

Original Article

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Abstract

Objective. The objective of this study was to assess the psychosocial distress and associated factors in advanced cancer patients consulting at the outpatient Palliative Care Unit at the National Cancer Institute in Mexico City.

Design. A retrospective study was conducted using electronic records (June 2015 to December 2016).

Sample. A total of 646 patients with advanced cancer during their first visit to the outpatient palliative care unit at the National Cancer Institute in Mexico were evaluated using the Distress Thermometer (DT) and ECOG performance status scores.

Findings. Overall, 62% were women, with a median age of 57 years, and married (54.8%). The most frequent diagnosis was gastrointestinal cancer (28.6%), and 38.9% had a functional performance status of ECOG 2. The median DT score was 4.0 (IQR = 2–6), with 56% reporting DT scores ≥ 4 . The three most frequent problems ≥ 4 were sadness (82.6%), feeling weak (81.2%), worry (79.6%), and < 4 were feeling weak (57.7%), fatigue (55.6%), and financial security (52.1%). The variables associated with distress according to the multiple logistic regression analysis were problems with housing (OR = 2.661, 95% CI = 1.538–4.602), sadness (OR = 2.533, 95% CI = 1.615–3.973), transportation (OR = 1.732, 95% CI = 1.157–2.591), eating (OR = 1.626, 95% CI = 1.093–2.417), nervousness (OR = 1.547, 95% CI = 1.014–2.360), and sleep (OR = 1.469, 95% CI = 1.980–2.203).

Conclusion. The principal factors were related to distress levels, housing problems, transportation issues, and emotional problems such as sadness, nervousness, lower functionality, and younger age. Therefore, psychosocial support is of considerable relevance in palliative care. These findings will help clinicians understand the distress of patients with advanced cancer in palliative care in Latin American countries.

Background

Non-communicable diseases (NCDs) such as cancer are a public health concern worldwide (DePinho and Hawk, 2016; Chan, 2017). In Mexico, cancer is the third leading cause of death (World Health Organization, 2018), with a high percentage of cases diagnosed at the later disease stages (Reynoso-Noverón et al., 2016).

The National Comprehensive Cancer Network (NCCN) (2018) defines distress as “unpleasant emotional experience of psychological, social, and spiritual nature that interferes with the capacity to cope with cancer diagnosis and its treatment.” The NCCN’s definition is internationally recommended as a necessary standard for appropriate cancer care given its high prevalence, negative consequences on quality of life, and validity as confirmed and applied in many countries (Mansourabadi et al., 2014). During the cancer trajectory, 22% (Lloyd-Williams and Friedman, 2001) to 89.3% of cancer patients report higher levels of distress (Küttner et al., 2017) depending on the disease stage (Moscoso, 2011; Holland et al., 2013) and cancer site (Herschbach et al., 2004, 2008).

High levels of distress in cancer have been widely reported in association with poor therapeutic adherence and treatment withdrawal, prolonged hospitalization, poor satisfaction with medical attention (Prieto et al., 2002; Kennard et al., 2004), communication problems, emotional disorders, such as anxiety or depression (Kelly et al., 2002; Herschbach et al., 2008), lower quality of life (Zabora et al., 2001), desire for an early death, fear of the future, poor control of disease-related symptoms (Brenne et al., 2013; Lee et al., 2015; Singh and Harding, 2015), and disease progression (Murray et al., 2010). Most frequent issues among cancer patients include financial problems, worries, nervousness, getting around, and sleep (VanHoose et al., 2015).

Psychological disorders are generally not assessed and treated in oncological settings (Grassi et al., 2013; Shimizu, 2013; Randazzo and Peters, 2016) and distress screening recommended to provide comprehensive care. Some of the most commonly used screening instruments include

the Distress Thermometer (DT; Roth *et al.*, 1998; Hamilton and Kroska, 2019), Edmonton Symptom Assessment System (ESAS; Bruera *et al.*, 1991), Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983), and the Brief Symptom Inventory-18 (BSI-18; Franke *et al.*, 2017).

Most studies on distress in advanced cancer patients were conducted in high-income countries (HIC). We identified 30 from low- and middle-income countries (LMIC). Only one study was exclusively dedicated to advanced cancer patients (Guan *et al.*, 2019), and four included advanced cancer patients (Iskandarsyah *et al.*, 2014; Dessai *et al.*, 2015; Huey *et al.*, 2018; Sah, 2019). The cutoff was ≥ 4 (Dessai *et al.*, 2015; Huey *et al.*, 2018) and ≥ 5 (Iskandarsyah *et al.*, 2014; Guan *et al.*, 2019). Guan *et al.* (2019) reported a 70.5% prevalence of high distress scores. Dessai *et al.* (2015) reported an 82% prevalence in patients with advanced cancer in contrast to 41.3% in non-advanced cancer patients.

The prevalence and sources of distress in patients with advanced cancer stages in LMICs are largely unknown. In Mexico, the GDP per capita is low, with a low standard of living, the lowest average salaries in the world, low educational levels (8.6 degrees in urban populations and 5.7 degrees in rural populations), and high levels of poverty and inequality (OECD, 2019).

This study identified the levels of distress and associated factors in patients with advanced cancer consulting at the outpatient palliative care unit at the National Cancer Institute in Mexico City, Mexico.

Design

A retrospective study of data collected from electronic medical records of patients with advanced untreatable cancer (incurable, locally advanced, or metastatic cancers) (American Cancer Society, 2013) at the palliative care unit at the National Cancer Institute in Mexico City who were seen between June 2015 and December 2016 was conducted. Patient records with incomplete data/information were excluded. Variables were assessed during the patients' first visit to the outpatient palliative care unit.

Instruments

The DT is a self-assessed one-item 11-point Likert scale represented on a visual graphic of a thermometer that ranges from 0 (no distress) to 10 (extreme distress), in which patients indicate their level of distress the week prior to assessment. Additionally, on a 35-item Problem List (PL), the patients identify specific problems as their sources of distress. The most recent version of the NCCN practice guidelines for the management of distress recommends that a DT score ≥ 4 indicates moderate to severe distress (Cuttillo *et al.*, 2017). The DT has been validated in palliative care settings (Gessler *et al.*, 2008; Wüller *et al.*, 2017). In Mexico, the DT (Version 1.2008) has been validated as a reliable and accepted instrument with strong clinometric parameters (Almanza-Muñoz *et al.*, 2008). This version was used in this study.

