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Original article

Sense of coherence, resilience, and habitual optimism in cancer patients

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ABSTRACT

Background/Objective: The aim of this study was to investigate whether the three resource variables sense of coherence, resilience, and dispositional optimism become impaired when people are ill with cancer, whether there are sex and age differences in these variables, and how these variables are associated with quality of life (QoL).
Method: A sample of 1108 patients with mixed cancer diagnoses were examined using the Sense of Coherence Scale-3 (SOC-3), the Brief Resilience Scale (BRS), the Life Orientation Test (LOT-R), and the QoL questionnaire EORTC QLQ-C30.
Results: The three resource variables showed somewhat lower levels in the patients' sample in comparison with general population controls, with effect sizes between −0.10 and −0.23. While there were only small sex differences in the resource variables, significant age differences were found in these variables, with stronger detriments in younger patients. The correlations among the resource variables ranged between .53 and .61. Sense of coherence was more strongly correlated with QoL than resilience and optimism.
Conclusions: Cancer patients with low levels of personal resources adapt to their disease more poorly than patients with high levels. In addition to limitations in QoL, health care professionals should also consider patients' resources for coping with the disease. Special attention should be given to young cancer patients.

Introduction

Cancer patients experience multiple detriments to their QoL and mental health (Hinz et al., 2018; Mehnert et al., 2014). While psycho-oncological research and care have historically been focused on deficits such as limited QoL, disease burden, and distress, in recent years, an additional resource-oriented perspective has been established. Several factors have been proposed as resources assumed to buffer the effects of events such as cancer diseases on QoL and mental health. The most relevant resource factors are sense of coherence (Antonovsky, 1993; Asaba & Okawa, 2021), dispositional optimism (Carver & Scheier, 2014; Forte et al., 2022), resilience (Calderon et al., 2022; Lau, Khoo, Ho, & Tan, 2021; Luthar, Cicchetti, & Becker, 2000; Zhou, Ning, Wang, & Li, 2022), self-esteem (Niveau, New, & Beaudoin, 2021), and self-efficacy (Bandura, 1997; Banik et al., 2017). Multiple studies have consistently shown that these resource variables are associated with QoL (Asaba & Okawa, 2021; Finck, Barradas, Zenger, & Hinz, 2018; Giglio, Rodriguez-Blazquez, Pedro-Cuesta, & Forjaz, 2015; Milbury, Tannir, & Cohen, 2011; Zenger, Brix, Borowski, Stolzenburg, & Hinz, 2010; Zhou et al., 2022), mental health (Fischer, Cripe, & Rand, 2018; Plitzko, Mehnert-Theuerkauf, & Götze, 2020; Uchida et al., 2018), spiritual well-being (Kavak, Özdemir, & Dural, 2021), and health behavior (Thomas et al., 2020).

In our study, we investigate the three constructs *sense of coherence, resilience*, and *optimism. Sense of coherence* is a global orientation to view the world and the individual environment as comprehensible, manageable, and meaningful (Antonovsky, 1993). *Resilience* is defined as the capacity to adapt to challenges that threaten system function, survival, or development (Masten, Lucke, Nelson, & Stallworthy, 2021). Habitual *optimism* is characterized as the generalized expectation that good things will happen (Scheier & Carver, 1992). We selected these three constructs because they are core resource constructs, and because there are short questionnaires for which German normative data are available.

Resource variables are assumed to be relatively stable over time. The first research question our study addressed concerned whether these resource variables nevertheless decrease when a severe disease such as cancer occurs, or whether these variables remain stable. While some oncological studies have shown that resource variables are slightly lowered in cancer patients (Hinz, Friedrich, Kuhnt, Zenger, & Schulte,

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2019), others have even found higher levels in cancer patients than in the general population (Krebs et al., 2019; Thieme, Einenkel, Zenger, & Hinz, 2017). These differences may be due to varying resource constructs, varying instruments for assessing the constructs, and differences in sociodemographic and clinical characteristics of the samples. In our study, we will test whether *sense of coherence, resilience*, and *optimism* are lowered in cancer patients or not.

The second research question was whether there are sex and age differences in these resource variables, and, if so, whether these differences occur the same way in patient groups as they do in the general population. Normative studies that were performed with questionnaires for measuring resource variables provide information on sex and age differences (e.g. (Grevenstein & Bluemke, 2022; Schmalbach, Tibubos, Zenger, Hinz, & Brähler, 2020) for *sense of coherence*, (Glaesmer et al., 2012; Hinz et al., 2017) for *habitual optimism*, and (Kunzler et al., 2018) for *resilience*), however, it is largely unknown to what degree these differences are also present in cancer patients.

