

Patient-Reported Distress and Problems Among Elderly Patients with Hematological Malignancy in Korea

Sun-young Park

National Evidence-Based Healthcare Collaborating Agency

Yoonjoo Kim

Yonsei University

Hyunju Hong (✉ 10598@ncc.re.kr)

National Cancer Center <https://orcid.org/0000-0002-0297-1586>

Research Article

Keywords: psychological distress, Distress Thermometer, elderly, hematologic malignancy, Patient-Reported Outcome Measures, problem lists

Posted Date: March 15th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1358599/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.
[Read Full License](#)

Abstract

Purpose: Treatment for hematological malignancies (HMs) and functional decline associated with age can cause distress in elderly patients with HMs. However, information about the nature and effects of distress in this population is scarce. Therefore, this study examined the level of distress, its source, and the practical/familial/physical/emotional problems among elderly patients with HMs.

Methods: We conducted a cross-sectional study of patients with HMs aged ≥ 65 years who visited an outpatient clinic at a tertiary medical center in Korea between November 2019 and March 2020. Patient-reported distress and problems were measured using the Distress Thermometer (DT) and 39-item Problem List by the National Comprehensive Cancer Network. Descriptive statistics, χ^2 test or Fisher's exact test, and multivariate logistic regression analyses were conducted ($N = 132$).

Results: In total, 62.1% of patients were had moderate to severe distress (DT score ≥ 4), experiencing an average of nine problems. Significant sources of distress on multivariate logistic analysis included problems with transportation, depression, and constipation, accounting for 47% of distress variance. Most patients had physical (97.0%) or emotional problems (79.5%). Among these, fatigue (60.6%), worry (59.8%), tingling (59.8%), getting around (47.0%), and memory/concentration (40.2%) were the most frequently reported problems.

Conclusions: Elderly patients with HMs have a high burden of distress, which is affected by different sources, compared with patients with general cancer. Thus, in this population, assessment and management of distress need to be conducted considering the unique features of their source and burden. Further research on distress should consider the cancer type and population age.

Introduction

Over half of hematological malignancies (HMs) are diagnosed in the elderly (age ≥ 65 years) [1]. Compared with younger patients with solid tumors, elderly patients with HMs are more likely to experience distressing events, including frequent hospitalization [2, 3], aggressive treatment [4, 5], physical limitations [2, 3], and poorer prognosis [1]. In addition, changes in their social role resulting from the loss of family/friends, retirement, or unemployment can escalate distress [6]. Although distress risk in elderly patients with HMs have been established, little is known about their distress [7, 8].

Distress is defined as “a multifaceted and unpleasant experience of a psychological, social, spiritual, or physical nature,” which can interfere in coping with cancer diagnosis/treatment and its symptoms, as reported by the National Comprehensive Cancer Network (NCCN) [9]. In fact, 24–62% of cancer patients have reported high levels of distress that require further psychological referrals [10–15]. Moreover, untreated distress is a common complication of cancer and its treatment [15], which negatively affects quality of life [9, 16], adherence to treatment [17], and survival [8, 10]. Thus, international guidelines mandate healthcare professionals for early screening of distress in patients with cancer [8–9, 13, 18].

To address this need, the NCCN developed the Distress Thermometer (DT), a patient-reported instrument that identifies levels of distress [19, 20], and the Problem List (PL), which explores potential sources of distress [9, 20]. Studies have shown that DT has been associated with varying PL items, including practical, familial, emotional, and physical problems [12–15, 19–23]. However, PL items related to distress have been reported differently across studies [12–15, 19–23], which may be caused by various factors, such as younger age [15, 24], female sex [15], living alone [7], low income [7], comorbid conditions [25], and recent cancer diagnosis [24].

Regarding PL, physical and emotional problems are the most prevalent in patients with cancer [12, 24], although the prevalence of specific problems varies. For example, the most commonly reported problems included fatigue, pain, nervousness, and breathing problems in patients with lung cancer [14]; depression, pain, and economic problems in elderly patients with solid tumors [7]; and fatigue, tingling, and worrying in women with gynecological cancers [21]. This varying frequency of problems among patients with cancer indicates that the problem characteristics of elderly patients with HMs might be different from those of younger patients with cancer or solid tumors. However, limited information is available regarding the relationship between distress and problems in elderly patients with HMs, despite having established the importance of distress in cancer care [6, 9, 16].

