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Quality of life in partners of patients with cancer

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Abstract

Objectives Cancer affects patients' quality of life (QOL) but might also influence their partners' QOL. We investigated QOL in partners of patients with different cancer types and examined potential predictors of partners' QOL.
Methods Three hundred seventy-three partners completed the SF-36 QOL questionnaire. Descriptive statistics, *t*-tests and linear regressions were performed. Potential predictors of partners' QOL included sociodemographic (sex, age, income), psychosocial (social support, quality of partner relationship, patient's QOL) and clinical variables (tumour stage, treatment, time since diagnosis).
Results Male partners reported better QOL than female partners on most SF-36 subscales. Both male and female partners reported significantly lower mental QOL than the norm population. Higher quality of the relationship predicted higher mental QOL in partners of patients with cancers of digestive organs ($P = 0.039$) and breast cancer patients' partners ($P = 0.001$). Higher mental QOL of the patient predicted higher physical ($P = 0.012$) and mental QOL ($P = 0.011$) in partners of breast cancer patients. For partners of patients with cancers of the male genital organs, none of the variables in the model was of predictive value.
Conclusion Mental, rather than physical, QOL of partners was impaired. Stage and other clinical variables of the patient did not influence partners' mental or physical QOL.

Keywords Cancer · Oncology · Partner · Quality of life

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Introduction

Cancer is a stressor that affects the patient but might also affect the partner's well-being in physical, emotional, social and functional domains. Partners of patients with cancer experience significant psychosocial distress during the course of treatment and may be confronted with subsequent ongoing difficulties.

Regarding psychosocial consequences, the assessment of health-related quality of life (QOL) in partners is a recent area of research. The question of which factors determine QOL of partners of cancer patients has been addressed in a few studies. Nevertheless, especially the relationship between health condition characteristics and QOL of partners of patients with cancer is yet not well understood.

In the field of partner research most of the literature has focussed on the consequences of prostate and breast carcinoma. The majority of the studies investigated coping strategies, support issues and psychological distress in patients and their partners [1–7]. Major themes concerning distress encompass enduring uncertainty, living with treatment effects, coping with changes and needing help [e.g. 8–10]. With regard to coping mechanisms, distress and the quality of the partner relationship studies stress that the partner's response is an important factor influencing patient's adaptation, for example in women with breast cancer [11]. As specified by Manne et al. [12], unsupportive behaviour, rated by the partner and the patient, had a significant negative impact on the coping process. More avoidant coping as well as more distress was shown. Patient perceptions were a mediator between unsupportive behaviour (partner rating) and patient distress. Furthermore, Manne et al. [13] examined the role of communication in couples coping with early-stage breast cancer in a longitudinal study. For both partners, mutual constructive communication was associated with less distress and more satisfaction regarding their relationship. In contrast, demand-withdraw communication was associated with lower satisfaction and higher distress. Mutual avoidance was only associated with higher distress. The study illustrated the relevance of partner communication for the coping process and implied possible intervention strategies. How relationship satisfaction serves as a moderator between protective buffering (defined as, e.g. hiding worries or denying concerns) and psychological distress was investigated by Manne et al. [14] at three time points over an 18-month period after breast cancer diagnosis. Protective buffering only predicted more distress in patients with a less satisfactory relationship. Relationship satisfaction moderated the association between patients' protective buffering and partners' distress. These results accentuated the relevance of a differential analysis of partnership interaction patterns.

Studies focussing on partners of male cancer patients support these findings. Eton et al. [15] investigated levels and predictors of psychological distress in the partners of men treated for early-stage prostate carcinoma. Psychosocial factors such as worse marriage quality, less social support, lower self-esteem, not finding meaning, and greater illness uncertainty were more likely to predict distress than medical factors. The severity of patients' symptoms was not necessarily related to partners' morbidity [16]. According to the results of a study conducted by Tuinman et al. [17] the time before chemotherapy appeared to be most stressful for couples. No decrease in QOL was found 1 year after diagnosis of disseminated testicular cancer. The authors concluded that the effect of cancer on QOL of patients and their partners seemed to be temporary. In a different study, Tuinman [18] found that, if the relationship existed before the diagnosis of testicular cancer, spouses showed better functioning scores.