The third research question concerns the extent to which the different resource variables correlate with each other and with different aspects of QoL and self-rated health. While multiple studies have shown moderate correlations with multiple aspects of QoL, it has not been systematically investigated to what degree the resource variables correlate with physical, mental, and social components of QoL, and whether there are systematic differences between the resource variables in terms of their associations with QoL parameters.

Patients with low levels of QoL perceive higher levels of supportive care needs, but the correlations are only of moderate size (Snyder et al., 2009). Patients with high levels of personal resources might feel able to manage the detriments in QoL themselves without external help, and they may therefore report lower levels of supportive care needs. In our study, we also examined whether resources are negatively associated with supportive care needs.

Finally, we investigate the relationship between the resource variables and the subjective importance of health. Though one might assume that health is especially important to people in relatively poor health, a connection that would appear as a negative correlation between importance of health and health ratings, several studies have found that there is actually a positive correlation between a person's subjective valuation of health and their own health state (Rohrer & Schmukle, 2018; Sirgy, Kim, Joshanloo, Lee, & Bosnjak, 2020). For a deeper understanding of the relationship between resources and health, it is also useful to investigate the associations between resources and subjectively perceived importance of health.

Taken together, the aims of this paper were (a) to compare levels of the three resource variables *sense of coherence, resilience*, and *optimism*, between a large sample of cancer patients and the corresponding values obtained in the general population, (b) to examine sex and age differences in these resource variables, and (c) to analyze the associations between the resource variables and multiple components of QoL including supportive care needs and perceived importance of health.

Method

Sample of cancer patients

This cross-sectional study was performed in a German oncological rehabilitation clinic between September 2020 and May 2021. In Germany, cancer patients are offered the opportunity to take part in a rehabilitation program to help restore their physical and psychosocial functioning after cancer treatment completion. The inclusion criteria used were: a proven cancer diagnosis, age of 18 years or older, absence of severe cognitive impairment, and sufficient command of the German language. Informed consent was obtained from the participants after they were given a full explanation of the purpose and nature of the data collection and storage. A total of 1547 consecutive patients were asked to participate, and 1108 (71.6%) of them agreed to take part in the study and complete the questionnaires during their stay in the rehabilitation clinic (cf. Table 1).

Instruments

SOC-3: The Sense of Coherence-3 scale (SOC-3) (Schmalbach et al., 2020) is an ultra-short form of the Sense of Coherence scale (Antonovsky, 1993; Schumacher, Wilz, Gunzelmann, & Brahler, 2000). It consists of three items of the 29-item Sense of Coherence scale. Item scores range from 1 to 7, and the SOC-3 score is the sum of these three item scores (range: 3–21). Normative values for the SOC-3 are available (Schmalbach et al., 2020) and are used for comparison with the cancer patient group.

BRS: The Brief Resilience Scale BRS (Chmitorz et al., 2018; Smith et al., 2008) comprises six items for measuring the ability to bounce back from stress. Each item has to be rated with one out of five answer options (1 = strongly disagree, . . ., 5 = strongly agree). Three of the items are positively phrased, while the other three items are negatively phrased. The scale scores are defined as the mean item scores. Normative scores are taken from a German representative study (Kunzler et al., 2018).

Table 1
Sociodemographic and clinical characteristics of the sample (n = 1108).

	n	%
Sex		
Males	404	36.5
Females	704	63.5
Age group		
18–39 years	220	19.9
40–49 years	183	16.5
50–59 years	327	29.5
60–69 years	233	21.0
≥ 70 years	145	13.1
Education [a]		
Elementary school (8–9 years)	248	22.4
Junior high school (10 years)	367	33.2
High school/university (≥ 11 years)	486	44.0
No formal qualification	4	0.4
Employment status [a]		
Employed	703	63.7
Unemployed	43	3.9
Retired	282	25.5
Other	76	6.9
Tumor localization		
Breast	381	34.4
Gastrointestinal tract	171	15.4
Prostate	144	13.0
Hematological	131	11.8
Female genital organs	78	7.0
Thyroid / endocrine glands	36	3.2
Melanoma	26	2.3
Male genital organs	23	2.1
Other	118	10.6
Time since diagnosis [a]		
< 6 months	334	30.2
6 months - < 12 months	374	33.8
≥ 12 months	399	36.0
Treatment		
Surgery [a]		
No	121	10.9
Yes	986	89.1
Chemotherapy [a]		
No	508	46.1
Yes	595	53.9
Radio therapy [a]		
No	538	50.2
Yes	534	49.8
Hormone therapy [a]		
No	780	74.0
Yes	274	26.0
Antibody therapy [a]		
No	864	82.8
Yes	179	17.2