In this study, we examined the levels of distress and its sources to identify patients at risk of distress and to devise optimal prevention and intervention strategies. In addition, to assess the burden of problems among elderly patients with HMs, we explored the characteristics of their practical, familial, physical, and emotional problems.

Methods

This was a cross-sectional study approved by the Institutional Review Board (IRB) of the National Cancer Center (approval number NCC 2019 – 0282). Patients were recruited from the outpatient clinic of a large cancer center (National Cancer Center) in Korea from November 2019 to March 2020.

Participants

To participate in the study, the inclusion criteria were as follows: (1) aged \geq 65 years, (2) diagnosed with HMs (i.e., lymphoma, multiple myeloma, leukemia, and myelodysplastic syndrome), (3) awareness of diagnosis, (4) did not receive palliative care, (5) received treatment with chemotherapy or follow-up, (6) ability to understand and communicate verbally in Korean, and (7) ability to provide written informed consent.

Procedures

A nurse practitioner consecutively reviewed the patients' medical records to determine eligibility for the study and contacted eligible patients to ask for participation. The study purpose and duration, as well as the fact that it is an anonymous survey unrelated to the ongoing treatment, were explained during

recruitment. After receiving written informed consent from patients who were willing to participate, the survey was conducted for 10–20 min using a questionnaire. For the patients with difficulty reading and writing, the nurse practitioner verbally read and explained the questionnaire and then wrote the answers on behalf of the patients.

Of the 142 patients who met the inclusion criteria and were asked to participate in the study, 10 patients refused due to conflicts in time and exhausted physical status. As such, a total of 132 patients completed the survey without any missing data. A power analysis using G*Power [26] suggested a sample size of 107 based on a two-tailed test, with an α of 0.05, power of 0.95, an odds ratio (OR) between emotional problems and distress of 1.99 [14], and distress incidence of 0.52 [15]. Therefore, our sample size met the minimum requirement for performing multivariate logistic analyses.

Measurements

Sociodemographic and clinical characteristics

For baseline data, participants completed a questionnaire on sociodemographic (age, sex, marital status, living with companion(s), education level, employment, and monthly family income) and clinical characteristics (types of cancer diagnosis, current treatment type, recurrence, number of comorbidities, and time with HM).

Patient-reported distress and problems

Patient-reported distress and problems were measured using the Korean version of the DT and PL [27]. The short-form Patient-Reported Outcome Measures (PROM) was developed to rapidly screen distress and identify sources of physical and psychosocial distress.

The DT is a single-item visual analog scale that resembles a thermometer. The level of distress in the previous week was measured from 0 (no distress) to 10 (extreme distress), with higher values indicating a higher level of distress. An established cut-off score of 4 indicates moderate or severe distress requiring additional psychological support [19, 27].

The PL is a 39-item questionnaire that asks patients if they had experienced any problems in the past week. Five categories are measured, including practical (six questions), emotional (six questions), familial (four questions), religious/spiritual (one question), and physical problems (22 questions) (Supplementary Table 1). The responses were either “yes” or “no” to indicate the “presence” or “absence” of a specific problem. Furthermore, the Cronbach alpha coefficient of this measurement tool was 0.90 in a previous study [28] and 0.73 in this study.

Statistical analysis

Descriptive statistics were applied to assess the means, frequencies, and percentages of patient characteristics, distress and problem lists. DT scores were divided into bivariate variables based on a cut-

off score of 4 [19, 27]. Moreover, the χ^2 and Fisher's exact tests were performed to compare distress between the groups with and without a specific problem.

Multivariate logistic regression analysis was also conducted to identify significant problems related to distress. Given the restrictions in available degrees of freedom, we included the significant problems from the χ^2 test and Fisher's exact tests, with the prevalence of more than 20%. In contrast, we excluded significantly correlated items within the same problem category and controlled variables, including sex, living alone, comorbidities, income, and time with HM, as indicated by previous studies [7, 24–25]. All analyses were performed using SPSS (version 25.0, Chicago, IL, USA), and P-values- of < 0.05 were considered statistically significant.

