Support Care Cancer (2017) 25:2305–2312
DOI 10.1007/s00520-017-3641-8

ORIGINAL ARTICLE

Predictors of psychological distress among cancer patients receiving care at a safety-net institution: the role of younger age and psychosocial problems

Chiara Acquati[1] · **Karen Kayser**[2]

Received: 24 October 2016 / Accepted: 10 February 2017 / Published online: 2 March 2017

Abstract
Purpose The present study examined prevalence and predictors of psychological distress among cancer patients receiving care at a safety-net institution during the first year of implementation of a distress screening protocol. Differences between screened and unscreened patients were also analyzed.
Methods Data on 182 breast and lung cancer patients who were treated at a NCI-designated Academic Comprehensive Cancer Center (ACAD) were abstracted from the patients' medical charts for a period of 1 year.
Results Among the patients screened for distress, 66.2% reported a score higher than 4 (the established cut-off for distress) on the Distress Thermometer. Results from multiple regression analysis indicated that younger age, practical, and emotional problems were significant predictors of higher self-reported scores of psychological distress. There were no significant differences on socio-demographic and clinical variables between patients screened and those who were not screened. However, patients who were receiving more than one treatment modality were more likely to be screened.
Conclusion The occurrence of psychological distress in this setting was higher than the percentages reported in other similar studies. Furthermore, younger cancer patients and those presenting psychosocial problems were at risk for higher distress, which requires referral to psychosocial providers and the implementation of services able to meet these areas of need.

Keywords Psychological distress · Distress thermometer · Breast cancer · Lung cancer · Age · Psychosocial predictors

Introduction

As cancer centers across the nation have begun to routinely implement distress screening protocols in clinical oncology care [1, 2], percentages of distressed patients vary considerably across studies, ranging from 32% to 62% [3–6]. Furthermore, there is increasing evidence to suggest improved medical outcomes and quality of life when distress is identified and managed [7–9]. As a consequence, questions have arisen about differences in the level of patient distress by individual and contextual characteristics, and whether programs will be able to adequately respond to patients' psychosocial needs. This represents a major concern, especially for cancer centers that serve a significant number of uninsured or low-income patients.

While studies have found that certain types of cancer patients tend to have higher rates of distress [10–12], there has been little empirical study of other patient or social characteristics that may be contributing to their distress. Recent findings indicate that patient characteristics and clinical factors may have a role in the presentation of distress. Female patients, patients who were single, and those who did not have private insurance were at greater risk for psychological distress [13–15]. Also, age emerges as a significant aspect, because in several studies younger patients screened higher for distress [3, 6, 12, 13, 15–17]. Among clinical factors, patients receiving active treatment (in particular chemotherapy), with advanced cancer, and greater symptoms were more likely to report distress [11, 18]. From a person-in-environment

---

✉ Chiara Acquati
cacquati@central.uh.edu

Karen Kayser
karen.kayser@louisville.edu

[1] Graduate College of Social Work, University of Houston, 3511 Cullen Blvd, Houston, TX 77204-4013, USA

[2] Kent School of Social Work, University of Louisville, Louisville, KY, USA

perspective, it follows that the role of contextual variables in the psychological distress of cancer patients should be examined. This is evidenced by the greater likelihood that patients reporting scores above the cut-off for distress are typically of low socioeconomic status [13, 16, 19], members of ethnic minority groups [20] or from rural areas [21]. Not only the initial level of distress at time of diagnosis has been found to be predictive of distress reported over time [22, 23] but also patient's distress at the time of discharge has been associated with the presence of a variety of problems [14] and a number of emotional issues [24, 25], suggesting that offering early intervention and referral to care has the potential to improve the subsequent quality of life of cancer patients.

These considerations motivated to authors to choose as site of the study a public cancer center that served as a safety-net institution for a large metropolitan area in Kentucky, a state with some of the highest rates of cancer incidence and mortality in the nation [26]. Furthermore, approximately 15% of the Kentucky population did not have access to health insurance at the time of the study conceptualization [27]. This retrospective analysis was designed to (1) determine the prevalence of psychological distress during the first year of implementation of a distress screening protocol; (2) assess demographic, clinical, and psychosocial variables predictive of higher distress; and (3) identify differences between screened and not screened patients on socio-demographic and clinical factors.

