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Psychometric Properties of the Questionnaire on Stress in Partners of Cancer Patients

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Abstract

A cancer disease can be associated with psychological stress for both patients and partners. To date, no psychometrically tested measuring instrument has been available for the assessment of cancer-specific distress in partners of cancer patients. The Questionnaire on Stress in Partners of Cancer Patients (QSC-P) was developed to close this gap. This study validates the QSC-P in two subsamples of n1 = 227 and n2 = 297 partners of cancer patients by application of exploratory factor analysis methods in n1 and confirmatory factor analysis methods in n2. Additionally, correlations with common measures of anxiety, depression, and quality of life were calculated. A cut-off for high distress was determined. A three-factor structure with 23 items that was generated in n1 could be replicated in n2. Reliability and validity analyses resulted in good to very good characteristic values of the resulting QSC-P (α = .84– .93). A cut-off of 68.5 with good sensitivity and specificity was calculated. The QSC-P proved to be a valid and reliable measuring instrument for psychological distress of partners of cancer patients and a helpful tool for clinical care and research. Future directions include development of a short-form and detailed comparison of the sexes.

In the last decades, there has been a growing awareness that a cancer diagnosis and its treatment not only affect the patients but also their families (Girgis & Lambert, 2009). Usually, the primary caregiver of patients is the spouse and spouses have been identified as the most important source of support for cancer patients (Manne & Badr, 2008). Like the patients, partners can experience psychosocial, emotional and physical distress (Girgis et al., 2013). In contrast to mental illness, the term distress does not represent specific symptoms or syndromes but describes a conglomerate of mental (cognitive, emotional, behavioral), social and spiritual components that can occur and change at any time of the illness and that is experienced as overstraining and uncontrollable (Schwarz & Singer, 2008).

In addition to intensive emotional and practical support for the patient during the usually long course of the cancer disease and treatment, partners must also consider and process the effects of the disease on their own well-being (Given & Sherwood, 2006). The fear of death, as well as the unpredictability of the disease combined with helplessness and loss of control, are frequent cancer-specific strains (Northouse et al., 2012; Toseland et al., 1995). The majority of studies describe a clinically significant level of distress, anxiety and depressive symptoms in caregivers that can be equated to or even exceed that of the patients (Bergelt et al., 2008; Couper et al., 2006; Eton et al., 2005; Kim et al., 2008; Lambert et al., 2013; Manne et al., 2005).

In the constantly progressing improvement of psychosocial care for cancer patients and their relatives, there is no comprehensive psychometrically tested measuring instrument in German-speaking countries that records the cancer-specific distress of the patient's partners. Cancer-induced stressors are often very multifaceted and represent a multitude of stress ranges (Mehnert & Koch, 2008). The necessity of developing a psychometrically sound procedure is shown by the fact that although previously known self-evaluation instruments cover mental symptoms and syndromes (Fletcher et al., 2012), the additional stress ranges that may exist are not adequately investigated in this specific situation. Thus, the main objective of the present study was to develop and psychometrically validate the *Questionnaire on Stress in Partners of Cancer Patients* (QSC-P) to close this gap and to record the existing stressors in a differentiated and cancer-specific way.

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Development of the QSC-P

First, an extensive literature search and supplementary discussions with experts in the field of psycho-oncology from both research and clinical care narrowed down the characteristics to be recorded. In addition, suitable items from the existing Questionnaire on Stress in Patients with Cancer (QSC; Herschbach et al., 2003), were adapted in terms of content in order to fit the spouse's perspective. The QSC is a psychological test that measures subjective psychological, social and somatic stress that can occur in cancer patients of all diagnoses and at all stages of treatment. The items describe current everyday stresses in all areas of life in concrete terms and in everyday language. Each of these potential stress situations should be answered in two ways: does it currently apply to the respondent and, if so, what is the extent of the stress caused by the problem. The answer categories are on a 5-point Likert scale from $0 = $ does not apply to $5 = $ applies and burdens me very much. For the development of the QSC-P, a first item pool of 53 items, which surveyed mental, social and partnership stress areas, was developed and tested in a pilot study (Kopsch, 2012). For the item analysis the indices selectivity, item difficulty and homogeneity were considered. Based on these values, an item selection was made. The aim was to identify those items that discriminate as well as possible between the test persons from the point of view of both method and content. In addition, items with duplicated content were removed from the item pool in order to develop a measuring instrument that is as economical as possible. The resulting 27 item version was then used as the item pool for the present study.

