies). However, we want to clarify that these labels only denote the main topic of the intervention. Most of the studies pursued multiple goals and applied various strategies. All of the interventions except for one (Senneeth et al., 2017) were offered to partners alone.

3.4.1. Social support

Senneeth et al. (2017) analyzed the effects of a social network program which was designed with the aim of optimizing social support for families of cancer patients. The program consisted of one session that was led by three experienced psychologists. In the first part, partners were informed about challenges and coping strategies as well as ways to sustain social support. In the second part, they were encouraged to express their needs to their social network members, who subsequently stated the types and frequencies of support to which they could commit. Positive effects were expected with regard to received and perceived social support, as well as psychological distress and quality of life. Indeed, they found a significant intervention effect on both received and perceived social support scales, but not with regard to psychological distress and quality of life. However, descriptive results showed that recipients of the intervention reported less distress and better quality of life at post-intervention while controls reported small or no changes.

3.4.2. Short-term problem solving

Blanchard et al. (1996) used a partly structured short-term problem solving approach which was administered in individual counseling sessions by an experienced oncology social worker. The aim of their study was to help partners develop strategies to manage specific problems associated with their distress and thus reduce their level of distress. They expected positive effects for the non-participating patients. In the sessions, partners should learn to identify problems, generate alternative solutions, and discuss and rehearse an action plan. The program did not prove to be differentially effective concerning quantitative outcomes for partners. There was a main effect of time on depression and avoidance coping in both groups. There was an intervention effect for patients. Specifically, patients whose partners were in the intervention group were significantly less depressed at follow-up. A number of the participating partners stated that the intervention helped to improve their communication with their partners. Some patients appreciated the fact that someone was helping their spouse cope with the illness.

3.4.3. The marital relationship quality

Jones et al. (2013) and Lewis et al. (2008) both provided a structured skill-building and efficacy-enhancing exercise (Helping Her Heal, HHH). The HHH program was originally developed as a one-on-one intervention with the aim of improving marital quality, interpersonal communication, and support as well as to improve the partner's emotional well-being with regard to depressive mood and anxiety. Since the intervention aimed at helping partners to be better able to meet their wives' changing needs and understand their emotions, positive intervention effects were expected for non-participating patients. In five sessions husbands were taught how to (1) become better listeners for their wife, (2) let go of fixed role models, (3) gain a deeper understanding of their wife, (4) develop strategies to enhance the quality of interpersonal connection, and (5) maintain the strategies in their

everyday life. Lewis et al. (2008) tested its effectiveness in a pilot study, using the originally intended individual counseling setting. They observed improvements for most of the assessed variables. Moreover, most of the partners who scored in the clinical range for anxiety and marital adjustment before the intervention scored out of the clinical range after it, supporting the clinical significance of the findings. Exit interviews revealed that the program strengthened the husbands' relationships with their wives. Effects of the intervention on patients was not measured.

Jones and colleagues' (2013) primary aim was to test the feasibility and acceptability of HHH delivered in a group-format as well as to obtain a preliminary estimate of its impact on skills, self-confidence, and self-care. Secondary aims were to assess the intervention effects with regard to ratings of marital satisfaction and depression. Similar to Lewis and colleagues (2008), they expected intervention effects for patients as well. The results in large reinforced those of Lewis et al. (2008). While they did not observe significantly improved marital functioning, they did see positive effects on support and self-care skills. As opposed to Lewis et al. (2008), they measured quantitative outcomes for patients and found a significant time effect for depression. Exit interviews revealed that the program reinforced the husbands' communication skills and recognition of the importance of self-care. The group format was reported to have been helpful since it offered the opportunity to identify shared experience and to bond.

3.4.4. Role expectations

Sabo et al. (1986) conducted an unstructured multisession men's discussion group with the aim of facilitating the husbands' adjustment by encouraging them to overcome their role expectations, explore the denial process and to communicate with their wives about mastectomy issues. They did not apply a specific strategy to target these goals. A significant and favorable difference between the groups was found on the communication about *mastectomy* scale. Qualitatively, observations and interviews conducted over the course of the sessions revealed that the support group stimulated verbal communication between the partners and helped the men to reflect on their role as their wife's protector.