Methods

Study participants and procedure

The sample consisted of 182 patients with breast and lung cancer treated at an NCI-designated Academic Comprehensive Cancer Center (ACAD). These two clinics at the site had been implementing distress screening procedures and algorithms for referral to psychosocial follow-up for approximately 1 year when the study was conducted. After obtaining approval from the Institutional Review Board, potential participants were identified by using the center's Cancer Registry records. Inclusion criteria were (1) being over 18 years of age, (2) having received a diagnosis of breast or lung cancer, and (3) receiving treatment at the participating institution. Data were extracted retrospectively from patient medical records. A total of 233 patients who met the eligibility criteria were identified. At the time of the study, medical charts were mostly paper-based, and thus, the investigators relied on whether charts were present in the Medical Records Department during the data collection period. Fifty-one medical charts could not be located because they had been removed from the floor due to death or patient's transfer to another facility. This resulted in a final sample of 182 cancer patients. Electronic medical records were also accessed to compare paper and electronic data about patients' psychological distress.

Measures

Psychological distress and psychosocial problems Patient-reported distress was assessed by the NCCN Distress Thermometer (DT) and Problem List. The DT is an 11-point scale from 0 (no distress) to 10 (extreme distress) rating the level of distress experienced during the previous week. Psychosocial problems were measured by a problem list that included practical, family, emotional, spiritual, and physical issues.

Patient characteristics Patient characteristics were measured with socio-demographic variables such as gender, age, race, marital status, insurance coverage, and geographic residence. Data on education, income, and occupation were available only for a small subset of the sample and these variables were not included in the current analysis. Type of cancer, stage of the disease, treatment modality, and number of diagnoses were the clinical factors examined.

Statistical analysis

Data were analyzed using SPSS version 22 and power analysis computed with G*Power 3.1. Descriptive statistics were calculated to describe the sample in terms of socio-demographic characteristics, clinical variables, distress scores and reported psychosocial issues. Differences between breast and lung cancer patients were examined conducting chi-square tests for categorical variables and *t*-tests/ANOVAs for continuous variables. Bivariate correlations (Pearson r) and multiple regression analysis (R squared, betas) were then used to identify predictors of distress scores. Finally, chi-square and independent samples *t*-test analyses were used to investigate differences between screened and non-screened participants on demographic and clinical variables. The level of significance was set at $p < .05$.

Results

Participants' characteristics: socio-demographic and clinical variables

Socio-demographic and clinical characteristics are summarized in Table 1. The majority of the patients were White (77.5%) and the mean age was of 58 years (SD = 11.9) at the time of the study. Fifty-two percent of participants had some type of public health care coverage (Medicare, Medicaid, VA, Medicare with supplement) while 32.2% had private health insurance. Twenty-seven patients (15.5%) were uninsured at time of the study. The majority of the sample (91.7%) was from urban areas, with 8.3% of patients living in counties defined as rural according to the Ministry of Agriculture [28].

Table 1 Frequencies of socio-demographic and clinical characteristics of the sample ($N = 182$) and by cancer type

Variable	Lung cancer ($N = 93$)	Breast cancer ($N = 89$)	Total sample ($N = 182$)	p value
Age (mean score)	61.67 (SD = 10.7)	54.34 (SD = 11.9)	58.08 (SD = 11.9)	$p < .001$
Age (3 categories)				
21–40 years	–	10 (11.2%)	10 (5.5%)	n.s.
41–60 years	40 (43.0%)	51 (57.3%)	91 (50.0%)	
>61 years	53 (57.0%)	28 (31.5%)	81 (44.5%)	
Gender				
Male	51 (54.8%)	–	51 (28%)	$p < .001$
Female	42 (45.2%)	89 (100%)	131 (72%)	
Race				
White	73 (78.5%)	68 (76.4%)	141 (77.5%)	n.s.
Black	20 (21.5%)	18 (20.2%)	38 (20.9%)	
Other	–	3 (3.3%)	3 (1.6%)	
Marital status				
Unknown	4 (4.3%)	–	4 (2.2%)	n.s.
Single	18 (19.4%)	13 (14.6%)	31 (17.0%)	
Married	39 (41.9%)	43 (48.3%)	82 (45.1%)	
Divorced	22 (23.7%)	25 (28.1%)	47 (25.8%)	
Widowed	10 (10.8%)	8 (9.0%)	18 (9.9%)	
Residence				
Urban	81 (87.1%)	85 (96.6%)	166 (91.7%)	$p < .05$
Rural	12 (12.9%)	3 (3.4%)	15 (8.3%)	
Insurance coverage				
Uninsured	17 (20.0%)	10 (11.2%)	27 (15.5%)	$p < .01$
Private insurance	16 (18.8%)	40 (44.9%)	56 (32.2%)	
Public coverage	52 (61.2%)	39 (43.8%)	91 (52.3%)	
Stage of the disease				
Stage 0	–	14 (15.7%)	14 (7.8%)	$p < .001$
Early stage (I and II)	23 (25.6%)	58 (65.2%)	81 (45.3%)	
Advanced stage (III and IV)	67 (74.4%)	17 (19.1%)	84 (46.9%)	
Treatment modality (3 levels)				
No treatment	7 (7.5%)	4 (4.5%)	11 (6.0%)	n.s.
Single modality	39 (41.9%)	26 (29.2%)	65 (35.7%)	
Multiple modality	47 (50.5%)	59 (66.3%)	106 (58.2%)	
Number of diagnoses				
One primary diagnosis	75 (82.4%)	72 (80.9%)	147 (81.7%)	n.s.
Two or more primary diagnoses	16 (17.6%)	17 (19.1%)	33 (18.3%)	

