

ARTICLE

Reporting of Cancer-related Fatigue in Palliative Care Journals

Senthil P Kumar¹ and Krishna Prasad²

¹Department of Physiotherapy, Kasturba Medical College, Manipal University, Mangalore, India

²Department of Medical Oncology, Kasturba Medical College, Manipal University, Mangalore, India

Corresponding author: Dr. Senthil P Kumar Email: senthil.kumar@manipal.edu

Published: 01 January 2013

Ibnosina J Med BS 2013,5(1):22-30

Received: 04 July 2012

Accepted: 19 September 2012

This article is available from: <http://www.ijmbs.org>

This is an Open Access article distributed under the terms of the Creative Commons Attribution 3.0 License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Introduction: Cancer-related fatigue (CRF) is a highly prevalent symptom in patients with cancer. Palliative care clinical practice depends upon an evidence-based decision-making process. We performed a quantitative analysis of research publications in palliative Care journals for their reporting of CRF. **Settings and Design:** Systematic review of palliative cares journals. **Materials and Methods:** Twelve palliative care journals were searched for articles with 'cancer' in title and 'fatigue' in title/abstract of the articles published from 2006-2010. The reporting rates of all journals were compared. The selected articles were categorized into assessment and treatment, and subsequently grouped into original and review articles. The original articles were sub-grouped into qualitative and quantitative studies, and the review articles were grouped into narrative and systematic reviews. Each subgroup in the original articles category was further classified according to study designs. Descriptive analysis using frequencies

and percentiles was used. **Results:** The overall reporting rate among all journals was 1.04% (38/3634), and *Am J Hosp Palliat Care* (AJHPC) had highest reporting rate of 1.98% (9/454), followed by *Palliat Med* (PM) with 1.85% (10/538), and *Indian J Palliative Care* (IJPC) with 1.69% (1/59). **Conclusions:** The overall reporting rate for CRF articles in palliative care journals was very low and there were very few randomized clinical trials and systematic reviews found. The study findings indicate a lack of adequate evidence base for CRF.

Key-words: evidence-based palliative care, research, journal reporting, publication trend, cancer-related fatigue

Introduction

Some of the most common symptoms in palliative care patients with cancer are pain, dyspnoea and fatigue (1). The goals of palliative care in the treatment of patients with cancer are to improve their symptom control, level

of function and quality of life (QoL) (2). Fatigue has direct influence on physical function and QoL in patients with cancer (3). The estimated prevalence of fatigue in patients with cancer ranges from 50% to 75% at the time of diagnosis. It increases to 80-96% in patients undergoing chemotherapy and to 60-93% in patients receiving radiotherapy (4). The proposed mechanisms for development of CRF include 5-HT neurotransmitter deregulation, vagal afferent activation, alterations in muscle and ATP metabolism, hypothalamic-pituitary-adrenal axis dysfunction, circadian rhythm disruption, and cytokine dysregulation (5). The diagnosis can be made through a combination of medical history and physical examination, relevant laboratory data, discussions with families and caregivers, and the use of standardized assessment tools (6,7). Evaluation of patients with CRF includes use of one-dimensional and multidimensional tools for assessment of fatigue. The simplest of these are the Visual Analogue Fatigue Scale (VAFS), Brief Fatigue Inventory (BFI), Functional Assessment of Cancer Therapy instrument and Multidimensional Fatigue Symptom Inventory-Short Form (8). The management of CRF involves a comprehensive multidisciplinary team-work involving pharmacological and non-pharmacological interventions. Kangas et al (8) reported a meta-analysis of 57 randomized clinical trials on non-pharmacological interventions and found multimodal exercise and walking programs, restorative approaches, supportive-expressive, and cognitive-behavioral psychosocial interventions to be promising and effective in ameliorating CRF among patients with advanced cancer. Carroll et al (9) reviewed 32 randomized clinical trials on pharmacologic interventions and found hematopoietic drugs (for anaemia), corticosteroids, and psychostimulant drugs as effective medications. Other therapeutic agents that were reported to be less well studied for CRF but are currently the focus of clinical trials included l-carnitine, modafinil, bupropion, and selective serotonin reuptake inhibitors such as paroxetine. Despite the growing emphasis on cancer-related fatigue in clinical palliative care practice, it is often underdiagnosed, and its management is frequently suboptimal (10). The current evidence era and the ensuing evidence-based practice warranted application of current research evidence into clinical decision making to facilitate evidence-based palliative care (EBPC) (11). Such an analysis of research evidence could not be based upon anecdotal statements and thus there is a need to evaluate the reporting of research on CRF in palliative care journals. Previously published studies on analysis of palliative care journals were on reporting of moral problems (ethical