Results

Participants

A total of 132 patients completed the survey (Table 1). The mean age was 72.4 ± 5.5 years, and 77 patients (58.3%) were men. The majority of patients were unemployed (81.1%), married (74.2%), and lived with others (84.1%). Over three-quarters of patients reported a monthly income of less than 2 million Korean won, which was approximately \$1,700 (mean household income in 2019, 4.8 million Korean won) [29]. Regarding clinical characteristics, the most common diagnoses were multiple myeloma and lymphoma (42.4% and 40.9%, respectively), followed by leukemia (11.4%) and myelodysplastic syndrome (5.3%). Moreover, approximately 65% received chemotherapy, 37.1% had recurrence, and 65.9% reported at least one comorbidity (e.g., hypertension, diabetes mellitus, cardiac disease, and cerebral infarction). The mean time with HM was 17.2 ± 21.0 months (Table 1).

Table 1
Sociodemographics and clinical characteristics of patients (N = 132)

	Characteristics	N	%
Sociodemographics			
Age (years)	Mean ± SD (range)		72.4 ± 5.5 (65–92)
Sex	Men	77	58.3
	Women	55	41.7
Marital status	Married	98	74.2
	Single/divorced/separated/widowed	34	23.8
Living with companion(s)	Lives alone	21	15.9
	Lives with others	111	84.1
Education level	≤ High school	102	77.3
	≥ College	30	22.7
Employment	Unemployed	107	81.1
	Employed	15	19.9
Monthly family income (10,000 KRW)	< 200 (1,700 \$)	102	77.3
	200–400 (1,700–3,400 \$)	23	17.4
	> 400 (3,400 \$)	7	5.3
Clinical characteristics			
Types of cancer diagnosis	Leukemia	15	11.4
	Lymphoma	54	40.9
	Multiple myeloma	56	42.4
	Myelodysplastic syndrome	7	5.3
Current treatment type	Chemotherapy	85	64.4
	Follow-up	47	35.6
Recurrence	No	83	62.9
	Yes	49	37.1
KRW, South Korean won; SD, standard deviation			
Exchange rate between Korean won and US dollar: 1,220 Korean won = 1 US dollar			

	Characteristics	N	%
Number of comorbid illnesses	None	45	34.1
	1	50	37.9
	≥ 2	37	28.0
Time with hematological malignancy (months)	< 12	73	55.3
	12–23	31	23.5
	≥ 24	28	21.2
KRW, South Korean won; SD, standard deviation			
Exchange rate between Korean won and US dollar: 1,220 Korean won = 1 US dollar			

Patient-reported distress

The mean level of distress was 4.7 ± 2.7 , and more than half of the patients (62.1%; N = 82) reported moderate or severe distress. This indicates that elderly patients with HMs were markedly distressed.

Sources of distress

According to the χ^2 test, the group with moderate or severe distress was more likely to report higher frequencies in three practical problems (transportation, treatment decisions, and housing, all $p < 0.05$), one familial problem (dealing with their partner, $p = 0.015$), all emotional problems (worry, depression, fear, sadness, nervousness, loss of interest in usual activities, all $p < 0.05$), and three physical problems (pain, $p = 0.005$; constipation, $p = 0.01$; and eating, $p = 0.005$) (Fig. 1, Supplementary Table 1). However, distress was not significantly related to the spiritual/religious problem ($p < 0.05$).

On multivariate logistic regression, transportation (OR = 3.57, 95% confidence interval [CI] = 1.05–12.19), depression (OR = 7.01, 95% CI = 2.16–22.69), and constipation (OR = 4.2, 95% CI = 1.24–14.22) remained significant sources associated with moderate or severe distress (Table 2). Other items that did not show a significant independent relationship with distress included treatment decisions, worry, sleep, and pain. The model accounted for 34% (Cox & Snell) to 47% (Nagelkerke) of variance for the distress status (Table 2).