The Eastern Cooperative Oncology Group (ECOG) Performance Status (Oken *et al.*, 1982) describes the patient's functioning level in terms of self-care, daily activity, and physical ability (walking, working, etc.). The ECOG scale consists of five categories: 0 (fully active, able to carry on all pre-disease performance without restriction) to 5 (death).

Medical and socio-demographic variables, including age, sex, civil status, place of residence, educational level, monthly income, and diagnosis, were also collected.

Statistical analysis

Categorical variables were described with frequencies and percentages, and continuous variables were described using the median and interquartile range (IQR). A simple logistic regression analysis between DT score and socio-demographic variables, medical variables, and PL was conducted. Independent variables that influenced the DT score in the simple logistic regression ($P < 0.001$) were included in the multiple logistic analysis. This cutoff point was considered to avoid variables that although could be statistically relevant were not relevant in the clinical context. For the simple and multiple logistic regressions, distress was considered a binary variable depending on whether the DT score was < 4 (absence of distress) or ≥ 4 (presence of distress). The level of significance for the multiple logistic regression analysis was $P \leq 0.05$, and clinically significant variables were discussed as predictors of a DT score ≥ 4 . IBM SPSS v.21 and StataCorp. v.12.0 (2011) were used for the statistical analysis.

The Institutional Review Board approved the use of the patients' information in this study (Ref. INCAN/CI/864/2017).

Results

Socio-demographic and clinical characteristics

We identified 750 palliative cancer patients from June 2015 to December 2016. Patients without psychological evaluation by triage ($n = 79$) or with incomplete or unknown information ($n = 25$) were excluded. Data from 646 patients were analyzed.

Overall, 62% were women. The participants' median age was 57 years (IQR = 46–68). Most of the participants were married (54.8%) and lived in Mexico City (38.5%). 50% had fewer than 7 academic years (in 2018, the average academic years in the 55–64-year age group was 7.4 years) (National Institute for the Evaluation of Education, 2018). The median household income was US\$199 (IQR = US\$125–US\$314), the minimum annual wage in Mexico was US\$164, and the average wage was US\$580. Gastrointestinal cancer was the most frequent diagnosis at 28.6% followed by gynecologic cancer (18.7%) and breast tumors (14.7%). ECOG 1 and 2 functional performance status was 33.4% and 38.9%, respectively. The sample characteristics are summarized in Table 1.

Prevalence of distress and problem list (PL)

The analyses of the DT scores demonstrated a median of 4 (IQR of 2–6). A total of 362 (56.0%) patients were defined as distressed with a DT score ≥ 4 . Table 2 shows the distribution of the patients' socio-demographic and clinical characteristics according to their DT scores.

All of the items in the PL were mentioned. In the PL, the median for emotional problems was 3 of 6 items (IQR = 1–5), for physical problems was 7 of 21 items (IQR = 4–10), and for practical problems was 1 of 5 items (IQR = 1–2).

The most frequently reported problems were physical: feeling swollen (70.9%), fatigue (68.1%), dry/itchy skin (49.1%), getting around (48.0%), pain (46.7%), emotional worry (65.9%), sadness (65.8%), nervousness (53.7%), and fear (48.1%). In the practical category, financial security was mentioned by 61% of the participants, followed by challenges with transportation (42.1%). Family problems (10%) and spiritual/religious problems (6.8%) were the least mentioned categories. Table 2 compares the

Table 1. The participants' socio-demographic and medical characteristics compared to their distress level on the DT

Socio-demographic characteristics	All participants, <i>N</i> = 646		DT \geq 4, <i>n</i> = 362		DT <4, <i>n</i> = 284	
	(<i>n</i>)	%	(<i>n</i>)	%	(<i>n</i>)	%
Age						
Median (IQR)	57 (46–68)		58 (48–70)		56.5 (45–66)	
Sex						
Male	244	37.8	134	37	110	38.7
Female	402	62.2	228	63	174	61.2
Marital status						
Married	354	54.8	191	52.7	163	57.3
Single	292	45.2	171	47.3	121	42.7
Federative entities						
Mexico City	249	38.5	249	38.5	249	38.5
Others	397	61.4	397	61.4	397	61.4
Academic level						
0 years	69	10.7	40	11	29	10.2
1–6 years	253	39.2	124	34.2	129	45.4
7–12 years	221	34.2	162	44.7	99	34.8
13–17 years	98	15.2	33	9.2	25	8.8
More than 18 years	5	0.8	3	0.8	2	0.7
Monthly income (USD \$)						
Median (IQR)	199.2 (125.2–314.4)		191.2 (126.7–314.4)		209.6 (125.7–314.4)	
Type of cancer by location						
Gastrointestinal tract	185	28.6	109	30.1	76	26.7
Gynecologic	21	18.7	73	20.2	48	16.9
Breast tumors	95	14.7	57	15.7	38	13.3
Urologic	76	11.8	37	10.2	39	13.7
Skin and soft parts	58	9.0	32	8.8	26	9.1
Bronchi and lung	37	5.7	18	4.9	19	6.6
Head and neck	36	5.6	16	4.4	20	7
Hematologic	27	4.2	13	3.5	14	4.9
Unknown primary	11	11.8	7	1.9	4	1.4
ECOG						
1	216	33.4	108	29.8	108	28.7
2	251	38.9	135	37.3	116	40.8
3	148	22.9	98	27	50	17.6
4	31	4.8	21	5.8	10	3.5

IQR, Interquartile range; USD, United States dollar; ECOG, Eastern Cooperative Oncology Group.

reported frequency of problems by the distressed and non-distressed patients.

The 10 most frequent problems reported by the distressed patients (DT score \geq 4) were sadness (82.6%), feeling swollen (81.2%), worry (79.6%), fatigue (77.9%), insurance/financial (68.0%), nervousness (67.7%), fear (61.2%), depression (60.5%), getting around (58.6%), and eating (55%). The 10 main problems for patients reporting DT score <4 were feeling swollen (57.7%), fatigue (55.6%), insurance/financial (52.1%), worry (48.6%),

dry/itchy skin (45.1%), sadness (44.4%), pain (38.7%), nervousness (35.9%), getting around (34.5%), and tingling in the hands/feet (33.5%) (Figure 1).

The univariate analysis did not show associations with any of the socio-demographic variables ($P < 0.001$); however, the clinical relevance of age ($P = 0.007$) and the ECOG ($P = 0.002$) in the distress level were considered in the final model. The simple logistic regression analysis of the reported DT scores and independent variables are shown in Tables 3 and 4.

