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PSYCHOMETRIC PROPERTIES OF A POLISH VERSION OF THE PARENTING CONCERNS QUESTIONNAIRE AMONG PARENTS WITH CANCER

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In this study, I investigated parenting concerns and worries in parents during cancer treatment and examined the psychometric properties of the Polish version of the Parenting Concerns Questionnaire. Reliability, as well as factorial and convergent validity, were analyzed. A total sample size of 145 parents during cancer treatment (parents of children aged 18 years or younger at the time of the survey) participated in the study. The study was an online survey method conducted between January 2019 and December 2021. Parents were sent a survey link and were requested to fill the Perceived Stress Scale (PSS-10), the Parenting Stress Index (PSI-3-SF), the SF-36v2 Health Survey (SF-36v2), and the Family Resilience Assessment Scale (FRAS). The author received permission for using these questionnaires in online research. Confirmatory factor analysis of the Polish version of the Parenting Concerns Questionnaire did not confirm the original three-factor structure. However, the standardized factor loadings for the three factors were moderate to high. Additionally, apart from high-reliability estimates, this instrument proved to have good convergent and discriminant validity for all three factors. The PCQ-PL demonstrated adequate convergent validity with expected correlations with parenting stress, perceived stress, quality of life, and family resilience. The results suggest that the PCQ-PL is a reliable and relatively valid measurement tool to evaluate the level of parental concerns in Polish patients. The PCQ can be a useful tool to recognize parents with cancer who might need psychological support regarding combining the role of a parent and oncological patient.

Keywords: cancer; oncology; Parenting Concerns Questionnaire; parents with cancer; validation study.

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The prevalence of cancer in parents of dependent children (under 18 years of age) is difficult to estimate because cancer registries do not systematically collect demographic statistics on whether a person diagnosed with cancer has minor children. Most data are based on estimating the likelihood of having dependent children based on the patient's age at cancer diagnosis. It is assumed that patients aged 24–59 years are likely to be parents of children under 18 years of age (Laizner, 2018). In Poland, in 2014 the incidence of malignant neoplasms in early adulthood was 6.7 thousand in women and 3.6 thousand in men, and in middle adulthood (age group 45–64) it was 3.2 thousand in women and 2.9 thousand in men (Wojciechowska et al., 2016). Moreover, in 2016 cancer became the dominant cause of death in young women (about a third of deaths in women aged 20–44 years) and middle-aged women (about half of deaths in women aged 45–64 years). Cancer was also the cause of a third of premature deaths in middle-aged men (45–64 years) (Didkowska, 2019). According to Global Cancer Observatory (2021), the incidence of cancer among young adults is increasing, at a period when parenting is one of the most important developmental tasks and this group of patients may need support in building strategies of combining the roles of a parent and a patient. In 2020, around 1.2 million young adults (aged 20–39) were diagnosed with cancer worldwide and 360 died from it.

