

review

Psychological distress and intervention in cancer patients treated with radiotherapy

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Background. Common side effects of treatment with radiation therapy (RT) often cause psychophysical distress in cancer patients. Anxiety, adjustment disorders and depression (which are according to many studies experienced in about half of the oncological population) might originate some serious psychiatric forms of mood disorders and can even culminate in suicide, if not treated appropriately. There are some groups of cancer patients who are especially vulnerable and among them are cancer patients undergoing RT –they should receive special attention from medical staff. The purpose of this review is to present a variety of psychosocial interventions and illustrate some methods that are (or could be) used in psycho-oncology practice.

Conclusions. A large body of literature suggests that the first intervention step should be effective screening for patients in distress. In regard to these proposals the development of (computerized) screening programmes is the first measure that ought to be taken. Moreover, further systematical research of traditional, non-traditional and complementary intervention strategies in cancer patients in distress would be necessary in order to provide reliable empirical results about the effectiveness of different approaches.

Key words: neoplasms –radiotherapy –psychology; mood disorders; adjustment disorders; distress, intervention, screening.

Introduction

The psychosocial oncology research studies indicated that significant proportion of cancer patients at all stages of the disease have been confronted with psychosocial distress.^{1,2} The prevalence of some psychiatric

illnesses (major depression, generalized anxiety, adjustment disorder) is higher in some groups of cancer patients (patients undergoing radiotherapy (RT) or palliative treatment, terminally ill patients and patients experiencing uncontrollable pain), which also implies an increased risk for suicidal behaviour.^{3,4}

Some studies estimated that approximately 20% of cancer patients need a psychiatrist for treating major depression or anxiety during their cancer experience. Additional 15% of cancer patients need the services of a psychologist for treating distress and 25% of patients require the services of social workers to deal with financial and practical issues.^{5,6}

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Since some reports emphasized that psychosocial interventions in cancer patients are not only effective but also economical, more attention should be focused on establishing routine psychosocial screening programs in order to assess psychological functioning, primarily anxiety and depression and overall Quality of Life (QoL).⁷⁻⁹ Cancer patients should be targeted around the time of initial diagnosis and treatment. They should be screened for distress and common problems during the treatment trajectory. The purpose is the identification of those cancer patients who experience significant distress at early stages of therapy in order to treat them proactively and avoid future psychosocial problems.¹⁰⁻¹⁴

RT was one of the earliest cancer treatments and it still plays an important role in the care of cancer patients. It has been used in curative as well as in palliative cancer treatment in order to achieve a local control over the tumour with minimum side effects. Despite astonishing progress of modern RT technique (safe doses of radiation which are skin sparing in comparison to old techniques), the treatment causes some common physical side effects, for example: fatigue, nausea, diarrhoea, gastrointestinal symptoms and skin irritation. Some of them can persist even after the treatment. Studies revealed that cancer patients may also face some psychological problems during the treatment with RT.^{11,15} A wide range of different aspects of psychological functioning and well-being can be impaired in cancer patients prior to, during, and after RT.^{16,17} Therefore a better insight into the psychosocial functioning of patients undergoing RT could facilitate the identification of those who are at higher risk of developing mood disturbances. These patients should receive a full psychosocial support to manage the coping process with cancer and adopt appropriate coping strategies.^{18,19}

There are many methods and techniques of psychosocial interventions that are com-

monly used in psycho-oncological practices. Most of them are useful in treating cancer patients undergoing RT as well.^{20,21} A variety of psychosocial approaches (education in group, education on pain management, meditation training, biofeedback, relaxation training, visualization, creative therapies such as music, art or role play, peer supportive group therapy, family counselling, etc.) have been studied and approved to significantly contribute to patient's QoL. Nevertheless, many of them are ineffective if medical staff is not acquainted with the dynamic of psychological functioning of cancer patients undergoing RT and well trained for recognizing the patient's crisis. In the following review some aspects of psychosocial functioning and distress in cancer patients treated with RT will be discussed. In addition some psychosocial interventions will be described.

Distress induced by experience with cancer

Several studies clearly demonstrate that psychosocial distress occurs in one-third to one-half of all cancer patients.^{3,10,11} There are some groups of cancer patients that are especially vulnerable to psychosocial distress. Particularly patients with history of chronic depression, patients with breast and genitalia cancer, patients using specific coping strategy (hopelessness/helplessness), patients without social support, children and elderly patients should be recognized at earlier stages of cancer diagnosis and treatment.^{3,5,22} Although severity of emotional distress is more closely related to a patient's pre-existing vulnerability than to the characteristics of the cancer, it is more likely to occur at the following stages of patient's experience with cancer:²³⁻²⁵

Diagnosis

Investigation and diagnosis can induce anger, shock, disbelief and emotional distress in

cancer patients. Whereas these can be resolved without interventions in the most cases, especially high levels of distress at this time are predictive for onset of later emotional problems.