3.4.5. Emotional resilience

Bultz et al. (2000) provided a supportive expressive group intervention with a focus on education and emotional support. The main aim of the intervention was to encourage mutual support between the partners and to help the participants deal with existential concerns (e.g., fear of recurrence of the cancer illness or patient's death). The expected positive intervention effects for patients due to improved verbal communication and mutual support. Partners received psychoeducation by watching a video and talking to a medical oncologist. In the group, they explored their feelings, dealt with individual concerns, and confronted fears and anxieties. The Total Mood Disturbance (TMD) score on the POMS was 22.9 scale points lower at the three-month follow-up measurement (initial score: 36.6). The control group's TMD score remained stable at approximately 28. However, this difference failed to reach statistical significance at the three-month follow-up measurement ($p = 0.07$). On behalf of the patients, total mood disturbance decreased ($p = 0.19$) while confidence support increased ($p = 0.06$). Some partners stated that they experienced a beneficial feeling of normalization through the intervention.

Carlson et al. (2017) used the same approach as Bultz et al. (2000). The aim of the intervention was to increase the partner's emotional well-being, ameliorate the couple's communication and relationship, as well as to make the partner a better caregiver. They did not detect significant intervention effects for any of the assessed variables neither for partners nor for patients. There was an effect of time on several subscales of the POMS for both patients and partners.

Manne et al. (2004) provided a closed, structured group intervention in six sessions. The main aim of the intervention was the reduction

of psychological distress. Within the sessions, partners received caregiving information (nutrition and medication) as well as stress management and coping skills training. Moreover, relationship (intimacy, communication) and survivorship (post-treatment concerns) issues were discussed. Each session was facilitated by an expert on the specific topic. Didactic presentations were combined with group contributions. Preliminary analyses revealed that 18% of the sample had elevated distress scores and 49% scored in the high range for cancer-specific distress at study entry. Significant intervention effects were only seen on four of the five post-traumatic growth scales and two of the five coping scales. General psychological distress declined over the course of the study in both control and intervention group. Wives who attended group meetings reported gains in terms of greater personal strength, spiritual growth, and appreciation of life.

3.4.6. Coping strategies

Duggleby et al. (2017) developed an online intervention based on a transition theory framework. The intervention aimed at helping partners to become aware of and deal with relevant changes in their situation brought about by the cancer illness. In the online program offered, partners were encouraged to express themselves (e.g., write down own story) and to develop strategies to care for themselves and their partners (e.g., positive self-talk, identify partner's needs, getting help). Moreover, they were provided with relevant information about changes to expect, resources (e.g., contact lists), and health information. It was assumed that increased self-efficacy and hope on behalf of the patients would positively affect non-participating patients. No significant effects were found with respect to relevant outcome variables. Effects on patients were not measured. According to narrative reports, most participants said that the intervention was convenient and that they would recommend it to another person. Half of the sample considered the intervention to be effective.

3.5. Acceptability of the interventions

We considered response rate, dropout, lost-to-follow-up, and treatment compliance rates as indicators acceptability. Response rates, i.e. the proportion of partners who took part in the intervention out of all partners who had been approached, was comparatively low, ranging from 18.2% (Carlson et al., 2017) to 57% (Manne et al., 2004). Dropout in the intervention group ranged from 0% (Bultz et al., 2000) to 27.6% (Duggleby et al., 2017). Lost to follow-up rates in the intervention group ranged from 13.3% (Bultz et al., 2000) to 28.9% (Carlson et al., 2017). The highest lost to follow-up rate was 31.8% after six months (Blanchard et al., 1996). Common reasons for dropout and lost to follow-up were: the patient's death (Blanchard et al., 1996), the deterioration of patient's health status (Duggleby et al., 2017; Jones et al., 2013; Senneseth et al., 2017), or time and transportation issues (Blanchard et al., 1996; Jones et al., 2013). Actual dissatisfaction with the program was mentioned in several studies, but caused only few dropouts (Blanchard et al., 1996; Carlson et al., 2017; Jones et al., 2013; Sabo et al., 1986; Senneseth et al., 2017).

Treatment compliance was defined on the basis of the number of sessions participants actually attended. It was, when reported, on average high. The lowest reported adherence rate was 86%, that is 5.1 of 6 sessions (Manne et al., 2004).