There is some evidence that the sex of the partner plays a role for QOL assessment. Female partners seemed to perceive more psychological distress and lower QOL compared to male partners [19]. This finding could not be explained by differences in the physical condition of the patient or partner. Wagner et al. [20] examined QOL in husbands of women with breast cancer. In comparison to a healthy group, husbands of women with breast cancer scored lower on general health, vitality, role-emotional and mental health subscales of the SF-36 questionnaire.

Further studies investigated the relationship between patients' and partners' QOL. Chen et al. [21] found that social and functional aspects of patients' QOL play a significant role in determining the QOL of their spouse caregivers. Unfortunately, the generalizability of findings so far is limited, since different types of cancer were investigated and different questionnaires were used. Most studies focussed on a specific cancer site.

The purpose of the present study was to provide detailed information about QOL in partners of patients with different types of cancer. We were specifically interested in predictors of partners QOL. Previous studies mainly included potential psychosocial predictors of partners' QOL. As an extension, we included clinical variables as well as patient-reported outcomes.

Methods

Participants and procedure

Patients with cancer and their partners were asked to participate in a multicentre study focussing on the role of partners in cancer rehabilitation. The criteria for selection were: cancer diagnosis in one partner, marriage or partnership and primary treatment (surgery and/or chemotherapy and/or radiation) of the patient with cancer completed. Exclusion criteria were: palliative treatment (patient), cognitive deficits (patient or partner), insufficient command of the German language (patient or partner) and refusal of participation (patient or partner).

Patients and partners were recruited consecutively and filled out a set of questionnaires either at the end of primary treatment or at the beginning of an inpatient cancer rehabilitation program. Recruitment took place between April 9, 2002 and December 30, 2003 when patients started their rehabilitation program in one of the five participating rehabilitation clinics or (in cases when patients decided not to participate in a rehabilitation program) at discharge from hospital or at the end of radiation treatment in one of ten cooperating acute or radiation clinics. Questionnaires were completed in the rehabilitation clinic (patients who participated in rehabilitation and accompanying partners), in the acute or radiation clinic (patients who did not participate in rehabilitation), or a questionnaire was mailed (partners who did not accompany the patient during rehabilitation and partners of rehabilitation nonparticipants). The data protection committee's statement did not allow us to obtain sociodemographic or medical data on nonparticipants. Due to organisational specifics of the participating clinics, information on refusal rates was not systematically documented.

Six hundred thirty-three couples participated in the study. Patients had been diagnosed with a wide range of cancer types. In order to enable sufficient group comparisons for the present paper, we restricted the sample to partners of patients diagnosed with the most common cancer types (cancers of the digestive organs: ICD-10 C15-26, breast cancer: ICD-10 C50, cancers of the male genital organs: ICD-10 C60-63). This procedure reduced the sample size to 396 couples. Another 23 cases were excluded due to unknown tumour stage of the patient with cancer. Thus, the final sample consisted of 373 partners of patients with cancer.

Measures

Quality of life

QOL was measured with the German version of the Short Form SF-36 Health Survey [22]. The SF-36 developed by Ware [23] is a generic quality of life instrument, which contains 36 items that measure eight dimensions of health status. The eight dimensions are: "physical functioning", "role limitation-emotional", "role limitation-physical", "social functioning", "mental health", "energy and vitality", "bodily pain" and "general health perception". Scores on each scale range from 0 to 100, with a score of 100 indicating the highest rating of health. In addition, a Mental Component Summary scale and a Physical Component Summary scale can be calculated. The internal consistency for the subscales of the German version ranges from $\alpha = 0.74$ to 0.94 [22].

Social support

Social support was measured with the short form of the social support questionnaire (F-SozU-K-22) by Sommer and Fydrich [24]. The F-SozU is a validated German questionnaire which assesses the availability of emotional and instrumental support and generates a global social support score. Scores range from 1 to 5, with a score of 5 indicating the highest perceived social support. The internal consistency for the short form is $\alpha = 0.91$ [25].

Quality of the partner relationship

The perceived quality of the partner relationship was measured with the German version of the Dyadic Adjustment Scale [26], which generates an overall score as well as four scale scores for "consensus", "cohesion", "satisfaction" and "affectional expression". Scores for the overall quality of the partner relationship range from 0 to 151, with higher scores indicating higher perceived quality of the partner relationship. The internal consistency for the overall score is high ($\alpha = 0.96$).