The present study aimed to further develop the QSC-P's structure and then validate this afterward. Additional examination of validity, item analyses, and the calculation of a cut-off was scheduled in order to maximize the QSC-P's utility for practical application.

Method

Data Sampling and Procedure

Inclusion criteria were that participants have been in a relationship with a cancer patient for at least 1 year, the relationship was already existing at the time of cancer diagnosis and the participant's partner had to be alive at the time of the survey. Exclusion criteria were language difficulties and severe mental or cognitive impairments. The dataset in this cross-sectional study consists of two subsamples. The study has been approved by the ethics committee of the University of Braunschweig (FV-2013-01). Written informed consent was obtained from all individual participants included in the study. The study conforms with the principles outlined in the Declaration of Helsinki.

Subsample 1

Subsample 1 was acquired through responses of partners of cancer patients collected in hospitals and oncological practices and centers, rehabilitation clinics, self-help groups, and cancer counseling centers as well as cancer-related internet forums. In addition, the study was referred to in newspaper advertisements and information presentations. Paper pencil versions of the survey as well as an online version were available. A total of 112 persons was approached via the paper-pencil survey resulting in 55 returned questionnaires (response rate = 49.1%). The online survey was started by 889 people and 178 (response rate = 20%) finished the survey and were thus included in the preliminary sample of 233 participants (overall response rate = 23.3%). It was decided that a maximum of three ($\sim$ 11%) missing values in the pool of 27 potential QSC-P items would be tolerable. No participant in this subsample exceeded this threshold. However, six cases (2.58%) were removed due to missing sex specification, resulting in a sample of $n_1 = 227$ participants.

Subsample 2

For subsample 2, similar recruitment channels were used as for subsample 1, but recruitment took place after completion of subsample 1 survey. Thus, the two subsamples are different subjects. A total of 947 paper-pencil questionnaires were distributed. The response rate was 32.1% with 304 returns. After seven participants (2.3%) were excluded due to more than three missing QSC-P items, this sample consisted of $n_2 = 297$ cases.

Participants

The final total sample consisted of $N = 524$ participants. The two subsamples differed in a statistically significant way regarding age, relationship status, relationship duration, education, and employment status (see Table 1).

Measures

Depression and anxiety. The German version of the Hospital Anxiety and Depression Scale (HADS-D) (Herrmann-Lingen et al., 2011) is a 14-item self-report screening instrument for anxiety and depression with two 7-item scales on a 4-point Likert scale ranging from 0 to 3 (not present; considerable), with higher scores indicating more anxiety or depressive symptoms. Scales have scores ranges from 0 to 21 and the cut-off indicating anxiety disorder and/or depression is $\geq$ 12. The HADS-D was used in subsample 1 and internal consistencies for this study were $\alpha = .88$ (depression) and $\alpha = .86$ (anxiety). In subsample 2 the Patient Health Questionnaire (PHQ-9 (Kroenke et al., 2001)) was used as a screening tool for depression. Participants respond to nine items on a 0–3 Likert scale (not at all; nearly every day) with higher scores reflecting higher levels of symptoms. The total score ranges from 0 to 27 and the cut-off of $\geq$ 10 indicates moderate depression. The internal consistency of the PHQ-9 in the present study was $\alpha = .86$. The Generalized Anxiety Disorder 7 (GAD-7 (Spitzer et al., 2006)) was used in subsample 2 as a self-report anxiety measure. Participants respond to seven items on a Likert-scale

Table 1. Demographic Characteristics of the Subsamples and the Total Sample.