Note. [a]Missing data not reported

LOT-R: The LOT-R (Hinz et al., 2022) is a 10-item instrument: three items are phrased optimistically (scale optimism), three pessimistically (scale pessimism), and four items are neutral filler items. The answer options range from 0 (strongly disagree) to 4 (strongly agree), resulting in scale ranges from 0 to 12 for the two single scales optimism and pessimism, and 0 to 24 for the total scale, which is composed of the optimism scale and the inverted pessimism scale. There is a debate concerning whether it is justifiable to combine the two scales into one sum score because the negative correlation between optimism and pessimism is low, and confirmatory factor analyses yield better fit indices when both scales are considered separately (Hinz et al., 2022). Nevertheless, in this article, we use the sum scale since the correlation between this sum score and other variables was generally higher than the correlations of the subscales, and the Cronbach alpha coefficients of the total scale are generally higher than the coefficients of the subscales (Hinz et al., 2022). General population mean scores for the LOT-R are taken from a normative study (Hinz et al., 2017).

EORTC QLQ-C30: The QoL questionnaire EORTC QLQ-C30 (Aaronson et al., 1993) was specifically designed for cancer patients. It consists of 30 items that belong to five functioning scales, three symptom scales, six single-item symptom scales, and a 2-item general health/QoL scale. A summary score of the EORTC QLQ-C30 can be calculated according to (Giesinger et al., 2016), averaging across all functioning scores and symptom scores except financial difficulties and the global health/QoL subscale. This sum score and the 2-item global health/QoL score are used as QoL outcome variables in this study. Norm values for the EORTC QLQ-C30 are taken from (Hinz, Singer, & Brähler, 2014).

Satisfaction with health, importance of health, and supportive care needs:

The participants were asked to answer three questions concerning their health: "How satisfied are you with your health?", "How important is health for you?", and "To what degree do you wish support for your health?". Five possible responses are given for each of these questions: "How satisfied are you with your health?": (very dissatisfied, . . ., very satisfied), "How important is health for you": (not important, . . ., very important), and "To what degree do you wish support for your health?" (no support at all, . . ., very much support).

Statistical analysis

Mean score differences were expressed in terms of effect sizes *d*. The impact of sex and age on the dependent variables was tested with two-way ANOVAs. Age was divided into three groups: ≤ 39 years, 40–59 years, and ≥ 60 years. For comparing the mean scores of the patients with the general population samples, we calculated mean scores for the sex and age groups of the general population separately and weighted these groups according to the frequencies in the patients' sample. This procedure provides the basis for a fair comparison between the patients and the general population despite differences in mean age and sex distribution. Associations within resource variables and associations between resource variables and quality of life scores were calculated using Pearson correlations. All statistics were performed with SPSS, version 27.

Results

Sample characteristics

Table 1 presents characteristics of the sample of patients. Finally, 704 females and 404 males completed the questionnaires, their mean age was 53.1 years (SD = 14.6 years), with a range from 18-88 years.

Comparison between patients and the general population

Table 2 presents mean scores for the samples of the cancer patients and the general population. The patients showed somewhat lower mean scores than the general population in the three resource scales, with effect sizes between $d = -0.10$ and $d = -0.23$. In contrast to that, the QoL variables as listed at the bottom of Table 2 showed much higher group differences, with effect sizes above 0.70.

Male patients showed higher mean scores than female patients in two of the three resource scales, the SOC-3 and the BRS. This sex effect also occurs in the general population. Older patients reported having more resources than younger patients in all three scales, while there was an opposite relationship in the general population. This means that younger patients (in comparison to their peers of the general population) report fewer resources, with effect sizes between $d = -0.21$ and $d = -.39$, while the signs were reversed in the older age group, with patients reporting more resources than the general population.