3.6. Study quality

Table 3 provides a summary of the quality and risk of bias appraisal of included studies based on the EPHP. Five studies received a moderate overall rating, and the rest were rated as being weak. Thus, many of the studies were at risk of bias. The results of the EPHP revealed a certain pattern of methodological strengths and weaknesses. Specifically, the instruments used were reliable and validated in all of the studies; all of the studies reported on drop-outs; the percentage of

participants completing the study as well as treatment adherence rates were high. On the other hand, the representativeness of the target population was mostly not likely (three studies) or only somewhat likely (six studies) and the participation rate was mostly low. This is due to the fact that most of the studies used evidence from single-center trials. Study participants were not blinded with regard to the experimental condition. Information about blinding of outcome assessors was often not provided. Six of the trials were RCTs. All of them applied simple randomization techniques, which were considered as appropriate.

4. Discussion

To our knowledge, this is the first systematic review so far that has examined the structure and effects of psychosocial interventions for partners of cancer patients. The interventions included covered a broad range of topics (building up social support, short-term problem solving, improving the marital relationship quality, overcoming role expectations, building up emotional resilience, developing coping strategies). Four studies reported mixed results (significant intervention effect on one or more, but not all of the variables), and one study reported significant improvements for all of the variables assessed. The remaining studies ($k = 4$) did not detect any significant intervention effects. The studies included in the current review were highly heterogenous, with regard to intervention approaches, goals, sample characteristics, as well as outcomes measured. In the following, we discuss research findings with the goal of providing meaningful recommendations for future research, thereby accounting for the studies' heterogeneity.

4.1. Discussion of results and implications for future research

Lewis et al. (2008) detected improvements on almost all scales. Their findings are best comparable to the results of Jones et al. (2013) who applied the same intervention approach in a group setting. Jones et al. (2013) could not replicate the positive effects for marital functioning. Based on these findings, it could be deduced that the HHH approach is – at least concerning marital relationship quality outcomes – more effective in the originally intended individual counseling setting. More studies are needed to investigate the conditions that are critical for the superiority of certain intervention formats.

Three studies reported positive intervention effects for non-participating patients (Blanchard et al., 1996; Bultz et al., 2000; Jones et al., 2013, 2013). Strikingly, intervention effects on patients match the effects found for partners in three out of four studies in which quantitative outcomes for patients were reported. Specifically, Jones and colleagues (2008) as well as Bultz and colleagues (2000) observed positive effects for both patients and partners while Carlson et al. (2017) failed to detect significant intervention effects for both partners and patients. Blanchard et al. (1996) reported decreased depression on the part of the patients, but not their participating partners. This indirect effect might be due to positive intervention effects concerning the patient-partner-relationship: Exit interviews revealed that the patients felt more supported and that the communication with their partners improved through the intervention. Furthermore, patients reported that the intervention helped them to worry less about being a burden on the partner – a relief which possibly led to reduced emotional distress (Blanchard et al., 1996). These findings support the view on coping with cancer as a dyadic process (Kayser et al., 2007). Future research should find out about the mechanisms that lead to a transfer of intervention effects on non-participating patients. Many cancer patients feel highly burdened. Finding out about how to alleviate emotional distress for both partners and patients without the need for patients to actively participate in the intervention could be a fruitful path for future research.

Due to the lack of well-established interventions, several studies adapted non-validated programs originally designed for other populations (Blanchard et al., 1996; Carlson et al., 2017; Manne et al., 2004).

Table 3
Quality ratings according to the EPHP.