	Subsample 1 ($n_1 = 227$)	Subsample 2 ($n_2 = 297$)	$p^{\dagger}$	Total Sample ($N = 524$)
Age in years	51.46	63.22	<.001	58.16
(SD, range)	(13.34, 19–83)	(11.04, 25–85)		(13.40, 19–85)
Sex (%)			.163	
Male	84 (37)	129 (43.4)		213 (40.7)
Female	143 (63)	168 (56.6)		311 (59.4)
Relationship status[‡](%)			<.001	
Married	178 (78.4)	272 (91.6)		450 (85.9)
Non-married (in partnership)	49 (21.6)	23 (7.7)		72 (13.7)
Relationship duration			<.001	
Years	27.05	34.96		32.66
(SD, range)	(16.10, 2–60)	(14.79, 1.5–62)		(15.59, 1.5–62)
Education (%)			<.001	
<=9 years[§]	36 (15.9)	105 (35.4)		141 (26.9)
10 years[§]	76 (33.5)	77 (25.9)		153 (29.2)
>10 years[§]	107 (47.1)	107 (36)		214 (40.8)
Other	8 (3.5)	—		8 (1.5)
Employment status (%)			.015	
Not unemployed	219 (96.5)	296 (99.7)		515 (98.2)
Unemployed	8 (3.5)	1 (0.3)		9 (1.7)

Note. [†]Group difference of subsample 1 and subsample 2. [‡]All participants were in a relationship. [§]Percentages are calculated from valid cases of school attendance.

ranging from 0 to 3 (not at all; nearly every day) and higher scores reflect higher symptoms. The total score ranges from 0 to 21 and a cut-off of ≥ 10 indicates a general anxiety disorder. The GAD-7 had an α of .90 in the present study.

Quality of life. The Short-Form Health Survey (SF-8 (Ware et al., 2001)) measures eight domains of quality of life that cover among others: physical and social functioning, global health, vitality, and bodily pain. Responses are summed into a physical (PCS) and a mental component score (MCS). These scores can be compared to sex- and age-specific norms from various countries. Internal consistency for the SF-8 in the total sample of the present study was α = .89.

Statistical Analysis

All statistical analyses were performed in R (R Core Team, 2018) and Factor (Lorenzo-Seva & Ferrando, 2006). Exploratory factor analysis (EFA) related computations were done in Factor, confirmatory factor analysis (CFA) related calculations were done using the R packages lavaan (Rosseel, 2012), semTools (Jorgensen et al., 2018) and mice (Buuren & Groothuis-Oudshoorn, 2010). All tests were based on a significance level of .05.

The number of remaining missing values in subsample 1 was low with seven (3.08%) participants returning the survey with up to three missing values in QSC-P items. The amount of missing data in QSC-P items was generally higher in subsample 2 than in subsample 1. In subsample 2 a group of 56 (18.9%) persons returned incomplete QSC-P questionnaires with up to three missing items. In order to account for the missing values in QSC-P items, multiple imputation methods

were used to impute missing values across the QSC-P items in factor analysis related computations.

The QSC-P's factor structure was tested using EFA-methods on subsample 1 ($n_1 = 227$). First, Kaiser-Meyer-Olkin sampling adequacy and Barlett's test of sphericity were examined to ensure that the data is suitable for EFA-methods. Then, parallel analysis was applied to determine the number of factors to be extracted. Missing values in QSC-P items were imputed using the hot–deck multiple imputation function of Factor. The model was then estimated using a robust weighted least squares estimator that uses diagonally weighted least squares as well as mean and variance adjusted test statistics as the QSC-P is measured on a categorical scale (WLSMV; (Barendse et al., 2015; Muthén, 1984)). In order to allow for the typically observed correlations of extracted factors (Schmitt, 2011), an oblique rotation method (Promin) was applied. Factor loadings of $\geq .45$ were taken into account and are considered fair according to Comrey and Lee (Comrey & Lee, 1992).

After EFA methods were utilized to extract factors, CFA-methods were conducted on subsample 2 ($n_2 = 297$) to validate the proposed factor structure. Missing values in QSC-P items were imputed using the mice package's chained equations method (Buuren & Groothuis-Oudshoorn, 2010). Parameters of the CFA were also estimated using WLSMV estimation. Model fit was assessed through the following fit indices: χ^2-test statistic for absolute fit, comparative fit index (CFI; (Bentler, 1990)) for fit relative to a null model, Root Mean Square Error of Approximation and 90% Confidence Interval (RMSEA; (Steiger & Lind, 1980)) and Standardized Root Mean Square Residual (SRMR; (Bentler, 1995)) for overall fit. The χ^2 test statistic is sensitive to large sample sizes and thus tends to reject models in large samples (Bollen, 1989).