Parents with cancer struggle not only with the physical and psychological burdens of the disease and its treatment, but also with concerns about the impact of the disease on their children's lives, the need for changes in the parenting role, and the inevitability of reconciling the tasks and needs of combining the roles of patient and parent (Kuswanto et al., 2018; Matuszczak-Swigoń & Bakiera, 2021). Most research on parenting in the context of cancer focuses on mothers and the impact of a parent's illness on children (Compas et al., 1996; Heiney et al., 1997; Helseth & Ulfsaet, 2003; Rauch & Muriel, 2004), with less research on how cancer affects being a parent. The experience of parenting during cancer was studied mainly using qualitative methods. The systematic review of qualitative studies by Matuszczak-Świgoń and Bakiera (2021) shows that parents during cancer face many challenges: 1) combining the role of a parent and patient, fulfilling the tasks that result from these roles; 2) identity reconstruction; 3) managing emotions caused by the difficult situation; 4) modifying the system of meanings and values; 5) deciding on the manner, scope, and time of informing family members—especially children—about the disease, its course, and prognosis. In order to cope with them they develop various strategies focusing on minimizing the negative impact of the disease on their children (Matuszczak-Świgoń & Bakiera, 2021). Research on ill parents shows that both cancer affects the experience of parenting and that being a parent affects treatment decisions and patients' quality of life (Check et al., 2017; Nilsson et al., 2009; Rauch & Muriel, 2004; Yellen & Cella, 1995). Parenting concerns influence decisions about when to start treatment and what type of treatment to apply. For example, some mothers delayed the start of treatment because they did not want to disrupt family life at special times, such as Christmas (Mackenzie, 2014). Quantitative studies report higher levels of psychological distress, the intrusiveness of illness, depressive and anxiety symptoms, and the fear of recurrence in parents with cancer (Arès et al., 2014; Götze et al., 2017). Mothers who reported the highest levels of parenting concerns about their low mood, physical limitations and changes in daily family life had the lowest levels of parenting efficacy (Moore, 2015). Moreover, parenting concerns in cancer are associated with anxiety, parental stress and depressive symptoms, and poorer quality of life (Inhestern et al., 2016a; Inhestern et al., 2016b; Park et al., 2016; Tavares et al., 2020). In a study by Stinesen-Kollberg et al. (2013), mothers who worried about the negative impact of illness on their children were 2.26 times more likely to have poorer psychological well-being. Concern about the impact of a parent's illness on a child was the most important factor associated with mothers' low well-being. It is therefore important to develop and test valid and reliable tools to identify parental worries during cancer. A reliable tool for assessing these problems will contribute to improving the healthcare services offered to these patients related to their parental needs. Parenting concerns are defined as parents' worries about the influence of cancer on their children and the capability to manage the parenting role during the cancer experience (Park et al., 2018).

Muriel and colleagues (2012) constructed a tool to assess specific parenting concerns during cancer. This questionnaire is composed of 15 items with a three-factor structure with five items for each factor. The items of the Parenting Concerns Questionnaire were constructed on the basis of telephone focus groups with parents with cancer with dependent children.

So far, there have been four validation studies of the PCQ for three countries: USA, Germany and Portugal (Inhestern et al., 2016b; Muriel et al., 2012; Park et al., 2017; Tavares et al., 2020). Both German and Portuguese studies supported the three-factor structure proposed by Muriel et al. (2012). Moreover, the German and Portuguese versions of the PCQ showed good reliability and moderate correlations, in the expected directions, with psychological distress, family functioning, and quality of life (Inhestern et al., 2016b; Tavares et al., 2020). However, the structure was not confirmed among American mothers with metastatic cancer. The results showed a suboptimal fit as measured by the CFI, TLI and RMSEA (Park et al., 2017). Therefore, Park et al. (2022) modified the PCQ and created a 13-item tool (PCQ-AD) to measure parenting concerns among parents with advanced cancer conceptualized as a unidimensional construct. They added items devoted to communication with children, the financial impact of cancer on children and making every moment count.

In this study, I examined the psychometric properties of the Polish version of the Parenting Concerns Questionnaire in a sample of parents with cancer. The aim of the present research was to (a) test the structure of the PCQ using exploratory and confirmatory factor analysis and to assess its reliability, and (b) obtain evidence regarding convergent validity.

METHOD

Participants

The inclusion criteria were as follows: a) being a parent of, at least, one minor child (younger than 18 years old), b) undergoing cancer treatment, c) understanding and completing a questionnaire in Polish. One hundred and forty-five parents (M_{age} = 37 years, *SD* = 6.28, range = 24–52 years), who met the inclusion criteria, answered all items of the PCQ and completed all the scales used. Sample socio-demographic and clinical characteristics are described in Table 1. The mean age of the youngest child was 7.1 years (*SD* = 4.74, range = < 6 months–18 years). The majority of the investigated parents had one child (*n* = 68, 46.9%) or two (*n* = 62, 42.8%) and higher education (*n* = 90, 62.1%). The majority of parents were undergoing chemotherapy at the time of the survey (*n* = 66, 45.5%). The mean time since diagnosis was 19.8 months (*SD* = 21.1, range = 1–144 months). The number of parents suffering from oncological diseases was 104, with 41 hematologic malignancies.

Table 1
Sample Socio-Demographic and Clinical Characteristics (N = 145)

Variable	*n*	%
Gender		
male	19	13.1
female	126	86.9
Education		
higher	90	62.1
secondary	42	29
basic vocational	12	8.3
primary	1	0.7

Table 1 (cont.)