Sex and age differences within the group of the patients were tested with ANOVAs. For the SOC-3, the effects were as follows: sex ($F = 5.92$, $p = .015$), age group ($F = 11.44$, $p < .001$), and interaction sex * age group ($F = 0.70$, $p = .498$). The corresponding effects for the BRS were: sex ($F = 14.98$, $p < .001$), age group ($F = 0.837$, $p = .433$), and interaction sex * age group ($F = 0.017$, $p = .983$), and for the LOT-R the following effects were obtained: sex ($F = 0.543$, $p = .461$), age group ($F = 2.34$, $p = .093$), and interaction sex * age group ($F = 0.712$, $p = .491$).

Correlations among the resource scales

The correlations of the resource scales including their subscales are given in Table 3. The sum scales of the three questionnaires are interconnected with correlations between .53 and .61. The correlations between the two (opposite) subscales within one questionnaire (BRS and LOT-R) were −.62 and −.44, respectively. All Cronbach's alpha coefficients

Table 2
Mean scores of the resource scales for the patients and the general population.

	Patients		General Population		
	M	(SD)	M	(SD)	*d* [a]
SOC-3 (range: 3–21)	—	—	—		
Males	15.79	(3.92)	16.44	(3.34)	−0.18
Females	14.82	(3.88)	15.71	(3.49)	−0.24
Sex effect size *d* [b]	*d* = −0.25		*d* = −0.21		
18–39 years	14.41	(3.75)	16.27	(3.33)	−0.53
40–59 years	14.86	(3.93)	16.10	(3.39)	−0.34
≥ 60 years	16.04	(3.85)	15.72	(3.57)	0.09
Age effect size *d* [b, c]	*d* = 0.43		*d* = −0.16		
Total	15.17	(3.92)	16.00	(3.44)	−0.23
BRS (range: 1–5)	—	—	—		
Males	3.39	(0.76)	3.53	(0.91)	−0.17
Females	3.17	(0.77)	3.19	(0.97)	−0.02
Sex effect size *d* [b]	*d* = −0.29		*d* = −0.36		
18–39 years	3.26	(0.78)	3.57	(0.91)	−0.37
40–59 years	3.20	(0.79)	3.33	(0.96)	−0.15
≥ 60 years	3.31	(0.74)	3.22	(0.96)	0.11
Age effect size *d* [b, c]	*d* = 0.07		*d* = −0.37		
Total	3.25	(0.77)	3.34	(0.95)	−0.10
LOT-R (range: 0–24)	—	—	—		
Males	15.69	(4.07)	16.10	(3.70)	−0.11
Females	15.78	(4.16)	16.40	(3.80)	−0.16
Sex effect size *d* [b]	*d* = 0.02		*d* = 0.08		
18–39 years	15.77	(3.98)	16.90	(4.00)	−0.28
40–59 years	15.47	(4.34)	16.38	(3.82)	−0.22
≥ 60 years	16.11	(3.90)	15.92	(3.52)	0.05
Age effect size *d* [b, c]	*d* = 0.09		*d* = −0.26		
Total	15.75	(4.13)	16.33	(3.84)	−0.15
	—	—	—		
EORTC QLQ-C30 sum	64.0	(17.6)	88.1	(12.7)	−1.59
EORTC QLQ-C30 QoL	58.1	(19.6)	72.2	(19.6)	−0.72

Note.[a] Differences between patients and the general population
[b] differences between subgroups within the patients or within the general population
[c] effect size of the difference between the oldest and the youngest age group.

Table 3
Correlations between SOC-3, BRS, and LOT-R scores.

	SOC-3	BRS			LOT-R		
		Positive	Negative	Total	Optimism	Pessimism	Total
SOC	1	.56	−.53	**.60**	.53	−.51	**.61**
BRS positive		1	−.62	.90	.49	−.37	.51
BRS negative			1	−.90	−.38	.39	−.45
BRS total				1	.48	−.42	**.53**
LOT-R Optimism					1	−.44	.83
LOT-R Pessimism						1	−.86
LOT-R Total							1
Cronbach's alpha	$\alpha = .72$	$\alpha = .73$	$\alpha = .73$	$\alpha = .84$	$\alpha = .69$	$\alpha = .74$	$\alpha = .76$

Note. Bold: Correlations between total scores

were between .69 and .84. For both scales that consist of subscales, BRS and LOT-R, the total scale achieved higher alpha coefficients than the subscales.

