



Conference on ‘Nutrition and age-related muscle loss, sarcopenia and cachexia’ Symposium 4: Sarcopenia and cachexia and social, clinical and public health dimensions

The nursing contribution to nutritional care in cancer cachexia

Jane B. Hopkinson

School of Healthcare Sciences, College of Biomedical and Life Sciences, Cardiff University, Cardiff, Wales, UK

Cancer cachexia is a complex syndrome. Its defining feature is involuntary weight loss, which arises, in part, because of muscle atrophy and is accompanied by functional decline. International expert consensus recommends that nutritional support and counselling is a component of multimodal therapy for cancer cachexia, as poor nutritional intake can contribute to progression of the syndrome. The present paper focuses on what is presently known about the nursing contribution to nutritional care in cancer cachexia. There is potential for nurses to play an important role. However, obstacles to this include lack of a robust evidence base to support their nutritional care practices and unmet need for education about nutrition in cancer. The nursing role’s boundaries and the outcomes of nurse-delivered nutritional care in cancer cachexia are both uncertain and should be investigated.

Cancer cachexia: Supportive care: Nutritional care: Nurse: Education

Cancer cachexia is a complex syndrome that causes weight loss, physical decline and other troubling symptoms that contribute to increasing dependency and associated economic and human cost. Although the syndrome is caused by disease, poor nutritional intake can contribute to its progression⁽¹⁾.

The present paper provides an overview of nutritional support and counselling in cancer cachexia. Particular attention is paid to the nursing role in the provision of this nutritional care.

What is cancer cachexia

In 2011, an expert consensus defined cancer cachexia:

Cancer cachexia is defined as a multifactorial syndrome characterised by an on-going loss of skeletal muscle mass (with or without loss of fat mass) that cannot be fully reversed by conventional nutritional support and leads to progressive functional impairment. The pathophysiology is characterised by a negative energy and protein balance driven by a variable combination of reduced food intake and abnormal metabolism⁽²⁾.

The expert consensus group also proposed three stages of cancer cachexia: pre-cachexia, cachexia and refractory cachexia. This proposition of a staged continuum where progression of the syndrome begins prior to any clinical symptoms suggests a need to consider cancer cachexia from the point of diagnosis. Nutritional care is now theorised to be an essential component of multimodal therapy for cancer cachexia, at all stages of the syndrome⁽¹⁾.

The management of cachexia

Although the importance of nutritional support and counselling for all patients with or at risk of cachexia is now agreed by the experts^(1,2), the definition and details of nutritional care across the trajectory of cancer cachexia have yet to be agreed and tested for impact on clinical and patient experience outcomes.

In pre-cachexia and cachexia, it is known that the effective cancer treatment can prevent or reverse the syndrome, providing nutritional intake is sufficient for physical recovery. Some cancer patient sub-groups are



more likely to benefit from nutritional care than others. For example, patients with colorectal cancer (who are likely to have a malnutrition component to physical decline) have been shown to have better short and long-term outcomes when they receive nutritional counselling from a dietitian through their treatments⁽³⁾.

However, it is also known that when cancer treatments are ineffective and the cancer is incurable, nutritional and pharmacological interventions are of limited, if any, benefit⁽²⁾ in bringing about weight gain or improving survival. Interestingly, there has been little investigation of other clinical and patient experience outcomes in this group. There is potential for nutritional care to improve clinical outcomes such as fatigue and patient experience such as distress. Furthermore, weight loss is associated with poor quality of life⁽⁴⁾. Any intervention for involuntary weight loss or its negative emotional impact might have a beneficial effect on quality of life. Expert consensus now recognises that outcomes in addition to survival are important goals in the management of cachexia⁽¹⁾. This is prompting a growing interest in the effects of nutritional interventions and the obstacles to optimisation of nutritional intake in cancer cachexia.