| Study | Representativeness of target population | Participation rate | Study design | Randomization | Appropriateness of randomization procedure | Differences between IG and CG prior to intervention ^a | Percentage of confounders that were controlled | Blinding of outcome assessors | Blinding of participants | Overall rating |
|-------------------------|---|--------------------|--------------|---------------|--|--|--|-------------------------------|--------------------------|----------------|
| Blanchard et al. (1996) | Somewhat likely | 25% (low) | RCT | Yes | Yes | No | N.a. | No information | No | Moderate |
| Bultz et al. (2000) | Somewhat likely | 31% (low) | RCT | Yes | Yes | No information | No information | No information | No | Moderate |
| Carlson et al. (2017) | Somewhat likely | 18% (low) | RCT | Yes | Yes | No information | No information | No information | No | Moderate |
| Duggleby et al. (2017) | Not likely | No information | RCT | Yes | No information | No | N.a. | No information | No | Moderate |
| Jones et al. (2013) | No likely | No information | Cohort | No | N.a. | N.a. | N.a. | N.a. | N.a. | Weak |
| Lewis et al. (2008) | Somewhat likely | No information | Cohort | No | N.a. | N.a. | N.a. | N.a. | N.a. | Weak |
| Manne et al. (2004) | Somewhat likely | 57% (low) | RCT | Yes | Yes | No | N.a. | No information | No | Moderate |
| Sabo et al. (1986) | Not likely | No information | Cohort | No | N.a. | N.a. | N.a. | No information | N.a. | Weak |
| Semeseth et al. (2017) | Somewhat likely | 51.1% (low) | RCT | Yes | Yes | No | N.a. | No | No | Moderate |

| Study | Validity of data collection tools | Reliability of data collection tools | Reporting of withdrawals and drop-outs | Percentage of participants completing the study | Treatment adherence ^b | Possibility of contamination (unintended intervention) ^b | Appropriateness of statistical methods ^b | Analyses based on intent to treat ^b | Overall rating |
|-------------------------|-----------------------------------|--------------------------------------|--|---|-------------------------------------|---|---|--|----------------|
| Blanchard et al. (1996) | Yes | Yes | Yes | 77% (moderate) | 5.5/6 sessions on average (high) | Yes | Yes | No | Moderate |
| Bultz et al. (2000) | Yes | Yes | Yes | 89% (high) | 2 missed 1/6, 1 missed 3/6 sessions | No | Yes | No | Moderate |
| Carlson et al. (2017) | Yes | Yes | Yes | 68% (moderate) | No information | Yes | Yes | No | Moderate |
| Duggleby et al. (2017) | Yes | Yes | Yes | 70% (moderate) | No information | Yes | Yes | No | Weak |
| Jones et al. (2013) | Yes | Yes | Yes | 87% (high) | 91% attended at least 4/5 sessions | Yes | Yes | Yes | Weak |
| Lewis et al. (2008) | Yes | Yes | Yes | 77% (moderate) | No information | Yes | Yes | No | Weak |
| Manne et al. (2004) | Yes | Yes | Yes | 88% (high) | 5.13/6 sessions on average (high) | Yes | Yes | No | Moderate |
| Sabo et al. (1986) | Yes | Yes | Yes | 100% (high) | No information | Yes | Yes | No | Weak |
| Semeseth et al. (2017) | Yes | Yes | Yes | 93.1% (high) | N.a. (only one session) | N.a. | Yes | No | Moderate |

Note. IG = intervention group, CG = control group.

^a Referring to differences with regard to demographic variables and pre-intervention scores on outcome measures.

^b Not taken into account for the overall score.

This might have led to a failure to meet the specific needs of caregiving partners, and hence may also explain some of the null-findings (Blanchard et al., 1996; Carlson et al., 2017). For example, Bultz et al. (2000) and Carlson et al. (2017) utilized the same intervention approach. However, while Bultz and colleagues (2000) saw a considerable improvement in the intervention group's total mood disturbance score (POMS) compared to the control group, Carlson and colleagues (2017) failed to replicate this effect. They deduced that the null-finding might be partly due to the fact that the intervention was originally developed for partners of breast cancer patients and was thus not suitable for addressing the needs of prostate cancer patients. In the future, care should be taken to develop and deliver programs that are tailored to the specific needs of certain subgroups (e.g., male partners of breast cancer patients or female partners of prostate cancer patients).

A related issue concerns the gender distribution in the samples. Most of the intervention studies included in the current review target partners of either prostate or breast cancer patients. Previous research has shown that partners of cancer patients adjust differently to the patients' illness depending on the partner's gender with regard to perceived burden, emotional well-being as well as caregiving behavior (e.g., Glantz et al., 2009; Hagedoorn et al., 2000; Pitceathly and Maguire, 2003). Accordingly, researchers should concentrate on developing interventions that take the specific needs of female or male partners of cancer patients into account.