issues) (12), euthanasia (13), chaplains and community-based clergy (14,15), religion and spirituality (15-17), cancer pain (18), pediatric palliative care (19) and quality of life (20). The objective of this paper was to perform a quantitative analysis of research articles on cancer-related fatigue (CRF), published in palliative care journals over the past five years.

Materials and Methods

Search strategy and criteria

Journals indexed in MEDLINE with name 'palliative' were included and searched from 2006 till 2010 for English papers with 'cancer' in title and 'fatigue' in title/abstract of the paper.

Data synthesis

The total number of articles in all the selected journals was taken as N. The number of included articles (N1) based on the search criteria was compared with number of articles that had "cancer" in title and "fatigue" in title/abstract (NR) to obtain reporting rates (N1/N%) for each journal. Such an estimate provided reporting rate (RR) for CRF. The journals were categorized broadly into multidisciplinary, medical, nursing and other (social work) categories of palliative care journals. The included studies were then categorized into original articles and review articles. The original articles further again grouped into qualitative and quantitative studies. The review articles were subgrouped into narrative and systematic reviews and the qualitative and quantitative studies were then sub-grouped based upon study designs. Further, the articles on CRF were grouped into two broad categories namely, assessment studies and treatment studies. The number of articles reported in each of the final subgroups was computed. The procedure of data synthesis is explained in the schematic flowchart (figure 1).

Data analysis

Descriptive analysis using frequencies for number of studies with respective percentiles was used for reporting characteristics and was done using 95% confidence interval by SPSS for Windows version 11.5 (SPSS Inc, IL). Comparison between journals and article-categories were done visually.

Results

Overall journals' characteristics

The study included twelve palliative care journals with a total number of 3634 articles and 38 included articles which met the inclusion criteria. The overall reporting rate for

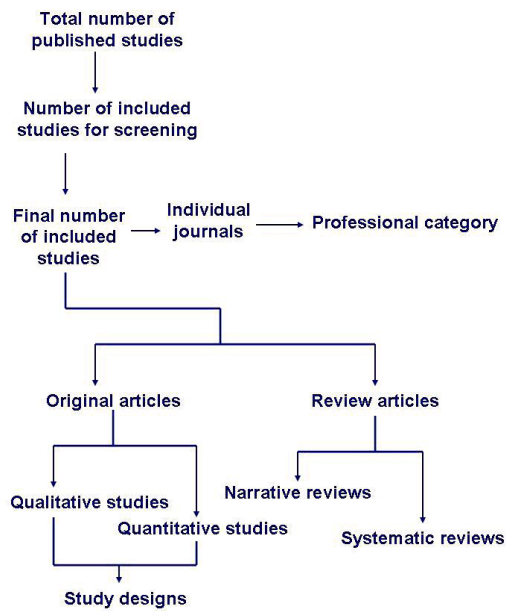


Figure 1. Schematic flowchart for data synthesis used in this study

Table 1. Comparison of reporting rates of palliative care journals on ‘cancer-related fatigue’ (CRF) articles (2006-2010).

	Total number of articles (N)	Number of articles on cancer or fatigue in title (N ₁)	Reporting rate (N _R) N ₁ /N%
<i>Am J Hosp Palliat Care</i> ^a	454	9	2.0 %
<i>BMC Palliat Care</i> ^a	76	0	0
<i>Curr Opin Support Palliat Care</i> ^a	204	0	0
<i>Indian J Palliat Care</i> ^a	59	1	1.7%
<i>Int J Palliat Nurs</i> ^c	430	2	0.5%
<i>J Hosp Palliat Nurs</i> ^c	8	0	0
<i>J Pain Palliat Care Pharmacother</i> ^b	261	0	0
<i>J Palliat Care</i> ^a	206	0	0
<i>J Palliat Med</i> ^b	1085	12	1.1%
<i>J Soc Work End Life Palliat Care</i> ^d	66	0	0
<i>Palliat Med</i> ^b	538	10	1.9%
<i>Palliat Support Care</i> ^a	247	4	1.6%
Total number of articles, N or overall reporting rate, %	3634	38	1.0%

a- multi-disciplinary journals; b- medical journals; c- nursing journals; d- other (social work)