The sample was almost equally divided between lung (51%) and breast cancer patients (49%). About one-half of the sample was diagnosed with early stage cancer and one-half with advanced stages (45.3% and 46.9%, respectively). The majority of the participants (58.2%) received combined treatments, with 35.7% of patients receiving only one form of treatment (surgery, radiation, or chemotherapy). Significant differences were identified between the two cancer groups for insurance coverage ($p < .01$), mean age ($p < .001$), and for geographic residence ($p < .05$), with lung cancer patients being older than breast cancer patients and more likely to have public health care coverage. Lung cancer patients were also more likely to be from rural counties than the breast cancer counterpart, although the majority of our sample resided in an urban environment. Among the clinical variables, there were differences in stage of the disease ($p < .001$) with lung cancer patients presenting more advanced diagnoses (Table 1).

Perceived distress and psychosocial problems

Overall, 66.2% of the participants met the center's cut-off score for distress, with an average score of 4.9 (SD = 3.27). A larger percentage of patients with lung cancer were distressed compared to breast cancer patients (68.7% versus 63.5%).

Among the two groups, 41% of lung and 38% of breast cancer patients were moderate on perceived distress (4–7), while 28% and 26%, respectively, reported high levels of distress (8–10) (Fig. 1). No statistically significant differences were identified for socio-demographic and clinical variables for the three levels of distress (no distress, moderate, and high distress) between groups. Multiple issues on the problem list were reported by 73.5% of participants. Among the problems that patients reported to be related to their distress, the majority indicated physical symptoms (81.9%), emotional (72.7%), and practical problems (51.6%), with lung cancer patients more likely to report emotional ($p < .05$) and physical issues ($p < .05$) (Fig. 2).

Relationship among distress, psychosocial problems, socio-demographic, and clinical characteristics

Using bivariate analyses, correlations between socio-demographic characteristics, clinical variables, patient-reported problems, and distress were initially examined (data not shown). Significant associations were identified between distress scores and age ($r = -.21$, $p < .01$), practical ($r = .37$, $p < .01$), family ($r = .31$, $p < .01$), emotional ($r = .49$, $p < .01$), spiritual ($r = .20$, $p < .05$), and physical problems ($r = .30$, $p < .01$). These variables were then entered in a multiple regression analysis (Table 2). The R^2 was statistically significant ($F_{(6,\ 145)} = 12.58$, $p < .001$, R^2 adjusted = .315), indicating that 31.5% of variance in distress screening scores can be explained by the model. In the present sample, younger age ($\beta = -.17$, $p < .05$), practical ($\beta = .18$, $p < .05$), and emotional problems ($\beta = .29$, $p < .001$) were significant predictors of higher self-reported scores of distress.

These variables were then entered into two separate multiple regression equations for each cancer type. Among lung cancer patients (Table 3), significant predictors of higher distress scores were younger age ($\beta = -.28$, $p < .01$), family ($\beta = .22$, $p < .05$), emotional ($\beta = .31$, $p < .01$), and physical problems ($\beta = .21$, $p < .05$). For women with breast cancer, the presence of practical ($\beta = .35$, $p < .01$) and emotional issues ($\beta = .36$, $p < .01$) contributed to higher perceived distress (Table 4).