During treatment

Side-effects of hospital attendance, unpleasant surgery, RT and/or chemotherapy are prevailing reasons for the distress. Patients might become particularly distressed during apparent treatment failure.

End of treatment

Some patients can experience "rebound" distress associated with the fear that cancer could spread or occur again. The sense of loss and vulnerability may also appear at this point as outcome of ending the prolonged relationship with the cancer service staff.

After treatment

Many patients who survive cancer may reorder their life priorities. On the other hand others need help to overcome worries, preoccupation with loss and illness, a tendency to avoid reminders of cancer, difficulties coping with intimacy and return to work. A form of health anxiety with misinterpretation of physiological sensations and anxious seeking of reassurance may develop as a form of fears of cancer recurrence.

Recurrence

Patients who believe that they have been cured are at greater risk of severe distress if recurrence occurs. For some of them recurrence of cancer may be more distressing than receiving the initial diagnosis.

Terminal disease

Depression is common in the terminal phase, particularly in cancer patients with poorly controlled physical symptoms. Majority of cancer patients experience fear of uncontrolled pain and the process of dying. They

worry what happens after death and are concerned about loved ones.

Negative or positive psychological states

Studies engaged with adjustment to cancer focused primarily on negative psychological states like depression, anxiety and general distress.²⁶⁻²⁸ Many of them concluded that cancer could be understood as an event and an ongoing process that may physically and emotionally weaken the individual. On the other hand, the number of studies on positive consequences of the cancer experience is growing. These studies suggested that experience with cancer may result also in some positive outcomes, for example: increased self-esteem and more optimistic look, improved interpersonal relationships, re-evaluation of prior goals, altered priorities in life and new pursuits.²⁹⁻³³

Radiotherapy and psychosocial functioning in cancer patients

The results of studies comparing RT to other cancer treatments revealed few differences in psychological functioning among different treatment modalities.^{11,34} The patients undergoing RT experienced a common distress –similar to patients without RT. Some studies indicated a great variability in reported results, but the global trends in psychological responses to RT prevailed. The most common reactions reported by patients before starting a course of RT, were feelings of anxiety rather than depressive symptoms. During the course of treatment, most studies indicated a decline in feelings of anxiety. An increase of depressive symptoms and negative mood was found during and after RT. It was also emphasized that the field lacks a systematic overview of the empirical data regarding psychological functioning prior to, during and after RT.^{11,16,35}

Although RT is not painful it induces

many side effects, which can continue long after completion of treatment. Nevertheless, the non-invasive nature of RT can make it easier for patients to adapt, which could explain why in spite of anxiety, patients often experience RT much more positive than initially expected.^{11,36} Some studies aimed to enlighten the psychosocial functioning in cancer patients undergoing RT since some unpleasant side-effects could interfere with their quality of life, namely: fatigue, skin irritation, nausea, diarrhoea, genitourinary and gastrointestinal symptoms, long-term cognitive disability in patients undergoing RT of brain, eating problems and oral complications in patients undergoing RT of head and neck, etc.³⁷⁻⁴⁴

Some recent studies reviewed the impact of RT on neuropsychological functioning in cancer patients.^{38,45-48} Neuropsychological side-effects of different cancer treatments may include difficulty concentrating, impaired verbal and visual memory, difficulty organizing information, decreased motor skills, and language problems. It remains unclear to which extent intellectual and cognitive impairment in cancer patients could be linked with RT, since some patients could have already been experiencing some cognitive decline due to the effects of stress, fatigue or the sometimes toxic by-products of the cancer process itself.

It has been emphasized, that the assessment of RT side-effects either by the doctor or the patient remains subjective and often leads to different results.⁴⁹ This implied a need for establishing reliable screening system with objective parameters in assessment of psychophysical and social distress of radiooncological patients.⁵⁰⁻⁵⁴ To provide effective psychosocial support for cancer patients undergoing RT, the screening for psychosocial status of patients should be performed during diagnostic and therapeutic procedures. A distress inventory composed of interviews; checklists and questionnaires

should be applied before, during and after the course of RT.