Table 2. Characteristics of assessment articles on ‘cancer-related fatigue’ (CRF) in terms of their type of article, method of research and study design. Total number of articles on CRF assessment (N_2) is 24.

Type of articles	Number of articles N_3 (% = N_3/N_2)	Types of research methods	Number of articles N_4 (% = N_4/N_2)	Study designs	Number of articles N_5 (% = N_5/N_2)
Original articles	18 (75%)	Quantitative studies	13 (54.2%)	Randomized clinical trial	0 (0)
				Non-randomized clinical trial	0 (0)
				Cohort study	3 (12.5%)
				Case control study	0 (%)
				Cross-sectional study	10 (41.7%)
				Case report	0
		Qualitative studies	5 (20.8%)	Randomized clinical trial	0
				Non-randomized clinical trial	0
				Cohort study	2 (8.3%)
				Case control study	0
				Cross-sectional study	3 (12.5%)
				Case report	0
Review articles	6 (25%)	Narrative reviews	5 (20.8%)		
		Systematic reviews	1 (4.2%)		

articles on CRF is 1.04%. AJHPC- Am J Hosp Palliat Care; BMCPC- BMC Palliat Care; COSPC- Curr Opin Support Palliat Care; IJPC- Indian J Palliat Care; IJPN- Int J Palliat Nurs; JHPN- J Hosp Palliat Nurs; JPPCP- J Pain Palliat Care Pharmacother; JPC- J Palliat Care; JPM- J Palliat Med; JSWELPC- J Soc Work End Life Palliat Care; PM- Palliat Med; and, PSC- Palliat Support Care. Individually AJHPC had nine articles (21-29), BMCPC had zero articles, COSPC had zero articles, IJPC had one article (30), IJPN had two articles (31,32), JHPN had zero articles, JPPCP had zero articles, JPC had zero articles, JPM had 12 articles

(33-44), JSWELPC had zero article, PSC had four articles (45-48) and PM had 10 articles (49-58) on CRF. Also refer table-1 for respective journal-wise reporting rates. Am J Hosp Palliat Care (AJHPC) had highest reporting rate of 1.98% (9/454), followed by Palliat Med (PM) with 1.85% (10/538), and Indian J Palliative Care (IJPC) with 1.69% (1/59).

Of the selected journals, seven were multidisciplinary (AJHPC, BMCPC, COSPC, IJPC, JPC, JPPCP, PSC) with a reporting rate of 0.89% (14/1573), two were medical (JPM, PM) with a reporting rate of 1.35% (22/1623), two

Table 3. Characteristics of treatment articles on ‘cancer-related fatigue’ (CRF) in terms of their type of article, method of research and study design. The total number of articles on CRF treatment is 14 articles (N_2).

Type of articles	Number of articles N_3 (% = N_3/N_2)	Types of research methods	Number of articles N_4 (% = N_4/N_2)	Study designs	Number of articles N_5 (% = N_5/N_2)
Original articles	12 (85.7%)	Qualitative studies	3 (21.4%)	Randomized clinical trial	0
				Non-randomized clinical trial	0
				Cohort study	2 (14.3%)
				Case control study	0
				Cross-sectional study	1 (7.1%)
				Case report	0
		Quantitative studies	9 (64.3%)	Randomized clinical trial	1 (7.1%)
				Non-randomized clinical trial	4 (28.6%)
				Cohort study	2 (14.3%)
				Case control study	1 (7.1%)
				Cross-sectional study	0
				Case report	1 (7.1%)
Review articles	2 (14.3%)	Narrative reviews	2 (14.3%)		
		Systematic reviews	0		

were nursing (IJP, JHPN) with a reporting rate of 0.45% (2/438), and one was other (social work- JSWEOLPC).