Disease- and treatment-related variables

Tumour diagnosis of the patient with cancer (cancer of digestive organs: ICD-10 C15–26, breast cancer: ICD-10 C50, cancers of the male genital organs: ICD-10 C60–63), tumour stage (UICC, stage 1–4), tumour treatment (surgery, chemo-, radio-, hormone therapy), and time since diagnosis as well as time since primary treatment in categories (0–3, 4–6, 7–12, more than 12 months) were obtained by physician report.

Data analyses

Data analyses were carried out using SPSS (Windows) version 13.0. With regard to QOL, we analysed associations between patients' and partners' QOL using Pearson's product-moment correlation. Male and female partners were compared by multivariate analysis of variance. Age was included as a covariate, since QOL is associated with age. We used published normative data of the SF-36 based on 416 adults aged 61–70 years from Germany for comparison with partners' QOL since the majority of the partners' sample belonged to this age category (40%).

To determine predictors of partners' QOL, linear regression analyses were conducted. The following independent predictors were included simultaneously in the analyses. As patient-related variables we included the disease- and treatment-related variables tumour stage (in categories), time since diagnosis (categories) and kind of treatment (surgery, radiation, chemotherapy, hormonal treatment; all dichotomous) as well as mental and physical QOL of the patient (continuous variables). As sociodemographic variables of the partner we included age (continuous), children (yes/no), years of schooling (categories) and household income (categories). As psychosocial variables of the partner we included partner's perception of social support and quality of partner relationship (continuous). The dependent variables were defined by the physical and mental health sum scores of the SF-36. All analyses were carried out for each cancer site separately.

Results

Sample characteristics

With an average age of 62 years (SD 11.1 years), partners or patients with cancers of the digestive organs were significantly ($P = 0.001$) older than partners of breast cancer patients (57.8 years, SD 9.6 years) and partners of patients with cancers of the male genital organs (57.3 years, SD 12.7 years). Sixty nine percent of the partners of patients with cancers of the digestive organs were female, as were all of the partners of patients with cancers of the male genital organs and none of the partners of breast cancer patients. Perceived quality of the partner relationship, perceived social support and physical QOL did not differ among the partners by cancer site, but mental QOL was significantly higher among partners of breast cancer patients (48.6 versus 44.5 in partners of patients with cancers of the digestive organs and 43.6 in partners of patients with tumours of the male genital organs; $P = 0.002$).

With regard to disease- and treatment-related variables, partners differed in all variables by cancer site. Significantly more partners of patients with cancers of the digestive organs experienced the cancer diagnosis in their partner recently ($P < 0.001$) and significantly more partners of breast cancer patients experienced surgery, chemotherapy, radiation therapy and hormone therapy in their partners (all P values < 0.001). However, physical and mental QOL in the patients did not differ by cancer site. Table 1 gives an overview of the sample characteristics.

Differences in QOL: male versus female partners

Male partners reported significantly better QOL than female partners in six of the eight subscales of the SF-36. The numerical difference of the means ranged from 5.4 ("physical functioning") to 14.8 ("emotional role functioning"). No difference was found for "role functioning" and "general health perception" (Table 2).

The analyses of the correlation of patients' and partners' mental and physical QOL (SF-36 sum scores) revealed that, for female partners, neither mental nor physical QOL was correlated with the patient's mental or physical QOL. We found, however, a negative correlation between the partner's perceived quality of the partner relationship and the patient's physical QOL. Partner's physical QOL was positively associated with perceived social support (Table 3). In male partners we found an association between the patient's mental QOL and the partner's physical QOL ($r = 0.179$), the patient's mental QOL and the partner's mental QOL ($r = 0.318$) and between the patient's physical QOL and the partner's physical QOL ($r = 0.178$). Furthermore, partner's mental QOL was correlated with perceived social support and quality of the partner relationship in male partners. As expected, quality of partner relationship was strongly associated with perceived social support in both male and female partners (Table 3).