First intervention step: screening for cancer patients in distress

Depressive and anxiety disorders often remain unrecognized. In this regard an active screening by simply asking patients about symptoms of anxiety and depression may be helpful. How can an oncologist screen for patients in distress? One research group reported that single-item screening was sensitive and specific for depression – an oncologist must simply ask a question: *"Are you depressed most of the time?"*³ Usually the questionnaire for assessing patients' anxiety and depression includes questions like: *"How are you feeling in yourself?"*; *"Have you felt low or worried?"*; *"Have you ever been troubled by feeling anxious, nervous, or depressed?"*; *"What are your main concerns or worries at the moment?"*; *"What have you been doing to cope with these?"*; *"What effects do you feel cancer and its treatment will have on your life?"*; *"Is there anything that would help you cope with this?"*; *"Who do you feel is helping you at the moment?"* Doctors should also be aware that patients might be distressed because of factors unrelated to cancer.^{23,55,56}

Additional check-up for some risk factors that underlie psychiatric disorders is also required in cancer patients. Risk factors associated with patient (history of psychiatric disorder, social isolation, dissatisfaction with medical care, poor coping), cancer (limitation of activities, disfiguring, poor prognosis) and treatment (disfiguring, side-effects) should be taken into consideration.^{8,57}

It is common to use diagnostic tools or (computerized) screening programs to provide a better insight into patient's crisis. Several agencies developed screening guidelines or books of standards in order to provide distress screening for each patient. Most widely used tools are: Brief Symptom Inven-

tory (BSI), Hospital Anxiety and Depression Scale (HADS), General Health Questionnaire, QoL Questionnaires and distress thermometer.⁹ A large amount of studies on psychometrical characteristics of these screening tools is available on-line.

Review of literature showed that more than 45 tools/instruments have been used to measure psychological distress.⁵⁸ Unfortunately none of them is able to identify patients who are highly distressed without clinical symptoms of anxiety and depression. Therefore, the development of a reliable screening mechanism seems appropriate and may help in identifying patients who specifically warrant the intervention. Distress-screening tool may also assist health professionals to provide patient-specific-intervention processes if the distress level and cause could be identified.

Several groups of scientists are dealing with development of screening mechanism for distress induced by RT. A group of German scientists (Klinikum Grosshadern, Munchen) developed questionnaire SIRO (The Stress Index RadioOncology).⁵⁰ A group in Canada has been developing a computerized QoL program for clinical use in palliative RT.^{5,59} In recent studies two instruments were tested for benefits in screening process: a short and structured interview procedure PRIME-MD (Primary Care Evaluation of Mental Disorders) and BCD (Brief Case-Find for Depression).^{10,60} Both instruments were found to quickly and reliably identify the prevalence and types of mood disorders (depressive disorders: major depression, minor - subsyndromal depression/adjustment disorder, dysthymia, bipolar disorder; anxiety disorders: panic disorder, generalized anxiety disorder). When compared to the PRIME-MD diagnosis of depression the BCD had greater sensitivity. No specific training is needed to administer PRIME-MD and BCD; their application is quick and therefore convenient for screening by oncologist.

Second intervention step: post-screening intervention strategies

Interventions usually assume the following common strategies: psycho-education, cognitive-behavioural training (group or individual), supportive therapy (group or individual).⁵ They target different points on the illness trajectory: diagnosis/pre-treatment, immediately post-treatment or during extended treatment (such as RT or chemotherapy) and disseminated disease or death. Certain modalities of intervention strategies have been proven to be more efficacious at one or more of these time periods. For example, psycho-education may be most effective during the diagnosis/pre-treatment period, when patient searches for information. Group support may be more effective at later stages to cope with more advanced disease.^{61,62} Cognitive-behavioural techniques such as relaxation, stress management and cognitive coping could be most useful during extended treatments.^{63,64} Relaxation and imagery have been shown to be effective in controlling nausea and vomiting associated with chemotherapy treatment,⁶⁵ and furthermore, these techniques can also help patient to decrease the usage of pain medications.⁶⁶

Many studies have focused on the efficacy of group interventions. It seems that group therapies have repeatedly been shown to be as effective as individual treatment.^{63,67} Because of the reduced cost of group therapies (the greater number of patients who can be treated at the same time) many researchers identify group therapy as the preferred route for treating distress in cancer patients. Several specific group therapy interventions have been standardized and proven efficacious, for example: supportive expressive therapy for metastatic early stage breast cancer,^{68,69} mindfulness-meditation based stress reduction^{70,71} and standardized group psycho-education for patients with different types of cancer diagnoses.⁷²

On the other hand recent surveys confirm the popularity of non-traditional therapies among cancer patients. 23% – 81 % of U.S. and Canadian, 22% – 52% of Australian, 16% – 32% of British and 10% – 61% of mainland European cancer patients used at least one such therapy.^{20,73,74} Psychological therapies (e.g., relaxation, meditation, visual imagery, and hypnotherapy) are among most popular non-traditional therapies. More than 50% of Australian and up to 29% of U.S. and 10% of European and Canadian cancer patients have reported the use of at least one type of psychological therapy.^{75,76} Patients have high expectations of these therapies: in one study, up to 25% of participants expected the psychological therapy to cure their cancer and 75% – 100% expected it to assist their traditional therapies.⁷⁶

