



ORIGINAL ARTICLE

Differences in distress severity among oncology patients treated by a consultation–liaison service. A five-year survey in Germany



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Abstract

Background and objectives: Cancer diagnosis commonly causes distress. There are associations between distress levels and clinical and psychosocial variables, but they are not necessarily dependent on cancer type. We assessed whether distress in hospitalised oncology patients treated by a consultation–liaison service (CLS) varied with oncological diagnosis or sociodemographic, clinical and care variables.

Methods: A naturalistic, retrospective survey of all cancer patients ($N=2864$) treated by a CLS over a five-year period (2012–2016). Data were collected using standardised documents. Differences were analysed using bivariate regression. Multivariate linear regression and logistic regression respectively were used to assess associations between distress as a continuous (0–10) or dichotomous variable (0–4 vs. 5–10) and clinical and care variables.

Results: Bivariate tests showed that the following characteristics were associated with higher distress levels: female (68.5%); foreign (7.9%); psychiatric comorbidity (18.9%); electively referral (23.6%); two or more interventions (20.7%); psychotherapeutic (35.3%) or psychopharmacological (5.4%) interventions; post-discharge treatment recommendation (23.3%). Level of functioning (Eastern Cooperative Oncology Group Scale-ECOG), number of contacts and cumulative treatment time were positively associated with distress, unlike age. Patients with gynaecological, lung, otorhinolaryngological and brain cancers had higher distress levels. Multivariate linear regression largely confirmed the bivariate results. Logistic regression demonstrated that a dichotomous distress variable did not differentiate between cancer types.

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Conclusions: Distress is less strongly related to cancer type than other clinical factors, e.g. psychiatric comorbidity, autonomy. Highly distressed patients should receive more intensive CLS care, irrespective of specific diagnosis. The positive association between elective referral and distress indicates that the CLS referral process works well.

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Introduction

General hospitals in the US began to recognise the importance of providing cancer patients with psychological and psychiatric treatment in the 1950s. Considerable effort has been devoted to assessing psychopathology and psychosocial comorbidity in this population, including developing screening instruments to identify patients in need of psycho-oncological care. It is well established that the specific patterns of distress and needs of oncology patients vary according to the type and stage of the disease. As time and staff resources are scarce there is a need for validated, short, highly sensitive and reasonably specific instruments for measuring distress.

An early approach to psycho-oncological care was outlined by Sutherland,¹ who formulated certain principles governing the various types of adaptation displayed by cancer patients: adaptation of the self (i.e. to stress), functional adaptations that depend on the body organ affected and psychosocial adaptation to the environment. These principles were applied to single cancer subtypes, for instance in the case of radical mastectomy due to breast cancer.² Bard and Sutherland described the psychological experience of radical mastectomy – a “terrifying experience for every woman” – as consisting of three phases: an anticipatory phase, an operative phase and finally a reparative phase in which the patient attempts to re-establish her previous functioning level using a variety of techniques. They concluded that “during each phase a sequence of reality events and emotional reactions is constantly in process for each patient”.^{2: 670}

The main target syndromes in psycho-oncology are distress, anxiety and depression. Distress is a dimensional concept meaning the subjective suffering level caused by a stressor such as a severe medical or psychosocial condition. Mood as well as anxiety disorders are categorical psychiatric constructs on the basis of inclusion as well as exclusion criteria. A meta-analysis of the results of 38 analyses of the accuracy of ultra-short methods of detecting cancer-related mood disorders found an overall sensitivity of 78.4% and an overall specificity of 66.8%, with a positive predictive value of 93.4%.³ The author concluded that ultra-short methods were modestly effective in screening for mood disorders but should not be used as diagnostic instruments, other than as a first-stage screen for ruling out depression.³ In a further investigation, the same author identified 45 potentially useful short and ultra-short tools, but only six which had been validated. These were the Hospital Anxiety and Depression