Variable	*n*	%
No. of children		
1	68	46.9
2	62	42.8
3	12	8.3
4	3	2.1
Serious illness of a child		
yes	15	10.3
no	130	89.7
Living with a partner		
in marriage	123	84.8
in cohabitation	22	15.2
singlehood	0	0
Self-assessment of the financial situation		
we live very poorly	0	0
we live modestly	6	4.1
we live on average	61	42.1
we live well	66	45.5
we live very well	12	8.3
Source of income		
employment	121	84
pension	21	14.6
social assistance	2	1.4
Other chronic illness		
yes	31	21.4
no	114	78.6
Psychiatric support		
yes	12	8.3
no	133	91.7
Stressful event during the past year		
yes	64	45.1
no	78	54.9
Cancer type by site		
breast	69	47.6
gynecologic	4	2.8
melanoma or other skin cancer	2	1.4
genitourinary	5	3.4
gastrointestinal	17	11.7

Table 1 (cont.)

Variable	*n*	%
head and neck	3	2.1
CNS	3	2.1
lungs	1	0.7
hematologic	41	28.3
Type of treatment		
radical	96	66.7
palliative	32	22.1
don't know	16	11.1
Tumor stage		
I–II	49	34
III	50	34.7
IV	20	13.9
don't know	25	17.4
Treatment (present)		
chemotherapy	66	45.5
radiotherapy	20	13.8
operation	17	11.7
hormone therapy	36	24.8
immunotherapy	15	10.3
transplantation	6	4.1
Cancer in the family		
yes	99	70.7
no	37	26.4
don't know	4	2.9
Loss of a close family member to cancer		
yes	79	55.2
no	64	44.8

Measures

The Parenting Concerns Questionnaire (PCQ) is a self-report questionnaire to assess the specific worries of parents with cancer. It consists of 15 items divided into three subscales (practical impact, emotional impact, and concerns about co-parent) 5 items each rated on a Likert-type scale, ranging from 1 (not at all concerned) to 5 (extremely concerned). The practical impact of the illness on children subscale measures parental concerns about how changes in parent's emotional, physical, and cognitive functioning and changes in children's daily routine evoked by parental illness affect children (e.g. "My own mood, worries or emotions are affecting my children" or "My physical limits or low energy are affecting my children"). The emotional impact subscale assesses parental concerns regarding children's emotional state caused by parental illness and fear of parent's death and their need for psychological help (e.g. "My children are emotionally upset by my illness." or "My children are worried that I am going to die"). The co-parent subscale measures parental concerns related to providing support to the children and the ill parent and taking care of children by a partner in case of the death of the ill parent (e.g. "My children's other parent would not be able to meet their emotional needs if I die" or "My partner is not providing me with enough practical support") (Muriel et al., 2012). The subscales scores and the total score is the sum of all the points based on the 5-point answer scale. The Parenting Concerns Questionnaire was shown to be reliable (Cronbach's alpha total scale = .83, Cronbach's alpha for each subscale: practical impact = .79, emotional impact = .79, concerns about co-parent = .85) and showed moderate correlations with quality of life, symptoms of depression, anxiety and distress measured by standardized tools (Functional Assessment of Cancer Therapy—General Scale, Hospital and Anxiety Depression Scale, Distress Thermometer) in expected directions proving scale validity ($r = .30$–$.59$, $p < .05$) (Cella et al., 1993; Jacobsen et al., 2005; Muriel et al., 2012; Zigmond & Snaith, 1983). Higher values indicate a higher level of parenting concerns. The possible range of scores is 15 to 75 (Muriel et al., 2012).

The author received permission from the creators of the PCQ to develop its Polish version. The translation was carried out in accordance with the recommendations of the International Test Commission (2017). The PCQ was translated into Polish by two independent psychologists fluent in English. Their translations were compared and the Polish language version was developed on the principle of preserving as far as possible the original content of items, using similar grammatical structures of questions and difficulty of terms. A blind back translation was done and the consistency of the original version with the translation was checked by a native speaker fluent in Polish.