Articles on CRF assessment studies

Of the 38 included articles, 24 were on assessment (21-25,27,28,30-32,35,38,41-45,49-51,53,55,57,58) and 14 were on treatment (26,29,33,34,36,37,39,40,46-48,52,54,56). Among the 24 assessment articles, 18 were original articles (21,24,25,27,28,35,38,41-45,49,50,53,55,57,58) and six were review articles (22,23,30-32,51).

Among the 18 original articles on assessment, five were qualitative studies (28,35,42,50,55) of which there were three cross-sectional studies (28,35,50) and two cohort studies (42,55) and 13 were quantitative studies of which three were cohort studies (25,27,44) and 10 articles were

cross sectional studies (21,24,38,41,43,45,49,53,57,58). Of the six review articles on assessment, five were narrative reviews (23,30-32,51) and one was a systematic review (22).

Articles on CRF treatment studies

Among the 14 treatment articles, 12 were original articles (26,33,34,36,37,39,40,47,48,52,54,56) and 2 were review articles (29,46). Of the 12 original articles on treatment, there were three qualitative studies (40,48,52) and nine quantitative studies (26,33,34,36,37,39,47,54,56). Of the nine quantitative studies, one was a randomized clinical trial (47), four were non-randomized clinical trials (33,36,37,54), two were cohort studies (26,56), one was a case-control study (77) and one article was a case

report (81). Among the three qualitative studies, two were cohort studies (40,48) and one was a cross-sectional study (52). Both the review articles on treatment were narrative reviews (29,46).

Discussion

This study is essentially the first of its kind of a review of palliative care journals utilizing a systematic approach to quantitatively identify reporting characteristics of articles on cancer-related fatigue (CRF). This study included 12 palliative care journals. The previous authors- Hermesen and ten Have reviewed 12 palliative care journals from 1984 to 1999 (30,31) and found reporting rate of 12% for ethical issues (458 articles) and euthanasia rate was unreported (75 articles). Hermesen and ten Have (33) reviewed 12 journals from 1984-2002 and found a reporting rate of 2% for 80 articles on spirituality, pastoral care and religion. Flannelly et al (32) reviewed three palliative care journals from 1990-1999 and they found a reporting rate of 5.6% (47/838) for articles on role of chaplains and clergy. Kumar found a two-year reporting rate of 5.6% for cancer pain articles (36) in 19 palliative care journals and five-year reporting rate of 2.66% for pediatric palliative care (37) articles in 12 palliative care journals, and five-year reporting rate of 1.96% for articles on quality-of-life (QoL) (20). The reason why this study found a much smaller reporting rate could only be due to the relatively lesser emphasis given towards CRF in the palliative care journals. This study included journals as they are indexed in MEDLINE since it is the common database for evidence search and the last five years of analysis provided information trend on reporting rates.

The present study reports some interesting observations. Some are expected and others are some rather unexpected. Medical focus on CRF was predictably evident when medical palliative care journals ranked the highest reporting rate compared to multidisciplinary and nursing palliative care journals. The two unexpected observations include: lack of systematic reviews among articles on CRF treatment and very few randomized clinical trials (either qualitative or quantitative) and/or systematic reviews were found. The insufficient number of systematic reviews and randomized clinical trials virtually undermines the current EBPC since they are ranked the highest in hierarchy among the levels of evidence.

Healthcare professionals need to be aware of the relatively lesser reporting of CRF articles in palliative care journal literature and should shoulder responsibility to foster better number of reporting high quality research on CRF

for evidence-based palliative care (EBPC). In future, such reviews could be performed with quality appraisal and identify the quality of reporting CRF articles. Also, reviews from other related journals like cancer/ oncology journals and general medical journals may yield different results. Comparison of reporting characteristics between journals based on their specialty would direct clinicians to find research appropriate to answer their relevant clinical questions during EBPC.

In conclusion, the overall 5-year reporting of articles on cancer-related fatigue was very low, only 1.0% among the 12 palliative care journals reviewed in the present study. The randomized clinical trials and systematic reviews found are rather few. Our findings indicate a lack of adequate evidence-base for CRF recognition, assessment and treatment. Further high quality clinical trials are required to guide clinical decisions for palliative care clinical practice.