Table 2. Frequency distribution of the participants' problem list item checked as a source of distress

Rank	Item	n (%)
1	Feeling swollen	458 (70.9)
2	Fatigue	440 (68.1)
3	<i>Worry</i>	426 (65.9)
4	<i>Sadness</i>	425 (65.9)
5	Insurance/financial	394 (61.0)
6	<i>Nervousness</i>	347 (53.7)
7	Dry/itchy skin	317 (49.1)
8	<i>Fear</i>	311 (48.1)
9	Getting around	310 (48.0)
10	Pain	302 (46.7)
11	Sleep	298 (46.1)
12	<i>Depression</i>	293 (45.4)
13	Eating	291 (45.0)
14	Transportation	272 (42.1)
15	Bathing/dressing	254 (39.2)
16	Tingling in hands/feet	244 (37.8)
17	Nausea	240 (37.2)
18	Appearance	233 (36.1)
19	Constipation	231 (35.8)
20	Memory/concentration	205 (31.7)
21	Breathing	197 (30.5)
22	<i>Loss of interest in usual activities</i>	165 (25.5)
23	Dry nose/congestion	146 (22.6)
24	Changes in urination	135 (20.9)
25	Housing	129 (20.0)
26	School/work	103 (15.9)
27	Indigestion	92 (14.2)
28	Diarrhea	90 (13.9)
29	Mouth sores	81 (12.5)
30	Fever	78 (12.1)
31	Dealing with children ^a	75 (11.6)
32	Child care	74 (11.5)
33	Dealing with partner ^a	50 (7.7)
34	Sexual	48 (7.4)
35	Spiritual/ religious ^b	44 (6.8)

Italics represents emotional problems.

Bold represents practical problems.

^aFamily problems.

^bSpiritual problems.

Among the PL, the items that increased the odds of the presence of distress (DT score ≥ 4) with $P < 0.001$ in the emotional problems category were sadness (OR = 5.951), depression (OR = 4.346), worry (OR = 4.118), nervousness (OR = 3.736), and fear (OR = 3.474); in the practical problems category: housing (OR = 3.946), transportation (OR = 2.502), and insurance/financial

(OR = 1.949); and in the physical problems category: feeling weak (OR = 3.164), sleep (OR = 2.911), fatigue (OR = 2.811), getting around (OR = 2.682), eating (OR = 2.548), breathing (OR = 2.511), dry nose/congestion (OR = 2.323), bathing/dressing (OR = 2.294), appearance (OR = 2.289), memory/concentration (OR = 2.059), and pain (OR = 1.787).

The variables that influenced the DT score in the simple logistic regression were included in the multiple logistic analysis for a final model predicting DT. In the multivariate analysis, the practical problems housing and transportation increased the adjusted odds of the presence of distress by a factor of 2.661 (95% CI = 1.538–4.602) and 1.732 (95% CI = 1.157–2.591), respectively. Emotional problems: sadness increased the adjusted odds of the presence of distress by a factor of 2.533 (95% CI = 1.615–3.973) and nervousness by 1.547 (95% CI = 1.014–2.203). Physical problems: eating and sleep increased the adjusted odds of the presence of distress by a factor of 1.626 (95% CI = 1.093–2.417) and 1.469 (95% CI = 1.980–2.203), respectively (Table 5).

Discussion

Advanced cancer patients in Mexico with palliative care requirements treated at the INCAN were mostly women. Half were younger than 57 years old. Their average educational level and income were below the average wage in Mexico. Overall, 56% of the patients reported high levels of psychosocial distress (DT score ≥ 4) with a median score of 4. This prevalence was lower than reported by advanced cancer patients in China (70.5%) (Guan et al., 2019) and Nepal (81.7%) (Sah, 2019). In HIC, the prevalence of palliative care needs in cancer patients who were cared for at home by a domiciliary palliative care service reported a high level of distress of 89.3% in Germany (Küttner et al., 2017), and only 14% in Iceland reported that they had not experienced any distress (Gunnarsdottir et al., 2012). In Middle Europe (Austria) and two southern European countries (Italy and Spain), cancer patients reported a 60% prevalence of distress (Meggiolaro et al., 2016). In Ireland, patients with medical oncology, hematology, and palliative care services reported a 53.6% prevalence of distress (Ryan et al., 2012). Akizuki et al. (2005) and Meggiolaro et al. (2016) stated that factors such as economic, social, and cultural differences as well as medical conditions (for example, cancer type) might influence the evaluation of distress.

Socio-demographic characteristics were not associated with self-reported DT scores (Jacobsen et al., 2005; Snowden et al., 2011). Previous studies reported gender differences. Various studies showed that women were more likely to experience and report distress than men (Snowden et al., 2011), but this was not significant in our sample. In addition to the ECOG 2, medical conditions such as the cancer site did not influence the DT scores as reported by Zabora et al. (2001).

Based on our model, the high distress score in the palliative care patients was associated with a young age and degree of dysfunctionality (ECOG 3 confined to bed or chair for more than 50% of waking hours) as reported by Goulia et al. (2012), Waller et al. (2013), and Cormio et al. (2019). Similarly, Guan et al. (2019) reported that the poorer the Karnofsky Performance Status as influencing factor, the higher the DT score.

The presence of higher distress in younger patients (DT score ≥ 4) coincided with findings reported in the literature (Van Scheppingen et al., 2011; Goulia et al., 2012; Kim et al., 2013; Haynes-Lewis et al., 2018). In a study of adolescents and young adults in China (15–39 years), Xie et al. (2017) reported a