Differences between screened and not screened patients

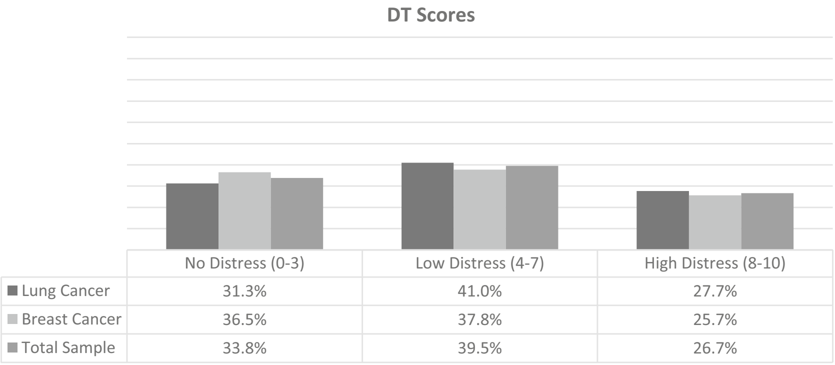
In the present sample, the majority of the patients (86.3%) had completed the Distress Thermometer at the time of their first visit, with only 14% having no documentation of screening. No significant differences were found between screened and not screened patients on socio-demographic and clinical variables, with the exception of treatment. Patients receiving multiple treatments were more likely to be screened ($p < .05$) than individuals who were receiving only one treatment modality.

Discussion

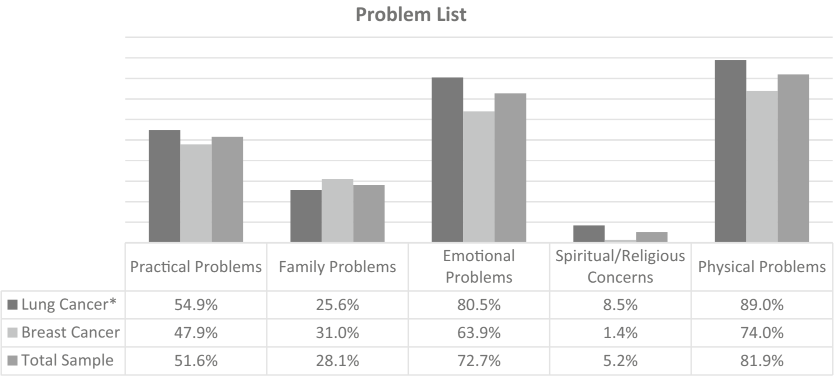
The present study examined psychological distress of cancer patients receiving care at a safety-net institution during the first year of implementation of a distress screening protocol. The authors were interested in determining the prevalence of distress reported by screened patients, predictors of higher scores on the Distress Thermometer, and differences between screened and unscreened patients. Findings further the knowledge about factors that contribute to the psychological distress of cancer patients and the potential benefits of implementing a distress screening protocol to identify patients who are highly distressed and may need psychosocial services; especially when the presenting level of distress is the result of pre-existing or co-occurring psychosocial problems.

First, the prevalence of self-reported distress in this sample is higher than data reported in the literature [3–6]. Whereas previous rates of psychological distress were usually between one third and two thirds of the sample, approximately 66% of our participants reported a score above the threshold of 4, suggesting that a significant number of patients included in the study experience a clinical level of distress after diagnosis.

Fig. 1 Distress Thermometer scores for the overall sample and by cancer type



	No Distress (0-3)	Low Distress (4-7)	High Distress (8-10)
■ Lung Cancer	31.3%	41.0%	27.7%
■ Breast Cancer	36.5%	37.8%	25.7%
■ Total Sample	33.8%	39.5%	26.7%



	Practical Problems	Family Problems	Emotional Problems	Spiritual/Religious Concerns	Physical Problems
■ Lung Cancer*	54.9%	25.6%	80.5%	8.5%	89.0%
■ Breast Cancer	47.9%	31.0%	63.9%	1.4%	74.0%
■ Total Sample	51.6%	28.1%	72.7%	5.2%	81.9%

Fig. 2 Problem list scores for the overall sample and by cancer type. *Statistically significant differences were detected for emotional and physical problems ($p < .05$)

Three factors can explain this finding: (1) the timing of the administration of the screening instrument, (2) the types of cancer included the sample, and (3) patient characteristics. When the distress screening protocol was initially introduced at the cancer center, patients received the DT at the first medical appointment. The high level of distress reported by the patients may have been influenced by the anxiety about the visit. Also, while mixed types of cancers were analyzed in other studies, the inclusion of only lung and breast cancer patients may have contributed to the higher percentage of distress because of the detrimental impact on quality of life documented for these cancer types [12, 13, 15, 29]. Finally, as mentioned earlier, the site of the study was a public cancer center that served as a safety-net institution for a large metropolitan area. Many of the patients were from low income backgrounds and may have experienced multiple pre-existing or co-occurring stressors, along with cancer, which contributed to the worse score captured by the screening instrument.