The comparison of partners' QOL with the norm data was also carried out separately for male and female partners. The overall finding was that the physical QOL of partners of patients with cancer was similar to the physical QOL of the normative population and the mental QOL of partners of patients with cancer was severely impaired compared to the normative population. This pattern was found in both male and female partners and regardless of the type of cancer diagnosed in the patient (Table 4). Female partners of patients with cancers of the digestive organs and female partners of patients with cancers of the male genital organs did not differ significantly from the norm population with regard to the physical subscales of the SF-36. They scored, however, significantly lower on all mental scales. Mean differences between female partners and the norm population ranged from 7.5 for "vitality" to 31.5 for "emotional role functioning" in female partners of patients with cancers of the digestive organs. The findings for male partners were similar. While the means for the physical scales were comparable or even better than those of the norm population ("general health perception" in partners of breast cancer patients), male partners of patients with cancers of the digestive organs scored significantly lower in all mental scales and male partners of breast cancer patients scored significantly lower in all mental scales but "vitality". Mean differences between male partners and the norm population ranged from 2.4 for "vitality" (partners of breast cancer patients) to 17.5 for "emotional role functioning" (partners of breast cancer patients) (Table 4). Consistently with the results presented in Table 2 the analyses of the QOL subscales for men and women by cancer site diagnosed in the patient showed that mental QOL reported by female partners was about 10 points lower than mental QOL reported by male partners in all mental QOL subscales of the SF-36.

Predictors for partners' QOL by cancer site

The regression analyses for 150 partners of patients with cancers of the digestive organs showed that only age was a significant predictor for partners' physical QOL ($P = 0.037$) whereas none of the other predictors contributed significantly to the regression model. The negative beta value indicated that higher age was correlated with lower physical QOL. The only predictor of mental QOL was perceived quality of the partner relationship ($P = 0.039$). However, the corrected R^2 values of 0.066 (physical QOL) and 0.103 (mental QOL), indicated that the predictive accuracy of the models were poor (Table 5).

For the 153 male partners of patients with breast cancer, the regression analyses revealed that both patient's physical QOL ($P = 0.019$) and patient's mental QOL ($P = 0.012$) were significant predictors for partner's physical QOL. These variables accounted for 16% of the variance. Patient's mental QOL ($P = 0.011$) was also a significant predictor for partner's mental QOL, which could also be predicted by the perceived quality of the partner relationship ($P = 0.001$). This model explained 17.5% of the variance (Table 6).

The regression analyses for the 70 female partners of patients with cancers of the male genital organs showed

Table 1 Sample characteristics of 373 partners of patients with cancer

	Partners of patients with tumours of			*P*[d]
	Digestive organs[a] ($n = 150$)	The breast[b] ($n = 153$)	The male genital organs[c] ($n = 70$)	
Partner-related variables				
Age (*M*, *SD*)	62.0 (11.1)	57.8 (9.6)	57.3 (12.7)	0.001
Females (%)	68.7	0	100	<0.001
Children (%)	85.8	86.6	87.1	0.962
Occupation (%)				
Employed	26.2	51.3	26.5	<0.001
Unemployed	4.3	6.7	7.4	
Retired	54.6	40.0	44.1	
Home maker	14.9	2.0	22.1	
Schooling (%)				
Up to 9 years	61.9	52.3	52.9	0.080
10 years	18.0	29.1	18.6	
12–13 years	20.1	18.5	28.6	
Household income per month (%)				
Up to 1,000 Euro (∼1,445$)	9.2	10.9	7.2	0.118
1,001–2,000 Euro (∼1,446 to ∼2,890$)	40.5	39.4	47.8	
2,001–3.000 Euro (∼2891 to ∼4335 $)	38.9	27.0	31.9	
More than 3,001 Euro (∼4,336$)	11.5	22.6	13.0	
Perceived quality of partner relationship (*M*, *SD*)	121.8 (15.2)	120.2 (14.1)	116.7 (17.1)	0.088
Perceived social support (*M*, *SD*)	4.3 (0.7)	4.2 (0.7)	4.4 (0.7)	0.203
Quality of life (SF-36) of the partner				
Physical sum score (*M*, *SD*)	47.8 (11.1)	48.4 (9.7)	46.7 (10.8)	0.571
Mental sum score (*M*, *SD*)	44.5 (12.2)	48.6 (10.6)	43.6 (11.5)	0.002
Patient-related variables				
Tumour stage (UICC) of the patient (%)				
Stage 1	28.0	37.9	5.7	<0.001
Stage 2	28.7	53.6	44.3	
Stage 3	28.0	6.5	35.7	
Stage 4	15.3	2.0	14.3	
Treatment of the patient with cancer (%)				
Surgery	96.7	100.0	81.4	<0.001
Chemotherapy	34.7	71.2	15.7	<0.001
Radiotherapy	14.7	83.7	32.9	<0.001
Hormone therapy	0.0	49.7	18.6	<0.001
Time since diagnosis (%)				
0–3 months	49.7	6.7	36.2	<0.001
4–6 months	9.7	31.5	15.9	
7–12 months	21.4	36.9	11.6	
More than 12 months	19.3	24.8	36.2	
Time since end of primary treatment (%)				
0–3 months	72.7	70.1	61.2	0.043
4–6 months	7.2	6.8	10.4	
7–12 months	7.2	2.0	1.5	
More than 12 months	12.9	21.1	26.9	
Quality of life (SF-36) of the patient				
Physical sum score (*M*, *SD*)	39.1 (9.7)	41.7 (10.1)	41.7 (10.9)	0.058
Mental sum score (*M*, *SD*)	46.5 (12.2)	45.0 (11.3)	47.7 (10.6)	0.246

