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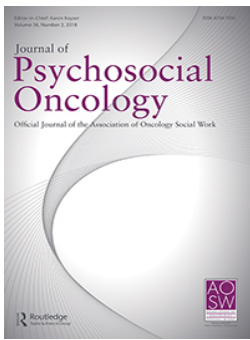
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Intent to use a web-based psychological intervention for partners of cancer patients: Associated factors and preferences

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ABSTRACT

This study examined partners of cancer patients intention to use a web-based psychological intervention, their preferences regarding its preconditions, functionalities and topics, and factors related to their intention. One hundred and sixty-eight partners completed a questionnaire about these aspects. Forty-eight percent of the partners would (maybe) make use of a web-based intervention. Partners who intended to participate were significantly younger, used the Internet more often, and perceived more caregiver strain. Most partners preferred an intervention that takes less than 1 hour/week, lasts five weeks or more, and contains information and peer support. Half of the partners would like to receive online guidance.

KEYWORDS

cancer; distress; oncology; partner; survey study; web-based interventions

Introduction

A diagnosis of cancer has a profound impact not only on the patients but also on their partners. In addition to providing informal care and emotional and practical support, partners also have to deal with their own emotions and often struggle to maintain their work, educational, and family life. This balancing act is highly demanding, often creating detrimental effects on the partner's physical, mental, and social health. For example, previous studies found psychological distress in 20–30% of partners of cancer patients (Verdonck-De et al., 2007; Ey, Compas,

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Epping-Jordan, & Worsham, 1999), with an increase to 30–50% in the palliative phase (Braun, Mikulincer, Rydall, Walsh, & Rodin, 2007).

To help partners face the challenges that accompany their partner's cancer diagnosis and treatment, supportive psychological interventions (e.g. psychoeducation, skills training, cognitive behavior therapy, peer support) targeting this particular group are needed (Stenberg, Ruland, & Miaskowski, 2010; Tang, Chan, So, & Leung, 2014). A recent meta-analysis (Northouse, Katapodi, Song, Zhang, & Mood, 2010) and five systematic reviews (Ussher, Perz, Hawkins, & Brack, 2009; Applebaum & Breitbart, 2013, Hudson, Remedios, & Thomas, 2010; Carlson, Bultz, Specia, & St-Pierre, 2000; Harding & Higginson, 2003) have found a number of such interventions that have positive effects on, for example, caregivers' mental health, quality of life, ability to cope, and self-efficacy. However, these interventions also have some limitations. First, most of the interventions aim at the couple instead of the partner alone, and Ussher et al. (2009) found that many of the interventions do not differentiate between the needs of the caregivers and the patients. Second, Northouse et al. (2010) found that many interventions focused primarily on the patient care and that only few intervention protocols were designed with a focus on the caregivers' self-care. Third, they often have difficulties reaching the target audience (Northouse et al., 2010; Ussher et al., 2009, Applebaum & Breitbart, 2013, Mosher, Given & Ostroff, 2015; Pitceathly & Maguire, 2003). In literature, multiple causes for lack of reach have been mentioned. For example it could be a result of poor recruitment strategies (Hudson, Aranda, & Hayman-White, 2005); partners are not aware of their own health complaints (Pitceathly & Maguire, 2003); they are reluctant to seek help because of long travel times or they feel embarrassed or stigmatized when participating in face-to-face interventions (Sinfield, Baker, Ali, & Richardson, 2012; Griffiths, Lindenmeyer, Powell, Lowe, & Thorogood, 2006); interventions may not completely meet the partners' needs and preferences (Ussher et al., 2009) or existing interventions may be too time-consuming and expensive because partners may have to take time off work in order to be able to attend the intervention or they need to find respite care (Kaltenbaugh et al., 2015) A systematic assessment of partners' needs prior and during the development of an intervention is, therefore, recommended (Ussher et al., 2009, Harding & Higginson, 2003; Sinfield et al., 2012).

The Internet can be a useful medium for psychological interventions, because of its numerous advantages, such as its ability to reach a broad audience, its flexibility and time-efficiency, interactivity, cost-effectiveness, and anonymity (Griffiths et al., 2006; Eysenbach, 2001; Leykin et al., 2012). The anonymity, flexibility, and time-efficiency of the Internet, for example, could help partners of cancer patients to overcome the threshold of seeking professional support because they do not have to schedule an appointment or find respite care. Despite the benefits of the Internet, and promising results of a recently developed web-based intervention for cancer patients and their family caregivers (Kaltenbaugh et al., 2015; Northouse et al. 2014), web-based interventions for partners of cancer patients remain scarce (Tang et al., 2014). Therefore, it is

not known yet how partners think of web-based interventions and what their needs and wishes are regarding such interventions.