In this sample, younger age and the presence of psychosocial problems were predictors of higher distress. The existence of a significant relationship between distress scores and age confirms that a cancer diagnosis earlier in life can have a profound effect on the individual's psychological well-being [3, 6, 12, 15–17, 30, 31]. Similar to previous works by Graves et al. [3], Jacobsen et al. [14], and Blenkiron et al. [24], higher distress was associated with the presence of psychosocial issues on the Problem List. In contrast with other studies [13, 15, 16, 18, 30, 32], clinical variables (stage of the disease and treatment) were not predictive of higher DT scores for our participants. Although moderate and high levels of distress were more frequent in the lung cancer group—a result consistent with the existing literature [12, 13]—no significant differences in distress were found by cancer type.

Recent studies have started to explore factors associated with psychological distress, with the goal to improve adherence and responsiveness of distress screening protocols [9, 24, 33]. At the present time, it is necessary to determine whether patients in need of psychosocial services are correctly identified and if vulnerable groups of patients are systematically excluded [6]. Our results indicate that higher consideration should be placed on pre-existing or concurrent psychosocial issues. When the sample was analyzed separately by cancer type, different variables emerged as significant. For patients with lung cancer, the role of psychosocial problems—especially at the emotional and family level—seems to confirm that this type of cancer is associated with worse well-being and more problematic relationships [12]. This result can be linked to the greater health-related stigma accompanying a diagnosis of lung cancer [11, 33]. There are different hypotheses currently proposed in the literature about the mechanism by which stigma influences

Table 2 Multiple regression analysis predicting distress scores from age, practical, family, emotional, spiritual, and physical problems for the overall sample

		Distress screening scores			
Variables	B	Std. Error(B)	β	*t*	Part correlation
Constant	4.51	1.31		3.43***	
Age	−.05	.020	−.17	−2.52*	−.17
Practical problems	1.18	.49	.18	2.39*	.16
Family problems	.72	.54	.09	1.30	.09
Emotional problems	2.17	.60	.293	3.60***	.24
Spiritual concerns	1.94	1.00	.13	1.93	.97
Physical problems	1.01	.66	.12	1.54	.10

Overall $R^2 = .342$, adjusted $R^2 = .315$, $F(6, 145) = 12.583$, $p < .001$

*$p < .05$ **$p < .01$ *** $p < .001$

Table 3 Multiple regression analysis predicting distress scores by age, practical, family, emotional, spiritual, and physical problems for lung cancer patients

	Distress screening scores				
Variables	B	Std. error(B)	β	*t*	Part correlation
Constant	5.91	1.96		3.02**	
Age	−.09	.03	−.28	−3.18**	−.28
Practical problems	.02	.66	.01	.04	.003
Family problems	1.61	.71	.22	2.26*	.12
Emotional problems	2.52	.87	.31	2.90**	.26
Spiritual concerns	1.37	1.07	.12	1.28	.11
Physical problems	2.21	1.02	.21	2.17*	.19

Overall $R^2 = .416$, adjusted $R^2 = .369$, $F(6, 75) = 8.90$, $p < .001$

*$p < .05$ **$p < .01$ *** $p < .001$

psychosocial outcomes in this group. Our findings show similarities with the work of Cataldo and colleagues, where the stigma of lung cancer is related to lower social support and higher interpersonal conflicts [34]. It is possible that the difficulties reported by our participants are indicative of a more complex interaction with the supportive network, where the ability to communicate about the diagnosis may be impaired [35–37]. Lung cancer patients appear therefore a high-risk group, which requires special attention to ensure early intervention. In our study, for women with breast cancer emotional and practical difficulties were predictive of their self-reported level of distress. This finding is in line with the existing literature [16, 18, 38, 39]. However, while emotional and physical issues were among the most significant concerns in other studies [16, 38, 39], practical problems were particularly relevant in this sample.

Previous research indicates that distress is associated with lower health-related quality of life, low satisfaction with medical care, and reduced survival [40]. It follows that it is critical to implement a screening protocol that correctly identifies distressed patients and refers them to psychosocial services. Results indicate that the cancer center was able to meet percentages of screening similar to the best performing centers reported in the literature [6, 13, 14, 41], with a rate of assessment of 86.3%. However, the current screening rate is still below the recommendation that all patients are screened routinely to identify level and sources of distress [42]. In our analysis, patients receiving multiple forms of treatment were more likely to be screened, which can be merely due to the higher frequency of visits.