Moreover, alternative/complementary therapies are increasingly used to reduce side effects of cancer treatment, without convincing evidence of their effectiveness.⁷⁷ Some studies are in favor of using complementary therapy in order to reduce the stress and anxiety in cancer patient.^{78,79} A study of patient's perceptions of the benefits of reflexology on their QoL revealed that reflexology interventions were perceived to impact positively on psychophysical functioning.^{80,81}

Further indications for effective acupuncture treatment of patients with radiation-induced xerostomia came from study with patients undergoing RT for head and neck cancer.^{82,83} Some national institutes of health support the use of acupuncture for chemotherapy-induced nausea and vomiting.⁸⁴ The nurse practitioners are obligated to be knowledgeable about the use of these and other effective complementary treatments in order to provide the best care. Used in conjunction with current antiemetic drugs, acupuncture and acupressure have been shown to be safe and effective for relief of the nausea and vomiting resulting from chemotherapy.

Application of psychological interventions has been found in many studies to improve the

QoL in cancer patients. These is hypothesized to be mainly due to reducing their psychological symptoms and distress, enhancing psychological and functional adjustment and rehabilitation as well.⁸⁵ However, the relevance of psychosocial interventions on survival from cancer has been widely criticized. In the recent review all identifiable publications about psychological therapies used by cancer patients have been critically and systematically analysed.²⁰ Despite of extensive body of literature authors could not make strong recommendations about the effectiveness of psychological intervention strategies at improving cancer patient's outcomes. The results of this review were considerably less enthusiastic about the likely benefits of psychological therapies for cancer patients compared to the results of other recent reviews. While many studies recommended widespread and routine use of psychological therapies to improve patient's psychosocial, side effect, survival and immune outcomes, this study emphasized that the most beneficial are group therapy, education, structured and unstructured counselling and cognitive behavioural therapy. Furthermore, some long-term cost studies have proven that psychosocial intervention programs have also beneficial economical value.^{5,86}

Cancer patients undergoing RT can engage in all above described intervention programs. Some findings about psychosocial side effects of RT, discussed in previous section have also got practical implications for medical staff in oncology practice.⁸⁷ Namely, it is very important that patient is well informed what to expect during the treatment period. The aim of the RT should be explained and misperceptions eliminated (role models that underwent the RT could be used for education of patients). This is not important only because of the cooperation between the patient and medical staff, but also because talking often reduces the anxiety that ascends from specific, unknown and uncontrollable situation. In addition, after completed treat-

ment with RT patients show high need for information – particularly about the psychophysical changes they could experience after completing RT. They are also interested how they could best ask their physicians questions, which agencies they could call when they need help and how they could cope with painful emotions. Therefore providing an information booklet in form of a self-management package seems to be an effective intervention.⁸⁸

Conclusions

Although recent studies comparing different cancer treatments suggested that the psychological impact of RT is not superimposed to other treatments, some measures have to be taken to avoid further psychiatric complications (anxiety, depression, adjustment disorders and suicide) in cancer patients undergoing RT.^{3,10,11,34} The first step is to effectively screen for patients in distress throughout the treatment process (patients should be screened at the initial visit and at appropriate intervals).¹⁰⁻¹⁴ A multidisciplinary approach that includes psychological as well as medical assessment and intervention should be carried out. Otherwise psychological care might be neglected by the medical focus on cancer treatment. Consequently screening programmes for those patients who are likely to show psychological dysfunction and helping them to cope with treatment and cancer related problems should be the constituent part of cancer management.^{5,36,86}

The knowledge of the coping process with cancer and some fundamental strategies in screening for distress is substantial for medical staff working with patients undergoing RT.⁸⁶ What is expected before starting a course of RT? The majority of patients will experience anxiety (which will probably decline during the treatment).^{11,16,35} They will be distressed mostly by fears of possible side-

effects and by the fact of being irradiated. An effective intervention strategy at this stage is psycho-education (providing information about RT and its side effects). The visualization and the relaxation training are also useful for reducing the anxiety. In contrast to the anxiety an increase of depressive symptoms is expected during and after RT. At this point the group-supportive therapy might be appropriate.⁶¹⁻⁶⁹ To conclude: different psychological interventions evoke different effects according to the specific stages of the cancer treatment.

In general, five types of therapies were established due to increasingly active participation by the recipient: providing information, emotional support, behavioral training in coping skills, psychotherapy and spiritual/existential therapy.⁷² The widespread usage of nontraditional psychological and complementary therapies^{20,73-84} is a big challenge to the traditional medical and psychological approaches to cancer experience. The field lacks a systematic overview of different approaches and their contributions to the QoL as well as to the cancer prognosis.