To check the convergent validity of the Polish version of the PCQ, the tools were selected on the basis of theory and previous validity studies. The Polish version of the Perceived Stress Scale (PSS-10) was used to assess the intensity of perceived stress related to one's life situation. Sum scores (0–40) of the ten items (0–4) can be generated with higher values indicating higher levels of stress. The scale has shown good reliability (Juczyński & Ogińska-Bulik, 2009). In this study, reliability using Cronbach's alpha was .89. Parental stress was assessed by the Polish version of the Parenting Stress Index (PSI-3-SF) (Abidin, 1995; Pisula & Barańczuk, 2020). The

PSI-3-SF consists of 36 items that reflect three subscales: Parental Distress (PD), Parent–Child Dysfunctional Interaction (PCDI), and Difficult Child (DC). Higher scores indicate higher levels of parenting stress. In the current study, the value of Cronbach's alpha was .97 for overall parenting stress. The Medical Outcomes Study Questionnaire Short Form 36 Health Survey (SF-36v2) was used to assess the mental and physical quality of life. The SF-36v2 consists of two health component summary measures and eight health domain scales. Higher scores indicate higher quality of life with a range from 0 to 100 (Maruish, 2011). Reliability using Cronbach's alpha was .73 for physical and .87 for mental quality of life. Family functioning was assessed with the Polish version of the Family Resilience Assessment Scale (FRAS) (Nadrowska et al., 201; Sixbey, 2005), a 54-item self-report measure, using a 4-point Likert-type scale (from 1 = *strongly disagree* to 4 = *strongly agree*). The scale consists of six subscales. In this study, Cronbach's alpha was .96.

In addition, participants completed a brief questionnaire, providing socio-demographic (e.g. education, age of children) and medical information (type of cancer, treatment).

Procedure

Participants were recruited online, between January 2019 and December 2021, through a web-based survey distributed to several websites, associations (e.g. Alivia Onkofundacja), and Facebook groups related to cancer. Invitations for parents with cancer were also placed in hospitals with oncology and haematology departments. An e-mail was sent to each person interested in the study outlining the purpose and conduct of the study, assurances of confidentiality, and a request for online informed consent to participate in the study and have personal data processed. Only participants who gave consent to participate could proceed and fill in the questionnaires. Persons willing to participate in the survey were sent an e-mail with a link to the questionnaires and a special code, which was a set of letters and numbers that the participants entered to access the questionnaires. Participants were rewarded with a 50 PLN e-card to a bookshop as an acknowledgement of their time (the author of the study received a grant from her university).

Ethical Considerations

1. The study protocol was approved by an ethics committee at the author's University (approval no. 1/30/04/2019).

2. The participants received an information letter and had the full liberty not to respond to the survey.

3. Anonymity was maintained and the personal information was kept confidential.

4. The researcher's contact detail was given in case someone wanted to seek help.

Data Analysis

To assess the psychometric proprieties of the Polish version of the PCQ, several statistical analyses were conducted using IBM SPSS Statistics 26.0 and AMOS 26.0, all for Windows™. They were used to perform analysis of basic descriptive statistics, correlation analysis with Pearson's r coefficient, confirmatory and exploratory factor analyses. The classical threshold of $\alpha = .05$ was taken as the level of statistical significance. The reliability of the scale was assessed using internal consistency by calculating Cronbach's alpha coefficients for the total score of the scale and the three subscales. Factorial validity was tested with CFA and EFA, using maximum likelihood estimation. Convergent validity was evaluated using the Pearson correlation between the Polish version of the PCQ and other measures (PSI-3-SF, PSS-10, FRAS, and SF-36).

RESULTS

In the first step, the distributions of the quantitative variables were checked. For this purpose, basic descriptive statistics were calculated together with the Kolmogorov–Smirnov test examining the normality of the distribution. The results of the analysis are presented in Table 2.

The results of the Kolmogorov–Smirnov test are statistically insignificant for the indicators: general parenting concerns, physical and mental dimensions of quality of life, and perceived stress. This means that the distributions of these variables are similar to a normal distribution. For the remaining variables, the distribution was off the Gauss curve. However, the skewness for all variables does not exceed the absolute value of 1, which indicates no serious departures from normality (Field, 2000; Gravetter & Wallnau, 2014). Therefore, the analyses were based on parametric tests. The average level of parental concern is 43.7. This value in comparison with the potential range of the variable (15–75) indicates that the respondents have an average level of parenting concerns. The highest average score is obtained by the parents in the subscale on concerns about the practical impact of the disease on children.