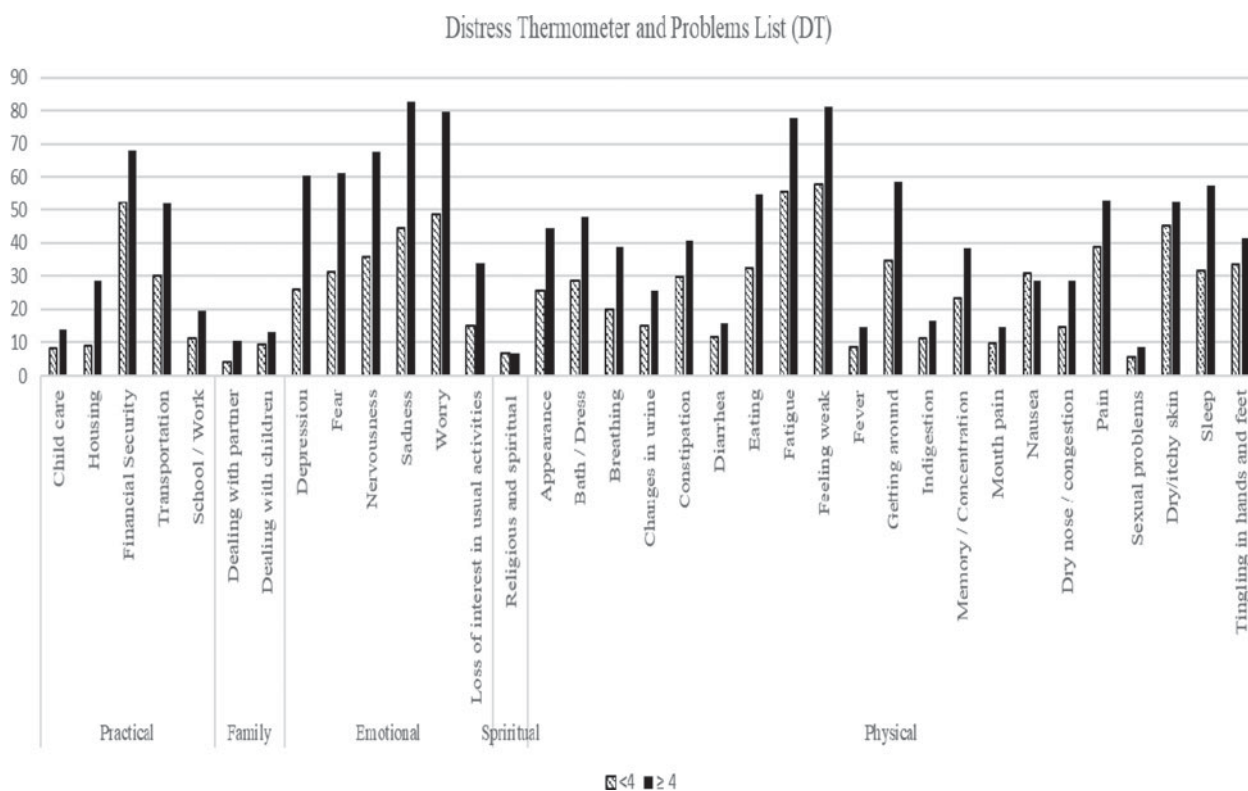


Fig. 1. Comparison of the percentages of the PL items according to the patients' level of distress on the DT

Table 3. Simple logistic regression of the reported DT scores and socio-demographic and clinical variables

Predictive socio-demographic variables	[OR]	Confidence interval [95%]	P-value	Predictive clinical variables	[OR]	Confidence interval [95%]	P-value
Age	0.98	[0.976–0.996]	0.007	Type of cancer by location			
Sex				Gastrointestinal	Ref.		
Male	Ref.			Gynecologic	1.06	[0.664–1.692]	0.806
Female	1.075	[0.780–1.481]	0.655	Breast tumors	1.045	[0.631–1.731]	0.862
Marital status				Urologic	0.661	[0.386–1.131]	0.131
Single	Ref.			Skin and soft parts	0.858	[0.473–1.555]	0.614
Married	0.829	[0.606–1.133]	0.241	Bronchi and lung	0.66	[0.325–1.340]	0.251
Federative entities				Head and neck	0.557	[0.271–1.145]	0.112
Mexico City	Ref.			Hematologic	0.647	[0.288–1.455]	0.293
Others	1.041	[0.756–1.432]	0.803	Unknown primary	1.22	[0.345–4.314]	0.757
Academic level				ECOG			
0 years	Ref.			1	Ref.		
1–6 years	0.696	[0.406–1.193]	0.188	2	1.163	[0.808–1.665]	0.414
7–12 years	1.186	[0.691–2.034]	0.535	3	1.96	[1.271–3.020]	0.002
13–17 years	0.957	[0.472–1.938]	0.903	4	2.1	[0.944–1.305]	0.069
More than 18 years	1.087	[0.170–6.929]	0.929				
Monthly income (USD \$) median (IQR)	0.999	[0.999–1.000]	0.42				

DT, Distress Thermometer; OR, odds ratio; IQR, interquartile range; USD, United States dollar; ECOG, Eastern Cooperative Oncology Group. Bold values indicates $P \leq 0.0001$.

Table 4. Simple logistic regression reported by the DT scores and Problem List

Items		OR	CI [95%]	P-value	Items		[OR]	CI [95%]	P-value
Practical problems	Child care	1.861	[1.107–3.127]	0.019	Physical problems	Constipation	1.628	[1.170–2.264]	0.004
	Housing	3.946	[2.483–6.273]	0.0001		Diarrhea	1.421	[0.897–2.252]	0.134
	Insurance/financial	1.949	[1.414–2.686]	0.0001		Eating	2.548	[1.844–3.521]	0.0001
	Transportation	2.502	[1.804–3.470]	0.0001		Fatigue	2.811	[1.998–3.954]	0.0001
	Work/school	1.921	[1.225–3.013]	0.004		Feeling Swollen	3.164	[2.221–4.505]	0.0001
Family problems	Dealing with partner	2.658	[1.362–5.188]	0.004		Fevers	1.777	[1.074–2.940]	0.025
	Dealing with children	1.455	[.883–2.398]	0.141		Getting around	2.682	[1.944–3.701]	0.0001
Emotional problems	Depression	4.346	[3.098–6.097]	0.0001		Indigestion	1.565	[.987–2.480]	0.057
	Fear	3.474	[2.503–4.823]	0.0001		Memory/concentration	2.059	[1.455–2.914]	0.0001
	Nervousness	3.736	[2.693–5.184]	0.0001		Mouth sore	1.568	[.964–2.552]	0.07
	Sadness	5.951	[4.158–8.519]	0.0001	Nausea	1.612	[1.163–2.235]	0.004	
	Worry	4.118	[2.915–5.817]	0.0001	Dry nose/congestion	2.323	[1.559–3.461]	0.0001	
	Loss of interest in usual activities	2.849	[1.927–4.212]	0.0001	Pain	1.787	[1.303–2.449]	0.0001	
Spiritual problems	Spiritual/religious concerns	1.035	[0.558–1.919]	0.914	Sexual	1.624	[0.873–3.024]	0.126	
Physical problems	Appearance	2.289	[1.634–3.208]	0.0001	Skin dry/itchy	1.331	[0.975–1.818]	0.072	
	Bathing/dressing	2.294	[1.649–3.191]	0.0001	Sleep	2.911	[2.103–4.031]	0.0001	
	Breathing	2.511	[1.754–3.597]	0.0001	Tingling in hands/feet	1.392	[1.007–1.923]	0.045	
	Changes in urination	1.91	[1.278–2.853]	0.002					

DT, Distress Thermometer; OR, Odds ratio; IQR, Interquartile range; USD, United States dollar; ECOG, Eastern Cooperative Oncology Group. Bold values indicates $P \leq 0.0001$.