In light of this need and the current lack of viable solutions, we were interested in developing an easily accessible (no geographical or time-bound restrictions) web-based psychological intervention for partners of cancer patients. In an earlier small-scale qualitative study amongst 16 partners of cancer patients (Köhle et al. 2015), we examined partners' interest in a web-based psychological intervention and their needs and preferences regarding such an intervention. We found that such an intervention can be a valuable addition to existing interventions for partners of cancer patients. The study revealed that the personal interest in participating in such an intervention varied, but that a substantial number of partners were interested in a web-based intervention that would be offered to them because they were in need of acknowledgement, they were looking for someone they could talk to, and they were interested in information, tips, and personal support. Furthermore, the study yielded insights into the content and form such a web-based intervention might implement. We found that an intervention should not be too time-consuming (about 1–2 hours a week), the content should be matched to the stage of the patient's disease, flexibility, and a positive approach (meaning that the intervention should be a source of hope and energy) were important, and most participants indicated that they would prefer to do the intervention without their ill partner. Furthermore, an intervention should contain medical and practical information and optional peer support. Partners' preferences regarding receiving professional psychological counseling during their participation in a web-based intervention varied. Whereas most of the partners liked the idea that a counselor would support them during their participation, others doubted the necessity of this kind of counseling. Because of the small and selective study group of the earlier study, we could not generalize these findings, and therefore we conducted this quantitative study. The first aim of the present study was to investigate the partners' needs and preferences regarding the preconditions (maximum time and duration, participate alone or together with patients), functionalities (information, peer support, personal guidance by professional), and content of such an intervention and to examine their intention to use it. To be able to examine if certain partners are more in need of an intervention, or would be more willing to accept a web-based intervention, we also aimed to identify variables that are associated with the intention to use a web-based intervention. Thus far, no previous studies have examined variables associated with an interest in web-based interventions among caregivers of cancer patients. However, Mosher et al. (2013) examined factors (including caregiver demographics, patient medical factors, and caregivers' distress) that were associated with face-to-face support service use among caregivers of lung cancer patients. They found that only the patients' receipt of chemotherapy was positively associated with the caregivers' mental health service use. From studies among population- and patient-based samples we know that health-related Internet use is associated with younger age (Kummervold et al.,

2008; van Uden-Kraan et al., 2009; Mancini et al., 2006), female gender (Kummervold et al., 2008; Bass et al., 2006), higher educational levels (van Uden-Kraan et al., 2009; Mancini et al., 2006; Bass et al., 2006), work employment (van Uden-Kraan et al., 2009; Bass et al., 2006), and greater distress symptoms (Swartz et al., 1998). Therefore, to gain a better understanding of associated factors with the intention to use a web-based intervention, the second aim of this study is to identify variables (partner's personal characteristics and psychological functioning psychological distress, positive mental health, caregiver strain and the cancer-related characteristics of the patient) that may be associated with the intention to use a web-based psychological intervention.

Methods

Study sample and procedure

A web-based and a paper version of a survey were used to collect data. The only inclusion criteria were that the participant be a partner of a cancer patient or cancer survivor and 18 years or older. In our study, we defined partners as people with a romantic relationship with the patient, regardless whether they were married and/or living together or whether they were in a relationship, but living apart. The data were collected from November 2012 to May 2013. The questionnaire was distributed in The Netherlands in two participating hospitals (one located in the east of the Netherlands and one in the western part of the country), one online forum, one hospice, and two centers where cancer patients and their families could receive, for example, (peer) support, advice, information, and training on how to cope with the disease. The staff, e.g., volunteers working in these settings, introduced the study to the partners and in case the partners were interested to participate, they received an information leaflet (with the link to the online version of the questionnaire) together with the paper version of the questionnaire and a return envelope. Partners could then decide whether they wanted to use the online or paper version of the questionnaire. Regarding the online forum, the procedure was different. We advertised our study on a publicly accessible forum and partners could participate by using a link to the online version of the questionnaire. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study protocol was checked by the Medical Ethical Committee of the VU University Medical Center (Amsterdam). They decided that according to the Dutch Medical Research Involving Human Subjects Act, ethical approval was not necessary, because the partners of cancer patients were not subjected to procedures or required to follow rules of behavior.