Correlations between the resource scales and other scales

The correlations between the sum scores of the three resource questionnaires and other scales are presented in Table 4. For all three resource variables, the highest correlations were found for emotional functioning (r between .41 and .60). Further scales with high associations were the global health/QoL scale, the EORTC QLQ-C30 sum score, and the satisfaction with health variable. The comparison among the three instruments showed the highest associations for the SOC-3, followed by the BRS and the LOT-R.

Discussion

The first research question of this study was the degree to which cancer patients perceive personal resources in comparison with the general population. Though detriments in QoL were high in the cancer patients, with a very strong effect size of $d = -1.59$ for the EORTC QLQ-C30 sum score, the patients were not markedly affected in terms of their perceived resources. The corresponding effect sizes ranged between −0.10 and −0.23, which indicates only slight reductions of the resource variables. Such results have also been found in another study with cancer patients (Hinz, Friedrich, et al., 2019), while other studies found even higher resource levels in cancer patients than in the general population (Galletta et al., 2019; Krebs et al., 2019). It is possible that the experience of having cancer activates two opposing tendencies, namely, a decrease in the perceived resources due to the correlations between limited QoL and lower resources, as well as the will to fight against the disease and to activate social relationships and resources in the sense of a fighting spirit. The similarity of the effect sizes for the three instruments used in our study shows the generalizability of the finding of slightly reduced resource scores.

Sex and age differences in the resource variables were calculated for the patients and compared with the corresponding differences in the general population. Sex differences were found for sense of coherence and resilience, with higher scores for the males, while optimism showed nearly no sex differences. This result was obtained both in the patients' group and in in the general population, thus not indicating any difference with the cancer patients. Concerning age differences, however, there were remarkable differences between the patients and the general population. In the group of the older patients (≥ 60 years), the mean levels of all three resource variables were higher than those of the patients in the youngest and the median age groups, while in the general population, there was an opposite trend with higher scores in the younger age groups. This means that cancer patients below the age of 60 years, and in particular the adolescents and young adults, report having fewer resources than their healthy peers, while this was not the case in older patients. Therefore, the slight reductions in the resource variables obtained in the total group of cancer patients (in comparison with the general population) appear only to be a function of the patients' age. One reason for the lower level of resources among the younger patients may be that they expect more severe problems in their ability to work. This result corresponds with the finding that, when compared with healthy peers, young cancer patients experience more mental health problems than older patients (Hinz, Herzberg, et al., 2019). Patients of working age and especially young adults up to the age of 40 years deserve special attention and special support in regaining their personal resources.

To what degree are the resource variables interchangeable? The correlations between the total scores of the three resource variables ranged between .53 and .61. This is similar to the coefficients reported in another study which also included SOC, resilience, and optimism, and which found coefficients between .53 and .57 (Grevenstein, Aguilar-Raab, Schweitzer, & Bluemke, 2016). This is lower than would be expected if equal constructs had been measured. Sense of coherence, resilience, and optimism share common variance to a certain degree, but they nevertheless represent different constructs. Here one has to take into consideration that the three instruments are relatively short, with item numbers between 3 and 6. This makes the three instruments comparable, but it is obvious that more reliable results could be expected if more comprehensive instruments were used.

The reliability coefficients of the instruments were roughly comparable with those reported in the literature. For the SOC-3, the alpha

Table 4
Correlations between the sum scales of the SOC-3, BRS, and LOT-R with scales of QoL and other health-related variables.

	SOC-3	BRS	LOT-R
EORTC QLQ-C30			
Physical functioning	.33	.31	.24
Role functioning	.30	.28	.19
Emotional functioning	.60	.55	.41
Cognitive functioning	.47	.40	.25
Social functioning	.42	.34	.22
Global health /QoL	.49	.41	.34
Fatigue	−.44	−.41	−.26
Nausea/vomiting	−.18	−.12	−.14
Pain	−.30	−.28	−.22
Dyspnea	−.22	−.21	−.16
Insomnia	−.34	−.28	−.24
Appetite loss	−.24	−.15	−.16
Constipation	−.17	−.10	−.12
Diarrhea	−.11	−.06	−.06
Financial difficulties	−.32	−.20	−.25
Sum score	.52	.44	.34
Satisfaction with health	.47	.45	.34
Importance of health	.02	−.02	.05
Supportive care needs	−.34	−.31	−.21

coefficient of our study (.72) was similar to the omega coefficient of .69 in the general population (Schmalbach et al., 2020). For the BRS, our alpha coefficient (.84) was nearly equal to the coefficient from the general population study (.85) (Chmitorz et al., 2018), and for the LOT-R, our alpha coefficient (.76) was even somewhat higher than the coefficients reported from general population studies (.66 (Hinz et al., 2017) and .68 (Glaesmer et al., 2012)). These results show that while the reliability of the instruments was not perfect it still seemed to be sufficient for deriving conclusions on the group level.