Patients are most often willing to participate in the therapeutic process of cancer, yet the psychological aspect of medication might be underestimated by the patient. Therefore oncologist should also notice if a patient needs some further psychological or psychiatric consultations. Quick and reliable screening tools could be useful for this purpose. Although there are some available instruments for such purposes (BSI, HADS, PRIME-MD, etc.),^{9,10,58} many findings suggest that the screening process for cancer patients experiencing distress while undergoing RT requires additional empirical analysis.

References

1. Sivesind D, Baile WF. The psychologic distress in patients with cancer. *Nurs Clin North Am* 2001; **36**: 809-25.

2. Parker PA, Baile WF, de Moor C, Cohen L. Psychosocial and demographic predictors of quality of life in a large sample of cancer patients. *Psychooncology* 2003; **12**: 183-93.
3. Chochinov HM. Depression in cancer patients. *Lancet Oncol* 2001; **2**: 599-606.
4. Filiberti A, Ripamonti C. Suicide and suicidal thoughts in cancer patients. *Tumori* 2002; **88**: 193-9.
5. Carlson LE, Bultz BD. Benefits of psychosocial oncology care: improved quality of life and medical cost offset. *Health Qual Life Outcomes* 2003; **1**: 8.
6. Fawzy FI. Psychosocial interventions for patients with cancer: what works and what doesn't. *Eur J Cancer* 1999; **35**: 1559-64.
7. Zabora J, BrintzenhofeSzoc K, Jacobsen P, Curbow B, Piantadosi S, Hooker C, et al. A new psychosocial screening instrument for use with cancer patients. *Psychosomatics* 2001; **42**: 241-6.
8. Keller M, Sommerfeldt S, Fischer C, Knight L, Riesbeck M, Lowe B, et al. Recognition of distress and psychiatric morbidity in cancer patients: a multi-method approach. *Ann Oncol* 2004; **15**: 1243-9.
9. Carlson LE, Bultz BD. Cancer distress screening. Needs, models, and methods. *J Psychosom Res* 2003; **55**: 403-9.
10. Leopold KA, Ahles TA, Walch S, Amdur RJ, Mott LA, Wiegand-Packard L, et al. Prevalence of mood disorders and utility of the PRIME-MD in patients undergoing radiation therapy. *Int J Radiat Oncol Biol Phys* 1998; **5**: 1105-12.
11. Stiegelis HE, Ranchor AV, Sanderman R. Psychological functioning in cancer patients treated with radiotherapy. *Patient Educ Couns* 2004; **52**: 131-41.
12. Roth AJ, Modi R. Psychiatric issues in older cancer patients. *Crit Rev Oncol Hematol* 2003; **48**: 185-97.
13. Zabora JR, Loscalzo MJ, Weber J. Managing complications in cancer: identifying and responding to the patient's perspective. *Semin Oncol Nurs* 2003; **19**: 1-9.
14. Chow E, Tsao MN, Harth T. Does psychosocial intervention improve survival in cancer? A meta-analysis. *Palliat Med* 2004; **18**: 25-31.
15. Janda M, Newman B, Obermair A, Woelfl H, Trimmel M, Schroeckmayr H, et al. Impaired quality of life in patients commencing radiotherapy for cancer. *Strahlenther Onkol* 2004; **180**: 78-83.
16. Sehlen S, Hollenhorst H, Schymura B, Herschbach P, Aydemir U, Firsching M, et al. Psychosocial stress in cancer patients during and after radiotherapy. *Strahlenther Onkol* 2003; **179**: 175-80.
17. Sehlen S, Song R, Fahmuller H, Herschbach P, Lenk M, Hollenhorst H, et al. Coping of cancer patients during and after radiotherapy—a follow-up of 2 years. *Onkologie* 2003; **26**: 557-63.
18. de Vries A, Sollner W, Steixner E, Auer V, Schiessling G, Stzankay A, et al. Subjective psychological stress and need for psychosocial support in cancer patients during radiotherapy treatment. *Strahlenther Onkol* 1998; **174**: 408-14.
19. Fritzsche K, Liptai C, Henke M. Psychosocial distress and need for psychotherapeutic treatment in cancer patients undergoing radiotherapy. *Radiother Oncol* 2004; **72**: 183-9.
20. Newell SA, Sanson-Fisher RW, Savolainen NJ. Systematic review of psychological therapies for cancer patients: overview and recommendations for future research. *J Natl Cancer Inst* 2002; **94**: 58-84.
21. Herschbach P, Keller M, Knight L, Brandl T, Huber B, Henrich G, et al. Psychological problems of cancer patients: a cancer distress screening with a cancer-specific questionnaire. *Br J Cancer* 2004; **91**: 504-11.
22. Kusch M, Labouvie H, Ladisch V, Fleischhack G, Bode U. Structuring psychosocial care in pediatric oncology. *Patient Educ Couns* 2000; **40**: 231-45.
23. White C, Macleod U. Cancer. ABC of psychological medicine. *BMJ* 2002; **325**: 377-80.
24. Strittmatter G, Tilkorn M, Mawick R. How to identify patients in need of psychological intervention. *Recent Results Cancer Res* 2002; **160**: 353-61.
25. Cordova MJ, Andrykowski MA. Responses to cancer diagnosis and treatment: posttraumatic stress and posttraumatic growth. *Semin Clin Neuropsychiatry* 2003; **8**: 286-96.
26. Epping-Jordan J, Compas B, Osowiecki D, Oppedisano G, Gerhardt C, Primo K, et al. Psychological adjustment in breast cancer: Processes of emotional distress. *Health Psychol* 1999; **18**: 315-26.
27. Kugaya A, Akechi T, Okuyama T, Nakano T, Mikami I, Okamura H, et al. Prevalence, predictive factors, and screening for psychologic distress in patients with newly diagnosed head and neck cancer. *Cancer* 2000; **88**: 2817-23.
28. Akechi T, Okuyama T, Sugawara Y, Nakano T, Shima Y, Uchitomi Y. Major depression, adjust-