According to Hu and Bentler (1999), good model fit can generally be assumed when CFI is higher than 0.95 (>0.90 is acceptable), SRMR is smaller than 0.08 and RMSEA is smaller than 0.06 (<0.09 is acceptable).

Cronbach's alpha (α, Cronbach, 1951) and McDonald's omega (ω, McDonald, 1999) were used to assess the internal consistencies of the QSC-P subscales in the total sample ($N = 524$).

The validity of the QSC-P was assessed by calculating Pearson-correlations between QSC-P total and subscale scores and depression, anxiety, and SF-8 subscale scores.

A receiver operator characteristic (ROC) curve analysis was applied via R's *pROC* package (Robin et al., 2011) to calculate the cut-off for the QSC-P total score and the area under the curve (AUC) to represent accuracy. The analysis was performed on the total sample as well as for men and women separately with anxiety and/or depression as a categorical criterium. The anxiety and/or depression category was formed using the HADS-D subscales as well as PHQ-9 and GAD-7 scores and their corresponding cut-offs (0 = no anxiety/depression indicated; 1 = anxiety/depression indicated). The AUC provides information on the discrimination ability of the test. Scores > .90 indicate excellent, >.80 indicate good, and >.70 indicate fair discrimination ability (Swets, 1988). In addition, sensitivity (SEN), specificity (SPE) and the Youden-Index (J = SENE + SPE-1) (Youden, 1950) were calculated.

Results

Exploratory Factor Analysis

First, the test of the Kaiser-Meyer-Olkin measure of sampling adequacy ($MSA = .92$) and Barlett's test of sphericity ($\chi^2 = 3399.2, p < .001, df = 351$) showed the data of subsample 1 ($n_1 = 227$) to be well suited for the application of EFA methods. Then, a parallel analysis of the data indicated that three factors should be extracted. A first three-factor EFA was then conducted and 23 of the 27 items showed factor loadings above the chosen threshold of .45. No items showed meaningful ($\geq .30$) cross-loadings on a second factor. A second EFA was then computed with these 23 items, leaving all of them with factor loadings above .45. Again, no significant cross-loadings could be observed. The three resulting scales were labeled as "Fear of progression," "General psychological stressors," and "Relationship stressors" according to their content. "Fear of progression" concerns the progression or worsening of the disease (e.g., "I'm afraid my partner will die from the disease" or "Uncertainty about the further course of the disease is/was difficult to bear"). The scale "General Psychological Stressors" describes typical psychological aspects of cancer-related stress. It includes symptoms of depression such as depressive mood and lack of drive. It also includes the consequences of long-term psychological stress such as overexertion, concentration problems, insomnia, exhaustion or psychosomatic complaints. For example: "Due to the illness of my partner it is difficult for me to get involved in activities" or "Due to the illness of my

partner I feel exhausted." The third scale "Relationship Stressors" defines and describes dysfunctional partnership patterns in dealing with the illness and asks for physical closeness, communication behavior and stability of the partnership (e.g., "Due to my partner's illness, our relationship has become more problematic" or "Due to my partner's illness, we exchange less physical affection"). The item loadings of the final three-factor solution, as well as the removed original items, are presented in Table 2.

Confirmatory Factor Analysis

The next step was to test if the data of subsample 2 ($n_2 = 297$) fitted the three-factor structure that was indicated by the EFA of subsample 1. The model showed an acceptable to good overall model fit with $\chi^2 = 508.316$, df = 227, $p < .000$, RMSEA = .06 (CI = .06–.07), CFI = .93, and SRMR = .00. In order to see if model fit could be improved, the content of the variables was examined to explore possible overlaps in content as similar content is known to have a negative impact on model fit when corresponding error covariances are not freed (Gerbing & Anderson, 1984). Additionally, modification indices were consulted. This revealed that including the error covariance of items 1 and 3 in the model showed the highest potential for model fit improvement (modification index = 103.80, standardized expected parameter change = .265). As the two items considerably overlap in content, it was likely that their covariance was not adequately taken care of by the latent variable.

The model was thus refitted with the freed error covariance of items 1 and 3 and differed significantly in fit from the initial model, $F(1, 3702.94) = 60.683, p < .000$. Additionally, it now showed a good to very good model fit with $\chi^2 = 303.449$, df = 226, $p < .000$, CFI = .95, RMSEA = .06 (CI = .05–.06), and SRMR = .00. A high correlation between the factors ($r = .74$) suggested the constructs Fear of Progression and General Psychological Stressors are considerably overlapping but still beneath a threshold of .85 (Cohen et al., 2003). Figure 1 shows the standardized factor loadings of the final model.