Table 2

Basic Descriptive Statistics With Kolmogorov–Smirnov Test Result

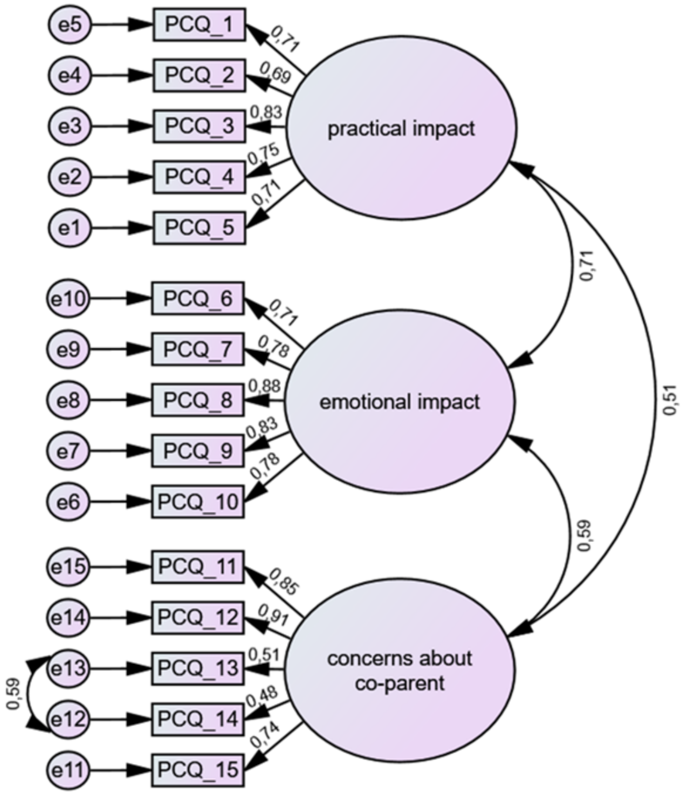
	M	*Me*	*SD*	*Skewness*	*Kurtosis*	*Min*	*Max*	*d*	*p*
PCQ									
Practical impact	16.36	17.00	5.24	–.29	–.75	5.00	25.00	.09	.003
Emotional impact	14.36	15.00	5.91	–.09	–1.00	5.00	25.00	.09	.008
Concerns about co-parent	12.94	13.00	5.94	.21	–1.13	5.00	25.00	.12	<.001
Parenting concerns: overall score	43.66	45.00	14.07	–.08	–.85	16.00	75.00	.06	.200
SF-36									
Physical functioning	45.95	46.06	6.56	–.32	–.30	26.92	57.54	.10	.002
Role: physical	38.16	39.19	8.81	.03	–.35	21.23	57.16	.11	<.001
Bodily pain	43.85	42.64	10.44	.14	–.67	21.68	62.00	.13	<.001
General health	39.62	40.35	10.39	.21	–.02	18.95	66.50	.08	.019
Vitality	46.72	46.66	8.74	.21	–.60	31.80	67.45	.10	.001
Social functioning	39.33	37.29	9.91	–.13	–.63	17.23	57.34	.13	<.001
Role: emotional	39.27	35.28	10.48	.01	–.46	14.39	56.17	.17	<.001
Mental health	42.23	43.02	9.36	–.02	–.72	22.09	63.95	.09	.005
Physical component summary	43.45	43.78	7.01	–.10	.01	24.76	61.64	.06	.200
Mental component summary	40.95	39.96	9.64	.24	–.39	19.71	66.56	.05	.200
PSS-10									
Stress	19.81	20.00	7.52	.11	–.62	1.00	36.00	.07	.055
PSI-3-SF									
Parental Distress	29.69	29.00	10.10	.35	–.75	13.00	55.00	.10	.003
Parent–Child Dysfunctional Interaction	26.23	23.00	11.01	.65	–.58	12.00	57.00	.15	<.001
Difficult Child	31.49	29.00	11.48	.37	–.73	13.00	59.00	.11	<.001
Parenting Stress: overall score	87.73	78.00	30.45	.54	–.53	39.00	162.00	.13	<.001