There are several limitations to this study. First, the small sample size and its cross-sectional design affect the generalizability of findings. Second, because data were retrospectively collected from the medical charts, authors could not include variables that were not consistently recorded by the institution such as patient education, income, and occupation. These variables would have been important in understanding differences in the psychological distress of patients. Finally, it is significant to mention the difficulties experienced collecting the data. The documentation of distress screening in the medical charts was not consistent, and largely based on the inclusion of a copy of the screening instrument in the patient's folder. Also, a specific field to record the Distress Thermometer score in the electronic medical records was not present at the time of the study. The authors had to review notes from providers to identify whether a screening was completed and the resulting score. Since the analysis focused on the first year of implementation, these challenges may have been due to the complexity of introducing and

Table 4 Multiple regression analysis predicting distress scores by age, practical, family, emotional, spiritual, and physical problems for breast cancer patients

	Distress screening scores				
Variables	B	Std. error(B)	β	*t*	Part correlation
Constant	2.14	1.973		1.08	
Age	−.01	.031	−.03	−.24	−.02
Practical problems	2.29	.747	.35	3.06**	.31
Family problems	.03	.855	.01	.040	.01
Emotional problems	2.42	.855	.36	2.83**	.28
Spiritual concerns	2.03	2.837	.07	.72	.07
Physical problems	.51	.895	.06	.56	.06

Overall $R^2 = .370$, adjusted $R^2 = .310$, $F(6, 63) = 6.176$, $p < .001$

*$p < .05$ **$p < .01$ ***$p < .001$

testing a new protocol. These difficulties can however contribute to biased findings when conducting retrospective studies, since the inability to locate documentation of screening and subsequent referral has the potential to affect our knowledge about psychological distress, by increasing or reducing occurrence of distress and subsequent adherence to standards.

Summarizing, this study revealed that younger patients with cancer are more likely to experience levels of distress that require the implementation of psychosocial interventions to effectively address their needs. While an emerging literature has started to investigate which types of interventions can be beneficial to this group, a recent systematic review highlighted how psychological distress was only a secondary outcome of four interventions included in the study [43], therefore suggesting the need to develop more age-appropriate interventions. Higher distress was also the result of psychosocial issues reported by the patient around the time of diagnosis. Hence, patients presenting family, emotional, and physical problems for lung cancer or women with practical and emotional issues after a breast cancer diagnosis should be connected with psychosocial services and resources in a timely manner.

These results have also key implications for psychosocial providers who work with uninsured or low-income patients. First, this work highlights the role of individual, social, and contextual factors in the psychological well-being of cancer patients. Second, as social workers are the largest group of mental health service providers in the USA [44], they are uniquely situated to offer psychosocial care that addresses the needs reported by those participating in the study. This then leads to the consideration that issues like child care, housing, insurance, financial concerns, transportation, treatment decision-making, and the relationships with loved ones should also be included among the services offered to address distress. Furthermore, the study reveals that the implemented distress screening protocol has started to address the recommendations from the American College of Surgeons [42]. Since distress screening is capable of improving patients' outcomes only in the presence of an effective system [2, 31, 45], future studies are needed to investigate patients' referral and connection to services, especially in settings serving vulnerable populations and individuals with limited resources.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

