

Psychosocial impact of cancer cachexia

Jane B. Hopkinson

Received: 3 March 2014 / Accepted: 26 March 2014 / Published online: 16 April 2014
© Springer-Verlag Berlin Heidelberg 2014

Abstract

Background Cancer cachexia has impact on patients and their family members. Patients experience loss of weight often accompanied by anorexia and other debilitating symptoms that have clinical impact and impact everyday life. The importance of understanding this impact lies in (1) the alleviation of cachexia-related suffering and (2) its implications for treating cachexia.

Review Two decades of exploratory investigation of the manifestations, meaning and management of cancer cachexia reveal emotional and social impacts for both patients and their carers. Patients can describe change in appearance and loss of physical strength often accompanied by change in eating habits (amount, type and pattern of food intake). The psychosocial effects can include loss of independence, sense of failure, sense of helplessness, conflict with family members over food, social isolation and thoughts of death. They are effects that can distress. Conversely, weight loss, especially early in its course and for those who are obese, can be perceived as beneficial, which inhibits self-management of diet and physical activity.

Conclusion Models of the psychosocial effects of cancer cachexia have been developed, leading to, as yet unproven, propositions of how negative patient and family impacts can be addressed. This literature overlooks the potential importance of psychosocial intervention to emerging multimodal treatments for the multicausal syndrome. Psychosocial intervention in cachexia should be tested for potential to help people affected by cancer cachexia feel better but also for potential to make people better by aiding uptake and compliance with multimodal therapy.

Keywords Cachexia · Cancer · Psychosocial effect · Supportive care · Patient · Family

1 Introduction

This paper provides an overview of the impact of cancer cachexia. Patients with cancer cachexia experience loss of weight often accompanied by anorexia and other debilitating symptoms that impact everyday life.

Two decades of exploratory investigation of the manifestations, meaning and management of cancer cachexia reveal emotional and social impacts for both patients and their family members. This literature provides explanations of why problems are experienced and, as yet unproven, propositions of what can be done about problematic psychosocial effects of cachexia [1, 2]. The literature overlooks the potential importance of psychosocial impact and intervention to treatment.

Since cachexia is multicausal, optimal management of the syndrome is now thought likely to require multimodal treatment. These multimodal treatments can be offered solely for the purpose of reducing cachexia's clinical impact. However, there may be importance in understanding psychosocial effects because of their implications for

1. Alleviating cancer cachexia-related suffering
2. Improving the multimodal treatment of cancer cachexia

This review discusses patient and family impacts, the understanding of what might be done to limit negative impacts and possible implications for research and clinical practice. Whilst the implications for the alleviation of cachexia-related suffering have previously been discussed in the literature, the implications for multimodal treatment have not.

J. B. Hopkinson (✉)
Cardiff School of Healthcare Sciences, Cardiff University, Cardiff,
Wales, UK
e-mail: HopkinsonJB@cardiff.ac.uk

2 Clinical impact

The clinical impact of cancer cachexia has been the focus of most discussion and research. A brief overview will be given here before considering the patient and family impacts of the syndrome.

In the case of cancer, the cachectic process is tumour induced. It manifests itself as involuntary weight loss often accompanied by anorexia and fatigue, all of which have negative clinical impacts, including the deterioration of physical function, quality of life, nutritional status and treatment outcomes.

Understanding the nature and management of the clinical impact of cancer cachexia has been hampered by a lack of agreed definition of the syndrome. There has been progress on this front. For example, Fearon et al. [3] provided a consensus definition of cachexia:

Cachexia is a complex metabolic syndrome associated with underlying illness and characterized by loss of muscle with or without loss of fat mass. The prominent clinical feature of cachexia is weight loss in adults (corrected for fluid retention) or growth failure in children (excluding endocrine disorders). Anorexia, inflammation, insulin resistance and increased muscle protein breakdown are frequently associated with wasting disease. Wasting disease is distinct from starvation, age-related loss of muscle mass, primary depression, malabsorption and hyperthyroidism and is associated with increased morbidity.

It is important to note that cancer cachexia can be present across the entire course of the disease. The group of experts who developed the definition proposed staging of the syndrome: precachexia (where there are clinical metabolic changes, but less than 5 % loss of weight), cachexia (more than 5 % weight loss, but sub-groups responsive to different treatment options) and refractory cachexia (irreversible catabolic cancer). It is argued that treatment trials of the future should be cachexia stage specific. This claim is based on the proposition that early stage cachexia is more likely to be responsive to treatment resulting in meaningful clinical impacts including improved tolerance to cancer treatments.