Research indicates that the level and form of distress partners exhibit greatly depends on the phase of the cancer illness trajectory the patient is in (Oberst and Scott, 1988; Sales, 1992). As such, null-findings may have been caused by specific needs of the partners having been neglected in the intervention. For example, Manne et al. (2004) discussed the lack of impact seen on the emotional approach and acceptance coping scales, positing that those items assessed processes which were more relevant to adjustments respondents usually make during the first several months after their partner's diagnosis. As most of the wives in their sample had been diagnosed more than a few months previous to when they joined the study, missing treatment effects might be due to these outcomes being less amendable to change. Strikingly, two of the RCTs that detected intervention effects comprised partners of patients that were relatively homogenous with regard to the cancer illness trajectory. Specifically, Bultz et al. (2000) included partners of cancer patients suffering from cancer stages I and II and Lewis et al. (2008) included partners of cancer patients that were diagnosed within six months before recruitment and suffered from cancer stages 0 to III. Both detected significant intervention effects. Possibly, these interventions were specifically suitable in meeting the needs of partners of patients suffering from early-stage cancer. Accordingly, researchers should consider the phase of the cancer illness trajectory the patient is in and the resulting challenges partners have to deal with in order to develop interventions that are effective.

One main reason the studies cited for null-findings was small sample size, a factor known to increase the risk of studies being underpowered (Carlson et al., 2017; Duggleby et al., 2017). Some authors reported having had serious recruitment difficulties that resulted in small and unrepresentative samples (Blanchard et al., 1996; Bultz et al., 2000; Lewis et al., 2008). Partners of cancer patients are a highly burdened population (Pitceathly and Maguire, 2003; Stenberg et al., 2010) and thus may consider participation in an intervention study too time-consuming or emotionally burdensome. Accordingly, most of the patients whose partners participated in the intervention studies were suffering from early stage or non-metastatic cancers; their partners were often coping relatively well from the beginning and did not exhibit relevant mood disturbance symptoms at baseline. This led to ceiling effects, i.e. treatment effects were difficult to detect as there was little space for improvement (Lewis et al., 2008; Manne et al., 2004). Much remains to be learned about how to effectively meet the challenge of recruiting more (highly burdened) partners in order to solve the problem of insufficient statistical power and ceiling effects.

Recruitment strategies such as the use of multiple sites, the active involvement of healthcare providers and peers, as well as alternative strategies such as mailing lists need to be explored (Ford et al., 2008; Jones et al., 2013).

A related issue concerns the relevance of the findings. Statistically significant findings do not necessarily indicate meaningful or practically relevant intervention effects. Accordingly, researchers and clinicians become increasingly interested in receiving information on the clinical relevance of research findings (Ogles et al., 2001). There was only one study included in the current review that reported on the clinical relevance of their findings (Lewis et al., 2008). Specifically, Lewis and colleagues (2008) used norm values and cutoff scores to evaluate whether participants scored in the normal or clinical range at study entry and post-intervention. Manne and colleagues (2004) also used norm values to classify the participants' scores at study entry, but omitted to provide information on how the results of those scoring in the clinical range changed over the course of the study as compared to individuals scoring in the normal range at study entry. Reporting on the clinical relevance of research findings not only enables researchers to evaluate results more critically, but also serves as an important mean for the derivation of practical recommendations (please see Ogles et al., 2001 for an overview of methods for defining improvement in clinical trials). Another aspect of clinical relevance concerns the long-term effects of interventions. Five of the nine studies included in the current review applied follow-up measurements. The duration of follow-up ranged from two to six months. Two studies reported significant intervention effects at three months follow-up (Bultz et al., 2000; Jones et al., 2013). These comparatively short follow-up periods decrease the meaningfulness of the findings. In order to detect long-term intervention effects and thus contribute to the evaluation of clinical significance, future studies should establish longer follow-up periods.