- ment disorders, and post-traumatic stress disorder in terminally ill cancer patients: associated and predictive factors. *J Clin Oncol* 2004; **22**: 1957-65.
29. Ferrell BR, Grant M, Funk B, Otis GS, Garcia N. Quality of life in breast cancer. Part II: Psychological and spiritual well-being. *Cancer Nurs* 1997; **21**: 1-9.
30. Sodergren S, Hyland M. What are the positive consequences of illness? *Psychol Health* 2000; **15**: 85-97.
31. Andrykowski MA, Brady MJ, Hunt JW. Positive psychosocial adjustment in potential bone marrow transplant recipients: cancer as a psychosocial transition. *Psychooncology* 1993; **2**: 261-76.
32. Stiegelis HE, Hagedoorn M, Sanderman R, van der Zee KI, Buunk BP, van den Bergh AC. Cognitive adaptation: a comparison of cancer patients and healthy references. *Br J Health Psychol* 2003; **8**: 303-18.
33. Petrie K, Buick D, Weinman J, Booth R. Positive effects of illness reported by myocardial infarction and breast cancer patients. *J Psychosom Res* 1999; **47**: 537-43.
34. De Leeuw JR, De Graeff A, Ros WJ, Hordijk GJ, Blijham GH, Winnubst JA. Negative and positive influences of social support on depression in patients with head and neck cancer: a prospective study. *Psychooncology* 2000; **9**: 20-8.
35. Lamszus K, Verres R, Hubener KH. How do patients experience radiotherapy? *Strahlenther Onkol* 1994; **170**: 162-8.
36. Mose S, Budischewski KM, Rahn AN, Zander-Heinz AC, Bormeth S, Boettcher HD. Influence of irradiation on therapy-associated psychological distress in breast carcinoma patients. *Int J Radiat Oncol Biol Phys* 2001; **51**: 1328-35.
37. Oehr K. *Oral Health and Experience of Oral Care among Cancer Patients during Radio- or Chemotherapy*. Uppsala: Acta Universitatis Upsaliensis, Comprehensive Dissertations from the Faculty of Medicine 1998; 2001. p. 7-10.
38. Klein M, Heimans JJ, Aaronson NK, van der Ploeg HM, Grit J, Muller M, et al. Effect of radiotherapy and other treatment-related factors on mid-term to long-term cognitive sequelae in low-grade gliomas: a comparative study. *Lancet* 2002; **360**: 1361-8.
39. Caffo O, Amichetti M, Mussari S, Romano M, Maluta S, Tomio L, et al. Physical side effects and quality of life during postoperative radiotherapy for uterine cancer, prospective evaluation by a diary card. *Gynecol Oncol* 2003; **88**: 270-6.
40. Larsson M, Hedelin B, Athlin E. Lived experiences of eating problems for patients with head and neck cancer during radiotherapy. *J Clin Nurs* 2003; **12**: 562-70.
41. Sehlen S, Hollenhorst H, Lenk M, Schymura B, Herschbach P, Aydemir U, et al. Only sociodemographic variables predict quality of life after radiotherapy in patients with head-and-neck cancer. *Int J Radiat Oncol Biol Phys* 2002; **52**: 779-83.
42. Chandra PS, Chaturvedi SK, Channabasavanna SM, Anantha N, Reddy BK, Sharma S, et al. Psychological well-being among cancer patients receiving radiotherapy—a prospective study. *Qual Life Res* 1998; **7**: 495-500.
43. Jacobsen PB, Thors CL. Fatigue in the radiation therapy patient: current management and investigations. *Semin Radiat Oncol* 2003; **13**: 372-80.
44. Montgomery C, Lydon A, Lloyd K. Psychological distress among cancer patients and informed consent. *J Psychosom Res* 1999; **46**: 241-5.
45. Anderson-Hanley C, Sherman ML, Riggs R, Agocha VB, Compas BE. Neuropsychological effects of treatments for adults with cancer: a meta-analysis and review of the literature. *J Int Neuropsychol Soc* 2003; **9**: 967-82.
46. Syrjala KL. The neuropsychology of cancer treatment. Introduction. *Semin Clin Neuropsychiatry* 2003; **8**: 197-200.
47. Wefel JS, Kayl AE, Meyers CA. Neuropsychological dysfunction associated with cancer and cancer therapies: a conceptual review of an emerging target. *Br J Cancer* 2004; **90**: 1691-6.
48. Costello A, Shallice T, Gullan R, Beaney R. The early effects of radiotherapy on intellectual and cognitive functioning in patients with frontal brain tumours: the use of a new neuropsychological methodology. *J Neurooncol* 2004; **67**: 351-9.
49. Goldner G, Wachter-Gerstner N, Wachter S, Dieckmann K, Janda M, Poetter R. Acute Side Effects during 3-D-Planned Conformal Radiotherapy of Prostate Cancer. *Strahlenther Onkol* 2003; **5**: 320-7.
50. Sehlen S, Fahmuller H, Herschbach P, Aydemir U, Lenk M, Duhmke E. Psychometric properties of the Stress Index RadioOncology (SIRO)—a new questionnaire measuring quality of life of cancer patients during radiotherapy. *Strahlenther Onkol* 2003; **179**: 261-9.
51. Thomas BC, Mohan VN, Thomas I, Pandey M. Development of a distress inventory for cancer: preliminary results. *J Postgrad Med* 2002; **48**: 16-20.