[a] ICD-10 C15-26 (cancers of the oesophagus, stomach, small intestines, colon, rectosigmoid junction rectum, anus and anal canal, liver and intrahepatic bile ducts, gallbladder, other and unspecified parts of biliary tract, pancreas)

[b] ICD-10 C50 (breast cancer)

[c] ICD-10 C60-63 (cancers of the penis, prostate, testis and of other and unspecified male genital organs)

[d] *P* values calculated from analysis of variance (ANOVA) (age, quality of partner relationship, social support, QOL) or chi-square

Table 2 Multivariate analysis of variance (MANOVA) of QOL of 173 female and 200 male partners of patients with cancer

SF-36 QOL subscales	Female partners ($n = 173$)		Male partners ($n = 200$)		df	*F*	*P*
	M	SD	*M*	SD			
Physical functioning	73.8	24.7	79.2	23.0	1	5.230	0.023
Role functioning	69.8	37.3	75.5	36.7	1	2.195	0.139
Pain	69.9	27.8	76.5	26.0	1	5.407	0.021
General health perception	60.7	17.7	62.6	18.6	1	0.957	0.329
Vitality	52.6	18.0	59.3	19.8	1	10.720	0.001
Social functioning	73.1	23.8	81.7	21.4	1	12.177	0.001
Emotional role functioning	58.0	42.9	72.8	38.2	1	11.466	0.001
Mental health	62.0	19.2	72.2	19.3	1	24.036	<0.001

Sex was included as an intersubject factor, age as a covariate

Table 3 Pearson product-moment correlation coefficients of mental and physical QOL (SF-36 sum scores) in cancer patients and their partners ($N = 373$)

	Patient's physical QOL	Patient's mental QOL	Partner's physical QOL	Partner's mental QOL	Perceived social support (partner)	Perceived quality of relationship (partner)
Female partners ($n = 173$)						
Patient's physical QOL	1	−0.038	0.005	0.082	−0.084	−0.236
Patient's mental QOL	−0.038	1	0.134	0.128	−0.013	−0.002
Partner's physical QOL	0.005	0.134	1	−0.238	0.193	−0.028
Partner's mental QOL	0.082	0.128	−0.238	1	0.053	0.153
Perceived social support (partner)	−0.084	−0.013	0.193	0.053	1	0.345
Perceived quality of relationship (partner)	−0.236	−0.002	−0.028	0.153	0.345	1
Male partners ($n = 200$)						
Patient's physical QOL	1	−0.089	0.178	0.053	0.069	0.013
Patient's mental QOL	−0.089	1	0.179	0.318	0.181	0.179
Partner's physical QOL	0.178	0.179	1	0.055	0.045	0.002
Partner's mental QOL	0.053	0.318	0.055	1	0.311	0.379
Perceived social support (partner)	0.069	0.181	0.045	0.311	1	0.461
Perceived quality of relationship (partner)	0.013	0.179	0.002	0.379	0.461	1

that none of sociodemographic, disease- and treatment-related, or psychosocial variables were significant predictors for partner's physical or mental QOL (Table 7).

Discussion

The current paper describes one of the few studies focussing on well-being of cancer patient partners. While most previous studies focussed on psychological distress, our study employed QOL as the outcome of interest and therefore included a broader view of the partners' well-being.

The result that female partners of cancer patients reported lower scores in all QOL dimensions than male partners corresponds to the findings in other patient samples and in the norm population. Women generally reported lower QOL scores than men. In comparison to a population-based reference group, physical QOL in male and female partners in our study was similar to the norm population. However, both male and female partners reported significantly lower mental QOL than the norm population. Differences between partner subgroups and the norm population with regard to mental QOL scales ranged from 7.5 for "vitality" to 31.5 for "emotional role functioning". This finding corresponds to previous studies, which showed that partners of patients with cancer were psychologically distressed [e.g. 4, 15, 27–29].