Factor Validity

To analyze the factor validity of the PCQ, a confirmatory factor analysis (CFA) was conducted to test the original three-factor structure of the questionnaire. The standardized factor loadings for the three factors were moderate to high (practical impact: .69–.83; emotional impact: .71–.88; and co-parent: .48–.91; see Figure 1). The values of most indicators obtained from the analysis do not indicate an adequate fit of the three-factor model. The results of the chi-square test are statistically significant: $\chi^2(86) = 245.82$, $p < .001$ (CMIN/DF = 2.83), indicating a discrepancy between the observed covariance matrix and the covariance matrix implied by the model. Furthermore, the root mean square error of the approximation (RMSEA) has a value greater than .8 (RMSEA = .11). Moreover, the CFI index has a value below the threshold value .95 (CFI = .88). Also, the model fit values GFI and AGFI are below an acceptable level (GFI = .82, AGFI = .75). However, SRMR = .0692 was less than recommended .08 which indicates good model-fit (Hooper et al., 2008; Hu & Bentler, 1999).

Figure 1

Confirmatory Factor Analysis of the Parenting Concerns Questionnaire



As the three-factor structure was not fully supported, the exploratory factor analysis was conducted. Bartlett's test of sphericity, which tests the whole correlation matrix to determine the adequacy of factor analysis based on identifying the correlation between variables, was significant, $\chi^2(105) = 1372, p < .001$, indicating that the dataset is suitable for a data reduction technique. Moreover, the value of the Kaiser–Meyer–Olkin measure of sampling adequacy was above recommended .7 (KMO = .845), thus it was acceptable to proceed with the analysis (Hair et al., 2009). The exploratory factor analysis was conducted on all 15 items with principal axis factoring by Oblimin rotation to examine the structure of the Polish version of the PCQ. The applied criterion of saturation of the item with the given factor is the loading value above .3 (Field, 2013). Table 3 shows the factor loadings.

Table 3
Three-Factor Solution of the EFA

Item	Factor 1	Factor 2	Factor 3
PCQ01		.573	
PCQ02		.591	
PCQ03		.922	
PCQ04		.538	
PCQ05		.648	
PCQ06		.392	.585
PCQ07			.882
PCQ08			.695
PCQ09			.655
PCQ10		.326	.447
PCQ11	.684		
PCQ12	.766		
PCQ13	.655		
PCQ14	.689		–.317
PCQ15	.759		

The interpretation of the factorial structure of the PCQ shows that Factor 1 is defined by five items (11, 12, 13, 14, 15) and explains 19.6% of the variance. Factor 2 is defined by seven items (1, 2, 3, 4, 5, 6, 10) and explains 20.5% of the variance. Factor 3 is defined by six items (6, 7, 8, 9, 10, 14) and explains 20.1% of the variance. There were three significant cross-loadings (items 6, 10, 14). Three factors explained 60.2% of the variance. However, the data did not show a good fit to a model of parenting concerns in cancer, $\chi^2(63) = 219, p < .001$, RMSEA = .130, 90% CI [.112, .150], TLI = .792 (Hair et al., 2009). Although the three-factor structure was not fully confirmed in CFA and EFA, this solution was applied for further investigations because of the theoretical assumptions, the results from previous adaptations and acceptable variance.

Reliability

The obtained coefficients turned out to be satisfactory, suggesting that the PCQ is an internally consistent tool. Cronbach's alpha coefficient for the total score of the PCQ was .91. All subscales revealed adequate internal consistency: $\alpha = .85$, $\alpha = .90$, $\alpha = .85$ for practical impact, emotional impact, and co-parent, respectively.

Next, composite reliability (CR) was used as a measure of internal consistency of the factors, where values greater than .70 are indicative of good reliability. Discriminant validity is achieved when the average variance extracted (AVE) is greater than the maximum shared squared variance (MSV) or average shared squared variance (ASV). For convergent validity, AVE should be equal or greater than .50 and lower than CR. In other words, the variance explained by the construct should be greater than measurement error and greater than cross-loadings (Hair et al., 2009).

Table 4 shows that CR indices indicate good reliability for all factors (all above .70). Moreover, convergent validity has been confirmed; all three factors AVE were less than CR and greater than .50. More importantly, indices of discriminant validity indicate good validity for all three factors (all AVE higher than MSV and ASV).