Reliability

The three scales of the QSC-P showed very good internal consistencies of $\alpha = .91/\omega = .92$ for Fear of progression, $\alpha = .93/\omega = .93$ for General psychological stressors, $\alpha = .84/\omega = .84$ for Relationship stressors and $\alpha = .94/\omega = .94$ for the total scale. This suggests very good internal validity of the QSC-P.

Validity

Correlations of the QSC-P total score with depression and anxiety were $r = .68$ ($p < .001$) and $r = .69$ ($p < .001$) respectively. The QSC-P total score also correlated in a statistically significant way with the PCS ($r=-.23, p < .001$) and especially the MCS scores ($r=-.70, p < .001$) of the SF-8. The

Table 2. Loadings of the Exploratory Factor Analysis.

Item No.	Item (German translation)	FoP[†]	GPS[‡]	RS[§]
	Due to/since my partner's illness . . . (Durch die/seit der Erkrankung meines Partners . . .)			
1.	. . . I often feel tired and weak. (. . . fühle mich häufig schlapp und kraftlos.)		1.03	
2.	. . . our relationship has become more problematic. (. . . ist unsere Beziehung problematischer geworden.)			.77
3.	. . . I feel exhausted. (. . . fühle ich mich erschöpft.)		.92	
4.	. . . I suffer from unexplained physical complaints (e.g., abdominal, head or back pain). (. . . leide ich unter ungeklärten körperlichen Beschwerden (z.B. Bauch-, Kopf-, oder Rückenschmerzen).)		.76	
5.	. . . it is difficult for me to get involved in activities. (. . . kann ich mich schwer zu Tätigkeiten aufraffen.)		.98	
6.	. . . I cry a lot. (. . . weine ich viel.)		.72	
7.	. . . I have severe mood swings. (. . . habe ich starke Stimmungsschwankungen.)		.91	
8.	. . . I feel strong anxiety and panic when I think of the disease. (. . . verspüre ich starke Angst und Panik, wenn ich an die Erkrankung denke.)	.60		
9.	. . . I feel overwhelmed. (. . . fühle ich mich überfordert.)		.65	
10.	. . . I suffer more often from sleep disorders. (. . . leide ich häufiger unter Schlafstörungen)		.52	
11.	. . . we exchange less physical affection. (. . . tauschen wir weniger körperliche Zärtlichkeit aus.)			.60
12.	. . . I am often depressed. (. . . bin ich häufig niedergeschlagen.)		.74	
13.	. . . my partner closes himself off from me. (. . . verschließt sich mein Partner von mir.)			.85
14.	. . . our relationship is less resilient. (. . . ist unsere Beziehung weniger belastbar.)			.93
15.	I'm afraid my partner will die from the disease. (Ich habe Angst, dass mein Partner durch die Erkrankung stirbt.)	.93		
16.	The waiting times between the medical examination and the results are/were grueling. (Die Wartezeiten zwischen der medizinischen Untersuchung und dem Ergebnis sind/waren zermürbend.)	.58		
17.	I am afraid of the extension/progression of my partner's disease. (Ich habe Angst vor einer Ausweitung/dem Fortschreiten der Erkrankung meines Partners.)	1.03		
18.	The side effects and consequences of the treatment are/have been frightening. (Die Nebenwirkungen und Folgeerscheinung der Behandlung sind/waren erschreckend.)	.53		
19.	To acknowledge the fact that my partner is ill is/was very difficult. (Die Tatsache anzuerkennen, dass mein Partner erkrankt ist, ist/war sehr schwer.)	.50		
20.	I'm afraid my partner might get pain from the disease. (Ich habe Angst, dass mein Partner durch die Erkrankung Schmerzen bekommen könnte.)	.95		
21.	Uncertainty about the further course of the disease is/was difficult to bear. (Die Ungewissheit über den weiteren Verlauf der Erkrankung ist/war schwer zu ertragen.)	.83		
22.	I don't want to burden my partner with my fears regarding the disease. (Mit meinen Ängsten in Bezug auf die Erkrankung will ich meinen Partner nicht belasten.)	.55		
23.	In terms of the disease, I'm afraid of what the future will bring. (In Bezug auf die Erkrankung habe ich Angst vor dem, was die Zukunft bringt.)	.90		
24.	Often I don't even know how I can support my partner with the disease. (Oft weiß ich gar nicht, wie ich meinen Partner mit der Erkrankung unterstützen kann.)	This item did not load meaningfully on any factor		
25.	Since the illness I have taken over the tasks of my partner in family and household. (Seit der Erkrankung habe ich die Aufgaben meines Partners in Familie und Haushalt übernommen.)	This item did not load meaningfully on any factor		