Questionnaire

Partners' personal characteristics and cancer-related characteristics of the patients

Partners' personal characteristics that were assessed included: age, gender, country of birth, education, employment, computer- and Internet use, and frequency of Internet use. Regarding the patient's disease, we asked partners about the type of cancer, time since diagnosis, and phase of disease. The latter was measured with one question: "Which statement describes best the current situation of your partner?" Partners could reply with one of the following: (1) "My partner is still in treatment and we have good hope that he/she will recover." (2) "The treatment is completed and we are moving on with our lives." or (3) "My partner is unlikely to be cured." We also asked the partners if they are or had been consulting a psychologist or counselor because of the patient's disease.

Partners' psychological functioning

Psychological distress was assessed with the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). This questionnaire measures the presence and severity of anxiety (seven items) and depressive symptoms (seven items). Responses are rated on a 4-point Likert scale (0–3). Anchor points for the Likert items vary depending on the item (e.g., "I feel cheerful" scores as 0 most of the time to 3 not at all; and "I can sit at ease and feel relaxed" scores as 0 definitively to 3 not at all). Items scores were summed into a score for the HADS total, anxiety, and depression. The cutoff score for both subscales is ≥ 8 for the identification of doubtful cases and ≥ 11 for definitive cases (Zigmond & Snaith, 1983). The HADS has shown good psychometric properties (Spinoven et al., 1997). Cronbach's alpha in the present sample was .91 for HADS total, .85 for anxiety, and .86 for depression.

Positive mental health was assessed with the Mental Health Continuum-Short Form (MHC-SF) (Keyes, 2005, Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). This 14-item questionnaire measures three dimensions of positive mental health: emotional well-being (three items), psychological well-being (six items), and social well-being (five items). Partners rated the frequency with which they had experienced certain feelings in the past month on a 6-point Likert scale (1 = never to 6 = every day). Scale scores were computed for the subscales as well as for the total scale ($\alpha = .93$), by averaging the scores on all relevant items. The MHC-SF has shown good psychometric properties (Lamers et al., 2011). Cronbach's alpha for the present sample was .84 for emotional well-being, .84 for psychological well-being, .82 for social well-being, and .93 for the total scale.

Caregiver strain was assessed with the 13-item Caregiver Strain Index (CSI) (Robinson, 1983). The CSI contains at least one item for each of the following major domains: employment, financial, physical, social, and time. Each item can be answered with "yes" (1) or "no" (0). A CSI-score is computed by counting the number of "yes," resulting in a score from 0 to 13. A score of ≥ 7 indicates

caregiver strain (Robinson, 1983). The CSI has shown good psychometric properties (Robinson, 1983). In the present study, the Cronbach's α for the CSI was .84.

Intention to use a web-based intervention and preferences regarding such an intervention

To give partners an idea about what a web-based intervention for partners of cancer patients might look like, we added a short description and two mock-ups of a possible web-based intervention (see Figure 1). In our previous interview study (Köhle et al., 2015), we experienced that using mock-ups facilitated partners to elaborate on their preferences. After the mock-ups and the description, partners were asked if they would make use of such an intervention (answer choices: no/maybe/yes). They could further explain their answers in a textbox. In addition, partners who responded either "maybe" or "yes" to the possibility of using a Web-based intervention were asked which preconditions the intervention should meet (maximum time per week and participation alone or with their ill partner), which functionalities the intervention should contain (information, peer support, and online psychological guidance by a counselor), and which topics should be addressed. Based on literature, suggestions of experts in the field, and the results of the previous interview study (Köhle et al., 2015), we created a list of eleven topics and we asked partners to rate their interest on a scale from 0 = not interested to 4 = interested. The topics were: (1) coping with emotions; (2) taking care of oneself; (3) sparing your partner or not?; (4) communication with patient; (5) communication with children; (6) communication with care providers; (7) sexuality and intimacy; (8) asking for help and refusing help; (9) moving on with life after successful cancer treatment; (10) living with cancer; and (11) if the end is near. Partners were also encouraged to add more topics in a textbox.

Statistical analyses

Proportions, percentages, and mean scores were calculated for the partner's personal characteristics and the cancer-related characteristics of the patient, along with the partner's psychological functioning, intention to use a web-based intervention, and preferences regarding such an intervention. Chi-square tests and Kruskal-Wallis tests were used to compare three groups: 1) partners with no intention to use a web-based intervention, 2) partners with an intention to use such an intervention, and 3) partners who would maybe make use of it. Variables that were significantly associated with the dependent variable (intention to use a web-based intervention) were entered simultaneously into a multinomial logistic regression analysis. All reported p values were two-sided, and a value of $p < 0.05$ was considered to be statistically significant. Data were analyzed using the Statistical Package for the Social Sciences (IBM SPSS 20.0 for Windows, Chicago, IL, USA). Free-text responses were used as illustrations, offering further insights into the quantitative data. The first author made a list of all free-text responses for



Figure 1. Mock-ups of a possible web-based intervention (top), personal homepage (after logging in) and description (bottom).

people who indicated to have *no* intention of using a web-based intervention, for people who would *maybe* make use, and who *definitively* would make use of an intervention. The arguments of all three groups were further categorized into sub-themes using inductive analysis.