With regard to the question of which factors might predict partners' QOL, we found that perceived quality of the partner relationship predicted mental QOL in partners of patients with cancers of the digestive organs and

Table 4 Comparison of QOL of 173 female and 200 male partners of patients with cancer with the German norm population [18] by cancer site

SF-36 QOL subscales	Norm population, females, 61–70 years ($n = 230$)		Female partners of patients with cancers of digestive organs ($n = 103$)		df	*T*	*P*	Female partners of patients with cancers of the male genital organs ($n = 70$)		df	*T*	*P*
	M	*SD*	*M*	*SD*				*M*	*SD*			
Physical functioning	74.8	22.3	74.9	24.7	101	0.049	0.961	72.7	23.7	69	−0.740	0.462
Role functioning	72.7	36.4	69.6	38.4	97	−0.789	0.432	67.2	37.9	65	−1.185	0.240
Pain	70.4	27.8	72.6	28.4	101	0.764	0.447	66.7	26.2	69	−1.173	0.245
General health perception	58.5	18.2	61.0	18.1	100	1.370	0.174	60.5	17.3	68	0.958	0.342
Vitality	60.1	17.8	52.3	19.6	101	−4.004	<0.001	52.3	16.0	68	−4.025	<0.001
Social functioning	85.7	19.7	72.7	24.5	100	−5.345	<0.001	73.0	23.6	69	−4.496	<0.001
Emotional role functioning	88.0	26.7	56.5	44.0	97	−7.100	<0.001	59.2	42.2	66	−5.589	<0.001
Mental health	73.6	17.1	61.7	19.8	100	−6.041	<0.001	62.2	18.3	68	−5.209	<0.001

SF-36 QOL subscales	Norm population, males, 61–70 years ($n = 204$)		Male partners of patients with cancers of digestive organs ($n = 47$)		df	*T*	*P*	Male partners of breast cancer patients ($n = 153$)		df	*T*	*P*
	M	*SD*	*M*	*SD*				*M*	*SD*			
Physical functioning	77.3	22.9	74.3	24.7	44	−0.809	0.423	80.8	22.1	149	1.952	0.053
Role functioning	72.3	34.0	76.1	35.8	43	0.712	0.480	74.7	37.1	147	0.774	0.440
Pain	72.2	26.1	76.8	26.2	45	1.197	0.238	76.1	25.7	150	1.864	0.064
General health perception	58.9	18.1	61.4	17.3	44	0.952	0.346	63.2	19.0	147	2.748	0.007
Vitality	62.3	19.1	55.9	18.3	44	−2.356	0.023	59.9	20.3	147	−1.456	0.147
Social functioning	88.8	16.8	81.0	21.0	45	−2.522	0.015	81.3	21.7	150	−4.244	<0.001
Emotional role functioning	90.0	24.7	74.2	38.6	43	−2.706	0.010	72.5	38.0	147	−5.590	<0.001
Mental health	78.2	15.8	70.1	19.8	44	−2.744	0.009	72.6	19.4	147	−3.535	0.001

One-sample *T*-tests

Table 5 Linear regression analyses of physical and mental QOL (SF-36 sum scores) in 150 partners of patients with cancers of the digestive organs (ICD 10 C15-26)

Predictor variables[a]	Partner's physical QOL					Partner's mental QOL				
	β	Standard error *B*	Standardized *β*	*P*	Corrected R^2	*β*	Standard error *B*	Standardized *β*	*P*	Corrected R^2
					0.066					0.103
Sex	−0.279	2.508	−0.012	0.912		5.323	2.794	0.208	0.060	
Age	−0.223	0.105	−0.238	0.037		0.123	0.117	0.116	0.269	
Children	−1.195	3.031	−0.039	0.694		−2.499	3.377	−0.073	0.461	
Schooling	0.886	1.401	0.070	0.529		1.338	1.560	0.093	0.393	
Income	0.543	0.814	0.072	0.506		1.149	0.907	0.134	0.209	
Tumour stage	1.264	1.220	0.122	0.303		−1.142	1.359	−0.097	0.403	
Time since diagnosis	−0.178	0.110	−0.187	0.110		0.115	0.123	0.106	0.350	
Treatment—radiation	−7.429	3.876	−0.238	0.058		3.207	4.318	0.090	0.460	
Treatment—chemotherapy	2.992	3.475	0.133	0.391		3.986	3.871	0.156	0.306	
Perceived quality of relationship	0.022	0.078	0.032	0.781		0.181	0.087	0.235	0.039	
Perceived social support	0.636	1.840	0.038	0.730		0.062	2.049	0.003	0.976	
Patient's physical QOL	−0.037	0.115	−0.033	0.748		0.133	0.129	0.105	0.303	
Patient's mental QOL	0.134	0.095	0.156	0.160		0.088	0.106	0.090	0.405	