Cachexia is often accompanied by malnutrition, which exacerbates the syndrome and contributes to its progression. In addition to the cachectic process, nutritional impact symptoms such as pain and nausea contribute to the progression of the syndrome by compromising nutritional intake, thereby adding a malnutrition component. There is a growing consensus that optimising nutritional intake is an important consideration to treat this malnutrition [4].

Future multimodal treatments of cancer cachexia are likely to combine pharmacological treatment of the syndrome with

the assessment and management of nutritional impact symptoms and appropriate nutritional support. Trials, such as the MENAC trial [5], are in progress testing this approach.

However, until effective multimodal treatments have been established in everyday clinical practice, there remains another consideration: the detection and management of cachexia-related psychosocial distress [1, 6], also described as cachexia-related suffering. This distress is caused by the impact of cachexia on both patients and their families.

3 Impact on patient experience

The defining characteristic of cancer cachexia is involuntary weight loss. Other symptoms are many and experienced by some, but not all, of the cachectic population. Common symptoms are anorexia, fatigue, functional loss, early satiety and food aversions. Patients can describe change in appearance and loss of physical strength often accompanied by change in eating habits (amount, type and pattern of food intake) [7, 8].

There is a long-recognised relationship between food, eating and patient experience:

Eating is a social activity, and food has social and psychological significance for individuals. These non-biological uses of food can contribute to nutritional disease or nutritional complications of other diseases. Conversely, nutritional therapies may disrupt established eating patterns, creating negative psychological and social consequences that can result in noncompliance or even rejection of therapy. [9]

There is an extensive literature evidencing the symbolic meanings of food, eating and weight amongst the healthy population. These meanings include sense of identity, personal control, status, independence, health and well-being, dependency, relationship enhancing, relationship constraining, life enhancing and life threatening [10, 11]. The meanings of food, eating and weight that emerge in the talk of people who are well are also evident in the lives of those with cancer cachexia. An examination of the literature about the experience of cancer cachexia evidences these meanings. They are considered below as positive and negative personal impacts.

3.1 Positive personal and social impacts

Muscle wasting in cancer cachexia can occur with normal or heavy body weight [12]. Some people have been found to express satisfaction with physical changes accompanying the syndrome. Rhondali et al. [13] found 23 % (11/48) of weight-losing outpatients with advanced cancer to report improved body image. Overweight people with cachexia have been found to assume weight loss has health benefits [8] that are

identical to the benefits of being of a normal weight when in good health. These observations evidence that weight and physical appearance are important to how we see ourselves and how we think others view us. The positive impact of cancer cachexia is perhaps less obvious, even hidden, compared to the negative emotional and social impacts.

3.2 Negative personal and social impacts

McClement [14] uses the phrase ‘dealing with a body in shambles’ in an attempt to capture the experience of disease-induced weight loss. She draws on emotive statements made by participants in an interview study to communicate the negative impact of cancer-related weight loss.

This bony thing shows up in the mirror every morning, and my eyes fall on this creature on the other side of the mirror.

I was five feet from him before he could figure out who it was. I cried, because he was a very, very good friend of mine. It seemed to confirm the fact that I was so skinny.

These quotes illustrate some of the themes identified in other exploratory studies of patient experience of involuntary weight loss or cancer cachexia. The physical change in appearance changes sense of self, which can lead to puzzlement and confusion [15], and even challenges identity [11]. The body is experienced differently leading to body image concerns [16] including negative body image [14], with younger people found to have the greatest dissatisfaction with body image [17].

Change in physical appearance is accompanied by change in social encounters and relationships. The negative perceptions of body image can be reinforced by the response of others to the change. A sense of being different can prompt feelings of helplessness, loss of control, abandonment [8] and stigmatisation [14]. Such experience can precipitate anxiety [18] and distress [19, 20].

People with disease-related weight loss have functional loss [21] accompanied by loss of independence [20], which can cause distress at being a burden to others [19].