Results

Partners' personal characteristics and cancer-related characteristics of the patients

A convenience sample of 168 partners filled out the questionnaire, 23 via the Web-based version and 145 via the paper version. An overview of the partners' personal characteristics and cancer-related characteristics of the patient is shown in [Table 1](#). Nearly all partners (93%) had computer- and home Internet access, and 67% used the Internet on a daily basis.

Partners' psychological functioning

[Table 2](#) presents the results of the partners' psychological functioning. Twenty-two percent of the partners scored above the cutoff score 8 on the depression subscale and 37% had a score above the cutoff score 8 on the anxiety subscale indicating an increased risk for depression and for an anxiety disorder. A score above the cutoff 11 on the depression- and anxiety subscale was found in 10% and 16% of the partners, respectively, indicating a probable presence of a mood disorder. The mean score on the total MHC-SF was 4.2 on a scale from 1 to 6, indicating a rather positive score on mental health. A third (33%) experienced caregiver strain.

Partners' intention to use a web-based intervention, preconditions, functionalities, and relevant topics

Of all the partners who answered the question regarding their intention to use a web-based intervention ($n = 159$), 53% (84/159) had no intention of using a web-based intervention, 35% (55/159) would "maybe" make use of an intervention and 13% (20/159) "definitively" would use one. A sub-sample of partners ($n = 22$) who had *no* intention to use a web-based intervention further explained their reply with one or several of the following arguments: (1) having no need for an intervention or already receiving sufficient support from personal network ($n = 18$); (2) online character of the intervention is not appealing (because they, for example, think that this kind of support is too impersonal) ($n = 7$); (3) not wanting to be confronted with the whole situation ($n = 1$); and (4) being afraid that such an intervention would form an additional burden ($n = 1$). Four partners of this group also reported that although they were not interested themselves, they did like the idea that such an intervention would become available.

Table 1. Partners' personal characteristics and partner cancer-related characteristics: Total and sub-totals divided by intention to use web-based intervention (*N* = 168).

	Intention to use the web-based intervention								<i>p</i> ^a
	Total (<i>n</i> = 155–167)		No (<i>n</i> = 71–83)		Maybe (<i>n</i> = 53–55)		Yes (<i>n</i> = 19–20)		
	<i>n</i>	% ^b	<i>n</i>	% ^b	<i>n</i>	% ^b	<i>n</i>	% ^b	
Personal characteristics									
Gender (<i>n</i> = 167)									.579
Female	81	49	39	47	27	49	12	60	
Male	86	52	44	53	28	51	8	40	
Age, mean (S.D.), years (<i>n</i> = 164)	59.2 (11.5)		60.7 (10.3)		59.0 (11.4)		51.6 (13.5)		.014 ^{*c}
Country of birth (<i>n</i> = 167)									.885
The Netherlands	157	94	77	93	52	95	19	95	
Other	10	6	6	7	3	6	1	5	
Children (<i>n</i> = 167)									.078
No / or living away from home	133	80	69	83	43	78	12	60	
Yes, living at home	34	20	14	17	12	22	8	40	
Education (<i>n</i> = 167)									.509
Low	73	44	42	51	20	36	9	45	
Middle	50	30	22	27	16	29	6	30	
High	44	26	19	23	19	35	5	25	
Employment (<i>n</i> = 167)									.094
Employed > 20 hours a week	54	32	25	30	17	31	11	55	
Unemployed / retired	113	68	58	70	38	69	9	45	
Relationship with patient (<i>n</i> = 167)									.349
Married and/or living together	158	95	80	96	51	93	20	100	
In a relationship but living apart	9	5	3	4	4	7	—	—	
Computer access, yes (<i>n</i> = 167)	155	93	74	88	54	98	19	95	.080
Internet access, yes (<i>n</i> = 167)	155	93	74	88	54	98	19	95	.080
Frequency of Internet use (<i>n</i> = 155)									.041 ^{*d}
Almost every day	103	67	45	61	37	69	15	79	
Several days in a week	31	20	11	15	15	28	3	16	
About one day in a week	10	7	7	10	2	4	1	5	
Less than one day a week	3	2	3	4	—	—	—	—	
(Previous) contact with a psychologist or counselor (<i>n</i> = 164)	28	17	15	18	6	11	5	25	.294
Cancer-related characteristics of the patient									
Type of cancer (<i>n</i> = 166)									.451
Breast cancer	44	27	20	28	18	33	1	5	
Lung cancer	25	15	13	18	8	15	3	15	
Head-and-neck cancer	23	14	11	16	3	6	5	25	
Leukemia	16	10	7	10	5	10	3	15	
Lymphoma	12	7	5	7	3	6	2	10	
Cancer of bone marrow	11	7	6	9	4	8	1	5	
Colon cancer	9	5	4	7	3	6	1	5	
Prostate cancer	9	5	3	4	5	10	1	5	
Skin cancer	8	5	1	1	2	4	2	10	
Other ^e	9	5	1	1	4	8	1	5	
Time since diagnosis (<i>n</i> = 167)									.349
<3 months ago	14	8	8	10	4	7	2	10	
3–6 months ago	10	6	3	4	7	13	—	—	
6–12 months ago	20	12	11	13	7	13	1	5	
1–5 years ago	87	52	43	52	27	49	11	55	
5–10 years ago	27	16	12	15	8	15	6	30	
>10 years ago	9	5	6	7	2	4	—	—	
Current treatment (<i>n</i> = 161)									.782
No current cancer treatment	81	50	43	54	23	44	8	40	
Chemotherapy	39	24	20	25	14	27	4	20	
Radiation treatment	2	1	1	1	0	0	1	5	