[a] "Treatment—surgery" was not included in the models because nearly all patient had received surgery, "treatment—hormone therapy" was not included since none of the patient had received this treatment

Table 6 Linear regression analyses of physical and mental QOL (SF-36 sum scores) in 153 male partners of patients with breast cancer (ICD 10 C50)

Predictor variables[a]	Partner's physical QOL					Partner's mental QOL				
	β	Standard error B	Standardized β	P	Corrected R^2	β	Standard error B	Standardized β	P	Corrected R^2
					0.160					0.175
Age	−0.185	0.106	−0.191	0.083		0.146	0.121	0.130	0.231	
Children	−2.629	2.377	−0.098	0.271		2.602	2.721	0.084	0.341	
Schooling	1.438	1.221	0.127	0.242		1.384	1.398	0.105	0.325	
Income	0.398	0.505	0.078	0.433		0.181	0.578	0.031	0.754	
Tumour stage	1.282	1.670	0.090	0.444		−0.883	1.912	−0.054	0.645	
Time since diagnosis	0.017	0.043	0.036	0.697		0.008	0.049	0.016	0.863	
Treatment—radiation	2.191	2.248	0.088	0.332		−1.689	2.573	−0.059	0.513	
Treatment—chemotherapy	−1.527	2.105	−0.078	0.470		2.879	2.410	0.127	0.235	
Treatment—hormone therapy	0.096	1.614	0.005	0.953		−0.288	1.848	−0.014	0.877	
Perceived quality of relationship	−0.021	0.066	−0.033	0.748		0.265	0.076	0.360	0.001	
Perceived social support	0.241	1.304	0.019	0.854		0.794	1.492	0.055	0.596	
Patient's physical QOL	0.206	0.087	0.237	0.019		0.030	0.099	0.030	0.763	
Patient's mental QOL	0.196	0.077	0.245	0.012		0.229	0.088	0.248	0.011	

[a] "Sex" was not included in the models because all partners were male, "treatment—surgery" was not included because all patient had received surgery

Table 7 Linear regression analyses of physical and mental QOL (SF-36 sum scores) in 70 female partners of patients with cancers of the male genital organs (ICD 10 C60-63)

Predictor variables*	Partner's physical QOL					Partner's mental QOL				
	β	Standard error B	Standardized β	P	Corrected R^2	β	Standard error B	Standardized β	P	Corrected R^2
					0.138					0.033
Age	−0.343	0.174	−0.411	0.055		0.305	0.200	0.337	0.135	
Children	−4.774	4.510	−0.171	0.296		−1.943	5.193	−0.064	0.710	
Schooling	2.615	1.693	0.222	0.130		0.789	1.950	0.062	0.688	
Income	0.499	1.118	0.074	0.658		−1.475	1.288	−0.201	0.259	
Tumour stage	−0.623	2.047	−0.044	0.762		1.936	2.358	0.127	0.416	
Time since diagnosis	0.137	0.144	0.165	0.346		−0.015	0.166	−0.016	0.930	
Treatment—surgery	−1.828	5.969	−0.062	0.761		5.865	6.873	0.184	0.399	
Treatment—radiation	−5.694	4.693	−0.245	0.232		4.765	5.403	0.189	0.383	
Treatment—chemotherapy	−2.528	5.340	−0.094	0.639		−0.578	6.149	−0.020	0.926	
Treatment—hormone therapy	−0.142	4.395	−0.005	0.974		−2.130	5.061	−0.073	0.676	
Perceived quality of relationship	0.008	0.107	0.012	0.942		0.133	0.123	0.194	0.287	
Perceived social support	1.672	3.132	0.091	0.596		2.213	3.606	0.111	0.543	
Patient's physical QOL	0.043	0.151	0.045	0.780		−0.012	0.174	−0.012	0.944	
Patient's mental QOL	0.091	0.157	0.094	0.565		0.148	0.181	0.141	0.420	

[a] "Sex" was not included in the models because all partners were female

partners of breast cancer patients, while quality of the partner relationship did not predict mental QOL in partners of patients with cancers of the male genital organs. These findings suggest that perceived quality of the partner relationship is more strongly associated with mental QOL in males than in females.