References

1. Clark PG, Bolte S, Buzaglo J, Golant M, Daratsos L, Loscalzo M (2012) From distress guidelines to developing models of psychosocial care: current best practices. J Psychosoc Oncol 30(2):694–714
2. Pirl WF, Fann JR, Greer JA, Braun I, Deshields T, Fulcher C et al (2014) Recommendations for the implementation of distress screening programs in cancer centers: report from the American Psychosocial Oncology Society (APOS), Association of Oncology Social Work (AOSW), and Oncology Nursing Society (ONS) joint task force. Cancer 120(19):2946–2954
3. Graves KD, Arnold SM, Love CL, Kirsh KL, Moore PG, Passik SD (2007) Distress screening in a multidisciplinary lung cancer clinic: prevalence and predictors of clinically-significant distress lung cancer. Lung Cancer 55(2):215–224
4. Kendall J, Glaze K, Oakland S, Hansen J, Parry C (2011) What do 1281 distress screeners tell us about cancer patients in a community cancer center? Psychooncology 20(6):594–600
5. Mitchell AJ, Hussain N, Grainger L, Symonds P (2011) Identification of patient-reported distress by clinical nurse specialists in routine oncology practice: a multicentre UK study. Psychooncology 20(10):1076–1083
6. Zebrack B, Kayser K, Sundstrom L, Savas SA, Henrickson C, Acquati C et al (2015) Psychosocial distress screening implementation in cancer care: an analysis of adherence, responsiveness, and acceptability. J Clin Oncol 33:1165–1170
7. Andersen BL, Thornton LM, Shapiro CL, Farrar WB, Mundy BL, Yang H-C et al (2010) Biobehavioral, immune, and health benefits following recurrence for psychological intervention participants. Clin Cancer Res 16(12):3270–3278
8. Giese-Davis J, Collie K, Rancourt KMS, Neri E, Kraemer HC, Spiegel D (2011) Decrease in depression symptoms is associated with longer survival in patients with metastatic breast cancer: a secondary analysis. J Clin Oncol 29:413–420
9. O'Hea EL, Monahan BR, Cutillo A, Person SD, Grissom G, Boudreaux ED (2016) Predictors of psychological distress and interest in mental health services in individuals with cancer. J Health Psychol 21(6):1145–1156
10. Linden W, Vodermaier A, Mackenzie R, Greig D (2012) Anxiety and depression after cancer diagnosis: prevalence rates by cancer type, gender, and age. J Affect Disord 141(2–3):343–351
11. Chambers SK, Dunn J, Occhipinti S, Hughes S, Baade P, Sinclair S et al (2012) A systematic review of the impact of stigma and nihilism on lung cancer outcomes. BMC Cancer 12:184–193
12. Zabora J, BrintzenhofeSzoc K, Curbow B, Hooker C, Piantadosi S (2001) The prevalence of psychological distress by cancer site. Psychooncology 10(1):19–28
13. Carlson LE, Angen M, Cullum J, Goodey E, Koopmans J, Lamont L et al (2004) High levels of untreated distress and fatigue in cancer patients. Br J Cancer 90(12):2297–2304
14. Jacobsen PB, Donovan KA, Trask PC, Fleishman SB, Zabora J, Baker F et al (2005) Screening for psychologic distress in ambulatory cancer patients. Cancer 103(7):1494–1502
15. Mehnert A, Brähler E, Faller H, Härter M, Keller M, Schulz H et al (2014) Four-week prevalence of mental disorders in patients with cancer across major tumor entities. J Clin Oncol 32(31):3540–3546
16. Head BA, Schapmire TJ, Keeney CE, Deck SM, Studts JL, Hermann CP et al (2012) Use of the distress thermometer to discern clinically relevant quality of life differences in women with breast cancer. Qual Life Res 21(2):215–223
17. Jacobsen PB, Shibata D, Siegel EM, Lee J-H, Fulp WJ, Alemany C et al (2011) Evaluating the quality of psychosocial care in outpatient medical oncology settings using performance indicators. Psychooncology 20(11):1221–1227
18. Iwatani T, Matsuda A, Kawabata H, Miura D, Matsushima E (2013) Predictive factors for psychological distress related to diagnosis of breast cancer. Psychooncology 22(3):523–529
19. Lynch J, Goodhart F, Saunders Y, O'Connor SJ (2011) Screening for psychological distress in patients with lung cancer: results of a clinical audit evaluating the use of the patient distress thermometer. Support Care Cancer 19(2):193–202