Though it was not the aim of the study to figure out which of the three scales was superior to the other ones, it is worth noting that among the three scales the SOC-3 consistently showed the highest correlations with the QoL data. This is in line with findings from a study with healthy persons that also found that the correlations between sense of coherence and somatization, anxiety, and depression were higher than the corresponding correlations of resilience and optimism (Grevenstein et al., 2016). One reason for this superiority of the concept of sense of coherence may be the inclusion of the aspect of meaningfulness in the theoretic conceptualization of sense of coherence (Grevenstein et al., 2016).

The resource variables correlated more strongly with mental health variables than with physical health variables. The highest correlations in Table 4 were found for emotional functioning in all three resource scales, while the association with physical health was lower. This confirms findings in the literature, e.g., (Lindahl, Juneja, Teljigovic, Rafn, & Nielsen, 2021). In a sample of patients with brain metastases, however, the highest correlations were found for social functioning, which may be due to a higher degree of detriments and a greater need for help in the social context in this patient group (Qiu, Zhang, Pan, Zhao, & Wu, 2020).

The subjective importance of health was not statistically associated with the resource variables. This means that even patients who attribute less importance to their health may still have high levels of resources. The resource variables were associated with supportive care needs, and the strengths of these associations were similar to the associations between resources and the dimensions of QozL. Patients seeking support will generally be those who have low levels of resources, and they should not only be supported in limiting the QoL burden but also in maintaining or enhancing their resources.

Various statistical methods have been used in the literature to analyze the role of resource variables. Many publications express the relationships between resource variables and target variables such as quality of life in terms of correlations, as has been done in this paper. Resource variables can also be modeled as factors that either mediate (Zhou et al., 2022) or moderate (Asaba & Okawa, 2021) the effect of stress on health outcomes. When long-term data are available, hierarchical regression analyses can be used to determine the effect of resource variables. Such statistical analyses appear to be more appropriate to the nature of resource variables than simple correlations, which do not imply assumptions about causality or pathways. However, even statistically significant moderator or mediator variables do not necessarily imply that the assumed causality is correct. In analyzing our cross-sectional data, we restricted ourselves to simple correlations between resource factors and target variables, from which we can infer statements about the strength of the relationships but not about the causes of the relationships. Long-term studies with multiple measurement time points might be helpful in elucidating the conceptual role of resource variables in the interaction of cancer-related stress and health.

Some further limitations of this study should be mentioned. The participants of the cancer rehabilitation program may not be representative of all cancer patients. While patients with strong detriments to their health state may feel unable to participate, other patients with low detriments in health my not see the necessity of taking part in a rehabilitation program. Disease stage data were not available, so relationships between disease stage and resource variables could not be explored. The scales for measuring the resources were short; the item numbers were between 3 and 6. Larger instruments would probably have provided results that are more reliable. However, we used the instruments in the same way in all groups; therefore, the mean scores of different groups are comparable. Two of the three instruments consist of two opposite subscales with only moderate negative correlations between them. Since the reliability coefficients of the total scales were nevertheless higher than those of the subscales, and since the correlations of the total scales with other scales were generally higher than those of the subscales, we nevertheless believe that it is justified to use the total scales. In our study, we used generic instruments for measuring the resources. There are also instruments specifically designed for cancer patients, e.g., a new 5-factor resilience instrument for cancer patients (Ye et al., 2018), or an instrument for measuring treatment-related optimism (Cohen, Moor, & Amato, 2001). However, using generic instruments makes it possible to compare the results of the cancer patients with other patients and with groups of the general population. Finally, we did not perform a longitudinal study, and, therefore, could not test the impact of the resource variables on changes in QoL.

In summary, the study showed that resource variables are relevant for understanding the situation of cancer patients. Clinicians who notice low levels of sense of coherence, resilience, or optimisms in their patients will be better prepared for identifying patients in need for interventions. Especially younger patients deserve special attention.

Conflict of interests

The authors declare that there is no conflict of interest.

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