Summary of the main findings

Although many side effects of radiotherapy are physical, previous research has shown that patients treated with radiotherapy also experience psychological problems. Chapter 2 presented a systematic overview of the literature regarding the psychological functioning of cancer patients prior to, during, and after treatment with radiotherapy. Moreover, it was examined whether medical factors, such as stage of disease, influence psychological functioning.

Using Medline and Psychlit databases over the period 1980 - 2002, 45 articles were selected that fulfilled the specified inclusion criteria. This indicates that studies had to include patients who had been treated with external radiotherapy, regardless of their cancer site, kind of treatment (curative or palliative) and other adjuvant treatment(s). Studies on the evaluation of this treatment on fatigue, metabolic, sexual and reproductive capabilities and skin integrity were excluded. Furthermore, case studies, commentaries on articles, letters, intervention studies, studies about information needs and receiving information related to radiotherapy, as well as studies not specifying fixed assessment points or not pointing out which aspects of psychological functioning were measured, were also excluded.

The results of our overview revealed that there was great variability in psychological functioning prior to, during, and after radiotherapy, although some global trends were found. Studies with a cross-sectional design showed that, at the start of a course of radiotherapy, psychological functioning is characterized by feelings of anxiety rather than by depressive symptoms. In general, studies found lower levels of anxiety during the course of treatment. Interestingly, compared to depressive symptoms at the start of radiotherapy, depressive symptoms during radiotherapy where rather high, up to 31% of the patients under study. The majority of longitudinal studies, who measured psychological functioning prior to, during, and after radiotherapy, demonstrated that feelings of anxiety, depressive symptoms, and psychological distress decreased in the period after radiotherapy.

Regarding medical factors, palliative instead of curative treatment and experiencing physical side effects appeared to be related to lower levels of psychological functioning. However, findings concerning stage of disease are inconsistent, although the majority of studies suggest no significant association with psychological functioning. Finally, the bulk of studies that compared patients who received radiotherapy with patients treated with other treatment modalities on psychological functioning, yielded no significant differences in psychological functioning between the different treatment groups.

Whereas global trends can indeed be found, it is impossible to draw firm conclusions with regard to patients’ psychological functioning at different assessment points and concerning the relationship between medical factors and psychological functioning. An exception is the comparison of different treatment
modalities. Evidence points out that patients treated with radiotherapy report no heightened level of feelings of anxiety, depressive symptoms, and psychological distress compared to patients treated with other cancer treatments.

Chapter 3 was aimed at exploring the role of cognitive factors and their associations with psychological distress, as indicated by depressive symptoms and feelings of anxiety. For these aims we used Taylor’s theory of cognitive adaptation which proposes that, adjustment depends on the ability to sustain and modify illusions (i.e., unrealistic optimism, exaggerated perceptions of control, and enhanced self-esteem) that buffer against threats, but also against possible future setbacks. Because patients have little opportunity to influence the progression or recurrence of this impairing and life threatening disease, it is obvious that a cancer diagnosis threatens optimism about the future, feelings of control, and self-esteem. But, if patients would be able to maintain these levels of optimism, control, and self-esteem (whether these cognitions reflect illusions or not) by showing at least similar levels of optimism, control, and self-esteem as healthy references, and if these cognitions would also predict psychological distress, this would support the theory of cognitive adaptation. To test these assumptions among patients treated with radiotherapy we examined the following research questions: (1) Are patients at least as optimistic and do they perceive at least as much control and self-esteem as healthy references?; (2) Are patients, as compared to healthy individuals, able to maintain similar or even higher levels of optimism, control, and self-esteem at two weeks as well as three months after radiotherapy?; and (3) Do lower levels of optimism, control, and self-esteem predict future depressive symptoms and feelings of anxiety?

The participants consisted of a heterogeneous group of 67 cancer patients and 50 healthy references. Patients filled out questionnaires prior to their first radiotherapy session (T1), at two weeks (T2), and at three months (T3) after completing radiotherapy. Healthy references filled out questionnaires at similar intervals. Interestingly, results revealed that patients experienced significantly higher levels of optimism and self-esteem compared to the healthy reference group. Concerning perceptions of control, no group differences were found. Importantly, regression analyses showed that, for both groups, lower levels of optimism and control at T1 were predictive of feelings of anxiety at T3. In addition, perceived control at T1 also predicted depressive symptoms at T3. For patients, these results show that, being high in optimism and control prior to initiating treatment means less feelings of anxiety at three months after radiotherapy. Also, patients who reported high levels of perceptions of control prior to radiotherapy, showed less depressive symptoms at three months after completing radiotherapy.

In sum, results support the theory of cognitive adaptation in that patients are indeed able to respond to cancer with high levels of optimism and self-esteem. In
addition, high levels of optimism and control seem protective of psychological well-being for both cancer patients and healthy references.

In Chapter 4, we examined the role of threat in relation to positive consequences due to the cancer experience, such as an improvement in relationships with other people. This idea is based on the assumption that the cancer experience, which can be considered as a significant threat, may stimulate a search for meaning, which in turn may result in positive consequences. In addition, one may argue that the threat of cancer is an objective threat because patients may vary in the extent to which they appraise the cancer event as threatening. More specifically, a diagnosis of cancer or the severity of this illness are both objective threats, because some patients appraise them as harmful, others as threats, and still others as challenges (Folkman et al., 2000a). This means that, at best, a moderate relationship between the objective threat and the perceived threat can be expected. Patients’ psychological distress in the acute phase of the illness could be seen as a proxy for perceived threat, because patients high in distress appraise their current situation as stressful.