(continued)

Table 2. (continued)

Item No.	Item (German translation)	FoP[†]	GPS[‡]	RS[§]
	Due to/since my partner's illness . . . (Durch die/seit der Erkrankung meines Partners . . .)			
26.	I have ways to replenish the reserves of strength that have been depleted by the disease. (Ich habe Möglichkeiten, die durch die Erkrankung aufgebrauchten Kraftreserven wieder aufzutanken.)			This item did not load meaningfully on any factor
27.	I talk openly with my partner about the disease. (Ich spreche mit meinem Partner offen über die Erkrankung.)			This item did not load meaningfully on any factor

Note. [†]Fear of Progression. [‡]General Psychological Stressors. [§]Relationship Stressors. Loadings lower than absolute .30 were omitted.
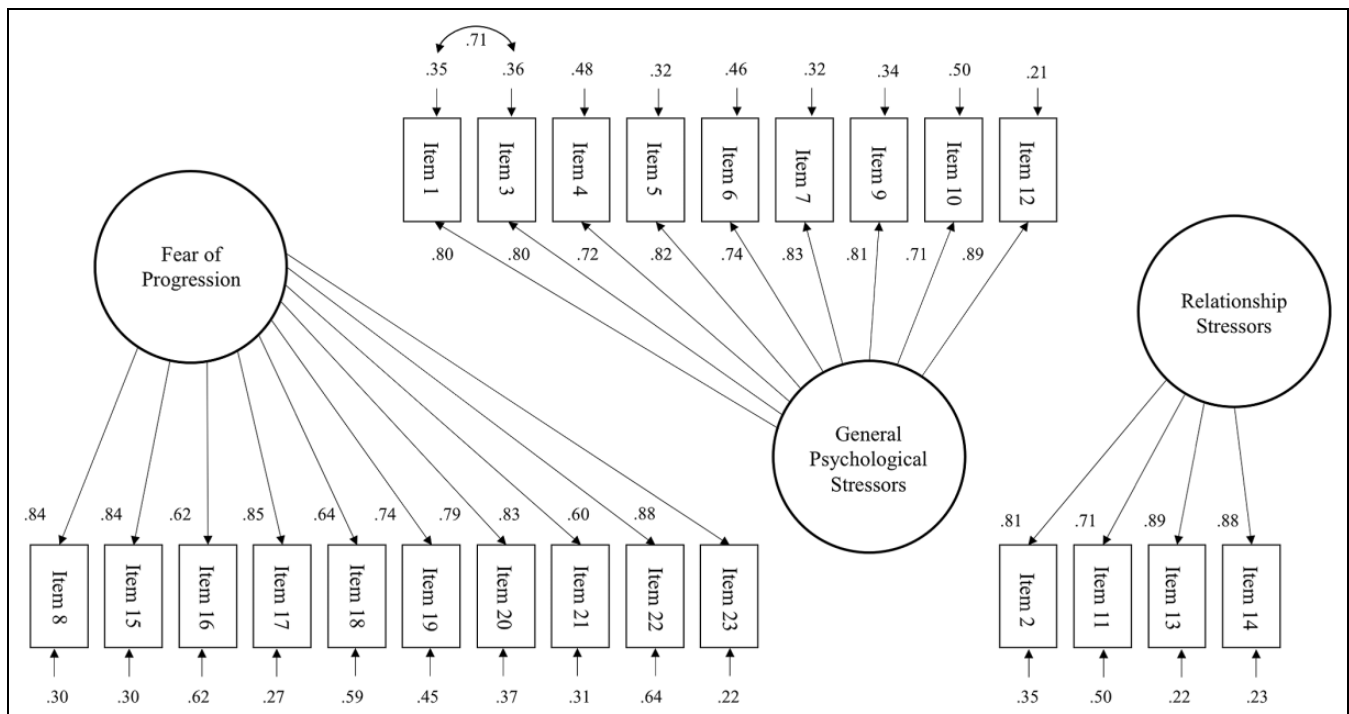
Figure 1. Standardized loadings of the confirmatory factor analysis. Inter-factor correlations: $r_{\text{Fear of Progression, General Psychological Stressors}}$ = .74, $r_{\text{Fear of Progression, Relationship Stressors}}$ = .46, $r_{\text{General Psychological Stressors, Relationship Stressors}}$ = .57. All loadings were statistically significant ($p < .05$).