I don't like being weak... frustrated, awfy [awfully] frustrated about it... Sometimes I can't even open these bottles. I haven't the strength to open it... I've forgotten all about this independence. I used to be awful independent. I would dae [do] a' [all] things myself. Nae [Not] now. No. No. Completely changed. I'm not scared to ask things now... I depend on others for lots of things now that I never did afore [before]. Cause I used to be

very very independent. Wouldn't let them do anything for me. But I'm glad of it now. [22]

Furthermore, uncontrolled weight loss provokes thoughts of imminent death [8].

You don't necessarily have to get on the scales, you see the bones begin to protrude and feel the end is nigh. [8]

Autonomy, control and independence are socially valued and admired. A dominant discourse in Western society is of taking control of one's body to sustain health and independence and prolong life. Physical appearance symbolises worthiness, control and self-discipline [10]. Visible wasting symbolises not only physical failing but also emotional and social failing.

Some authors are beginning to identify tumour, social context or disease site-specific causes of distress. For example, Chasen and Bhargava [23] have found head and neck cancer patients can experience social isolation as a consequence of drooling and other problems associated with their disease and treatment. A study by Lövgren et al. [17] found that those living with a partner found appetite loss more problematic than those living alone. Bell et al. [24] argue for culturally sensitive dietary information on the basis of holding a focus group with a Canadian Chinese cancer support group. The group members were experiencing conflict between the biomedical perspective on food and nutrition and traditional Chinese beliefs about food, health and illness.

3.3 Consequences of personal and social impacts

The personal and social impacts of cancer cachexia whether positive or negative have implications for the management of the syndrome. If involuntary weight loss is welcomed amongst the obese, it may inhibit their self-management of diet and physical activity, currently thought important for maintenance of muscle mass and mitigation of progression of the syndrome. Conversely, if involuntary weight loss is unwelcome and evokes distress, talking about weight, diet and physical activity may be difficult, presenting an obstacle to both offering psychosocial support and supporting compliance with multimodal treatment.

4 Impact on family experience

Because the symptoms of cancer cachexia impact social interactions and relationships, patients' families are affected. Little attention has been paid to family members of people with cachexia, in spite of their potential to influence both psychosocial support and treatment compliance.

4.1 Positive personal and social impacts

Unlike patients, family members have not been found to report patients' involuntary weight loss being a health benefit, or even as being of no concern.

4.2 Negative personal and social impacts

A consistent story emerges from the few studies exploring family experience of cancer cachexia. In England, Ireland, Switzerland, Canada and America, empirical studies have found the symptoms of cachexia distressing for family members [15, 20], to disrupt daily routines [15], to be experienced as a cascade of losses [25], to bring about role change [15] and to be accompanied by lost opportunities for interpersonal interaction [26]. All of these impacts are illustrated in the following quote from a work by Meares [27]:

I cooked a lot, I baked a lot... He ate what I made because I made what he liked... We always ate together... He wouldn't eat if I didn't eat, so I stopped eating when he stopped eating... and dinner hour, I didn't realize until he stopped eating that there was a dinner hour, and then there was none, and it was so difficult to get through the day because what to do you do from 5 to 7? That part of your day is empty.

Such changes in everyday life can precipitate conflict within families over food [18]:

His daughter came last November and she was forcing him to eat gelatin, and I said, "He doesn't want it. Let him decide what he wants." She would say, "Dad you have got to eat, you have got to eat." He would become agitated, and he would say, "No," and she would still say for him to eat to be strong. At the end, I was watching his daughters trying to coax him, and never giving up. And I said, "Good Lord, leave the poor man alone!"

Conflicting opinion in families relating to food and eating may arise from not knowing what to do in a context where it is unusual to initiate discussion about weight and diet with someone who has visible weight loss. Moreover, the limited talk that does take place about weight and eating problems can result in feelings of being neglected by health-care professionals [25, 28], feelings of rejection [18] and even social exclusion [16]:

At first I thought we were in limbo, nobody cared, that we couldn't turn to anybody... nobody seemed to help us... we just had to cope on our own... I thought that someone should have come and spoke to us as a family to tell us what to expect... when he wasn't feeling well

and he wasn't eating... we didn't know whether to call for a doctor or what or who to turn to.

4.3 Consequences of personal and social impacts

The importance of considering the impact of cancer cachexia for family members, as with patients, lies in the management of the syndrome. Family members influence patient self-management [29]. For example, they may reinforce or challenge a patient's response to the symptoms of cancer cachexia. For example, support a decision by an obese patient to consider self-management of diet and physical activity as being unimportant. Similarly, if the patient's involuntary weight loss and other symptoms evoke distress and a reluctance to talk about the experience, then this might be a further obstacle to patient uptake and compliance with both multimodal treatment and supportive psycho-educational interventions.