Scale (HADS; 13 items), the Distress Thermometer (DT; 1 item), a single verbal question (1 item), the Psychological Distress Inventory (PDI; 13 items), combined DT and impact thermometer (2 items), and combination of two verbal questions (2 items). All these tools had similar accuracy, but their efficiency varied; the combination of two verbal questions plus the PDI was identified as the optimal short method of identifying distress.⁴

The DT is the shortest screening instrument for assessing psychological distress in cancer patients, and the most widely investigated. Forty studies have examined the performance of the DT alone or in combination with the problem list, respectively other scales.⁵

The DT is an eleven-point scale (range: 0–10) and can be used on its own (1 item), or combined with a ‘help’ question (2 items) or a problem list (5 categories: practical, family related, emotional, spiritual/religious and physical).⁶ The short version of the DT has been translated into 21 languages and there is a consensus that using a score around 4 as the threshold for clinical relevant distress optimises sensitivity and specificity.⁷ The reported optimal DT threshold for relevant distress varies between 2, in the case of patients newly diagnosed with advanced cancer⁸ and 7 in the case of patients newly diagnosed with breast cancer.⁹ The DT has been shown to be highly sensitive to distress and mood, anxiety and adjustment disorders (sensitivity=100%), but lacks specificity (49–60%) i.e. was less effective at identifying non-distressed individuals.¹⁰

The German version of the National Comprehensive Cancer Networks (NCCN) ‘Distress Thermometer’ has been validated using the HADS-D and the brief version of the Fear of Progression Questionnaire (PA-F 12). Using a threshold of 5 points the DT had a sensitivity of up to 84% and specificity of up to 47%. The discriminant power of the DT was particularly high with respect to more severe symptoms of anxiety or depression.¹¹

In the majority of studies, a threshold of 4 points was found to maximise sensitivity and specificity.^{12,13} However, a recent study using HADS reported that a threshold of 5 points produced the best balance between sensitivity and specificity.¹⁴ Studies in China have demonstrated that a threshold of ≥ 5 points discriminates well between demoralisation and depression.¹⁵ A Dutch study of 181 women who had recently received a breast cancer diagnosis reported that the optimal DT threshold score for detecting distress was 7 points (sensitivity=0.75, specificity=0.84, positive predictive value of 69% and negative predictive value of 87%).¹⁶ However Racklitis et al. found

out that no DT score met the criteria for acceptable sensitivity ($\geq 85\%$) and specificity ($\geq 75\%$) in detecting a SCI-based psychiatric diagnosis.¹⁷ In conclusion, the DT is acceptable and useful as a tool for promoting the delivery of structured psycho-oncology care and enhancing the effectiveness of specialist psycho-oncology interventions,¹⁸ but it should not be used as a standalone psychological screening tool.¹⁷

In this study we did not compute validation parameters, instead we investigated whether DT score, expressed as a score between 0 and 10 or dichotomised using the threshold of 5 points supported by other investigations,^{11,15} was associated with clinical and care intensity variables and whether distress varied systematically with oncological diagnosis.

Objectives

Our first objective was to explore possible differences in distress amongst cancer patients referred by a general hospital to a consultation-liaison service (CLS) related to important socio-demographic, clinical (especially cancer diagnoses) and care variables. Our second objective was to assess possible associations between distress and clinical and care variables.