Table 2
Multivariate logistic regression for exploring the source of distress (N = 132)

Factors	Distress (score < 4 vs. ≥ 4)			
	Model 1		Model 2	
	OR (95% CI)	p	OR (95% CI)	p
Sociodemographic and clinical characteristics				
Sex (ref: men)	0.66 (0.31–1.42)	0.285	0.45 (0.16–1.22)	0.117
Living with companion(s) (ref: lives alone)	1.21 (0.42–3.48)	0.721	1.20 (0.32–4.43)	0.787
Monthly family income	0.91 (0.71–1.17)	0.456	1.11 (0.81–1.52)	0.522
Recurrence (ref: no)	1.38 (0.63–3.06)	0.423	1.34 (0.48–3.72)	0.571
Number of comorbid illnesses	2.11 (1.28–3.48)	0.003	1.46 (0.79–2.7)	0.229
Time with hematological malignancy	1.00 (0.98–1.02)	0.916	1.00 (0.98–1.02)	0.995
Problems				
Transportation (ref: no)			3.57 (1.05–12.19)	0.042
Treatment decisions (ref: no)			2.14 (0.57–7.98)	0.259
Worry (ref: no)			1.90 (0.73–4.91)	0.187
Depression (ref: no)			7.01 (2.16–22.69)	0.001
Sleep (ref: no)			2.01 (0.68–5.92)	0.204
Pain (ref: no)			2.89 (0.95–8.76)	0.061
Constipation (ref: no)			4.20 (1.24–14.22)	0.021
Full model statistics				
Model R ² (Cox & Snell)	0.09	0.046	0.34	< 0.001
OR: odds ratio, CI: confidence interval, ref: reference group				

Factors	Distress (score < 4 vs. ≥ 4)			
	Model 1		Model 2	
	OR (95% CI)	p	OR (95% CI)	p
Model R ² (Nagelkerke)	0.13		0.47	

OR: odds ratio, CI: confidence interval, ref: reference group

Patient-reported problems

The mean number of problems was 9.0 ± 22.1 , which increased to 10.8 ± 15.7 problems among participants with moderate or severe distress. The majority of patients had some type of physical (97.0%) and emotional problems (79.5%), whereas practical (54.5%) and familial problems (36.2%) were reported relatively less frequently. Furthermore, few patients (3.8%) reported a spiritual/religious problem (Fig. 1, Supplementary Table 1).

The most frequently reported problems with prevalence of $\geq 30\%$ were fatigue (60.6%), worry (59.8%), tingling (59.8%), getting around (47.0%), memory/concentration (40.2%), depression (38.6%), feeling swollen (37.1%), skin dry/itchy (35.7%), fear (34.8%), and sadness (34.8%), indicating that patients experienced more emotional and physical problems than practical and familial problems. Other problems, such as fever (5.3%), sexual (3.0%), childcare (1.5%), and work/school (0.8%), were rare. None of the patients had problems with the ability to have children or substance abuse (Fig. 1, Supplementary Table 1).

Discussion

We elucidated three key findings in this cross-sectional study using patient-reported distress and problems among the elderly with HMs. First, elderly patients with HMs have a high burden of distress and problems, revealing that 62.1% of patients were distressed, with an average of nine problems. Second, the significant sources of distress were transportation, depression, and constipation, suggesting that their distress was affected by unique sources, compared to patients with general cancer. Finally, the most common five problems were fatigue, worry, tingling, getting around, and memory/concentration. Ultimately, these results can provide deeper understanding of distress in elderly patients with HMs, which may validate or contrast the findings of previous studies.

In comparison, our patients were more distressed than patients with varying cancer types and ages in previous studies, which reported distress prevalence of 24–62% [10–15]. Despite having no prior studies that confirmed our results, several studies have suggested that the characteristics of elderly patients with HMs can negatively affect distress. In particular, the dynamic characteristics of HM treatment [4–5] and the decline in physical and social functions caused by aging were found to cause distress [30]. Therefore, our findings consistently showed that elderly patients with HMs may be more vulnerable to distress than younger patients with other types of cancer.