(Continued on next page)

Table 1. (Continued)

	Intention to use the web-based intervention								<i>P</i> ^a
	Total (<i>n</i> = 155–167)		No (<i>n</i> = 71–83)		Maybe (<i>n</i> = 53–55)		Yes (<i>n</i> = 19–20)		
	<i>n</i>	% ^b	<i>n</i>	% ^b	<i>n</i>	% ^b	<i>n</i>	% ^b	
Chemotherapy combined with other treatment	2	1	1	1	0	0	1	5	
"Drugs" not specified	9	6	4	5	3	6	2	10	
Hormonal therapy	9	6	4	5	4	8	1	5	
Treatment graft-versus-host disease	6	4	3	4	2	4	1	5	
Other	13	8	4	5	6	12	2	10	
Self-reported phase of disease (<i>n</i> = 167)									.789
Patient is still in treatment with curative intent	58	34.7	30	36.1	20	36	5	25	
Treatment with curative intent is completed; patient is recovered	63	37.7	33	39.8	19	35	8	40	
Patient will (probably) not get better anymore	46	27.5	20	24.1	16	29	7	35	

^aKruskal-wallis test for age, time since diagnosis, and how often contact with healthcare professional; chi-square tests for the remaining variables.

^bPercentages may not total 100 due to rounding.

^cAlso significant in the multinomial logistic regression analysis.

^dNot significant in the multinomial logistic regression analysis.

^eSeven different kinds of cancer.

**p* < .05.

Of the 20 partners who indicated that they would *definitively* make use of a web-based intervention, nine explained their answer as follows: (1) they felt that it was important that partners receive support, because of the highly challenging and

Table 2. Partners' psychological functioning (psychological distress, mental health, and caregiver strain). Total and subtotals divided by intention to use a web-based intervention (*N* = 168).

	Intention to use the web-based intervention				<i>P</i> ^a
	Total (<i>n</i> = 168) Mean (S.D.)	No (<i>n</i> = 84) Mean (S.D.)	Maybe (<i>n</i> = 55) Mean (S.D.)	Yes (<i>n</i> = 20) Mean (S.D.)	
Psychological distress					
HADS total (<i>n</i> = 161)	11.2 (7.2)	10.8 (7.5)	11.1 (6.5)	12.6 (7.3)	.486
Depression (<i>n</i> = 163)	4.5 (3.8)	4.4 (4.0)	4.4 (3.5)	4.9 (3.7)	.686
≥ 8 (%)	22.1	23.5	11 (20)	21.1	.888
≥ 11 (%)	10.4	11.1	4 (7)	15.8	.543
Anxiety (<i>n</i> = 161)	6.7 (4.0)	6.4 (3.9)	6.7 (3.8)	7.8 (4.2)	.378
≥ 8 (%)	36.6	32.1	21 (38)	55.6	.172
≥ 11 (%)	15.5	13.6	7 (13)	27.8	.264
Mental health					
MHC-SF total (<i>n</i> = 164)	4.2 (1.0)	4.2 (1.0)	4.3 (0.9)	4.1 (1.2)	.959
Emotional well-being (<i>n</i> = 166)	4.6 (1.1)	4.6 (1.1)	4.8 (0.9)	4.3 (1.3)	.326
Social well-being (<i>n</i> = 165)	3.8 (1.2)	3.9 (1.2)	3.8 (1.2)	3.8 (1.4)	.837
Psychological well-being (<i>n</i> = 165)	4.3 (1.1)	4.3 (1.9)	4.4 (0.9)	4.3 (1.4)	.857
Caregiver strain					
CSI (<i>n</i> = 154)	5.1 (3.5)	4.9 (3.3)	4.6 (3.4)	7.1 (3.5)	.020 ^{*b}
≥ 7 (%)	33.0	32.0	28.6	45.0	.413