Method

Study design

This was a retrospective study covering five years (2012–2016). It included all the oncology patients ($N=2864$) treated by a multidisciplinary CLS team working in a 520-bed hospital during the study period. All therapists were trained in psycho-oncology according to an official German curriculum. Six accredited centres (breast, bowel, gynaecological, pancreas, prostate, and stomach centres), a palliative unit and regular medical as well as surgical wards attending oncologic patients have been included in the study. In accredited centres (76.4% of sample) a universal survey is intended, whereas oncologic patients from regular wards were referred to CLS only electively (23.6% of sample). Data concerning accredited centres are fairly accurate only from 2013 onwards ($n=2566$). Psychiatric diagnoses were based on the ICD-10. Global Assessment of Functioning (GAF), Eastern Cooperative Oncology Group Scale (ECOG) and Distress-Thermometer (DT) scores (all administered by a trained consultation physician) at first contact with the CLS were used. The data were collected systematically using a separate structured clinical sheet for each consultation and then transferred into an Excel table. After the quality of the data had been checked, the variables of interest (number of interventions, total treatment time, post-discharge treatment recommendations) were aggregated on a per patient basis and then all names and identification codes were removed from the database. All six doctors and therapists assigned to the CLS had been trained before in coding the variables reliably. This study design was approved by the Ethics Committee of the University of Ulm (220/15).

Investigated variables

- Socio-demographic variables: gender, age, and nationality.
- Clinical variables: distress; activity level; current psychiatric diagnosis; psychiatric diagnosis prior to hospitalisation; cancer type.
- Care variables: treatment centre affiliation; CLS contacts per patient; one contact vs. two or more contacts; total treatment time; psychotherapeutic intervention; psychopharmacological intervention; post-discharge care recommendation.

Instruments

- Distress-Thermometer (DT)¹¹: A self-report instrument developed by the NCCN. It is a visual scale ranging from 0 (no distress) to 10 (extreme distress), which can be used to assess patient's current state or general level of distress over the previous week.
- Eastern Cooperative Oncology Group Scale (ECOG)¹⁹: The ECOG measures performance status, i.e. the patient's ability to care for him or herself and carry out daily activities and physical activity. Scores are coded as follows: 0 = normal activity; 1 = symptomatic, but almost fully ambulatory; 2 = requires some bed time, but needs to be in bed less than 50% of normal working hours; 3 = needs to be in bed for more than 50% of normal working hours; 4 = confined to bed.

Statistical analysis

The sample was grouped by the type of cancer and by affiliation to an oncology centre and described in terms of the following variables: (a) continuous variables: age; distress (DT score); activity level (ECOG; interval variable treated as a continuous variable); number of interventions; total treatment time and (b) dichotomous variables: gender; accredited centre vs. oncologic treatment as usual; current psychiatric diagnosis; psychiatric diagnosis prior to admission; low-moderate vs. severe distress; one intervention vs. two or more interventions; psychotherapeutic intervention vs. treatment as usual; recommendation for post-discharge treatment vs. standard follow-up.

Distress-continuous was regressed on the metric and dichotomous variables and regression coefficients were obtained for all bivariate associations; effect sizes were computed as beta. Differences in distress according to cancer type were assessed using analyses of variance (ANOVA) and the Scheffé post hoc test.

Associations between distress (DT score) and clinical and care variables were computed using multivariate linear regression analysis with robust standard errors for single regression coefficients as tests for heteroscedasticity (Ramsey's and White's tests) were positive. Multivariate logistic regression was used to calculate associations between distress-dichotomous (low and moderate: 0–4; severe: 5–10) and clinical and care variables.

Table 1 Description of sample ($N=2864$).

	<i>N</i>	<i>M</i> (<i>SD</i>) or %	Range
<i>Socio-demographic variables</i>			
Age	2861	64.4 (12.9)	1–100
Gender (% women)	2863	68.5%	
Nationality (% foreigners)	2856	7.9%	
<i>Clinical variables</i>			
DT (DT = 0–10)	2305	4.6 (2.5)	0–10
Subsample $DT \geq 5$	2305	47.2%	
Current psychiatric comorbidity	2257	18.9%	
Psychiatric comorbidity prior to admission	2787	10.2%	
ECOG	2503	1.35 (1.57)	0–4
<i>Treatment variables</i>			
Proportion treated in accredited centres (2013–2016)	2058	76.4%	
Proportion receiving a psychopharmacological intervention	2247	5.4%	
Proportion receiving psychotherapeutic treatment	2251	35.3%	
Proportion for whom post-discharge follow-up was recommended	2244	23.3%	
Total treatment time (min)	2864	53.7 (113.6)	15–3135
Number of contacts with CLS	2861	1.55 (1.98)	1–47
Proportion of patients receiving ≥ 2 interventions	2861	20.7%	

CLS, consultation–liaison service; DT, Distress-Thermometer (range: 0–10); ECOG, Eastern Cooperative Oncology Group Scale; *N*, sample size; *M*, mean; *SD*, standard deviation; Range, smallest value-highest value.