Table 5. Multiple logistic regression of the predictive variables

	OR	[95% confidence interval]	P-value
Age	0.992	[0.980–1.005]	0.274
ECOG			
1	Ref		
2	0.997	[0.639–1.556]	0.99
3	1.236	[0.720–2.119]	0.441
4	1.432	[0.517–3.964]	0.489
Problems List			
Housing	2.661	[1.538–4.602]	0.0001
Sadness	2.533	[1.615–3.973]	0.0001
Transportation	1.732	[1.157–2.591]	0.008
Eating	1.626	[1.093–2.417]	0.016
Nervousness	1.547	[1.014–2.360]	0.043
Sleep	1.469	[1.980–2.203]	0.062
Depression	1.445	[0.909–2.299]	0.119
Worry	1.428	[0.905–2.253]	0.126
Getting around	1.314	[0.843–2.049]	0.227
Feeling swollen	1.291	[0.793–2.100]	0.303
Breathing	1.269	[0.814–1.978]	0.291
Loss of interest in usual activities	1.22	[0.745–1.998]	0.429
Dry nose/congestion	1.147	[0.694–1.896]	0.592
Bathing/dressing	1.122	[0.704–1.789]	0.628
Memory/concentration	1.1	[0.703–1.729]	0.675
Fear	1.101	[0.702–1.727]	0.672
Insurance/financial	1.125	[0.741–1.708]	0.578
Appearance	1.068	[0.680–1.677]	0.773
Fatigue	0.969	[0.606–1.549]	0.898
Pain	0.959	[0.643–1.431]	0.839

OR, Odds ratio.

prevalence of 89.1% of DT score ≥ 4 . Age and level of functionality are relevant in the clinical setting since patients with less functionality and adolescents and young adults (AYA) represent a greater challenge in oncological palliative care.

The participants reported physical and emotional problems more frequently. Sadness, worries, and nervousness were among the most frequent problems mentioned regardless of the DT score. Sadness and nervousness are predictive factors for increased distress, so psychological attention is required to prevent an adaptive or mood disorder. Emotional symptoms occur very frequently in the majority of cancer patients and may be part of the adaptive or maladaptive response to the disease depending on the coping strategies and resources of each individual patient. Although worries were the strongest single item associated with high distress scores as stated by VanHoose et al. (2015), Skaczkowski et al. (2018), and Sah (2019), in our sample, this was not a predictor. In Ireland, the most common problems were fatigue (66.8%), pain (52.2%), worry (45.4%), sadness

(38.0%), and fear (37.1%). Overall, 13.7% endorsed the depression item, and 22.4% loss of interest (Ryan et al., 2012). Similar findings were reported in Iceland, where distressed patients indicated a higher number of emotional (depression, fear, and nervousness) and physical problems (Gunnarsdottir et al., 2012).

Frequent physical symptoms of cancer were fatigue as reported by Teunissen et al. (2007) in a systematic review of 44 studies (25,074 patients). Numerous studies described the relationship between cancer pain and psychological distress. Unrelieved pain increases the risk of psychological distress. Psychological factors influence both the experience of pain and the response to pain treatment in cancer patients (Zaza and Baine, 2002; Syrjala et al., 2014). According to a meta-analysis, 66.4% of advanced cancer patients experience pain (van den Beuken-Van et al., 2016). However, in our study, pain was mentioned by 46.1% of the participants and was associated with a high distress score.

The most commonly mentioned practical problems by patients regardless of their DT score were financial problems. The patients' income was higher than the minimum wage, but below the average wage in Mexico. The economic impact/financial burden of living with a chronic illness such as cancer is well-known (Essue and Essue et al., 2017; Dean et al., 2019) such as additional costs through transportation, since more than 60% of the patients were from other cities. Practical problems such as housing and transportation were a predictive factor for a DT score > 4 . Transportation was a source of distress in our population, probably due to the physical discomfort as well as time consumption and costs associated with it, as Mexico City and the metropolitan area have serious transit problems. Skaczkowski et al. (2018) reported that the most frequently identified problem in the practical domain was transportation. The association between distress and housing may be due to payments, family dynamics, responsibilities, roles, and proper functioning of their home while managing the limitations and symptoms of advanced disease.

Sleep problems were associated with DT scores ≥ 4 . In general, sleep problems are common in patients with advanced cancer and are strongly associated with symptoms of pain, dyspnea, lower performance status, and distress (Palesh et al., 2010; Sharma et al., 2012). Psychological distress influences sleep quality and sleep disorders and may induce or aggravate symptoms such as depression, anxiety, pain, fatigue, and deterioration of quality of life (Nishiura et al., 2015). Therefore, it is important to identify distress in palliative care patients to improve their quality of life.

The relationship between DT scores and palliative care needs, especially emotional and practical needs, was demonstrated (Milne et al., 2013). The most prevalent unmet needs were in the physical and daily living domain and the emotional domain (McDowell et al., 2010). This reinforces Abraham Maslow's Theory of Human Motivation, which proposes a hierarchy of needs and factors that motivate people, identifying five categories of needs (physiological, security, love and belonging, esteem, and self-fulfillment), and constructed considering an ascending hierarchical order according to its importance for survival and motivational capacity (Angarita, 2007). We demonstrated this population's need for psychosocial support.

Latin American culture is characterized by spirituality and religiousness (Cruz-Oliver et al., 2014); however, spiritual issues were a problem in only a few cases, contrary to a study by Sah (2019) in Nepal, in which more than 50% of patients reported experiencing spiritual or religious concerns that were associated with high DT scores. It is possible that the DT was unable to detect all of the problems, and other specific tools may be necessary.

Limitations

This study had several limitations. First, the generalization of the results can be challenged since the patients were a heterogeneous sample with primary tumor sites and stages. It was a single-institution study, although it is the largest service provider in Mexico and is considered a typical oncological hospital functioning as a regional cancer center. However, we think that the results are applicable to other institutions.

Our study shares the limitations of retrospective studies. More data are necessary regarding protective and predictive factors behind the PL.

Although spiritual needs were frequently mentioned, in this study, it was not possible to detect them. The DT was insufficient for detecting and assessing spiritual problems, which can be important for treatment strategies (Gielen et al., 2017). Addressing spirituality can be necessary at the end of life as a coping resource to improve well-being in advanced disease stages and for its relationship in the relief of physical and emotional symptoms such as chronic pain, anxiety, and depression, which are recurrent in palliative care patients (Evangelista et al., 2016; Rudilla et al., 2018). In clinical practice, we consider applying some complementary assessment tools such as the Spiritual GES or FACIT-S.