Table 4

Indicators of Internal Consistency and Validity

	CR	AVE	ASV	MSV
Practical impact	.86	.55	.38	.50
Emotional impact	.90	.64	.43	.50
Concerns about co-parent	.83	.52	.30	.34

Note. CR = composite reliability, AVE = average variance extracted, ASV = average shared squared variance, MSV = maximum shared squared variance.

Convergent Validity

Correlations between the PCQ and parenting stress, parents' quality of life, perceived stress, and family resilience (see Table 5) provided evidence for convergent validity.

Table 5

Correlations Between Subscales of the PCQ and Parenting Stress, Quality of Life, Perceived Stress, and Family Resilience (N = 145)

	Practical impact	Emotional impact	Co-parent	PCQ Total
PSI-3-SF	.34**	.42**	.57**	.55**
PSI-3: Parental Distress	.43**	.50**	.57**	.61**
PSI-3: Parent–Child Dysfunctional Interaction	.30**	.40**	.57**	.52**
PSI-3: Difficult Child	.25*	.32**	.47**	.43**
SF-36v2: Physical Functioning	–.27**	–.12	–.25**	–.25**
SF-36v2: Role Physical	–.42**	–.16	–.13	–.28**
SF-36v2: Bodily Pain	–.28**	–.16	–.14	–.23*
SF-36v2: General Health	–.43**	–.42**	–.34**	–.48**
SF-36v2: Vitality	–.56**	–.31**	–.31**	–.47**
SF-36v2: Social Functioning	–.39**	–.21	–.23*	–.33**
SF-36v2: Role Emotional	–.49**	–.32**	–.26*	–.43**
SF-36v2: Mental Health	–.54**	–.50**	–.45**	–.60**
SF-36v2: Physical Component Score	–.33**	–.14	–.16	–.25*
SF-36v2: Mental Component Score	–.58**	–.45**	–.39**	–.57**
PSS-10	.66**	.55**	.45**	.67**
FRAS	–.169*	–.132	–.443**	–.306**
FRAS: Family Communication and Problem Solving	–.137	–.116	–.446**	–.287**
FRAS: Utilizing Social and Economic Resources	–.236**	–.201*	–.370**	–.329**
FRAS: Maintaining a Positive Outlook	–.238**	–.283**	–.462**	–.403**
FRAS: Family Connectedness	–.128	–.147	–.412**	–.283**
FRAS: Family Spirituality	.023	.237**	.120	.158
FRAS: Ability to Make Meaning of Adversity	.085	.055	–.250**	–.051

* $p < .05$, ** $p < .01$.

The analysis included variables that, from the theoretical point of view, are constructs related to parenting concerns during cancer. Correlations between the scales were statistically significant. Parenting concerns were positively correlated with parenting stress. Only the associations between the practical impact of illness on children and parental stress related to dysfunctional parent-child interaction and difficult children are weak—the rest of the correlations are moderate to strong. Moreover, parenting concerns were negatively associated with general health perception, vitality, social functioning, and limitations related to emotional disturbance (moderate correlations), as well as with mental health and the overall mental dimension of quality of life (strong correlations). The analysis showed that perceived stress was positively associated with every indicator of parenting concerns during cancer. Mostly these are high-strength relationships (the exception of the relationship of stress and the subscale co-parent). Furthermore, parenting concerns were negatively correlated with family resilience. The highest correlation is between PSS-10 and PCQ. The lowest correlations are between Utilizing social and economic resources and Emotional impact, Bodily pain and PCQ, and also between Social functioning and Concerns about co-parent.

DISCUSSION

The results of the study confirmed the satisfactory reliability of the Polish version of the PCQ. Internal consistency coefficients for this version were: $\alpha = .85$ for the practical impact, $\alpha = .90$ for the emotional impact, $\alpha = .85$ for the concerns about co-parent, and $\alpha = .91$ for Total Parenting Concerns. These findings are consistent with the internal consistency of the original version of the PCQ.

Confirmatory and explanatory factor analyses did not fully confirm the three-factor structure of the original questionnaire. Goodness-of-fit statistics showed not enough fit to the data. However, the values of CFI, GFI, and AGFI were slightly below the required values and the factor loadings for the three factors were moderate to high (Hooper et al., 2008; Hu & Bentler, 1999). Moreover, the analysis of validity confirmed convergent and discriminant validity for all three factors. Therefore, the three-factor structure was tested but requires further studies. It is worth mentioning that the factor analysis is sensitive to sample size. It would be worth checking the structure of the Polish version of PCQ on a larger size (at least 200 parents).