same pattern was observed for all three subscales as can be seen in Table 3.

Cut-Off Scores

Cut-off scores were calculated in the total sample as well as for males and females separately. The ROC analysis of the total sample indicated a good fit (AUC = .89; 95% CI = . 86–.91) resulting in a cut-off score of 68.5 while the scale mean was 55.2 (SD = 26.11). The cut-off had a sensitivity off .77, a specificity of .87, and a Youden-Index of J = .63. For males, the same cut-off score of 68.5 emerged with a scale mean of 51.53 (SD = 23.5), SEN = .75, SPE = .90, AUC = .87, 95% CI = .81–.92, J = .65. The cut-off score for women was 70.5

with a scale mean of 57.72 (SD = 27.51), SEN = .76, SPE = .88, AUC = .89, 95% CI = .85–.92, J = .64.

Discussion

The aim of this study was to develop and psychometrically evaluate a measure of psychological distress in partners of cancer patients, the QSC-P. While the question of whether instruments should be developed for very specific situations or whether wide-range instruments should be used for diagnostics is critically discussed in research (Deeken et al., 2003; Weitzner et al., 1999), the focus of most research efforts is on detecting symptoms, syndromes, and conditions as differentiated as possible. This ultimately requires specific

Table 3. Correlations of the QSC-P Subscales with Depression (PHQ-9), Anxiety (GAD-7) and Quality of Life (SF-8).

	PHQ-9[†]	GAD-7[‡]	SF-8[§]	
			PCS	MCS
Fear of Progression	.53***	.59***	−.13***	−.56***
General Psychological Stressors	.72***	.71***	−.30***	−.73***
Relationship Stressors	.39***	.34***	−.14**	−.38***

Notes: [†]Patient Health Questionnaire. [‡]Generalized Anxiety Disorder 7. [§]Short-Form Health Survey with the physical (PCS) and mental component score (MCS). ***$p < .001$. **$p < .01$.

questionnaires as they provide more precise information and allow conclusions about necessary clinical implications.

A three-factor structure containing 23 items that was close to the structure found in a former pilot study (Kopsch, 2012) was indicated by EFA-methods and could be replicated via CFA resulting in a well-fitting model. The resulting scales were described as "Fear of Progression," "General Psychological Stressors," and "Relationship Stressors." All scales showed very good internal consistency. The partly high correlations of the measured constructs indicate a significant overlap in content at least for "General Psychological Stressors" and "Fear of Progression" ($r = .74$). Nonetheless, this correlation ranges still beneath the threshold formulated by Cohen et al. (Cohen et al., 2003) and the differentiation is thus statistically justified. But the separation of "General Psychological Stressors" from "Fear of Progression" is especially useful regarding clinical practice. Fear of progression emerged as a specific anxiety that is clearly distinguished from other anxieties or psychosocial stress and therefore requires separate consideration (Herschbach et al., 2005).

All scales of the QSC-P correlated positively in the medium to high range with the self-report measures used for testing convergent validity regarding symptoms of depression and anxiety. There were additional medium to high negative correlations with measures for quality of life, especially regarding the mental aspects, which add to the assumption of the validity of the QSC-P. As there is no complete agreement with the given constructs, the conceptual independence of the QSC-P is guaranteed at the same time.