References

1. Patrick DL, Ferketich SL, Frame PS, Harris JJ, Hendricks CB, Levin B et al; National Institutes of Health State-of-the-Science Panel. National Institutes of Health State-of-the-Science Conference Statement: Symptom Management in Cancer: Pain, Depression, and Fatigue, July 15-17, 2002. *J Natl Cancer Inst* 2003;95:1110-7.
2. Hofman M, Ryan JL, Figueroa-Moseley CD, Jean-Pierre P, Morrow GR. Cancer-related fatigue: the scale of the problem. *Oncologist* 2007;12(Suppl 1):4-10.
3. Curt GA, Breitbart W, Cella D, Groopman JE, Horning SJ, Itri LM et al. Impact of cancer-related fatigue on the lives of patients: new findings from the Fatigue Coalition. *Oncologist* 2000;5:353-60.
4. Stasi R, Abriani L, Beccaglia P, Terzoli E, Amadori S. Cancer-related fatigue: evolving concepts in evaluation and treatment. *Cancer* 2003;98:1786-801.
5. Ryan JL, Carroll JK, Ryan EP, Mustian KM, Fiscella K, Morrow GR. Mechanisms of cancer-related fatigue. *Oncologist* 2007;12(Suppl 1):22-34.
6. Jean-Pierre P, Figueroa-Moseley CD, Kohli S, Fiscella K, Palesh OG, Morrow GR. Assessment of cancer-related fatigue: implications for clinical diagnosis and treatment. *Oncologist* 2007;12(Suppl 1):11-21.
7. Jacobsen PB. Assessment of fatigue in cancer patients. *J Natl Cancer Inst Monogr*. 2004;32:93-7.