Results

The sample had a mean age of 64.4 years ($SD=12.9$) and was composed mainly of women (68.5%) and German natives (only 8% foreigners). Distress scores showed moderated scattering (variation coefficient about 54%) and the average score was 4.6 (0–10 scale); 47.2% of patients had distress scores ≥ 5 . Only a fifth of the sample (18.9%) had a current ICD-10 psychiatric comorbidity and a tenth (10.2%) had had a psychiatric diagnosis prior to the index hospitalisation. The average activity level, as measured by ECOG, was around 1.35 (0–4 scale) and scores were widely scattered ($SD=1.57$). The majority of patients were treated in accredited, specialist centres (76.4%). Only 5.4% received a psychopharmacological intervention, a third (35.3%) received a psychotherapeutic intervention and post-discharge psychological treatment was recommended in about a quarter (23.3%) of cases. The total treatment time per patient was less than an hour (53.7 min) but times were widely scattered (variation coefficient about 211%). Patients received 1.6 interventions on average, only a fifth had two or more contacts with the CLS (see [Table 1](#)).

The second step in the analysis was a series of bivariate tests between distress level and single variables, carried out independently of cancer type. Distress was positively associated with the presence of a prior or current psychiatric diagnosis, with elective referral, foreign citizenship, female gender, receipt of a psychotherapeutic or psychopharmacologic interventions and recommendation for post-discharge psychological support. Distress was negatively associated with age and activity level (ECOG), but positively associated with number of interventions and total treatment time. In general the effects were of moderate size ($\beta \leq 0.37$; see [Table 2](#)).

The third step in our analysis was to compare distress levels according to cancer diagnosis. Distress levels were lowest in patients with prostate cancer (3.38) and other urological cancers (4.12), followed by those with colorectal (4.27) and breast (4.48) cancer. The highest distress levels were observed in patients with lung (6.26), otorhinolaryngological (7.12) and brain (7.52) cancers. Comparison of treatment facilities showed that, as expected, patients in accredited centres had the lowest distress levels (4.39), whereas elective referrals from the palliative care unit (5.88) and from facilities other than oncology centres (6.53) showed the highest distress levels (see [Table 3](#)).

The fourth step was the exploration of associations between distress as dependent variable (continuous and dichotomous) and clinical and care variables as regressors using linear multivariate and logistic regression models respectively. In both models age and activity level were negatively associated with distress. Presence of current psychiatric comorbidity, receipt of psychotherapeutic interventions and recommendation produced only one important change, when prior diagnosis of psychiatric disorder was included in the statistical model: there was no independent association between prior psychiatric diagnosis and distress level, but the positive association between distress level and psychopharmacological intervention became negative. Gender, number of interventions and total treatment time were not associated with distress level. The multivariate regression revealed few differences between cancer types: patients with gynaecological, brain and otorhinolaryngological cancers showed the highest distress levels compared with breast cancer, whereas in the logistic model these differences disappear. The multivariate model explained 26% and the logistic 17% of the distress variance (see [Table 4](#)).

Table 2 Bivariate associations between distress level and socio-demographic, clinical as well as treatment variables, irrespective of cancer type.