Nutritional care as a component of multimodal management of cancer cachexia

In cancer cachexia, nutritional intervention may act synergistically with other interventions, such as physical activity and exercise. Physical activity, exercise and nutrition are important for the maintenance of muscle mass in healthy people. In cohort studies of cancer patients undergoing treatment, physical activity or exercise has been found to improve physical performance, fatigue and functional quality of life⁽⁵⁻⁷⁾. However, patients with cancer cachexia may be underrepresented in the samples studied. The effect of physical activity in combination with nutritional support in cachexia has yet to be established and may differ by stage of the syndrome. Investigations, such as the MENAC trial⁽⁸⁾, are in progress to establish an empirical evidence base for multimodal therapies. Multimodal therapy that combines symptom management, pharmacology, nutrition, physical activity and psychosocial support is presently considered best practice in the management of cachexia^(2,9). It may yet be proven that nutritional care can improve outcomes and patient experience in cachexia when offered in combination with other interventions (see Fig. 1). In the future, there might be cachexia clinics providing best supportive care, where treatment, including nutritional care, is personalised according to medical condition, symptoms, physical function, patient/family goals and potential benefit v. risk of pharmacological intervention⁽¹⁰⁾.

What we know about the nursing contribution to nutritional care in cancer cachexia

Providing information (including simple nutritional advice), symptom management, psychological support

and the facilitation of health promoting behaviour change are all activities that fall within the scope of nursing practice. All cancer patients meet nurses. So, nurses are well placed to make a contribution to the supportive care of people with cancer cachexia.

An example of a nurse-delivered intervention for people with advanced cancer that includes the provision of advice on oral dietary intake is the Macmillan Approach to Weight and Eating. A Phase II exploratory cluster trial of Macmillan Approach to Weight and Eating was conducted in 2006–2007 to investigate its feasibility and acceptability, and to identify changes in weight- and eating-related distress⁽¹¹⁾. The study found the intervention to be deliverable by palliative care clinical nurse specialists with both nurses and patients considering it acceptable and beneficial.

Given the known relationship between quality of life and weight loss, the Macmillan Approach to Weight and Eating study included the outcome measure, EORTC QLQ-C15-PAL⁽¹²⁾ to explore the impact of the intervention on quality of life (study report is available from the author). The findings of improved nutritional intake and improvement in appetite and emotional status (which are aspects of quality of life) are consistent with a systematic review of the effectiveness of dietary advice in disease-related malnutrition⁽¹³⁾. This review found oral nutritional interventions (dietary advice with or without nutritional supplements) to have no effect on survival either across disease groups or in the subgroup of studies of cancer patients⁽¹⁴⁾, corroborating similar earlier reviews. However, for cancer patients, beneficial effect was found in some aspects of quality of life; emotional functioning, dyspnoea, loss of appetite and global quality of life. This suggests that whilst nutritional intervention may be offered to address any malnutrition component to involuntary weight loss, the beneficial effect is most likely to be seen in factors that contribute to quality of life, such as emotional function. In the majority of the studies included in the review, dietitians delivered the intervention. In two studies, nurses alone⁽¹⁵⁾ or nurse working in partnership with a dietitian⁽¹⁶⁾ delivered the intervention. There has thus been relatively little investigation of the effectiveness of nurses delivering nutritional interventions in cancer care. Nutrition is a small component of a nurse's education⁽¹⁷⁾ and may not provide adequate preparation to offer nutritional care in cancer.

However, literature from across the Western World demonstrates that nutritional care is within the scope of nursing practice. In the USA, nutrition is one of the thirteen domains of nursing as defined by the North American Nursing Diagnosis Association⁽¹⁸⁾ and DiMaria-Ghalili *et al.*⁽¹⁹⁾ conclude from a review of nutrition education for the US nurses that nutrition knowledge should be updated throughout a nurse's professional career. Similarly, in the UK, nutrition is seen as central to providing safe and effective care by the regulatory body for nursing, the Nursing and Midwifery Council. Standards of nutrition and fluid management form one of the five essential skill clusters required for the achievement of standards of competence in nursing⁽²⁰⁾.