Conclusion

In this study, more than half of the advanced cancer patients reported high distress levels. The routine/systematic use of the DT allows clinicians to identify patients with certain characteristics that may increase the risk of developing psychosocial distress and identify those who could benefit from additional resources. The screening also normalizes emotional status and explores different needs (Blais et al., 2014).

Our findings show that the presence of problems such as housing, transportation, sadness, nervousness, eating, sleep, and ECOG predict the level of distress in advanced cancer patients in palliative care in Mexico. The principal factors related to the level of distress were problems related to housing, transportation, and emotional problems such as sadness and nervousness.

In general, we consider the PL a good instrument to detect the needs of palliative and end-of-life cancer patients. Nevertheless, it must be complemented with different diagnostic instruments that will allow clinicians to further define patients' needs including spiritual distress.

The psychosocial care of cancer patients is considered an essential component of the quality of cancer care. Detecting distress experienced by advanced cancer patients is particularly important for identifying the main needs of care to offer the best comprehensive treatment to patients and guarantee appropriate treatment in palliative care.

These findings contribute to understanding distress in Latin American cancer patients and confirm the importance of addressing psychological factors. We highlight the importance of our study as reports from limited-resource centers and LMICs remain scarce in the international literature.

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References

- Akizuki N, Yamawaki S, Akechi T, et al. (2005) Development of an Impact Thermometer for use in combination with the Distress Thermometer as a brief screening tool for adjustment disorders and/or major depression in cancer patients. *Journal of Pain and Symptom Management* 29(1), 91–99.
- Almanza-Muñoz JJ, Juárez IR and Pérez S (2008) Traducción, adaptación y validación del termómetro de distrés en una muestra de paciente mexicanos con cáncer. *Revista De Sanidad Militar* 6(5), 209–217.
- American Cancer Society (2013) *American Cancer Society. What is advanced cancer?*. Available at: <http://www.cancer.org/treatment/understandingyour-diagnosis/advancedcancer/advanced-cancer-what-is> (Retrieved 04 June 2020).
- Angarita JRQ (2007) *Teoría de las necesidades de Maslow. Obtenido de Teoría de las necesidades de Maslow*. Available at: http://doctorado.josequintero.Net/documentos/Teoria_Maslow_Jose_Quintero.pdf.
- Blais MC, St-Hilaire A, Fillion L, et al. (2014) What to do with screening for distress scores? Integrating descriptive data into clinical practice. *Palliative & Supportive Care* 12(1), 25–38. doi:10.1017/s1478951513000059.
- Brenne E, Loge JH, Kaasa S, et al. (2013) Depressed patients with incurable cancer: Which depressive symptoms do they experience? *Palliative & Supportive Care* 11(6), 491–501. doi:10.1017/S1478951512000909.
- Bruera E, Kuehn N, Miller MJ, et al. (1991) The Edmonton Symptom Assessment System (ESAS): a simple method for the assessment of palliative care patients. *Journal of Palliative Care* 7(2), 6–9. <https://doi.org/10.1177/2F082585979100700202>.
- Chan M (2017) *Ten Years in Public Health, 2007–2017*. World Health Organization. Retrieved from: <https://apps.who.int/iris/bitstream/handle/10665/255355/9789241512442-eng.pdf;jsessionid=357D973F878EE11F53C51B97A5892ACD?sequence=1>.
- Cormio C, Caporale F, Spatuzzi R, et al. (2019) Psychosocial distress in oncology: Using the distress thermometer for assessing risk classes. *Supportive Care in Cancer: Official Journal of the Multinational Association of Supportive Care in Cancer* 27(11), 4115–4121. doi:10.1007/s00520-019-04694-4.
- Cruz-Oliver DM, Talamantes M and Sanchez-Reilly S (2014) What evidence is available on end-of-life (EOL) care and Latino elders? A literature review. *American Journal of Hospice & Palliative Care* 31(1), 87–97. doi:10.1177/1049909113480841.
- Cutillo A, O'Hea E, Person S, et al. (2017) NCCN Distress Thermometer: Cut off points and clinical utility. *Oncology Nursing Forum* 44(3), 329–336. doi:10.1188/17.ONF.329-336.
- Dean LT, Moss SL, Ransome Y, et al. (2019) "It still affects our economic situation": Long-term economic burden of breast cancer and lymphedema. *Supportive Care in Cancer* 27(5), 1697–1708. doi:10.1007/s00520-018-4418-4.
- DePinho RA and Hawk E (2016) Cancer prevention in developing countries: A vision for preserving health in Mexico. *Salud Publica De Mexico* 58(2), 93–96.
- Dessai SB, Chakraborty S, Sajeew Kumar PB, et al. (2015) Pilot study of single-day distress screening with the NCCN Distress Thermometer to evaluate the feasibility of routine distress screening in tertiary cancer center in rural India. *Psychooncology* 24(7), 832–834. doi:10.1002/pon.3739.
- Essue BM and Essue BM (2017) Economic burden of chronic Ill health and injuries for households in low- and middle-income countries. In Jamison DT, Gelband H, Horton S, Jha P, Laxminarayan R, Mock CN and Nugent R (eds), *Disease Control Priorities: Improving Health and Reducing Poverty*. Washington: The International Bank for Reconstruction and Development/The World Bank, pp. 121–143.
- Evangelista CB, Lopes ME, Costa SF, et al. (2016) Palliative care and spirituality: An integrative literature review. *Revista Brasileira de Enfermagem* 69(3), 554–563. doi:10.1590/0034-7167.2016690324i.
- Franke GH, Jaeger S, Glaesmer H, et al. (2017) Psychometric analysis of the brief symptom inventory 18 (BSI-18) in a representative German sample. *BMC Medical Research Methodology* 17(1), 1–7. doi:10.1186/s12874-016-0283-3.
- Gessler S, Low J, Daniells E, et al. (2008) Screening for distress in cancer patients: Is the distress thermometer a valid measure in the UK and does