^achi-square test for scores ≥ 8 and ≥ 11 on hads depression and hads anxiety; ≥ 7 caregiver strain; kruskall-wallis test for remaining scores.

^bNot significant in the multinomial logistic regression analysis.

**p* < .05.

emotional time they were experiencing, and that an intervention could be another source of information and support ($n = 5$); and (2) they would like the easy accessibility of a web-based intervention, its flexibility, and its anonymity ($n = 4$).

Thirteen partners who would *maybe* make use of an intervention also further explained their choice. Their arguments were similar to the abovementioned arguments for and against the use of a web-based intervention. For example, they felt that they did not need any intervention at the moment ($n = 7$), but at the same time, eight partners indicated that they would be happy if such an intervention were available. A few ($n = 5$) reported referred to the online nature of the intervention (either for or against).

In [Table 3](#), the partners' preferences regarding the preconditions, functionalities, and relevant topics of a web-based intervention are shown. Of the partners who indicated that they would (maybe) make use of a web-based intervention, 82% felt that the intervention should take less than 1 hour a week, 56% of the partners thought that the intervention should have a duration of 5 weeks or more, and 57% would prefer that at least some parts of the intervention be addressed to the partner alone. The majority of the partners felt that an intervention should contain information (82%) and peer support (72%). Partners differed in their preferences regarding the need for having online contact with a professional counselor. Half of the partners considered such contact as important. The partners' preferences regarding the preconditions and functionalities were not associated with the partner's self-reported phase of their ill partner's disease.

Partners were interested in the majority of the proposed topics. They were especially interested in the topics "living with cancer," "if the end is near," and "communication with the patient." They were the less interested in the topic "sexuality and intimacy." Only five partners suggested an additional topic. Four partners would like to receive more information about financial matters, practical support (if they could get support with household chores or what to do when you have your own business), and availability of (professional) support close to their homes. One partner would like to receive information about how to get more understanding from the social network.

Associated factors

We examined differences between those who (maybe) intended to use a Web-based intervention and those who did not with respect to their personal characteristics and the cancer-related characteristics of the patients ([Table 1](#)), as well as to their personal psychological functioning ([Table 2](#)). Partners who intended to use a web-based intervention were significantly younger ($P = .014$), used the Internet more often ($P = .041$), and perceived more caregiver strain ($P = .020$). The Intention to use the intervention was not associated with the patient's cancer-related characteristics nor with the partners' psychological distress or positive mental health.

Table 3. Partners' (who would maybe or definitively intend to participate in a web-based intervention) preferences regarding preconditions, functionalities, and topics of a web-based intervention ($N = 71-74$).

	<i>N</i>	% ^a
Preconditions		
Maximum time per week		
Less than 30 minutes per week	32	46
30 minutes to 1 hour a week	25	36
1–2 hours a week	11	16
3–4 hours a week	1	1
More than 4 hours a week	—	—
Maximum amount of weeks		
1–2 weeks	13	20
3–4 weeks	16	24
5–6 weeks	10	15
More than 6 weeks	27	41
Participation alone or with ill partner		
Alone	19	28
Some parts alone and some parts together	20	29
Together	30	44
Functionalities		
Information		
Unimportant	13	18
Important	60	82
How should information be presented		
On website	34	47
Via link to other relevant websites	39	53
Peer contact (chat, forum, discussion board)		
Unimportant	21	28
Important	53	72
Personal guidance with professional		
Unimportant	37	50
Important	37	50
How often personal contact with professional (per week)		
No contact	29	40
1 time a week	39	54
2 times a week	3	4
More often	1	2
Topics (range 0–4), mean (S.D.)		
Living with cancer	3.1 (1.0)	
The end is near	3.1 (1.0)	
Communication with patient	3.0 (1.1)	
Coping with feelings	2.8 (1.1)	
Sparing your partner or not?	2.8 (1.0)	
Moving on with life after cancer treatment	2.8 (1.1)	
Asking for help and refusing help	2.7 (1.0)	
Communication with children	2.7 (1.5)	
Taking care for oneself	2.6 (1.2)	
Communication with care providers	2.6 (1.2)	
Sexuality and intimacy	2.4 (1.3)	

^aPercentages may not total 100 due to rounding.