8. Kangas M, Bovbjerg DH, Montgomery GH. Cancer-related fatigue: a systematic and meta-analytic review of non-pharmacological therapies for cancer patients. *Psychol Bull* 2008;134:700-41.
9. Carroll JK, Kohli S, Mustian KM, Roscoe JA, Morrow GR. Pharmacologic treatment of cancer-related fatigue. *Oncologist* 2007;12(suppl 1):S43-51.
10. Mitchell SA. Cancer-related fatigue: state of the science. *PMR* 2010;2:364-83.
11. Lunder U, Sauter S, Fürst CJ. Evidence-based palliative care: beliefs and evidence for changing practice. *Palliat Med* 2004;18:265-6.
12. Hermsen MA, ten Have HA. Moral problems in palliative care journals. *Palliat Med* 2001;15:425-31.
13. Hermsen MA, ten Have HA. Euthanasia in palliative care journals. *J Pain Symptom Manage* 2002;23:517-25.
14. Flannelly KJ, Weaver AJ, Smith WJ, Oppenheimer JE. A systematic review on chaplains and community-based clergy in three palliative care journals: 1990-1999. *Am J Hosp Palliat Care* 2003;20:263-8.
15. Hermsen MA, ten Have HA. Pastoral care, spirituality, and religion in palliative care journals. *Am J Hosp Palliat Care* 2004;21:353-6.
16. Flannelly KJ, Weaver AJ, Costa KG. A systematic review of religion and spirituality in three palliative care journals, 1990-1999. *J Palliat Care* 2004;20:50-6.
17. Puchalski CM, Kilpatrick SD, McCullough ME, Larson DB. A systematic review of spiritual and religious variables in Palliative Medicine, *American Journal of Hospice and Palliative Care*, *Hospice Journal*, *Journal of Palliative Care*, and *Journal of Pain and Symptom Management*. *Palliat Support Care* 2003;1:7-13.
18. Kumar SP. Reporting characteristics of cancer pain: a systematic review and quantitative analysis of research publications in palliative care journals. *Indian J Palliat Care* 2011;17:57-66.
19. Kumar SP. Reporting of pediatric palliative care: a systematic review and quantitative analysis of research publications in palliative care journals. *Indian J Palliat Care* 2011;17:202-9.
20. Kumar SP. Reporting of 'quality-of-life': a systematic review and quantitative analysis of research publications in palliative care journals. *Indian J Palliat Care* 2012;18:59-67.
21. Kirkova J, Rybicki L, Walsh D, Aktas A, Davis MP, Karafa MT. The Relationship Between Symptom Prevalence and Severity and Cancer Primary Site in 796 Patients With Advanced Cancer. *Am J Hosp Palliat Care*. 2010 Dec 8. [Epub ahead of print]
22. Seyidova-Khoshknabi D, Davis MP, Walsh D. Review article: a systematic review of cancer-related fatigue measurement questionnaires. *Am J Hosp Palliat Care*. 2011;28:119-29.
23. Kirkova J, Walsh D, Aktas A, Davis MP. Cancer symptom clusters: old concept but new data. *Am J Hosp Palliat Care* 2010;27:282-8.
24. Alshemmari S, Ezzat H, Samir Z, Sajnani K, Alsirafy S. Symptom burden in hospitalized patients with cancer in kuwait and the need for palliative care. *Am J Hosp Palliat Care* 2010;27:446-9.
25. Zimmermann C, Burman D, Follwell M, Wakimoto K, Seccareccia D, Bryson J, Le LW, Rodin G. Predictors of symptom severity and response in patients with metastatic cancer. *Am J Hosp Palliat Care* 2010;27:175-81.
26. Lasheen W, Walsh D, Mahmoud F, Davis MP, Rivera N, Khoshknabi DS. Methylphenidate side effects in advanced cancer: a retrospective analysis. *Am J Hosp Palliat Care* 2010;27:16-23.
27. Hauser K, Walsh D, Rybicki LA, Davis MP, Seyidova-Khoshknabi D. Fatigue in advanced cancer: a prospective study. *Am J Hosp Palliat Care* 2008;25:372-8.
28. Miyashita M, Morita T, Shima Y, Kimura R, Takahashi M, Adachi I. Physician and nurse attitudes toward artificial hydration for terminally ill cancer patients in Japan: results of 2 nationwide surveys. *Am J Hosp Palliat Care* 2007;24:383-9.
29. Sood A, Barton DL, Loprinzi CL. Use of methylphenidate in patients with cancer. *Am J Hosp Palliat Care* 2006;23:35-40.
30. Narayanan V, Koshy C. Fatigue in cancer: a review of literature. *Indian J Palliat Care* 2009;15:19-25.
31. Hawthorn M. Fatigue in patients with advanced cancer. *Int J Palliat Nurs* 2010;16:536-41.
32. Saarik J, Hartley J. Living with cancer-related fatigue: developing an effective management programme. *Int J Palliat Nurs* 2010;16:8-12.
33. Hardy JR, Carmont SA, O'Shea A, Vora R, Schluter P, Nikles CJ, Mitchell GK. Pilot study to determine the optimal dose of methylphenidate for an n-of-1 trial for fatigue in patients with cancer. *J Palliat*