- it measure change over time? A prospective validation study. *Psycho-Oncology* 17(6), 538–547. doi:10.1002/pon.1273.
- Gielen J, Bhatnagar S and Chaturvedi S** (2017) Prevalence and nature of spiritual distress among palliative care patients in India. *Journal of Religion and Health* 56(2), 530–544. doi:10.1007/s10943-016-0252-5.
- Goulia P, Papadimitriou I, Machado MO, et al.** (2012) Does psychological distress vary between younger and older adults in health and disease? *Journal of Psychosomatic Research* 72(2), 120–128. doi:10.1016/j.jpsychores.2011.11.011.
- Grassi L, Johansen C, Annunziata MA, et al.** (2013) Screening for distress in cancer patients: a multicenter, nationwide study in Italy. *Cancer* 119(9), 1714–1721. <https://doi.org/10.1002/cncr.27902>.
- Guan B, Wang K, Shao Y, et al.** (2019) The use of distress thermometer in advanced cancer inpatients with pain. *Psycho-Oncology* 28(5), 1004–1010. doi:10.1002/pon.5032.
- Gunnarsdottir S, Thorvaldsdottir GH, Fridriksdottir N, et al.** (2012) The psychometric properties of the Icelandic version of the distress thermometer and problem list. *Psycho-Oncology* 21(7), 730–736.
- Hamilton J and Kroska EB** (2019) Distress predicts utilization of psychosocial health services in oncology patients. *Psycho-Oncology* 28(1), 61–67. doi:10.1002/pon.4910.
- Haynes-Lewis H, Clayton MF, Viswanathan S, et al.** (2018) Distress and supportive care needs of ethnically diverse older adults with advanced or recurrent cancer. *Oncology Nursing Forum* 45(4), 496–507. doi:10.1188/18.ONF.496-507.
- Herschbach P, Keller M, Knight L, et al.** (2004) Psychological problems of cancer patients: A cancer distress screening with a cancer-specific questionnaire. *British Journal of Cancer* 91(3), 504–511. doi:10.1038/sj.bjc.6601986.
- Herschbach P, Book K, Brandt T, et al.** (2008) Psychological distress in cancer patients assessed with an expert rating scale. *British Journal of Cancer* 99(1), 37–43. doi:10.1038/sj.bjc.6604420.
- Holland JC, Andersen B, Breitbart WS, et al.** (2013) Distress management. *Journal of the National Comprehensive Cancer Network: JNCCN* 11(2), 190–209.
- Huey NS, Guan NC, Gill JS, et al.** (2018) Core symptoms of major depressive disorder among palliative care patients. *International Journal of Environmental Research and Public Health* 15(8). doi:10.3390/ijerph15081758.
- Iskandarsyah A, de Klerk C, Suardi DR, et al.** (2014) Consulting a traditional healer and negative illness perceptions are associated with non-adherence to treatment in Indonesian women with breast cancer. *Psycho-Oncology* 23(10), 1118–1124. doi:10.1002/pon.3534.
- Jacobsen PB, Donovan KA, Trask PC, et al.** (2005) Screening for psychological distress in ambulatory cancer patients: A multicenter evaluation of the distress thermometer. *Cancer* 103, 1494–1502. doi:10.1002/cncr.20940.
- Kelly C, Ghazi F and Caldwell K** (2002) Psychological distress of cancer and clinical trial participation: A review of the literature. *European Journal of Cancer Care* 11(1), 6–15.
- Kennard BD, Stewart SM, Olvera R, et al.** (2004) Nonadherence in adolescent oncology patients: Preliminary data on psychological risk factors and relationships to outcome. *Journal of Clinical Psychology in Medical Settings* 11(1), 31–39. doi:10.1023/B:JOCS.0000016267.21912.74.
- Kim HS, Shin SJ and Kim SC** (2013) Randomized controlled trial of standardized education and telemonitoring for pain in out patients with advanced solid tumors. *Supportive Care in Cancer* 21(6), 1751–1759. <https://doi.org/10.1007/s00520-013-1722-x>.
- Küttner S, Wüller J and Pastrana T** (2017) How much psychological distress is experienced at home by patients with palliative care needs in Germany? A cross-sectional study using the Distress Thermometer. *Palliative & Supportive Care* 15(2), 205–213. doi:10.1017/s1478951516000560.
- Lee YP, Wu CH and Chiu TY** (2015) The relationship between pain management and psycho spiritual distress in patients with advanced cancer following admission to a Palliative Care Unit. *BMC Palliative Care* 14(1), 3–7. doi: 10.1186/s12904-015-0067-2.
- Lloyd-Williams M and Friedman T** (2001) Depression in palliative care patients – A prospective study. *European Journal of Cancer Care* 10(4), 270–274. doi:10.1046/j.1365-2354.2001.00290.x.
- Mansourabadi A, Moogooei M and Nozari S** (2014) Evaluation of distress and stress in cancer patients in AMIR oncology hospital in Shiraz. *Iranian Journal of Pediatric Hematology and Oncology* 4(4), 131.
- McDowell ME, Occhipinti S, Ferguson M, et al.** (2010) Predictors of change in unmet supportive care needs in cancer. *Psycho-Oncology* 19, 508–516. doi:10.1002/pon.1604.
- Meggiolaro E, Berardi MA, Andritsch E, et al.** (2016) Cancer patients' emotional distress, coping styles and perception of doctor-patient interaction in European cancer settings. *Palliative & Supportive Care* 14(3), 204–2011. doi:10.1017/S1478951515000760.
- Milne D, Aranda S, Jefford M, et al.** (2013) Development and validation of a measurement tool to assess perceptions of palliative care. *Psycho-Oncology* 22(4), 940–946. doi:10.1002/pon.3071.
- Moscoco MS** (2011) Chronic stress and the measurement of perceived emotional distress in medicine & health psychology. *Liberabit* 17(1), 67–76.
- Murray SA, Kendall M, Boyd K, et al.** (2010) Archetypal trajectories of social, psychological, and spiritual wellbeing and distress in family care givers of patients with lung cancer: Secondary analysis of serial qualitative interviews. *BMJ (Clinical Research Ed.)* 340, c2581. doi:10.1136/bmj.c2581.
- National Institute for the Evaluation of Education** (2018) Available at: <https://www.inee.edu.mx/evaluaciones/panorama-educativo-de-mexico-isen/cs03a-escolaridad-media/>.
- NCCN** (2018) Clinical Practice Guidelines in Oncology (NCCN Guidelines): Distress Management. Version 2.2018. Retrieved from: https://oncolife.com.ua/doc/nccn/Distress_Management.pdf.
- Nishiura M, Tamura A, Nagai H, et al.** (2015) Assessment of sleep disturbance in lung cancer patients: Relationship between sleep disturbance and pain, fatigue, quality of life, and psychological distress. *Palliative & Support Care* 13, 575–581.
- OECD** (2019) Presentación del Estudio Económico de México 2019. Available at: <https://www.oecd.org/economy/2019-economic-survey-of-mexico-may-2019-sp.htm> (Retrieved 20 May 2020).
- Oken MM, Creech RH, Tormey DC, et al.** (1982) Toxicity and response criteria of the Eastern Cooperative Oncology Group. *American Journal of Clinical Oncology* 5(6), 649–655.
- Palesh OG, Roscoe JA, Mustian KM, et al.** (2010) Prevalence, demographics, and psychological association of sleep disruption in patients with cancer: University of Rochester Cancer Center-Community Clinical Oncology Program. *Journal of Clinical Oncology* 28, 292–298.
- Prieto JM, Blanch J, Atala J, et al.** (2002) Psychiatric morbidity and impact on hospital length of stay among hematologic cancer patients receiving stem-cell transplantation. *Journal of Clinical Oncology* 20(7), 1907–1917. doi:10.1200/JCO.2002.07.101.
- Randazzo D and Peters KB** (2016) Psychosocial distress and its effects on the health-related quality of life of primary brain tumor patients. *CNS Oncology* 5(4), 241–249. doi:10.2217/cns-2016-0010.
- Reynoso-Noverón N, Meneses-García A, Erazo-Valle A, et al.** (2016) Challenges in the development and implementation of the National Comprehensive Cancer Control Program in Mexico. *Salud Pública de México* 58(2), 325–333. doi:10.21149/spm.v58i2.7804.
- Roth AJ, Kornblith AB, Batel-Copel L, et al.** (1998) Rapid screening for psychological distress in men with prostate carcinoma: a pilot study. *Cancer: Interdisciplinary International Journal of the American Cancer Society* 82(10), 1904–1908. doi:10.1002/(sici)1097-0142(19980515)82:103.0.co;2-x.
- Rudilla D, Soto A, Pérez MA, et al.** (2018) Intervenciones psicológicas en espiritualidad en cuidados paliativos: Una revisión sistemática. *Medicina Paliativa* 25(3), 203–212. doi:10.1016/j.medipa.2016.10.004.
- Ryan DA, Gallagher P, Wright S, et al.** (2012) Sensitivity and specificity of the Distress Thermometer and a two-item depression screen (Patient Health Questionnaire-2) with a 'help' question for psychological distress and psychiatric morbidity in patients with advanced cancer. *Psycho-Oncology* 21(12), 1275–1284.
- Sah GS** (2019) Psychosocial and functional distress of cancer patients in a tertiary care hospital: A descriptive cross-sectional study. *JNMA Journal of Nepal Medical Association* 57(218), 252–258.
- Sharma N, Holm C, O'Connor M, et al.** (2012) Sleep problems in cancer patients: Prevalence and association with distress and pain. *Psycho-Oncology* 21, 1003–1009.
- Shimizu K** (2013) Effects of integrated psychosocial care for distress in cancer patients. *Japanese Journal of Clinical Oncology* 43(5), 451–457. doi:10.1093/jjco/hyt024.