5 Models of the psychosocial effect of cancer cachexia

Theoretical explanations of how people feel and behave in response to cancer anorexia that can inform clinical interventions are few. McClement et al. [28] developed a model that categorised patient and caregiver response to anorexia as 'fighting back', 'letting nature take its course' or 'waffling' (vacillating between approaches). These three categories were proposed as different ways of 'doing what's best' when confronted by anorexia. Shragge et al. [30, 31], during a longitudinal interview study with 12 patients with cancer cachexia, found that they shift conscious control of eating once the normal desire to eat was lost. He theorises that taking conscious control is important for emotional and social adaptation to anorexia and therefore that patients should be supported in this behaviour.

My own work has proposed that there is a weight loss taboo sustained by the helplessness induced by cancer anorexia in patients, caregivers and health-care professionals [8]. This taboo can obstruct communication which might otherwise help patients and their family members seek help for weight- and eating-related distress. The identified solution is to develop communication techniques that can break through the weight loss taboo. The work also has developed a theory of self-management of weight and eating problems [29] informed by both Lazarus' theory of adaptation and coping [32] and the ways patients and their family members were found to manage life with cancer anorexia. Breaking through the weight loss taboo is seen as a pathway to the reinforcement of existing coping resources and raising awareness of alternatives. More recently, Reid et al. [18] reported that the emotional consequences of cancer anorexia may be greatest for caregivers and that distress is caused by the resulting conflict

between patient and caregiver perspectives on declining food intake. She argues that family members use feeding as a defence against anxiety, and therefore, the solution is to provide information about cancer cachexia.

However, it should be noted that the models identified to date are based on empirical studies of people who would mostly fall into the category of refractory cachexia. No empirical work has been conducted to examine the similarity and difference in psychosocial impact according to the stage of cachexia.

6 Are models useful and relevant?

The empirically based models of the psychosocial effect of cancer cachexia generate complementary propositions explaining the experience of cancer cachexia for patients and their family members. These propositions, which may help identify effective psychosocial interventions to alleviate the negative impact of cancer cachexia, include the following:

- Providing information about cachexia will alleviate anxiety and break the cycle of conflict [18].
- Aiding conscious control can facilitate adaptation [31].
- Enhancing personal and environmental coping resources will aid self-management and alleviate cachexia-related suffering [2, 29].
- The weight loss taboo is an obstacle to the communication necessary to address cachexia-related problems, such as nutritional impact symptoms [8].

Collectively, the models suggest that providing information about cancer cachexia, supporting adaptation and strengthening coping and intervening in the interactional processes between someone with cachexia and others will all have benefit. These interventions have all been theorised to reduce the negative emotional consequences of cancer cachexia. This has yet to be demonstrated empirically. Only one approach has been tested, this being one that combined an interactional process for breaking through the weight loss taboo with information provision and support for self-management of cachexia-related problems. The approach was found acceptable and feasible in a small exploratory trial with no negative consequences [33].

7 Utility and relevance of psychosocial support for multimodal treatment

Cancer cachexia is currently understood to be multicausal, thus requiring multimodal treatment. For example, a multimodal treatment might combine pharmacology to treat primary causes such as the tumour-induced inflammatory process

that contributes to weight loss, nutritional support to counter any malnutrition component of symptom progression and exercise to maintain muscle mass. It could also include a psychosocial component to address cachexia-induced distress. However, no empirical work has been conducted to investigate the potential for psychosocial intervention to facilitate multimodal treatments.

Obstacles to effective multimodal treatment may include psychosocial factors, such as attitudes, beliefs and behaviours of patients, carers and health-care professionals. The weight loss taboo may explain why patients and families can report the unmet need for information about weight loss and anorexia [34]. It may also explain why health-care professionals have been found to manage the syndrome reactively [35]. Attention to patient-family-health-care professional communication may be an important consideration for the delivery of effective multimodal therapy.