The results of this study aid in the understanding of the unique sources of distress among elderly patients with HMs. Specifically, housing, transportation, and problems with a partner were significant sources of distress, and transportation remained significant on multivariate logistic analysis, which has rarely been reported in prior studies [7, 13, 15, 21, 24]. This can be explained by the fact that physical disabilities and the family's caregiving burden can disrupt independence and familiar interactions among elderly patients with cancer, thereby leading to distress [3, 6, 31]. Our findings also suggest that the loss of autonomy and role changes in families may affect distress, especially in elderly patients with HMs, although further research is needed to confirm this.

Notably, our study found that depression was the most powerful influencer, resulting in seven-fold higher levels of distress. However, previous studies reported other emotions that affect distress among patients with cancer, which include nervousness [13–14], loss of interest [22], sadness [14–15], and worry [12–13]. Although no studies have explained this inconsistency among studies, one possible explanation is that elderly patients with cancer can be more affected by depression than younger patients [32]. Additionally, given the strong association between depression and distress in the present study, it may be important for healthcare professionals to weigh the reports of depression symptoms more heavily than those of the other items when assessing distress in this population.

Another essential finding of this study was that distressed elderly patients with HMs were affected by constipation, which was not found in prior studies [7, 13, 15, 20–21, 24]. This implies that distressing factors may differ according to patient age, as constipation is a common complaint that occurs in 30% of the elderly and is a deteriorating factor for distress in this population [33]. This explanation is further supported by the fact that our study focused only on the elderly, whereas previous studies included patients of differing ages. Thus, assessing and modifying bowel function may be important to minimize distress in elderly patients with HMs [34].

Moreover, although this study found fatigue to be prevalent, similar to in previous studies [11, 13–15, 17, 20–21, 24], a significant association between fatigue and distress was not found [12, 14–15, 19]. An explanation for this discrepancy might be due to the fact that elderly patients with cancer often regard fatigue as part of aging, possibly minimizing the severity and life-threatening impact of symptoms [35]. However, further research is needed to confirm the relationship between fatigue and distress in older adults with HMs.

Additionally, the prevalence of pain (30.3%) and sleep (32.6%) problems in this study was similar to or lower than those in previous studies, reporting pain prevalence of 29.8–64.5% and sleep problem prevalence of 36.6–61.5% [7, 12, 14–15, 20, 24]. The reason for these discrepancies is yet to be confirmed; however, one study indicated that pain was reported less frequently in older patients with cancer than in younger patients [36]. Elderly patients may also develop higher pain tolerance over time, leading them to report symptoms that are newer, more serious, or more specifically related to cancer treatment [30]. Therefore, our results indicated that pain and sleep might be high priority problems that

should be assessed and managed in elderly patients with HMs due to their association with distress. Further research is required to validate this assertion.

Furthermore, this study found unique features of physical problems among elderly patients with HMs. Specifically, some physical problems, such as tingling, getting around, and memory/concentration, were reported to be 5–13% higher than those of other cancer patients in prior studies [7, 13–14, 20–21]. This discrepancy can be explained by the effects of aging and HM treatment on physical problems. In particular, patients with HMs, especially lymphoma and multiple myeloma, frequently experience tingling due to neurotoxic treatments (e.g., bortezomib, thalidomide, brentuximab vedotin, vinca alkaloid) [37]. Moreover, our prevalence of memory impairment and difficulty in getting around was comparable to other elderly patients with cancer that was measured using a different diagnostic tool (e.g., Mini-Mental State Examination) [38]. Given their circumstances, it can be asserted that elderly patients with HMs have higher prevalence of tingling, getting around, and memory/concentration than other patients with cancer.

Study limitations

Despite these findings, some limitations of the study should be noted. Since the study data were collected using a convenience sample and the participants were diagnosed with diverse types of HMs, our results may not be generalizable to a particular type of HM. In addition, distress and problem burden were measured using PROM, which may have different results from objective measurements by healthcare professionals. It is also possible that patients provided more socially acceptable responses than truthful ones. Lastly, the PL questionnaire only collects binary answers on whether patients have a specific problem. Therefore, it does not represent the severity of the reported problems.