- Singh T and Harding R** (2015) Palliative care in South Asia: A systematic review of the evidence for care models, interventions, and outcomes. *BMC Research Notes* **8**(172), 1–15. doi:10.1186/s13104-015-1102-3.
- Skaczkowski G, Sanderson P, Shand M, et al.** (2018) Factors associated with referral offer and acceptance following supportive care problem identification in a comprehensive cancer service. *European Journal of Cancer Care* **27**(5), e12869. doi:10.1111/ecc.12869.
- Snowden A, White CA, Christie Z, et al.** (2011) The clinical utility of the distress thermometer: A review. *British Journal of Nursing* **20**, 220–227. doi:10.12968/bjon.2011.20.4.220.
- StataCorp** (2011) *Stata Statistical Software: Release 12*. College Station, TX: StataCorp LP.
- Syrjala KL, Jensen MP, Mendoza ME, et al.** (2014) Psychological and behavioral approaches to cancer pain management. *Journal of Clinical Oncology* **32**(16), 1703–1711. doi:10.1200/jco.2013.54.4825.
- Teunissen SC, Wesker W, Kruitwagen C, et al.** (2007) Symptom prevalence inpatients with incurable cancer: a systematic review. *Journal of Pain and Symptom Management* **34**(1), 94–104. <https://doi.org/10.1016/j.jpainsymman.2006.10.015>.
- Van den Beuken-Van MH, Hochstenbach LM, Joosten EA, et al.** (2016) Update on prevalence of pain in patients with cancer: Systematic review and meta-analysis. *Journal of Pain and Symptom Management* **51**(6), 1070–1090. doi:10.1016/j.jpainsymman.2015.12.340.
- VanHoose L, Black LL, Doty K, et al.** (2015) An analysis of the distress thermometer problem list and distress in patients with cancer. *Supportive Care in Cancer* **23**(5), 1225–1232. doi:10.1007/s00520-014-2471-1.
- van Scheppingen C, Schroevers MJ, Smink A, et al.** (2011) Does screening for distress efficiently uncover meetable unmet needs in cancer patients? *Psycho-Oncology* **20**(6), 655–663. doi:10.1002/pon.1939.
- Waller A, Williams A, Groff SL, et al.** (2013) Screening for distress, the sixth vital sign: Examining self-referral in people with cancer over a one-year period. *Psycho-Oncology* **22**(2), 388–395. doi:10.1002/pon.2102.
- World Health Organization** (2018) <https://www.who.int/cancer/en/> (Accessed on 30 May 2019).
- Wüller J, Küttner S, Foldenauer AC, et al.** (2017) Accuracy of the Distress Thermometer for home care patients with palliative care needs in Germany. *Palliative & Support Care* **15**(3), 288–294. doi:10.1017/s1478951516000699.
- Xie J, Ding S, He S, et al.** (2017) A prevalence study of psychosocial distress in adolescents and young adults with cancer. *Cancer Nursing* **40**(3), 217–223. doi:10.1097/NCC.0000000000000396.
- Zabora J, Brintzenhofszoc K, Curbow B, et al.** (2001) The prevalence of psychological distress by cancer site. *Psycho Oncology* **10**(1), 19–28. doi:10.1002/1099-1611(200101/02)10:13.0.co;2-6.
- Zaza C and Baine N** (2002) Cancer pain and psychosocial factors: A critical review of the literature. *Journal of Pain and Symptom Management* **24**(5), 526–542. doi:10.1016/s0885-3924(02)00497-9.
- Zigmond AS and Snaith RP** (1983) The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica* **67**(6), 361–370.