There is evidence that carers influence patient response to cancer cachexia [36]. In other conditions, carer and health-care professional behaviour has been found to affect patient behaviour. For example, people on cardiac rehabilitation programmes are more likely to attend with support from a family member [37], family support and caregiver factors effect medicine adherence, conflict in the family has a negative effect on adherence [38] and, in diabetes, family support, in particular the quality of patient-family relationships, is important for adherence to dietary regimes and other treatments, the nature of support determining positive or negative effect on outcomes [39]. Psychosocial interventions may thus have utility and relevance for effective multimodal treatment of cancer cachexia. Not only do they have the potential to relieve distress and conflict, but in doing so, they may also improve compliance with other treatment components.

8 Conclusions and future research

Attention to the assessment of psychosocial, as well as clinical, impacts of cancer cachexia and implications for patient-health professional communication may be important to both quality of life of patients and multimodal treatment of the syndrome. If multimodal interventions are to be offered in early stages of cachexia before disease is refractory to treatment, then they should perhaps become part of treatment regimes and psychosocial support integrated with supportive care in oncology clinics. In this way, some psychosocial obstacles to the treatment of cachexia might be overcome.

Psychosocial intervention in cachexia should be researched for potential to not only help people affected by cancer cachexia feel better but also for its potential to improve clinical outcomes through better uptake and compliance with multimodal therapy.

Acknowledgments The authors certify that they comply with the ethical guidelines for authorship and publishing of the *Journal of Cachexia, Sarcopenia and Muscle* 2010; 1:7–8 (von Haehling S, Morley JE, Coats AJ, and Anker SD).

Conflict of interest Jane Hopkinson has received a consultancy fee from Helsinn Healthcare to participate as a member of the Scientific Advisory Board in the development of a website for health-care professionals dedicated to cachexia.