20. Luckett T, Goldstein D, Butow PN, Gebski V, Aldridge LJ, McGrane J et al (2011) Psychological morbidity and quality of life of ethnic minority patients with cancer: a systematic review and meta-analysis. Lancet Oncol 12(13):1240–1248
21. Burris JL, Andrykowski M (2010) Disparities in mental health between rural and nonrural cancer survivors: a preliminary study. Psychooncology 19(6):637–645
22. Akechi T, Okuyama T, Akizuki N, Azuma H, Sagawa R, Furukawa TA et al (2006) Course of psychological distress and its predictors in advanced non-small cell lung cancer patients. Psychooncology 15(6):463–473
23. Brandão T, Schulz MS, Matos PM (2016) Psychological adjustment after breast cancer: a systematic review of longitudinal studies. Psychooncology: Early View. doi:10.1002/pon.4230
24. Blenkiron P, Brooks A, Dearden R, McVey J (2014) Use of the distress thermometer to evaluate symptoms, outcome and satisfaction in a specialist psycho oncology service. Gen Hosp Psychiat 36(6):607–612
25. Ichikura K, Yamashita A, Sugimoto T, Kishimoto S, Matsushima E (2015) Persistence of psychological distress and correlated factors among patients with head and neck cancer. Palliat Support Care 14(1):42–51
26. Siegel R, Ma J, Zou Z, Jemal A (2014) Cancer statistics, 2014 CA. Cancer J Clin 64:9–29
27. U.S. Census Bureau (2011) Health Insurance Coverage Status by State for All People: 2010.Available from: https://www.census.gov/hhes/www/cpstables/032011/health/toc.htm
28. U.S. Department of Agriculture ERS (2013) Measuring rurality: Rural-Urban Continuum Codes. Available from: http://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx
29. Nekolaichuk CL, Cumming C, Turner J, Yushchyshyn A, Sela R (2011) Referral patterns and psychosocial distress in cancer patients accessing a psycho-oncology counseling service. Psychooncology 20(3):326–332
30. Admiraal JM, Reyners AKL, Hoekstra-Weebers JEHM (2013) Do cancer and treatment type affect distress? Psychooncology 22(8):1766–1773
31. Hollingworth W, Metcalfe C, Mancero S, Harris S, Campbell R, Biddle L et al (2013) Are needs assessments cost effective in reducing distress among patients with cancer? A randomized controlled trial using the distress thermometer and problem list. J Clin Oncol 31(29):3631–3638
32. Valdes-Stauber J, Vietz E, Kilian R (2013) The impact of clinical conditions and social factors on the psychological distress of cancer patients: an explorative study at a consultation and liaison service in a rural general hospital. BMC Psychiatry 13:226
33. Chambers SK, Baade P, Youl P, Aitken J, Occhipinti S, Vinod S et al (2015) Psychological distress and quality of life in lung cancer: the role of health-related stigma, illness appraisals and social constraints. Psychooncology 24(11):1569–1577
34. Cataldo JK, Slaughter R, Jahan TM, Pongquan VL, Hwang WJ (2011) Measuring stigma in people with lung cancer: psychometric testing of the Cataldo lung cancer stigma scale. Oncol Nurs Forum 38(11):E46–E54
35. Rohan EA, Boehm J, Allen KG, Poehlman J (2016) In their own words: a qualitative study of the psychosocial concerns of posttreatment and long-term lung cancer survivors. J Psychosoc Oncol 34(3):169–183
36. Conlon A, Gilbert D, Jones B, Aldredge P (2010) Stacked stigma: oncology social workers' perceptions of the lung cancer experience. J Psychosoc Oncol 28(1):98–115
37. Badr H, Taylor CLC (2006) Social constraints and spousal communication in lung cancer. Psychooncology 15(8):673–683
38. Agarwal J, Powers K, Pappas L, Buchmann L, Anderson L, Gauchay L et al (2013) Correlates of elevated distress thermometer scores in breast cancer patients. Support Care Cancer 21(8):2125–2136
39. Lester J, Crosthwaite K, Stout R, Jones RN, Holloman C, Shapiro C et al (2015) Women with breast cancer: self-reported distress in early survivorship. Oncol Nurs Forum 42(1):E17–E23
40. Carlson LE, Waller A, Mitchell AJ (2012) Screening for distress and unmet needs in patients with cancer: review and recommendations. J Clin Oncol 30(11):1160–1177
41. Donovan KA, Jacobsen PB (2013) Progress in the implementation of NCCN guidelines for distress management by member institutions. J Natl Compr Canc Net 11(2):223–226
42. American College of Surgeons (2012) Cancer Program Standards 2012: Ensuring Patient-Centered Care. Available at https://www.facs.org/~/media/files/quality%20programs/cancer/coc/programstandards2012.ashx
43. Richter D, Koehler M, Friedrich M, Hilgendorf I, Mehnert A, Weißflog G (2015) Psychosocial interventions for adolescents and young adult cancer patients: a systematic review and meta-analysis. Crit Rev Oncol Hemat 95(3):370–386
44. National Association of Social Workers (2016) Social Work Profession. Available from: https://www.socialworkers.org/pressroom/features/general/profession.asp
45. Carlson LE, Groff SL, Maciejewski O, Bultz BD (2010) Screening for distress in lung and breast cancer outpatients: a randomized controlled trial. J Clin Oncol 28(33):4884–4891