The variables of age, frequency of Internet use, and caregiver strain were included in the multinomial logistic regression analyses (MLRA). Together these variables significantly predicted the intention to use a web-based psychological intervention ($\chi^2(12) = 33.17, p < .001$), accounting for about 22% of the variance (Cox and Snell R^2). MLRA showed that only age was a significant predictor to the model, $\chi^2(2) = 7.03, p = .030$ (frequency of Internet use $\chi^2(2) = 15.05, p = .058$; and caregiver strain $\chi^2(2) = 4.85, p = .089$). Compared with the group of partners

who had no intention of participating in web-based psychological interventions, partners who did want to participate were younger ($\beta = -.07$, Wald $\chi^2(1) = 6.25$, $p = .012$, odds ratio .94, 95% Confidence Interval .89–.99).

Discussion

Our study indicates that the interest in a web-based supportive intervention varied. 53% of the partners were not interested in such an intervention, 35% would maybe be interested, and 13% would definitely be interested. Of those who were (maybe) interested in an intervention, the majority would prefer an intervention that takes less than one hour a week, lasts up to five weeks or more, and contains information and peer support. About half of the partners would like to use a web-based intervention under the guidance of a professional counselor. The partners were interested in topics about what it means to live with cancer or when you know that the patient will not get better anymore, or topics that were related to the communication with the patient (and also with children and care providers); how to cope with emotions; if they should or should not spare their ill partner; how to move on with life after a successful cancer treatment; how to ask for help or refuse help; how to take care of yourself; and matters regarding sexuality and intimacy. These results regarding the precondition, functionalities, and content of a web-based intervention are in line with the outcomes of our earlier qualitative study in which we interviewed 16 partners of cancer patients about their needs and preferences regarding such an intervention (Köhle et al., 2015).

Existing supportive interventions for cancer caregivers are mostly delivered as face-to-face visits in the clinical setting (Northouse et al., 2010). We expected that web-based interventions would be welcomed by partners of cancer patients because of the flexibility and accessibility of such interventions, helping partners of cancer patients to overcome any reluctance in seeking help and/or allowing them more choice as to when to seek help within the time restraints of their (caregiving) tasks and responsibilities (Eysenbach, 2001; Ostroff, Ross, Steinglass, Ronis–tobin, Singh, 2004). In the present study, 48% of the partners were (maybe) interested in a web-based intervention, which is higher than what was reported by Mosher et al. (2013) In their study, 29% of caregivers of lung cancer patients, of whom the majority (65%) were spouse/partners, were willing to attend a support group or talk to professionals. Our result is, however, comparable to the percentage found in a study by Skleranova et al. (Sklenarova et al., 2015), who reported that 48% of caregivers of patients with various cancers would intend to take part in a supportive face-to-face intervention if it were offered. Based on the responses from the partners in our study, it appeared that some partners found the idea of a Web-based intervention particularly appealing, as it was flexible and convenient, whereas others rejected the idea of a web-based intervention because of its impersonal character or because they were generally not in need for help or already received sufficient support from their personal network. The rejection of a

web-based intervention because of the perceived impersonal character is a known barrier of eHealth interventions. For example, Nijland, van Gemert-Pijnen, Boer, Steehouder, and Seydel (2009) found in a sample of primary care patients with chronic complaints that the preference to have a personal consult with a healthcare professional (e.g., a general practitioner) is one of the main reasons for nonuse of web-based interventions. The finding that partners are not interested in such an intervention because they are not in need for help or because they already receive sufficient support from their network is in line with findings from our qualitative study among partners of cancer patients (Köhle et al., 2015) and the results of a study among distressed family caregivers of lung cancer patients. (Mosher, Given, & Ostroff, 2015). Based on these findings, we conclude that both web-based and face-to-face interventions have value when attempting to reach all partners of cancer patients.