52. Katz MR, Kopeck N, Waldron J, Devins GM, Tomlinson G. Screening for depression in head and neck cancer. *Psychooncology* 2004; **13**: 269-80.
53. Lee-Preston V, Steen IN, Dear A, Kelly CG, Welch AR, Meikle D, et al. Optimizing the assessment of quality of life after laryngeal cancer treatment. *J Laryngol Otol* 2004; **118**: 432-8.
54. Monfardini S, Ferrucci L, Fratino L, del Lungo I, Serraino D, Zagonel V. Validation of a multidimensional evaluation scale for use in elderly cancer patients. *Cancer* 1996; **77**: 395-401.
55. McDaniel JS, Musselman DL, Porter MR, Reed DA, Nemeroff CB. Depression in patients with cancer. Diagnosis, biology, and treatment. *Arch Gen Psychiatry* 1995; **52**: 89-99.
56. Sheard T, Maguire P. The effect of psychological interventions on anxiety and depression in cancer patients: results of two meta-analyses. *Br J Cancer* 1999; **80**: 1770-80.
57. Forester BM, Kornfeld DS, Fleiss J. Psychiatric aspects of radiotherapy. *Am J Psychiatry* 1978; **135**: 960-3.
58. Thomas BC, Mohan VN, Thomas I, Pandey M. Development of a distress inventory for cancer: preliminary results. *J Postgrad Med* 2002; **48**: 16-20.
59. Bezjak A, Skeel R, Depetrillo AD, Comis R, Taylor KM. Oncologist's use of quality of life information: results of a survey of castem cooperative oncology group physicians. *Qual Life Res* 2001; **10**: 1-13.
60. Jefford M, Mileskin L, Richards K, Thomson J, Matthews JP, Zalcberg J, et al. Rapid screening for depression - validation of the Brief Case-Find for Depression (BCD) in medical oncology and palliative care patients. *Br J Cancer* 2004 [in print].
61. Blake-Mortimer J, Gore-Felton C, Kimerling R, Turner-Cobb JM, Spiegel D. Improving the quality and quantity of life among patients with cancer: a review of the effectiveness of group psychotherapy. *Eur J Cancer* 1999; **35**: 1581-6.
62. Clark MM, Bostwick JM, Rummans TA. Group and individual treatment strategies for distress in cancer patients. *Mayo Clin Proc* 2003; **78**: 1538-43.
63. Bottomley A. Where are we now? Evaluating two decades of group interventions with adult cancer patients. *J Psychiatr Ment Health Nurs* 1997; **4**: 251-65.
64. Fawzy FI. A short-term psychoeducational intervention for patients newly diagnosed with cancer. *Support Care Cancer* 1995; **3**: 235-8.
65. Fawzy FI, Fawzy NW, Arndt LA, Pasnau RO. Critical review of psychosocial interventions in cancer care. *Arch Gen Psychiatry* 1995; **52**: 100-13.
66. Sloman R, Brown P, Aldama E, Chu E. The use of relaxation for the promotion of comfort and pain relief in persons with advanced cancer. *Contemp Nurse* 1994; **3**: 6-12.
67. Fobair P. Cancer support groups and group therapies: Part I. Historical and theoretical background and research on effectiveness. *Journal of Psychosocial Oncology* 1997; **15**: 63-81.
68. Classen C, Butler LD, Koopman C, Miller E, DiMiceli S, Giese-Davis J. Supportive-expressive group therapy and distress in patients with metastatic breast cancer: a randomized clinical intervention trial. *Arch Gen Psychiatry* 2001; **58**: 494-501.
69. Spiegel D, Morrow GR, Classen C, Raubertas R, Stott PB, Mudaliar N. Group psychotherapy for recently diagnosed breast cancer patients: a multicenter feasibility study. *Psychooncology* 1999; **8**: 482-93.
70. Carlson LE, Ursuliak Z, Goodey E, Angen M, Specia M. The effects of a mindfulness meditation based stress reduction program on mood and symptoms of Stress in cancer outpatients: six month follow-up. *Support Care Cancer* 2001; **9**: 112-23.
71. Specia M, Carlson LE, Goodey E, Angen M A. Randomized, waitlist controlled clinical trial: the effect of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosom Med* 2000; **62**: 613-62.
72. Cunningham AJ, Edmonds VI, Hampson AW, Hanson H, Hovenac M, Jenkins G. A group psychoeducational program to help cancer patients cope with and combat their disease. *Advances* 1991; **7**: 41-56.
73. Begbie SD, Kerestes ZL, Bell DR. Patterns of alternative medicine use by cancer patients. *Med J Aust* 1996; **165**: 545-8.
74. Miller M, Boyer MJ, Butow PN, Gattellari M, Dunn SM, Childs A. The use of unproven methods of treatment by cancer patients. Frequency, expectations and cost. *Supp Care Cancer* 1998; **6**: 337-47.
75. Maher EJ, Young T, Feigel I. Complementary therapies used by patients with cancer. *BMJ* 1994; **309**: 671-2.
76. Sollner W, Zingg-Schir M, Rumpold G, Fritsch P. Attitude toward alternative therapy, compliance