References

- Hopkinson J. The emotional aspects of cancer anorexia. *Curr Opin Support Palliat Care*. 2010;4:258.
- Oberholzer R, Hopkinson JB, Baumann K, et al. Psychosocial effects of cancer cachexia: a systematic literature search and qualitative analysis. *J Pain Symptom Manag*. 2013;46:77–95.
- Fearon K, Strasser F, Anker S, et al. Definition and classification of cancer cachexia: an international consensus. *Lancet Oncol*. 2011;12:489–95.
- Aapro-Piancentini M, Arends J, Bozzetti F, et al. Early recognition of malnutrition and cachexia in the cancer patient: a position paper of a European School of Oncology Task Force. *Ann Oncol*. 2014. doi:10.1093/annonc/mdu085.
- Kassa S, Fearon K. A feasibility study of multimodal exercise/nutrition/anti-inflammatory treatment for cachexia - the pre-MENAC study. 2011. <http://clinicaltrials.gov/show/NCT01419145>.
- Hopkinson JB, Wright DNM, Foster C. Management of weight loss and anorexia. *Ann Oncol*. 2008;19:289–93.
- Hopkinson J, Comer J. Helping patients with advanced cancer live with concerns about eating: a challenge for palliative care professionals. *J Pain Symptom Manag*. 2006;31:293–305.
- Hopkinson J, Wright D, Comer J. Exploring the experience of weight loss in people with advanced cancer. *J Adv Nurs*. 2006;54:304–12.
- Bayer LM, Bauers CM, Kapp SR. Psychosocial aspects of nutritional support. *Nurs Clin N Am*. 1983;1:119–28.
- Chamberlain K. Food and health: expanding the agenda for health psychology. *J Health Psychol*. 2004;9:467–81.
- Matheison CM, Stam H. Reneotiating identity: cancer narratives. *Sociol Health Illn*. 1995;17:283–306.
- Baracos VE, Reiman T, Mourtzakis M, Gioulbasanis I, Antoun S. Body composition in patients with non-small cell lung cancer: a contemporary view of cancer cachexia with the use of computed tomography image analysis. *Am J Clin Nutr*. 2010;91:1133S–7.
- Rhondali W, Chisholm GB, Daneshmand M, et al. Association between body image dissatisfaction and weight loss among patients with advanced cancer and their caregivers. *J Pain Symptom Manag*. 2013;45:1039–49.
- McClement S. Involuntary weight loss and altered body image in patients with cancer anorexia-cachexia syndrome. In: Del Fabbro EBE, Baracos V, Bowling T, Demark-Wahnefried W, Hopkinson J, editors. *Nutrition and the cancer patient*. Oxford: Oxford University Press; 2010. p. 471–6.
- Strasser F, Binswanger J, Cemy T, Kesslerling A. Fighting a losing battle: eating related distress of men with advanced cancer and their female partners: a mixed methods study. *Palliat Med*. 2007;21:129–37.
- Reid J, Santin O, Porter S. The psychological and social consequences of cachexia in patients with advanced cancer: a systematic review. *Cachexia Conference*; Boston, USA. *J Cachexia Sarcopenia Muscle*. 2012;3:281–301.
- Lövgren M, Tishelman C, Sprangers M, Koyi H, Hamberg K. Symptoms and problems with functioning among women and men with inoperable lung cancer - a longitudinal study. *Lung Cancer*. 2008;60:113–24.
- Reid J, McKenna H, Fitzsimons D, McCance TV. The experience of cancer cachexia: a qualitative study of advanced cancer patients and their family members. *Int J Nurs Stud*. 2009;46:606–16.
- Locher JL, Robinson CO, Bailey FA, et al. Disruptions in the organisation of meal preparation and their family caregivers. *Psycho-Oncology*. 2010;19:967–74.
- del Fabbro E, Inui A, F Strasser. *Impact of cancer cachexia. Cancer Cachexia: Pocket books for cancer supportive care*: Springer Healthcare, 2012.
- Fearon KC, Voss AC, Hustead DS. Definition of cancer cachexia: effect of weight loss, reduced food intake, and systemic inflammation on functional status and prognosis. *Am J Clin Nutr*. 2006;83:1345–50.
- Muir CI, Linklater GT. A qualitative analysis of the nutritional requirements of palliative care patients. *J Human Nutr Diet Off J Br Diet Assoc*. 2011;24:470–8.
- Chasen MR, Bhargava R. A descriptive review of the factors contributing to nutritional compromise in patients with head and neck cancer. *Support Care Cancer*. 2009;17:1345–51.
- Bell K, Lee J, Ristovski-Slijepcevic S. Perceptions of food and eating among Chinese patients with cancer: findings of an ethnographic study. *Cancer Nurs*. 2009;32:118–26.
- McClement S. Cancer anorexia-cachexia syndrome: psychological effect on the patient and family. *J Wound Ostomy Continence Nurs*. 2005;32:264–8.
- Holden C. Anorexia in the terminally ill cancer patient: the emotional impact on the patient and the family. *Hosp J Phys Psychol Pastor Care Dying*. 1991;7:73–84.
- Meares CJ. Primary caregiver perceptions of intake cessation in patients who are terminally ill. *Oncol Nurs Forum*. 1997;24:1751–7.
- McClement S, Degner L, Harlos M. Family beliefs regarding the nutritional care of a terminally ill relative: a qualitative study. *J Palliat Med*. 2003;6:737–48.
- Hopkinson J. How people with advanced cancer manage change in eating habits. *J Adv Nurs*. 2007;59:454–62.
- Shragge J, Wismer W, Olson K, Baracos V. The management of anorexia by patients with advanced cancer: a critical review of the literature. *Palliat Med*. 2006;20:623–9.
- Shragge E, Wismer W, Olson K, Baracos V. Shifting to conscious control: psychosocial and dietary management of anorexia by patients with advanced cancer. *Palliat Med*. 2007;21:227–33.
- Lazarus R. *Emotion & adaptation*. Oxford: Oxford University Press; 1991.
- Hopkinson JB, Fenlon D, Wright DNM, et al. 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 Manag*. 2010;40:684–95.
- Reid J, McKenna HM, Fitzsimons D, McCance TV. An exploration of the experience of cancer cachexia: what patients and their families want from healthcare professionals. *Eur J Cancer*. 2010;19:682–9.
- Dewey A, Dean T. Assessment and monitoring of nutritional status in patients with advanced cancer: part 1. *Int J Palliat Nurs*. 2008;13:258–65.
- Hopkinson J. Carers' influence on diets of people with advanced cancer. *Nurs Times*. 2008;104:28–9.
- Clark AM, King-Shier KM, Thompson DR, et al. A qualitative systematic review of influences on attendance at cardiac rehabilitation programs after referral. *Am Heart J*. 2012;164:835–45.
- Kardas P, Lewek P, Matyjaszczyk M. Determinants of patient adherence: a review of systematic reviews. *Front Pharmacol*. 2013;4:1–16.
- Miller TA, DiMatteo MR. Importance of family/social support and impact on adherence to diabetic therapy. *Diabetes Metab Syndr Obes Targets Ther*. 2013;6:421–6.