Clinical implications

Elderly patients with HMs had a high level of distress in this study. Considering the low level of disclosure of psychological symptoms by elderly patients with cancer [6, 15] and the lack of understanding of distress in elderly patients with HMs among healthcare professionals [6], this study suggests that greater attention should be given when screening and managing distress in this population.

This study found unique features of distress and problems among elderly patients with HMs due to aging and HM treatment. First, loss of autonomy and changing roles within the family were found to lead to distress among this population. As such, focusing on supporting functional independence and familial interaction is needed. Second, regarding the distinct physical problems experienced in this population, we recommend that health care professionals pay particular attention to constipation, mobility, depression, tingling, and memory/concentration problems. Lastly, it is necessary to assess the distress of elderly patients with HMs with consideration of their unique needs. Further research on distress should also consider the distinct characteristics of distress and problems according to cancer type and patient age.

Conclusions

Overall, the present study confirms that elderly patients with HMs have a high burden of physical and emotional problems, implying that there are unmet needs in these patients. It is therefore important to recognize their problems, with consideration to the adverse effects of aging and HM treatments, to allow health professionals to better understand the disease burden and manage distress.

Declarations

Funding: The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

Competing Interests: The authors have no relevant financial or non-financial interests to disclose.

Author Contributions: All authors contributed to the study conception and design. Specifically, Park S performed the statistical analysis and drafted the manuscript. Kim Y was involved in revising the manuscript for important intellectual contents. Hong H collected the data and helped to draft the manuscript. All authors read and approved the final manuscript.

Ethics Approval: This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of National Cancer Center (Number NCC 2019-0282).

Consent to Participate: Informed consent was obtained from all individual participants included in the study.

Data Availability: The datasets generated and/or analyzed during the present study are available from the corresponding author on reasonable request.

References

1. Surveillance E (2018) and End Results Program SEER cancer statistics review 1975–2014: age distribution at diagnosis and death.
https://doi.org/seer.cancer.gov/archive/csr/1975_2014/results_merged/topic_age_dist.pdf. Accessed 10 February 2022
2. Johnsen AT, Tholstrup D, Petersen MA, Pedersen L, Groenvold M (2009) Health related quality of life in a nationally representative sample of haematological patients. *Eur J Haematol* 83(2):139–148.
<https://doi.org/10.1111/j.1600-0609.2009.01250.x>
3. Else M, Smith AG, Cocks K, Richards SM, Crofts S, Wade R et al (2008) Patients' experience of chronic lymphocytic leukaemia: baseline health-related quality of life results from the LRF CLL4 trial. *Brit J Haematol* 143(5):690–697. <https://doi.org/10.1111/j.1365-2141.2008.07407.x>
4. Barata A, Wood WA, Choi SW, Jim HS (2016) Unmet needs for psychosocial care in hematologic malignancies and hematopoietic cell transplant. *Curr Hematol Malig Rep* 11(4):280–287.
<https://doi.org/10.1007/s11899-016-0328-z>