- with standard treatment, and need for emotional support in patients with melanoma. *Arch Dermatol* 1997; **133**: 316–21.
77. Post-White J, Kinney ME, Savik K, Gau JB, Wilcox C, Lerner I. Therapeutic massage and healing touch improve symptoms in cancer. *Integr Cancer Ther* 2003; **2**: 332–44.
78. Keegan L. Therapies to reduce stress and anxiety. *Crit Care Nurs Clin North Am* 2003; **15**: 321–7.
79. Fellowes D, Barnes K, Wilkinson S. Aromatherapy and massage for symptom relief in patients with cancer. *Cochrane Database Syst Rev* 2004; **2**: CD002287.
80. Wright S, Courtney M, Donnelly C, Kenny T, Lavin C. Client's perceptions of the benefits of reflexology on their quality of life. *Complement Therap Nurs Midwifery* 2002; **8**: 69–76.
81. Luebbert K, Dahme B, Hasenbring M. The effectiveness of relaxation training in reducing treatment-related symptoms and improving emotional adjustment in acute non-surgical cancer treatment: a meta-analytical review. *Psychooncology* 2001; **10**: 490–502.
82. Blom M, Dawidson I, Fernberg JO, Johnson G, Angmar-Mansson B. Acupuncture treatment of patients with radiation-induced xerostomia. *Eur J Cancer B Oral Oncol* 1996; **32B**: 182–90.
83. Blom M, Lundeberg T. Long-term follow-up of patients treated with acupuncture for xerostomia and the influence of additional treatment. *Oral Dis* 2000; **6**: 15–24.
84. Collins KB, Thomas DJ. Acupuncture and acupressure for the management of chemotherapy-induced nausea and vomiting. *J Am Acad Nurse Pract* 2004; **16**: 76–80.
85. Ross L, Boesen E H, Dalton SO, Johansen C. Mind and cancer: does psychosocial intervention improve survival and psychological well-being? *Eur J Cancer* 2002, **38**: 1447–57.
86. Šprah L, Šoštarič M. Psychosocial coping strategies in cancer patients. *Radiol Oncol* 2004; **38**: 35–42.
87. Fritzsche K, Liptai C, Henke M. Psychosocial distress and need for psychotherapeutic treatment in cancer patients undergoing radiotherapy. *Radiother Oncol* 2004; **72**: 183–9.
88. Jenkins V, Fallowfield L, Saul J. Information needs of patients with cancer: results from a large study in UK cancer centres. *B J Cancer* 2000; **84**: 48–51.