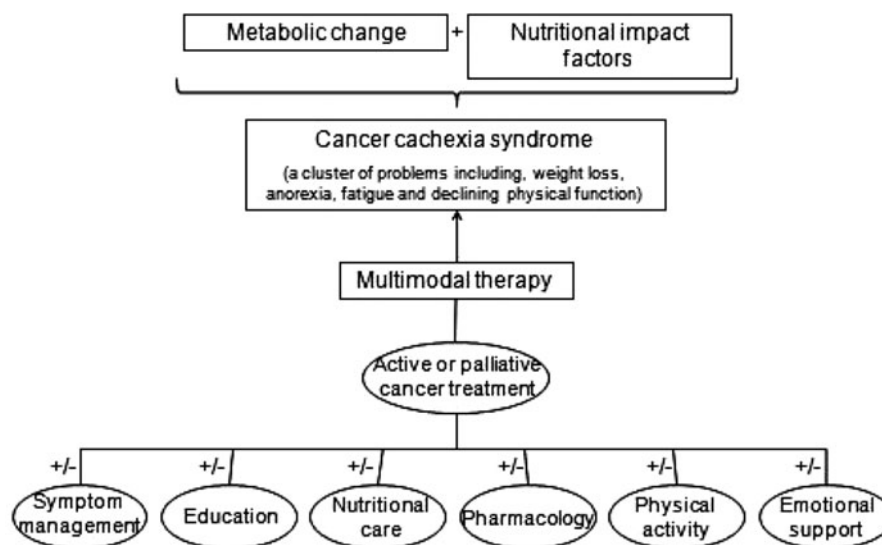


Fig. 1. Multimodal therapy in cancer cachexia.

The observation that nutritional care is a recognised part of the nursing role but has not been tested for effectiveness in the context of cancer care, led to the examination of literature.

Review: evidence of the effect of nurse nutritional care

A scoping review was conducted to evaluate nurse delivered dietary/nutritional advice. The search was of Medline, CINAHL, PsycINFO, from January 2010 to December 2014 and the Cochrane library. Search terms were nurse, nutritional advice, dietary counselling, education and training (and other equivalent terms). English language publications presenting analysis of primary data using any methodological approach were included.

The review found that nurses recognise the importance of nutritional care in preventing and managing disease^(21,22) and acknowledge that nutritional care is an important part of their role^(23–25). However, studies have consistently found obstacles to the delivery of nutritional care by nurses, which include: (i) lack of knowledge, (ii) lack of clarity regarding the nursing role in nutritional care and (iii) lack of confidence in the effectiveness of nutritional care interventions.

Lack of knowledge

Poor knowledge of nutritional care needs has been found in staff caring for nursing home residents in Australia⁽²⁶⁾ and Wales⁽²⁷⁾. It has also been found amongst the hospital nurses in Turkey⁽²²⁾ and Australia⁽²⁸⁾.

Australian practice nurses believe that they have a low level of nutrition knowledge⁽²¹⁾. In contrast, care home staff in Wales drew on their personal knowledge of nutrition striving to provide personalised care in partnership with families and were found to assume that they had knowledge of what constitutes a healthy diet for older people. However, their practice did not reflect a sound

understanding of the nutritional requirements of older people or people with special dietary needs, such as those with diabetes⁽²⁷⁾.

No study was found that investigated nurse knowledge of nutrition in cancer. However, lack of knowledge may explain, in part, an identified barrier to nutritional care in advanced cancer; the weight loss taboo⁽²⁹⁾. This barrier is reluctance of patients, family carers and healthcare professionals to talk about weight loss arising from a belief that nothing can be done to help, and/or concern that discussion may provoke anxiety and distress. Education to improve knowledge of nutritional care in cancer could be an important strategy for enhancing nutritional support and counselling in cancer cachexia.

Lack of clarity of the nutritional care role

The scoping review suggests that lack of clarity in the nutritional care role may also be an obstacle to nutritional care in cancer cachexia, as this has been found in other clinical conditions. Australian practice nurses have been shown to lack clarity in their nutritional care role⁽²⁸⁾ and to have differing opinions and understandings of basic nutritional advice⁽²¹⁾ and optimal nutritional care process⁽²⁵⁾. Similarly, a systematic review of nutritional care in stroke patients concluded that there is much variability in how such care is understood and what nurses do. No evidence of nursing nutritional care intervention effects (beneficial or otherwise) was found⁽³⁰⁾. To evaluate such effects in cancer care, the nursing role's boundaries would need to be established to differentiate it from other roles within the multidisciplinary team.