On the basis of dropout, lost to follow-up, and treatment compliance rates, it can be deduced that the interventions were generally well accepted. However, response rates were low (between 18.1 and 57%) indicating that researchers should explore more effective ways to recruit partners of cancer patients for intervention studies. Duggleby et al. (2017), the only team who conducted an online study, were also the only researchers to report a comparatively high number of dropouts. Dropouts and low adherence rates are common problems among internet-based interventions (Cavanagh, 2010; Melville et al., 2010; Wangberg et al., 2008). The familiarity with computer-based applications will likely increase over the next few years and, consequently, online interventions may be an accessible and well accepted alternative to face-to-face interventions (Nguyen et al., 2004). Moreover, the restraining threshold for taking part in online interventions may be lower for some individuals than participating in face-to-face interventions. This could pave the way for including highly burdened individuals or those who may not be able to take part in face-to-face interventions (e.g., due to long distances or time-consuming caregiving tasks). Accordingly, future research should aim at developing effective online interventions for partners of cancer patients.

One goal of our review was to evaluate the instruments that were used to detect intervention effects. While psychometric properties (i.e., reliability and validity) of the instruments were generally good, not all of them were suitable with regard to certain research aims and intervention foci. For example, Blanchard and colleagues (1996) applied a short-term problem-solving approach with the aim of reducing problem-related distress. However, they measured a variety of outcomes (depression, functioning, social support, marital satisfaction, burden, coping) that do not seem appropriately targeted by the intervention, especially taking the focus and the brevity of the program into account. Bultz et al. (2000) measured social support using the functional social support scale (Broadhead et al., 1988). However, their intervention aimed at improving the marital relationship quality and not social support in general. The same applies to Carlson et al. (2017). While social support interventions may affect more distal variables, such as

quality of life or emotional distress (e.g., [Senneseth et al., 2017](#)), it seems unreasonable to assume that interventions that aim at improving the marital relationship quality or alleviating emotional distress levels readily affect general social support outcomes. Instead of measuring the entire spectrum of well-being outcomes, researchers are well advised to focus on the assessment of variables that suit the content and goals of the intervention they delivered. In summary, we recommend the application of appropriate (i.e. well suited to the content of the intervention) and sufficient (i.e. covering a broad range of emotional and physical health) outcome variables, which measure both positive and negative aspects of the caregiving experience. Moreover, outcome variables should account for the processes that are amendable to change in different phases of caregiving with regard to the cancer illness trajectory. Researchers should provide a clear rationale for each outcome measured based on theoretical considerations and related research findings.

4.2. Discussion of methodological weakness

It was notable that, according to the EPHPP, none of the trials achieved a satisfactory methodological quality rating score. Five studies received moderate ratings, and the rest were rated as being weak. Thus, many of the studies were at risk of bias. Strikingly, some aspects of methodological quality were rated as being high in all of the included studies, e.g., the reliability and validity of the instruments or the percentage of participants completing the study. On the other hand, the representativeness of the target population was mostly not likely or only somewhat likely and participation rate was mostly low indicating that recruitment strategies should be expanded and researchers should not rely on evidence from single-center trials. While the categories of the EPHPP are informative in that they provide certain criteria that should be considered when planning intervention studies as well as with regard to the evaluation of research findings, some criteria appear to be less relevant than others. For example, while blinding of outcome assessors should be aimed at, blinding of participants is difficult to apply in case of psychological intervention studies that require informed consent. Moreover, recruitment might be more or less difficult in different situations and for different target populations. For example, in the case of recruiting partners of cancer patients for an intervention study, a participation rate of over 50% appears to be comparably high (and not low as suggested by the EPHPP). In summary it can be stated that in evaluating the methodological quality of intervention studies, researchers may rely on instruments such as the EPHPP but are well-advised to carefully assess the relevance of the criteria applied. In line with previous recommendations (see e.g., [Guyatt et al., 2011](#)) we strongly advise against using summary ratings since they entail the risk of overestimating irrelevant aspects of methodological quality while at the same time underestimating the impact of serious methodological flaws. That is, weights are arbitrary assigned to different criteria ([Guyatt et al., 2011](#)). Altogether, more randomized controlled trials that meet high methodological standards are needed to verify the assumptions made in the current review.

4.3. Practical implications

[Senneseth et al. \(2017\)](#) found statistically significant improvements with regard to perceived a received social support and descriptive findings indicated positive intervention effects with regard to distress and quality of life. Presumably, partners are more likely to receive the support they need when they are actively encouraged to reach out for help ([Gage, 2013](#); [Ryan et al., 2008](#)). Practitioners may consider including the social network when offering support to partners of cancer patients.