	<i>N</i>	<i>b</i>	<i>t</i>	<i>p</i>	Effect size
<i>Socio-demographic variables</i>					
Age	2303	−0.99	−9.68	<0.001	0.20
Gender (0 = women; 1 = men)	2304	−0.01	−2.49	0.013	−0.05
Nationality (0 = foreign; 1 = German)	2299	−0.005	−2.22	0.027	−0.04
<i>Clinical variables</i>					
Current psychiatric comorbidity (0 = absent; 1 = present)	1845	0.04	12.7	<0.001	0.28
Psychiatric diagnosis prior to admission (0 = no; 1 = yes)	2256	0.02	7.8	<0.001	0.16
ECOG (0–4)	2098	0.08	6.29	<0.001	0.13
<i>Treatment variables</i>					
Treatment centre (0 = accredited centre; 1 = other facility) (2013–2016)	1684	0.04	10.1	<0.001	0.24
Number of contacts with CLS	2302	0.12	8.32	<0.001	0.17
More than 1 contact with CLS (1 = 0; >1 = 1)	2302	0.04	12.3	<0.001	0.25
Total treatment time (min)	2305	6.81	8.81	<0.001	0.18
Psychopharmacological intervention (0 = no; 1 = yes)	1800	0.01	8.44	<0.001	0.19
Psychotherapeutic intervention (0 = no; 1 = yes)	1802	0.06	14.2	<0.001	0.32
Post-discharge treatment recommended (0 = no; 1 = yes)	1800	0.06	16.7	<0.001	0.37

CLS, consultation–liaison service; ECOG, Eastern Cooperative Oncology Group Scale; *N*, sample size for index variable; *b*, regression coefficient; *t*, *t*-value on *t*-distribution; *p*, level of significance; effect size, beta.

Table 3 Differences in distress according to treatment facility and main oncological diagnosis.

	<i>N</i>	Distress <i>M</i> (<i>SD</i>)
<i>Treatment facility (2013–2016)</i>		
Accredited oncologic centres	1394	4.39 (2.45)
Regular wards	195	6.53 (2.08)
Palliative care unit	175	5.88 (2.79)
Average	1764	4.78 (2.48)
<i>Oncologic diagnoses (2012–2016)</i>		
Breast cancer	993	4.48 (2.50)
Other gynaecological cancers	258	5.32 (2.26)
Colorectal cancers	479	4.27 (2.31)
Digestive tract cancers	138	5.21 (2.48)
Prostate cancer	145	3.38 (2.75)
Other urological cancers	90	4.12 (2.71)
Leukaemia	32	5.97 (2.44)
Lung cancer	64	6.26 (2.38)
Brain cancers	21	7.43 (1.47)
Otorhinolaryngological cancers	16	7.12 (2.39)
Other specified cancers	66	5.67 (2.69)
Average	2302	4.64 (2.54)
Differences (ANOVA with Scheffé test)	$F = 17.7; p < 0.001$ $8,9,10 > 1,3,5,6$ $5 < \text{all except } 3$ $2 > 1,3,5$	

N, sample size; *M*, mean; *SD*, standard deviation; ANOVA, bivariate analysis of variance; Scheffé, post hoc test of group (cancer type) differences in distress.

Discussion

This investigation demonstrated that oncology patients electively referred to the CLS, patients with a psychiatric

comorbidity and patients with lower levels of physical functioning and autonomy reported higher distress levels. Higher distress levels were associated with receipt of psychopharmacological and psychotherapeutic interventions and a

Table 4 Multivariate linear and logistic regression models with distress as dependent variable and clinical and treatment variables as regressors.