Most supportive interventions currently available target the couple (patient and partner), instead of the partner alone (Northouse et al., 2010). In the current study, however, we found that less than half (44%) of the partners would prefer to participate in the intervention together with the patient. The majority (57%) would like to participate alone or they prefer that at least some parts of the intervention be addressed to them alone, which is in line with the results of Mosher et al. (2013) who found that only 15% (7/46) of the lung cancer caregivers were interested in couples counseling and only 19% (14/72) were interested in family counseling. Partners of terminally ill patients might prefer to participate alone in an intervention because of the especially challenging tasks of discussing their fears in presence of the patient about losing them and/or the strain they experience due to their caregiving tasks. However, in our sample, we found no similar relationship of the partner's self-reported phase of the patient's disease. Nevertheless, these results should be interpreted with caution because of the small sample size. In our earlier qualitative study, the majority of the partners also indicated that they would prefer to participate in the intervention without the patient because they doubted that patients' and partners' needs could be combined in one supportive intervention. However, other partners preferred to participate together with the patient, because the cancer affects both their lives, and they needed to cope with the situation together (Köhle et al., 2015). Because of the different preferences, we recommend that future (web-based) interventions for partners of cancer patients offer a flexible approach allowing them to choose whether they want to participate alone or together with the patient.

Age was the only significant factor associated with the intention to use a psychological web-based intervention. This finding is in accordance with previous studies showing that younger people are using the Internet and web-based interventions more often (Kummervold et al., 2008; van Uden-Kraan et al., 2009; Peels et al., 2012). Interestingly, gender was not associated with the intention. On the basis of prior research (Kummervold et al., 2008, Swartz et al., 1998), we had hypothesized that female partners would be more interested in a web-based intervention. Phase

of disease was not associated with the intention to make use of a web-based intervention, which corresponds with the study of Mosher et al. (2013) who found that phase of disease was not associated with use of mental health services.

Interestingly, the intention to use a psychological web-based intervention was not associated with levels of psychological distress. Possible explanations could be that partners experiencing severe distress would prefer a different kind of intervention, such as face-to-face interventions; they have no time or energy to participate in an intervention due to caregiving tasks and other responsibilities; or they already receive sufficient support from their personal network. In fact, some of the partners in our study mentioned these last two explanations as reasons for not being interested in a web-based intervention, and these findings compare with a study by Clover, Mitchell, Britton, and Carter (2014) among cancer patients. In Clover's study, 71% of the patients with high levels of emotional distress declined help because they preferred to manage the distress themselves. On the other hand, it could also be that the intention to use a web-based intervention is determined by a person's ideas about the usefulness of psychological interventions, in general, and their willingness to reflect on their own behavior, rather than on their actual amount of distress.

Due to the limitations of this study, some caution is needed when interpreting the results. First, we made use of a convenience sample, and information about the response rate is not available. It appeared that the stress level in our sample was somewhat lower than stress levels reported in earlier studies (Mosher et al., 2013; Rumpold et al. 2015; Chen et al., 2016, Soylu, Ozaslan, Karaca, & Ozkan, 2015). Second, it might have been difficult for partners to decide upon their interest in a nonexistent intervention. We did attempt to clarify what an intervention for partners might look like by offering a mock-up version and a short written explanation, and we know from our previous study (Köhle et al., 2015) that this helped partners to elaborate on their preferences. Third, it might also have been difficult for partners to elaborate on what they think might be their needs in the future. For example, the finding that partners were less interested in topics such as "sexuality and intimacy" or "communication with care providers" may be related to something other than lack of interest (e.g., they do not have any problems at this moment), and does not necessarily need to be associated with interest at a later point in the illness trajectory. Fourth, the intention to make use of an intervention does not necessarily mean that partners will actually take part in it. Fifth, due to the explorative character of our study and the increased risk of type 1 error, a replication of our findings in an independent sample would be suggested. No exact power calculation was conducted due to the explorative character of this study. However, considering the rule of thumb of Hosmer (Hosmer, Lemeshow, & Sturdivant, 2013), which states that you need at least 10 observations for each independent variable, we expect that the power is adequate.

We conclude that almost half of the partners of cancer patients were interested in a web-based intervention, especially those who were younger. Any potential

intervention should not be too time-consuming, and it should be flexible regarding participation with or without the patient. Furthermore, the intervention should contain information, peer support, and the option of online guidance by a counselor. Web-based delivered and tailored psychological interventions may be a valuable contribution to the healthcare system in order to optimally support partners of cancer patients.

Informed consent and patient details

I confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.

Conflict of interest

The authors declare no conflict of interest.

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