We found that outcomes of cancer patients often match those of participating partners ([Bultz et al., 2000](#); [Carlson et al., 2017](#); [Jones et al., 2013](#)). Thus, practitioners may consider delivering interventions

to partners of cancer patients rather than cancer patients alone or both partners and patients together in case they aim at enhancing the patient's and the partner's well-being. Patients who are highly burdened due to the illness may not always be able to take part in face-to-face interventions. Offering the intervention to the partner and thereby enhancing the patient's well-being outcomes may be a feasible alternative. However, more research has to be conducted in order to find out about the conditions under which treatment effects are transferred to non-participating patients.

Moreover, clinicians are well advised to take the intervention recipients' characteristics into account when selecting specific intervention approaches. For example, the needs of female partners of prostate cancer patients may differ from those of male partners of breast cancer patients and the needs of partners of cancer patients who suffer from early-stage cancer may differ from those of partners of patients suffering from a metastatic or terminal cancer disease.

5. Limitations of the review

Recent research indicates that the number and quality of partner interventions in oncologic settings has improved considerably ([Northouse et al., 2012](#)). Thus, it may seem a contradiction that only nine publications met the inclusion criteria for the present paper. However, it is possible that further partner interventions exist but they lack more comprehensive documentation. On the one hand, considering only published material ensures that the included studies are of a higher quality. On the other hand, excluding unpublished studies likely introduces an upward bias concerning the estimation of intervention effects. However, as most of the obtained studies reported statistically non-significant effects, we consider the influence of publication bias leading to an overestimation of treatment effects rather negligible.

The validity of a systematic review is strongly dependent on the risk of bias present in the studies it includes ([Noordzij et al., 2009](#)). Some researchers have addressed the issue of risk of bias that arises when there is a high degree of clinical and methodological heterogeneity between studies included in meta-analyses ([Melsen et al., 2014](#); [Shibata, 2013](#)). The present review comprises highly heterogeneous studies with regard to both clinical (e.g., patient population, diagnostic methods, interventions) and methodological (e.g., study design, definitions of outcomes) heterogeneity. We met the challenge of accounting for clinical heterogeneity among the trials by providing a detailed report of the participants' characteristics, the interventions' content, as well as the assessed variables and outcomes. The EPHPP tool provides a rough estimation of the studies' methodological quality. To assess the full range of risk of bias, it is recommended to choose the domains that are to be assessed based on a combination of theoretical and empirical considerations rather than to estimate risk of bias using overall resulting scores ([Higgins et al., 2011](#)). As we included trials comprising different study designs (such as RCTs and one group pre-post studies), it is likely that, due to different degrees of bias, the studies do not all estimate the same effects ([Gagnier et al., 2012](#)).

6. Conclusion

The status of research on effective ways of improving cancer patients' partners' psychosocial wellbeing remains significantly limited. Studies that address this population's needs are rare and their methodological quality is typically moderate or weak. We were able to derive several implications for future research and practice. Specifically, interventions targeting partners of cancer patients often affect both partners and patients. Researchers need to find out about the mechanisms that support the transfer of intervention effects on non-participating patients. Moreover, intervention approaches should match the needs of specific sub-populations (especially with regard to gender and the cancer phase trajectory) in order to effectively increase the partners' well-being. Null-findings were likely due to small sample

sizes. Partners were often coping well already at baseline. Accordingly, effort should be made to recruit more and especially burdened individuals. Only one of the included studies reported on the clinical relevance of their findings (Lewis et al., 2008). Future studies should apply cut-off scores and mean values to evaluate the clinical relevance (next to the statistical significance) of their findings both with regard to post-intervention as well as follow-up outcomes. Another focus should lie on the development of effective internet-based interventions since they may be a feasible alternative for highly burdened partners or in case participation in face-to-face interventions is not feasible. Finally, researchers should provide clear rationale for the assessment of certain outcomes. They need to carefully consider whether outcome variables account for the processes that are targeted in the intervention.

Conflict of interest

The authors certify that there is no conflict of interest regarding the material discussed in the manuscript.

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