Lack of confidence in nutritional care delivery

A general lack of confidence in nutritional care delivery has also been found amongst nurses, so is likely to be another obstacle to nutritional care in cancer cachexia. Nurses have been shown to place low priority on nutritional care⁽²³⁾, to consider their nutritional education



inadequate⁽³¹⁾, to not follow guidelines for screening and intervention for those malnourished or at nutritional risk^(23,32–34), and to feel powerless to make improvements⁽²⁸⁾ because of other responsibilities and workload demands with more immediate and obvious consequences⁽³⁵⁾.

Martin *et al.*⁽²⁵⁾ conducted an on-line survey of Australian practice nurses, which helps explain the low priority given to nutritional care. Of the 181 nurses, more than half were uncertain of the effectiveness of the nutritional care they delivered, with uncertainty not only about adequacy of training, but also patient motivation to follow advice. It seems these nurses lacked confidence in both the utility of nutritional care and their nutrition education. Establishing an evidence base could be an important strategy for justifying and improving nutritional care in cancer, including cancer cachexia. In addition to establishing an evidence base, strategies, to include education, are needed for improving nurse confidence in the delivery of nutritional care.

Addressing unmet educational needs

There is evidence that education can improve nurse nutritional care. In Sweden, Fossum *et al.*⁽³⁶⁾ conducted a trial of training nursing home staff in the use of a computerised decision support system in the management of nutritional risk. Training was provided in screening, assessment and intervention. The proportion of malnourished nursing home residents was reduced significantly by 9% over a 2-year period (Malnutrition time point one 28.9%, time point two 19.8%; $P = 0.05$).

In Ireland, Kennelly *et al.*^(37,38) also found a positive effect on nutritional care practices in a study where fifty-three community nurses and twenty private nursing home staff nurses were trained to screen patients using the Malnutrition Universal Screening Tool and to manage malnutrition. Six months after the educational programme, changes to practice included weighing patients more frequently, providing simple dietary advice to people at malnutrition risk, and clinical justification for the use of oral nutritional supplements^(37,38).

In Denmark, Pedersen *et al.*⁽²⁴⁾ investigated outcomes of nurse nutrition education not only on nursing practice, but also on patient experience and knowledge. The study found there to be a similar number of patients with eating difficulties on medical and surgical wards pre- and post-educational interventions ($n = 42$ v. $n = 45$). Following the study intervention, a higher proportion of patients reported being offered snacks between meals (pre-intervention 45.5% v. post-intervention 63.8%; $P = 0.00$). Patients also had improved knowledge of their nutritional requirements; for example, a smaller proportion reported vegetables important for increasing energy intake (pre-intervention 59.6% v. post-intervention 22.2%; $P = 0.00$).

These three studies of educational interventions suggest that nurses can be trained to give nutritional information and advice, resulting in improvements to patient nutritional status and behaviour.

Overall, this rapid scoping review demonstrates nurse-delivered oral nutritional interventions have only rarely

been subjected to rigorous testing. This is perhaps surprising given that all cancer patients meet nurses, while dietitians, being in limited supply, tend to dedicate their time to those with the most complex nutritional needs. Little is known about the effectiveness of nurse-delivered nutritional advice either within or beyond the context of cancer care. Evidence of benefit is needed to support the delivery of nurse nutritional care. Nurses need to know how their nutritional care can make a difference to patient outcomes and why their contribution is valuable, if they are to have confidence in their nutritional care role.

Recommendations

Whilst nurses have an important contribution to make to improve the nutritional care of patients with cancer cachexia, we know very little about the nature and effectiveness of the nutritional care they give. Similarly, we know little about their educational needs in this area. For these reasons, it is recommended that we need to: (i) identify the boundaries of the nurse's role; (ii) understand how this role can be effective; (iii) develop strategies to overcome associated obstacles; and (iv) identify and meet the relevant education and training needs.