In partners of breast cancer patients, patient's mental QOL predicted both partner's physical and mental QOL. In female partners of patients with cancers of the male genital organs, none of the variables in the model was a significant predictor of partner's QOL. This indicates that, although mental QOL was lower among these partners compared to population norms, the relationship between partner and patient QOL appears to be different than in the other groups. Generally, women possess wider social networks compared to men, who predominantly rely on the social support of their partners and thus might be emotionally more dependent on them.

These mixed results with regard to the association of patient's and partner's QOL in different subgroups of patients and partners correspond to previous research findings on psychological distress in cancer patients and their partners. While some studies found that the patient's and the partner's level of distress correlate with each other [30, 5], other studies found no such correlation [31]. Baider and Bengel [32] reviewed studies on gender-related differences in the experience of cancer patients and their spouses. They stated that, although findings are inconsistent, the majority of studies reported a correlation between patient's and partner's distress.

None of the disease- or treatment-related variables such as tumour stage, time since diagnosis and kind of cancer treatment was able to explain any variance in the partners' physical or mental QOL, irrespective of the cancer site diagnosed in the patient. Thus, the finding that the mental QOL of male and female partners of patients with cancer was significantly decreased compared to the normative population cannot be attributed to any of those disease- and treatment-related factors. These findings support the results of other studies, which found that medical variables could not predict distress in partners [15, 20]. The results indicate that, although mental QOL in partners of patients with cancer is significantly impaired, there is no linear relationship between the severity of the disease (as measured with these variables) and the impact on partners' psychosocial well-being. They further imply that, in couples with breast cancer patients, patient's and partner's QOL appear to be associated regardless of stage and other clinical variables.

Even though this study is one of the first attempts to address this topic, there are some limitations to the current approach. First, there are the usual problems associated with cross-sectional data, especially concerning an undetermined causal direction between variables. With the performed cross-sectional study design only correlations between patient's and partner's QOL could be analyzed while the causal direction of the association between these variables remains unclear. However, it can be assumed that the patient's QOL might be decreased due to the partner's distress. Second, the demographic characteristics of the sample might limit the generalizability of our findings. The mean age of the partners (between 57 and 62 years) was rather high, however, well within the usual age range of samples of cancer patients and their partners. Third, a comparison with healthy couples may have provided relevant information on partners' QOL without the diagnosis of cancer influencing a relationship. Fourth, some variables which might have explained some of our findings have not been assessed. Results from previous studies on communication and social support indicate that these are important mediators of patients' as well as partners' distress [11, 13, 15, 33].

Finally, the assessment of disease- and treatment-related factors was restricted to tumour stage, time since diagnosis and treatment received. Physical symptoms of the cancer patient were only accounted for within the physical subscales of the SF-36. An inclusion of a more detailed assessment of physical symptoms such as treatment side-effects might have given a more comprehensive view and thus might have allowed for more detailed analyses on the association of the patient's physical state and the partner's QOL.

Despite these limitations our study does have relevant clinical implications. QOL issues with regard to cancer patients are often discussed in the context of treatment decisions and side-effects. Consequently, the contact between cancer patients, their partners and health care professionals is mainly centred around the physical aspects of the disease and its treatment and side-effects. The finding that the patient's mental rather than physical condition significantly influences the partner's well-being stresses the importance of distress screening not only for the sake of the patient's psychosocial treatment but also with regard to possible family or couple interventions. More often than not, the role of the partner is only pictured as a source of social and practical support for the patient, but these findings indicate that partners of patients with low QOL might be in need of external support themselves.

The analysis of predictors of partners' QOL identifies those who might be at higher risk or might need special support. Future research should examine QOL longitudinally, so that the course of QOL in relationship with different treatment stages can be investigated. Furthermore, coping patterns and the effect of minimal interventions such as the different sources of information might be relevant mechanisms which should be examined in depth.

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