5. Franchini M, Frattini F, Crestani S, Bonfanti C (2013) Bleeding complications in patients with hematologic malignancies. *Semin Thromb Hemost* 39:94–100. <https://doi.org/10.1055/s-0032-1331154>
6. Hurria A, Li D, Hansen K, Patil S, Gupta R, Nelson C et al (2009) Distress in older patients with cancer. *J Clin Oncol* 27(26):4346–4351. <https://doi.org/10.1200/JCO.2008.19.9463>
7. Hong JF, Zhang W, Song YX, Xie LF, Wang WL (2015) Psychological distress in elderly cancer patients. *Int J Nurs Sci* 2(1):23–27. <https://doi.org/10.1016/j.ijnss.2015.02.006>
8. Shreders AJ, Niazi SK, Hodge DO, Chimato NT, Kureti M, Kirla N et al (2018) Correlation of sociodemographic and clinical parameters with depression and distress in patients with hematologic malignancies. *Ann Hematol* 97(3):519–528. <https://doi.org/10.1007/s00277-017-3198-0>
9. Riba MB, Donovan KA, Andersen B, Braun I, Breitbart WS, Brewer BW et al (2019) Distress management, version 3.2019, NCCN clinical practice guidelines in oncology. *J Natl Compr Canc Netw* 17(10):1229–1249. <https://doi.org/10.6004/jnccn.2019.0048>
10. Troy JD, de Castro CM, Pupa MR, Samsa GP, Abernethy AP, LeBlanc TW (2018) Patient-reported distress in myelodysplastic syndromes and its association with clinical outcomes: a retrospective cohort study. *J Natl Compr Canc Netw* 16(3):267–273. <https://doi.org/10.6004/jnccn.2017.7048>
11. Musiello T, Dixon G, O'Connor M, Cook D, Miller L, Pettersson A (2017) A pilot study of routine screening for distress by a nurse and psychologist in an outpatient haematological oncology clinic. *Appl Nurs Res* 33:15–18. <https://doi.org/10.1016/j.apnr.2016.09.005>
12. Troy JD, Locke SC, Samsa GP, Feliciano J, Richhariya A, LeBlanc TW (2019) Patient-reported distress in hodgkin lymphoma across the survivorship continuum. *Support Care Cancer* 27(7):2453–2462. <https://doi.org/10.1007/s00520-018-4523-4>
13. VanHoose L, Black LL, Doty K, Sabata D, Twumasi-Ankrah P, Taylor S et al (2015) An analysis of the distress thermometer problem list and distress in patients with cancer. *Support Care Cancer* 23(5):1225–1232. <https://doi.org/10.1007/s00520-014-2471-1>
14. 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* 55(2):215–224. <https://doi.org/10.1016/j.lungcan.2006.10.001>
15. Mehnert A, Hartung TJ, Friedrich M, Vehling S, Brähler E, Härter M et al (2018) One in two cancer patients is significantly distressed: prevalence and indicators of distress. *Psychooncology* 27(1):75–82. <https://doi.org/10.1002/pon.4464>
16. Ownby KK (2019) Use of the distress thermometer in clinical practice. *J J Adv Pract Oncol* 10(2):175. <https://doi.org/10.6004/jadpro.2019.10.2.7>
17. Berry DL, Blonquist TM, Hong F, Halpenny B, Partridge AH (2015) Self-reported adherence to oral cancer therapy: relationships with symptom distress, depression, and personal characteristics. *Patient Prefer Adherence* 4(9):1587–1597. <https://doi.org/10.2147/PPA.S91534>
18. American College of Surgeons Commission on Cancer (2020) Optimal resources for cancer care (2020 standards). American College of Surgeons Commission on Cancer: Chicago, IL, USA.