Conclusion

Nutritional care is important in the management of cancer cachexia. However, there are obstacles to meeting the nutritional care needs of people with or at risk of the syndrome. There is potential for nurses to play an important role in nutritional care in cancer cachexia but obstacles to achieving this. The obstacles include lack of a robust evidence base to support their nutritional care practices and unmet need for education about nutrition in cancer. The role of the nurse and outcomes of nurse-delivered nutritional care in cancer cachexia are uncertain and should be investigated.

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Conflict of Interest

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References

1. Aapro M, Arends J, Bozzetti F *et al.* (2014) Early recognition of malnutrition and cachexia in the cancer patient: a



- position paper of a European School of Oncology Task Force. *Ann Oncol* **25**, 1492–1499.
2. Fearon K, Strasser F, Anker S *et al.* (2011) Definition and classification of cancer cachexia: an international consensus. *Lancet Oncol* **12**, 489–495.
 3. Ravasco P, Monteiro-Grillo P & Camila M (2012) Individualized nutrition intervention is of major benefit to colorectal cancer patients: long-term follow-up of a randomized controlled trial of nutritional therapy. *Am J Clin Nutr* **96**, 1346–1353.
 4. Wheelwright S, Darlington A, Hopkinson J *et al.* (2013) A systematic review of health-related quality of life instruments in patients with cancer cachexia. *Support Care Cancer* **21**, 2625–2636.
 5. Speck R, Courneya K, Måsse L *et al.* (2010) An update of controlled physical activity trials in cancer survivors: a systematic review and meta-analysis. *J Cancer Survivorship* **4**, 87–100.
 6. Stene G, Helbostad J, Balstad T *et al.* (2013) Effect of physical exercise on muscle mass and strength in cancer patients during treatment—a systematic review. *Crit Rev Oncol Hematol* **88**, 573–593.
 7. Cramp F & Byron-Daniel J (2012) Exercise for the management of cancer-related fatigue in adults. Cochrane Database of Systematic Reviews: Cochrane Collaboration, Contract No.: CD006145.
 8. Kassa S & Fearon K (2014) MENAC: The Multimodal Exercise/Nutrition/Anti-inflammatory treatment for Cachexia trial. <http://www.ntnu.edu/prc/menac-study-presentation>: European Palliative Care Research Centre (accessed January 2015).
 9. Radbruch L, Elsner F, Trottenberg P *et al.* (2010) *Clinical Practice Guidelines on Cancer Cachexia in Advanced Cancer Patients*. Aachen: Department of Palliative Medicine.
 10. Dev R, Del Fabbro E & Bruera E (2014) Outcomes of novel trials in cachexia. *Clin Invest* **4**, 247–257.
 11. Hopkinson J, Fenlon D, Wright D *et al.* (2010) The deliverability, acceptability and perceived effect of the Macmillan Approach to Weight loss and Eating difficulties (MAWE): Phase II cluster randomised exploratory trial of a psychosocial intervention for weight- and eating-related distress in people with advanced cancer. *J Pain Symptom Manage* **40**, 684–695.
 12. Groenvold M, Petersen M, Aaronson N *et al.* (2006) The development of the EORTC QLQ-C15-PAL: a shortened questionnaire for cancer patients in palliative care. EORTC Quality of Life Group. *Eur J Cancer* **42**, 55–64.
 13. Baldwin C & Weeks C (2011) Dietary advice with or without oral nutritional supplements for disease-related malnutrition in adults. <http://dx.doi.org/10.1002/14651858.CD002008.pub4>: Wiley Online Library; (accessed May 2015).
 14. Baldwin C, Spiro A, Ahern R *et al.* (2012) Oral nutritional interventions in malnourished patients with cancer: a systematic review and meta-analysis. *J Natl Cancer Inst* **104**, 371–385.
 15. Dixon J (1984) Effect of nursing interventions on nutritional and performance status in cancer patients. *Nurs Res* **33**, 330–335.
 16. McCarthy D & Weihofen D (1999) The effect of nutritional supplements on food intake in patients undergoing radiotherapy. *Oncol Nurs Forum* **26**, 897–900.