	DT (metric)			DT (dichotomous)		
	<i>b</i>	<i>t</i>	<i>p</i>	OR	<i>z</i>	<i>p</i>
<i>Clinical & care variables</i>						
Age	−0.03	−5.98	<0.001	0.98	−3.86	<0.001
Gender		n.s.			n.s.	
ECOG	0.38	5.35	<0.001	1.46	5.96	<0.001
Current psychiatric comorbidity	1.33	5.86	<0.001	3.03	4.37	<0.001
Prior psychiatric diagnosis		n.s.			n.s.	
Psychopharmacology	−0.69	−3.26	<0.001	0.61	−2.32	0.020
Psychotherapy	1.10	7.71	<0.001	2.92	7.44	<0.001
Follow-up recommendation	0.57	2.71	0.007	2.13	3.70	<0.001
Number of interventions		n.s.			n.s.	
Treatment time		n.s.			n.s.	
<i>Oncological diagnosis</i> (base outcome: breast cancer)						
Gynaecological	0.50	2.54	0.011	1.54	1.99	0.047
Colorectal		n.s.			n.s.	
Digestive tract		n.s.			n.s.	
Prostate	−0.79	−2.07	0.038		n.s.	
Other urological		n.s.			n.s.	
Leukaemia		n.s.			n.s.	
Lung cancer		n.s.			n.s.	
Brain cancer	1.69	3.98	<0.001		–	
Otorhinolaryngological	1.91	2.29	0.022		n.s.	
Other specified cancers		n.s.			n.s.	
<i>Constant</i>	5.95	15.9	<0.001	1.43	0.98	0.326
<i>N</i>		1302			1288	
<i>F/prob > F</i> <i>LR Chi²/prob > Chi²</i>		25/<0.0001			310/<.0001	
<i>R² pseudo R²</i>		0.26			0.17	

DT (metric), DT as continuous variable 0–10; DT (dichotomous), DT as dummy variable: 0–4=0; 5–10=1; ECOG, Eastern Cooperative Oncology Group Scale; Gender: female, 0; male, 1; Psychiatric diagnosis, psychopharmacology, psychotherapy, recommendation: 0, not given; 1, given; *b*, regression coefficient; *t* & *z*, value on normalised *t*- and *z*-distributions respectively; *p*, level of significance; *N*, sample size; *F*, value on *F*-distribution for variance; *R²*, multiple correlation coefficient; OR, odds ratio, similar to relative risk; LR, likelihood ratio; n.s., not significant at 0.05 level.

recommendation for post-discharge psychological care. Both number of interventions and total treatment time were positively associated with distress level in bivariate tests; this effect disappears in multivariate models. Small differences among cancer types were found after adjusting for variance in socio-demographic, clinical and treatment variables: patients suffering from gynaecological, brain and neck cancers displayed the highest distress levels, those suffering from urological cancers the lowest levels. Although there was no gender difference in distress, age was negatively associated with distress level.

Self-reported distress is surely relevant to care needs,²⁰ but there is no consensus about the optimal threshold DT scores in order to ensure accurate diagnosis and effective care planning. Supplementing the DT with the Impact Thermometer failed to improve its accuracy in identifying distress.²¹ A better alternative might be to include the DT in an interview-based expert rating scale, such as the long and short forms of the Basic Documentation for Psycho-Oncology²² or to use 'emotion thermometers' consisting of four visual analogue scales (distress, anxiety, depression, anger) in combination with a "need for help" question.^{23–26}

In this investigation we adopted a DT threshold of ≥ 5 points and calculated multivariate models with continuous and dichotomous (<5 ; ≥ 5) distress scores as the dependent variable. The associations between distress and the clinical and treatment variables were similar in both models. Overall, metric DT score is useful an important source of information for allocation of psychological resources – especially psychotherapeutic interventions – to cancer patients, regardless of type of cancer, because distress represents the outcome of a highly individual processing of information about one's disease.