- https://www.facs.org/-/media/files/quality-programs/cancer/coc/optimal_resources_for_cancer_care_2020_standards.ashx. Accessed 10 February 2022
19. Jacobsen PB, Donovan KA, Trask PC, Fleishman SB, Zabora J, Baker F et al (2005) Screening for psychologic distress in ambulatory cancer patients: a multicenter evaluation of the distress thermometer. *Cancer* 103(7):1494–1502. <https://doi.org/10.1002/cncr.20940>
 20. McFarland DC, Jutagir DR, Miller A, Nelson C (2020) Physical problem list accompanying the distress thermometer: its associations with psychological symptoms and survival in patients with metastatic lung cancer. *Psychooncology* 29(5):910–919. <https://doi.org/10.1002/pon.5367>
 21. Jewett PI, Teoh D, Petzel S, Lee H, Messelt A, Kendall J et al (2020) Cancer-related distress: revisiting the utility of the National Comprehensive Cancer Network distress thermometer problem list in women with gynecologic cancers. *JCO Oncol Pract* 16(8):649–659. <https://doi.org/10.1200/JOP.19.00471>
 22. Clover KA, Oldmeadow C, Nelson L, Rogers K, Mitchell AJ, Carter G (2016) Which items on the distress thermometer problem list are the most distressing? *Support Care Cancer* 24(11):4549–4557. <https://doi.org/10.1007/s00520-016-3294-z>
 23. Cook SA, Salmon P, Hayes G, Byrne A, Fisher PL (2018) Predictors of emotional distress a year or more after diagnosis of cancer: a systematic review of the literature. *Psychooncology* 27(3):791–801. <https://doi.org/10.1002/pon.4601>
 24. Bergerot CD, Clark KL, Nonino A, Waliyan S, Buso MM, Loscalzo M (2015) Course of distress, anxiety, and depression in hematological cancer patients: association between gender and grade of neoplasm. *Palliat Support Care* 13(2):115–123. <https://doi.org/10.1017/S1478951513000849>
 25. Subramaniam S, Kong YC, Chinna K, Kimman M, Ho YZ, Saat N et al (2018) Health-related quality of life and psychological distress among cancer survivors in a middle-income country. *Psychooncology* 27(9):2172–2179. <https://doi.org/10.1002/pon.4787>
 26. Faul F, Erdfelder E, Lang A-G, Buchner A (2007) G* Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav Res Methods* 39(2):175–191. <https://doi.org/10.3758/BF03193146>
 27. National Comprehensive Cancer Network (2011) Distress Thermometer and Problem List <https://doi.org/www.nccn.org/guidelines/submissions-licensing-and-permissions/permissions-distress-tool>. Accessed 10 February 2022
 28. Park JS, Oh YJ (2012) Development and evaluation of the psychosocial distress nursing intervention for patients with gynecological cancer. *Korean J Adult Nurs* 24(3):219–231. <https://doi.org/10.7475/kjan.2012.24.3.219>
 29. Statistics Korea: Household Income Trends in the Fourth Quarter of 2019. <http://kostat.go.kr/portal/eng/pressReleases/6/1/index.board>. Accessed 10 February 2022
 30. Wochna Loerzel V (2015) Symptom Experience in Older Adults Undergoing Treatment for Cancer. *Oncol Nurs Forum* 42(3):269–278. <https://doi.org/10.1188/15.ONF.E269-E278>

31. Rocha LS, Beuter M, Neves ET, Leite MT, Brondani CM, Perlini NMOG (2015) Self-care of elderly cancer patients undergoing outpatient treatment. *Texto Contexto Enferm* 23:29–37. <https://doi.org/10.1590/S0104-07072014000100004>
32. Spoletini I, Gianni W, Repetto L, Bria P, Caltagirone C, Bossu P et al (2008) Depression and cancer: an unexplored and unresolved emergent issue in elderly patients. *Crit Rev Oncol Hematol* 65(2):143–155. <https://doi.org/10.1016/j.critrevonc.2007.10.005>
33. Dore MP, Pes GM, Bibbò S, Tedde P, Bassotti G (2018) Constipation in the elderly from northern sardinia is positively associated with depression, malnutrition and female gender. *Scand J Gastroenterol* 53(7):797–802. <https://doi.org/10.1080/00365521.2018.1473485>
34. Talley NJ (2004) Definitions, epidemiology, and impact of chronic constipation. *Rev Gastroenterol Disord* 4:3–10. <https://pubmed.ncbi.nlm.nih.gov/15184814/>
35. Siegel K, Lekas H-M, Maheshwari D (2012) Causal attributions for fatigue by older adults with advanced cancer. *J Pain Symptom Manage* 44(1):52–63. <https://doi.org/10.1016/j.jpainsympman.2011.07.013>
36. Cataldo JK, Paul S, Cooper B, Skerman H, Alexander K, Aouizerat B et al (2013) Differences in the symptom experience of older versus younger oncology outpatients: a cross-sectional study. *BMC Cancer* 13(1):1–16. <https://doi.org/10.1186/1471-2407-13-6>
37. Li T, Timmins HC, Lazarus HM, Park SB (2020) Peripheral neuropathy in hematologic malignancies—past, present and future. *Blood Rev* 43:100653. <https://doi.org/10.1016/j.blre.2020.100653>
38. Caillet P, Laurent M, Bastuji-Garin S, Liuu E, Culine S, Lagrange J-L et al (2014) Optimal management of elderly cancer patients: usefulness of the comprehensive geriatric assessment. *Clin Interv Aging* 9:1645. <https://doi.org/10.2147/CIA.S57849>

Figures

Figure 1

Top 30 most frequently reported problems.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- STROBEchecklistDistressinelderlywithHMs.docx
- SupplementarymaterialDistressinelderlywithHMs.docx