Three recent studies assessed the psychometric properties of the Parenting Concerns Questionnaire among German parents (cancer stages I–IV), among American mothers with metastatic cancer (stage IV), and among Portuguese parents (cancer stage not reported). The German and Portuguese studies supported the original three-factor structure (Inhestern et al., 2016b; Tavares et al., 2020), but in the study with patients with metastatic cancer, this structure was not confirmed (Park et al., 2018). In this study parents with cancer stages I–IV took part. Therefore, it is worth checking the factor structure of the Polish version of the PCQ separately among parents with advanced and non-advanced cancer.

Studies on parenting concerns among parents with advanced cancer show that these parents have specific concerns about the impact of their anticipated deterioration of health and death on their children (Park et al., 2018; Park et al., 2022). Therefore, Park et al. (2022) adapted the PCQ for parents with advanced disease and created PCQ-AD. They added items related to concerns about parental death, communication, appreciation of every moment, and the financial impact of cancer on children.

As pointed out by Park et al. (2018, 2022) PCQ would benefit from some enhancements. Many qualitative studies (Barnes et al., 2000; Billhult & Segesten, 2003; Semple & McCance, 2010; Shands et al., 2000; Stiffler et al., 2008; Turner et al., 2007) support this view revealing that communication with children about cancer raises many doubts and concerns. The original item base contained questions about communication but they were not included in the final version of the PCQ (Muriel et al., 2012). It is important as communication is one of the key processes in family resilience.

Limitations

Some of the limitations of our study should be mentioned. The test-retest reliability of the Polish version of the PCQ has not been evaluated. Since the challenges of parenting and cancer change over time, subsequent studies should assess the psychometric properties of the Polish version of the PCQ over time. The majority of participants were well-educated women with breast cancer, in an intimate relationship, with non-advanced cancer (during radical treatment), and with an above-average income. In this study, few fathers took part making it impossible to compare parenting concerns among mothers and fathers with cancer. Future studies with more heterogeneous samples are needed, as well as studies to examine the invariance of the PCQ across several groups (e.g. single parents, stepfamilies, metastatic cancer, parents with disabled children, parents with lower income, and fathers). Moreover, future studies incorporating criterion variables, repeated assessments, and larger samples will allow for a more comprehensive evaluation. Despite these limitations, the information learned from the study suggests that the tested version of the PCQ may be a promising instrument for measuring specific parenting concerns in Polish cancer patients.

Clinical Implications

There are a few implications for clinical practice. First, future studies should check the psychometric properties of the Polish version of the PCQ in order to use it as a screening tool for diagnostic purposes. For example, this scale can be used to check how parents experience balancing a double role, a patient and a parent and facilitate designing interventions aimed at decreasing the level of parenting concerns in parents facing cancer. It is important as studies show that parenting concerns are associated with their quality of life (Park et al., 2016; Park et al., 2018). Being a parent is often a central part of a patient's identity, so helping patients to fulfil this role during treatment is a key aspect of holistic treatment. The awareness of parenting concerns will enable the development of an effective model of oncology care with the family in its centre and facilitate understanding of parents' treatment decisions. In this study, the association between parenting concerns and family functioning was found. This result may indicate the direction that can be followed in designing interventions. There is a chance that interventions directed towards the development of strategies that enhance family resilience may alleviate parenting concerns during cancer.

Conclusions

The Polish version of the PCQ can be considered a relatively valid and reliable instrument showing medium correlations with parenting stress, perceived stress, family resilience, and quality of life in expected directions. The results of various analyses suggest that the discussed tool for measuring specific parenting concerns during cancer has relatively acceptable psychometric parameters in the Polish version. Further studies should take into account different variables in order to verify the factor structure and external validity of the PCQ. The PCQ can be a useful tool to recognize parents with cancer who might need psychological support regarding combining the role of a parent and oncological patient. As this study has failed to reach conclusive results on the optimal factor structure for the PCQ, further research is needed in order to elucidate the possible effects of gender and cancer stage on parental concerns.

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