 17. Henning M (2009) Nursing's role in nutrition. *Comput Inf Nurs* **27**, 301–306.
 18. Herdman T (2012) *NANDA International Nursing Diagnoses: Definitions and Classification, 2012–2014*. Oxford, UK: Wiley Blackwell.
 19. DiMaria-Ghalili R, Mirtallo J, Tobin B *et al.* (2014) Challenges and opportunities for nutrition education and training in the health care professions: intraprofessional and interprofessional call to action. *Am J Clin Nutr* **99**, Suppl., 1184S–1193S.
 20. Nursing and Midwifery Council (2010) *Standards for Competence for Registered Nurses*. London: NMC.
 21. Cass S, Ball L & Leveritt M (2014) Australian practice nurses' perceptions of their role and competency to provide nutrition care to patients living with chronic disease. *Aust J Prim Health* **20**, 203–208.
 22. Yalcin N, Cihan A, Gundogdu H *et al.* (2013) Nutrition knowledge level of nurses. *Health Sci J* **7**, 100–108.
 23. Green S, James E, Latter S *et al.* (2014) Barriers and facilitators to screening for malnutrition by community nurses: a qualitative study. *J Hum Nutr Diet* **27**, 88–95.
 24. Pedersen P, Tewes M & Bjerrum M (2012) Implementing nutritional guidelines – the effect of systematic training for nurse nutrition practitioners. *Scand J Caring Sci* **26**, 178–185.
 25. Martin L, Leveritt M, Desbrowa B *et al.* (2014) The self-perceived knowledge, skills and attitudes of Australian practice nurses in providing nutrition care to patients with chronic disease. *Fam Pract* **31**, 201–208.
 26. Beattie E, O'Reilly M, Strange E *et al.* (2014) How much do residential aged care staff members know about the nutritional needs of residents? *Int J Older People Nurs* **9**, 54–64.
 27. Merrell JPS, Warring J, Hobby D *et al.* (2012) Addressing the nutritional needs of older people in residential care homes. *Health Soc Care Commun* **20**, 208–215.
 28. Ross L, Mudge A, Young A *et al.* (2011) Everyone's problem but nobody's job: staff perceptions and explanations for poor nutritional intake in older medical patients. *Nutr Diet* **68**, 41–46.
 29. Hopkinson JB, Wright DNM & Corner JL (2006) The experience of weight loss in people with advanced cancer. *J Adv Nurs* **54**, 304–312.
 30. Perry L, Hamilton S, Williams J *et al.* (2013) Nursing interventions for improving nutritional status and outcomes of stroke patients: descriptive reviews of processes and outcomes. *Worldviews Evid Based Nurs* **10**, 17–40.
 31. Johansson U, Rasmussen H, Mowe M *et al.* (2009) Clinical nutrition in medical gastroenterology: room for improvement. *Clin Nutr* **28**, 129–133.
 32. Green S & James E (2013) Barriers and facilitators to undertaking nutritional screening of patients: a systematic review. *J Hum Nutr Diet* **26**, 211–221.
 33. Schonherr S, Halfens R, Meijer J *et al.* (2012) Structural and process indicators of nutritional care: a comparison between Austrian hospitals and nursing homes. *Nutrition* **28**, 868–873.
 34. Pullar J, Chisholm A & Jackson C (2012) Dietary information for colorectal cancer survivors: an unmet need. *N Z Med J* **125**, 27–37.
 35. Bjerrum M, Tewes M, Pedersen P *et al.* (2012) Nurses' self-reported knowledge about and attitude to nutrition – before and after a training programme. *Scand J Caring Sci* **1**, 81–89.
 36. Fossum M, Alexander G, Ehnfora M *et al.* (2011) Effects of a computerized decision support system on pressure ulcers and malnutrition in nursing homes for the elderly. *Int J Med Inform.* **80**, 607–617.



37. Kennelly S, Kennedy N, Rughoobur G *et al.* (2010) An evaluation of a community dietetics intervention on the management of malnutrition for healthcare professionals. *J Hum Nutr Diet* **23**, 567–574.
38. Kennelly S, Kennedy N, Corish C *et al.* (2011) Sustained benefits of a community dietetics intervention designed to improve oral nutritional supplement prescribing practices. *J Hum Nutr Diet* **24**, 496–504.