ROC analyses were performed and cut-off values were determined for the total sample as well as for men and women individually. All determined cut-off values indicate a fair to good discrimination ability and thus confirm the diagnostic selectivity of the questionnaire since they all exceed the threshold value of 0.5 (Swets, 1988). With a sensitivity of 77% and a specificity of 87%, just under a quarter of the respondents that were actually significantly affected regarding depression and/or anxiety symptoms would not be recognized when the cut-off for the total sample of the QSC-P was considered. At the same time, the specificity determined here indicates that only 13% of cases in which there is no clear burden are nevertheless classified as such. Because of the little difference in sensitivity, the sex-specific cut-offs might not

be of great practical value and can thus be ignored. The calculated cut-off value across both sexes indicates a good quality of the procedure, as it is within the guideline values that are considered desirable for many test procedures in the psychological area (Browne & Cudeck, 1992).

It should nonetheless be considered that the QSC-P is not designed to screen for mental illness, but rather to describe the extent of the subjectively perceived distress. A critical issue to discuss is the extent to which this distress is a construct that is easy to dichotomize. Dichotomization is obviously necessary in order to determine subgroup differences in research or help for decision making in screening processes while a dimensional view on distress in the clinical care of cancer patients and relatives should be favored. It should be kept in mind that distress can influence disease management in many ways (Mehnert et al., 2006) and does not only have a negative effect on the quality of life of the affected person when a cut-off is exceeded. Therefore, the presented cut-off should carefully be regarded as a guideline value, for example with regard to how fast interventions should be carried out. The results of a large database with cancer patients using the QSC-R10 showed a large heterogeneity in the experience of distress in terms of socio-demographic and clinical variables (Herschbach et al., 2019).

Limitations

The present study shows a number of methodological limitations. First, due to the breadth of recruitment for both subsamples a homogeneity of the samples could not be ensured, which leads to slight differences in the two subsamples. This selective sampling should be considered in the effort to generalize the results obtained. In addition, the low recruitment rate may also lead to bias and limited generalizability. Future research on the QSC-P should seek to ensure a more representative data collection in order to increase the generalizability of the results.

Secondly, only partners of cancer patients were included in the data collection. Accordingly, it was not possible to take the medical data of the patients into account. Data collection from the patients would have been beneficial for the completeness and complexity of the information collected, but it was assumed that a smaller sample size would have been achieved by dyadic data collection. However, the primary objective of the study was to check the QSC-P psychometrically, so that as large a sample as possible was required, which is why the additional survey of patients was omitted.

In addition, the current sample is very heterogeneous with regard to the time since diagnosis, as no restrictions were made in this respect. Since it can be assumed that partners in different stages of the disease experience different strains and intensities (Hagedoorn et al., 2008; Kim et al., 2013; Lambert et al., 2013), the results of the present study should not be generalized to all partners in all stages of the disease. The sample size in the present study was too small to form subgroups with regard to the time of onset of the disease, in order to record burdens in different phases of the disease in a more differentiated way. This could be another goal for future research. The detection of

cancer-specific distress immediately after diagnosis and during intensive primary medical treatment seems to be of particular interest. It is known that partners often experience the highest distress during this period (Kim et al., 2013) and interact more directly with the medical staff so that the threshold for receiving psychosocial support is lowered.

Cella and colleagues (Cella et al., 1996) emphasize that the burden of responding to self-report instruments should always be considered in the clinical setting. According to this, the QSC-P with 23 items cannot be regarded as an economic and less stressful self-evaluation instrument, making the evaluation of a short form another reasonable goal for future research.

Additionally, future examinations of the QSC-P's factor structure should determine whether a second order factor model might fit that data even better due to the high factor intercorrelations that were observed in the present study.

Clinical Implications

The psychometric examination in the present study offers a number of implications for psycho-oncological research and practice, as the presented results suggest that the QSC-P is a useful tool for psycho-oncologic research and practice. To our knowledge, there is no other reliable, valid, German-language instrument for the measurement of distress in partners of cancer patients besides the newly developed QSC-P. Additionally, the determination of a cut-off offers the possibility of categorical assessment which is of high practical utility.

Conclusions

It can be summarized that the QSC-P is a helpful and valid tool for the assessment of psychological distress in partners of cancer patients and ready for further examination. Future research directions include normative scores collected in a more representative sample, more detailed comparison in group differences regarding sex, time since diagnosis and cancer entity of the diseased partner. Lastly, a psychometrically tested short form could help to make the QSC-P a standard instrument in psycho-oncological research and care in German-speaking countries.

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