Selectively referred CLS patients who were not treated in accredited oncology centres were more distressed. In an earlier study we demonstrated that patients referred from services other than oncology centres showed greater mental impairment as well as being physically more disabled and needed more intensive treatment from the CLS.²⁷ These results indicate that decisions about referrals and the allocation of CLS care resources are appropriate. The cancer type associated with the lowest distress levels was prostate cancer, regardless of treatment facility, probably because the disease tends to be silent until the advanced stages and to

the particular coping strategies adopted by men. According to Orom et al. the factors associated with higher levels of distress in prostate cancer patients were low self-efficacy in decision-making, lack of confidence about control of one's cancer, masculine identity threat, lack of optimism and lack of resilience.²⁸ In our study the average distress level of patients with breast cancer was between 4 and 5 points, which is similar to the average for the whole sample. Ates et al. reported that in women undergoing endocrine treatment emotional distress was associated with patient variables rather than medical or treatment characteristics.²⁹ In a more recent investigation rumination, thought suppression, social constraints and previous exposure to life stress were identified as potential risk factors for chronic distress in response to advanced breast cancer.³⁰ In this investigation the highest distress levels were found in patients with lung, brain and neck cancers (average scores > 6); however, caution must be exercised in interpreting this result as the subsamples of patients with these cancers were smaller than those for the other cancer types. Brain and neck cancers tend to have a poor prognosis, progress rapidly and put physical as well as psychological stress on patients. In the case of both brain and neck cancers there is evidence that the levels of anxiety and depression are tendentially higher.³¹ Our multivariate model confirmed that the highest distress levels were associated with brain, neck and gynaecological cancers, even after adjusting for variance in clinical and treatment variables. Level of functioning, i.e. ability to care for oneself as measured by the ECOG, was positively associated with distress level. Marten-Mittag et al. recently demonstrated in a German sample that low performance status was associated with higher distress levels.²² It could be hypothesised that restrictions on daily activities and loss of autonomy increase distress.

Finally, bivariate tests demonstrated that independently of cancer type, patients suffering from more distress had more contacts with CLS, more CLS treatment time and were more likely to be offered psychopharmacological and psychotherapeutic interventions and more likely to be given a recommendation for specific post-discharge psychological support. However, it should be pointed out that psychopharmacological interventions were negatively associated with distress levels in multivariate regression models, probably because of psychiatric comorbidity that accounts for the psychopharmacological variance. On the other hand, oncology patients are less likely to receive psychopharmacological interventions than other CLS patients. The positive associations between distress level and psychotherapy as well as post-discharge recommendation for psychosocial support indicate the importance of psychological interventions in oncology, especially when distress levels are higher. The lack of association between gender and distress is especially important. Special attention has to be paid for old people since negative association between distress and age could mean the presence of other real needs than younger people have, as pointed out in prior investigations.³²

Limitations

We need to highlight some limitations of our study. Our investigation did not deal with the psychometric properties of

DT; it focused on distress and was intended to describe the pattern of associations between distress and both clinical and treatment variables in the subpopulation of oncology patients in a general hospital who were seen by a CLS. The fact that not all oncology patients were assessed, only those referred to the CLS, could be considered a limitation as it means our results do not apply to the large population of cancer patients, but only to those treated by a CLS. Furthermore, for ethical reasons patients treated by the CLS were not compared with those who refused treatment – about 33.25% of the patients from accredited oncology centres did not want a full-scale CLS intervention. Finally, in the case of some variables the proportion of missing values was significant, however STATA handles missing data by omitting the missing values and implements listwise deletion automatically if any of the variables listed after the 'regression command' is missing.

General conclusion

The advantages of this naturalistic investigation are the focus on distress in oncology patients treated by a CLS and the large sample size. The results highlight that cancer type is less relevant to patients' level of distress than other clinical factors such as psychiatric comorbidity and autonomy. Furthermore, treatment time and number of contacts by CLS were positively associated with distress levels, indicating that resources are being targeted appropriately. There are no advantages to measuring distress as a dichotomous variable rather than an interval variable. Prospective research that includes measurement of additional variables such as specific psychosocial stressors, personality traits or sources of meaning should be carried out to provide a more comprehensive picture of the factors associated with distress in cancer patients.

Conflict of interest

The authors declare not to have any conflict of interests.

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