- Med 2010;13:1193-7.
34. Okishiro N, Tanimukai H, Tsuneto S, Ito N. Can “steroid switching” improve steroid-induced psychosis in a patient with advanced cancer? *J Palliat Med* 2009;12:487-90.
 35. Centeno C, Portela Tejedor MA, Carvajal A, San Miguel MT, Urdiroz J, Ramos L, De Santiago A. What is the best term in Spanish to express the concept of cancer-related fatigue? *J Palliat Med* 2009;12:441-5.
 36. Blackhall L, Petroni G, Shu J, Baum L, Farace E. A pilot study evaluating the safety and efficacy of modafinil for cancer-related fatigue. *J Palliat Med* 2009;12:433-9.
 37. Mercadante S, Ferrera P, Villari P, David F, Giarratano A, Riina S. Effects of red blood cell transfusion on anemia-related symptoms in patients with cancer. *J Palliat Med* 2009;12:60-3.
 38. Reddy SK, Parsons HA, Elsayem A, Palmer JL, Bruera E. Characteristics and correlates of dyspnea in patients with advanced cancer. *J Palliat Med* 2009;12:29-36.
 39. Khoshknabi DS, Davis MP, Ranganathan VK, Siemionow V, Walsh D, Kirkova J, Yue GH. Combining objective and subjective outcomes in cancer-related fatigue: illustrations from a single case report. *J Palliat Med* 2008;11:829-33.
 40. Dhillon N, Kopetz S, Pei BL, Fabbro ED, Zhang T, Bruera E. Clinical findings of a palliative care consultation team at a comprehensive cancer center. *J Palliat Med* 2008;11:191-7.
 41. Reddy S, Bruera E, Pace E, Zhang K, Reyes-Gibby CC. Clinically important improvement in the intensity of fatigue in patients with advanced cancer. *J Palliat Med* 2007;10:1068-75.
 42. Podnos YD, Borneman TR, Koczywas M, Uman G, Ferrell BR. Symptom concerns and resource utilization in patients with lung cancer. *J Palliat Med* 2007;10:899-903.
 43. Scialla SJ, Cole RP, Bednarz L. Redefining cancer-related asthenia-fatigue syndrome. *J Palliat Med* 2006;9:866-72.
 44. Montoya M, Fossella F, Palmer JL, Kaur G, Pace EA, Yadav R, Simmonds M, Gillis T, Bruera E. Objective evaluation of physical function in patients with advanced lung cancer: a preliminary report. *J Palliat Med* 2006;9:309-16.
 45. Paddison JS, Temel JS, Fricchione GL, Pirl WF. Using the differential from complete blood counts as a biomarker of fatigue in advanced non-small-cell lung cancer: an exploratory analysis. *Palliat Support Care* 2009;7:213-7.
 46. Schofield P, Ugalde A, Carey M, Mileskin L, Duffy M, Ball D, Aranda S. Lung cancer: challenges and solutions for supportive care intervention research. *Palliat Support Care* 2008;6:281-7.
 47. Savard J, Simard S, Giguère I, Ivers H, Morin CM, Maunsell E, Gagnon P, Robert J, Marceau D. Randomized clinical trial on cognitive therapy for depression in women with metastatic breast cancer: psychological and immunological effects. *Palliat Support Care* 2006;4:219-37.
 48. Midtgaard J, Tveterås A, Rørth M, Stelter R, Adamsen L. The impact of supervised exercise intervention on short-term postprogram leisure time physical activity level in cancer patients undergoing chemotherapy: 1- and 3-month follow-up on the body & cancer project. *Palliat Support Care* 2006;4:25-35.
 49. Bausewein C, Booth S, Gysels M, Kühnbach R, Haberland B, Higginson IJ. Individual breathlessness trajectories do not match summary trajectories in advanced cancer and chronic obstructive pulmonary disease: results from a longitudinal study. *Palliat Med* 2010;24:777-86.
 50. Hauser K, Rybicki L, Walsh D. What’s in a Name? Word descriptors of cancer-related fatigue. *Palliat Med* 2010;24:724-30.
 51. Minton O, Stone PC. Review: the use of proteomics as a research methodology for studying cancer-related fatigue: a review. *Palliat Med* 2010;24:310-6.
 52. Orrevall Y, Tishelman C, Permert J, Cederholm T. The use of artificial nutrition among cancer patients enrolled in palliative home care services. *Palliat Med* 2009;23:556-64.
 53. Johnsen AT, Petersen MA, Pedersen L, Groenvold M. Symptoms and problems in a nationally representative sample of advanced cancer patients. *Palliat Med* 2009;23:491-501.
 54. Spathis A, Dhillan R, Booden D, Forbes K, Vrotsou K, Fife K. Modafinil for the treatment of fatigue in lung cancer: a pilot study. *Palliat Med* 2009;23:325-31.
 55. Hagelin CL, Wengström Y, Ahsberg E, Fürst CJ. Fatigue dimensions in patients with advanced cancer in relation to time of survival and quality of life. *Palliat Med* 2009;23:171-8.

56. Echteld MA, van Zuylen L, Bannink M, Witkamp E, Van der Rijt CC. Changes in and correlates of individual quality of life in advanced cancer patients admitted to an academic unit for palliative care. *Palliat Med* 2007;21:199-205.
57. Tsai JS, Wu CH, Chiu TY, Hu WY, Chen CY. Symptom patterns of advanced cancer patients in a palliative care unit. *Palliat Med* 2006;20:617-22.
58. Murphy H, Alexander S, Stone P. Investigation of diagnostic criteria for cancer-related fatigue syndrome in patients with advanced cancer: a feasibility study. *Palliat Med* 2006;20:413-8.