Thus, in Chapter 4 we explored the association between objective threat and perceived threat, on the one hand, and positive consequences, on the other hand. Objective threat was defined in terms of number of treatments (strongly related to stage of disease which in turn reflects illness severity) and perceived threat as psychological distress. In addition, number of treatments was indicated as low when breast cancer patients received surgery and radiotherapy and as high when patients received, besides surgery and radiotherapy, also hormonal or chemotherapy. To be able to compare patients and to ascribe differences to treatment, it was important to have a homogeneous group with respect to gender and type of cancer. Therefore, we included only participants who were diagnosed with breast cancer. Hundred-nine women with breast cancer filled out questionnaires prior to their first radiotherapy and at three months after completing radiotherapy.

In line with our assumption, objective threat was not significantly correlated with perceived threat. In fact, the correlation was very low. Importantly, multiple regression analyses revealed significant interaction effects, demonstrating that, patients who scored high on only one threat (i.e., either a high objective threat in combination with a low perceived threat or a low objective threat in combination with a high perceived threat) reported the highest level of positive consequences. Furthermore, women scoring low and women scoring high on both objective and perceived threat, reported the fewest positive consequences.

In Chapter 5, we pursued the topic of positive consequences by exploring its relation with cognitive factors. Till now, this issue has received only little attention. There are, however, a number of studies that have focused on the relationship between cognitive factors and psychological well-being or distress. One could
assume that the relationship between cognitive factors and *positive consequences* would not be differently because, individuals who show a higher psychological well-being or less psychological distress automatically report higher levels of positive consequences. Interestingly, the relationship between positive consequences, on the one hand, and psychological well-being or distress on the other hand, is not well-established. This indicates that we do not know, at this point, whether earlier findings with psychological well-being or distress as an outcome variable can be applied to positive consequences as well. In *Chapter 5* we started with exploring this relationship. Since we did not know beforehand what these results would reveal, we included both positive consequences and psychological distress as outcome variables. Thus, we examined the relationship between several individual cognitive factors, on the one hand, and positive consequences and psychological distress, on the other hand. Finally, the effects of mediator variables on these relationships were explored.

A sample of 209 patients was included in the present study. The individual cognitive factors that were measured included monitoring (i.e., information seeking), blunting (i.e., information avoiding), and social comparison orientation (i.e., the degree to which one likes to compare oneself). These factors were measured prior to patients’ first treatment with radiotherapy (T1) and served as predictor variables. At two weeks after radiotherapy (T2) we measured four mediator variables, need for information about coping skills, need for information about other patients, frequency of downward social comparison (i.e., making comparisons with others who are doing worse), and frequency of upward social comparison (i.e., making comparisons with others who are doing better). Positive consequences and psychological distress were measured three months after radiotherapy (T3).

Some interesting findings were revealed. First, we found no significant relationship between positive consequences and psychological distress, indicating that experiencing positive consequences is not associated with the absence of psychological distress. Second, regarding positive consequences the findings clearly demonstrated that higher levels of monitoring and social comparison orientation were related to higher levels of positive consequences. Interestingly, the need for specific information mediated the relationship between monitoring and social comparison orientation and positive consequences. For instance, patients who were higher in monitoring at T1, were more inclined to report a higher need for information about coping skills at T2. This, in turn, was associated with more positive consequences at T3. Third, results concerning psychological distress as an outcome variable yielded rather different findings. Only social comparison orientation at T1 was associated with psychological distress at T3. In contrast to our findings regarding positive consequences, none of the mediator variables mediated the relationship between the individual cognitive factors at T1 and psychological distress at T3.
It can be concluded that patients who report high levels of positive consequences are not automatically less psychologically distressed. Furthermore, patients who adopt cognitive styles that are labeled as strongly information approaching or information orientated, may show more positive consequences at a later point in time.

Because a lack of control and feelings of uncertainty are found to be strongly related to psychological distress (see Chapter 3 and 5, and Ell et al., 1989; Mishel et al., 1984; Taylor et al., 1991; Thompson & Collins, 1995; Wong et al., 1992), Chapter 6 examined whether an information booklet, specifically designed for patients who underwent radiotherapy, could mitigate these negative effects. Prior to radiotherapy, a heterogeneous group of 209 cancer patients completed baseline measures, including control and illness uncertainty. After completing radiotherapy, patients were randomly allocated to either receive a booklet (experimental group; N=103) or to receive no booklet (control group; N=106). At three months after the intervention, aspects of psychological distress, including tension, anger, depression, fatigue, and vigor, were assessed.

The results supported the hypotheses and indicated that those patients who were low in perceived control or high in illness uncertainty prior to their first treatment with radiotherapy, seemed to benefit from the information booklet they received shortly after treatment. These patients reported less tension, anger, and depression at three months after the intervention compared to patients low in control or high in illness uncertainty who had not received the information booklet.

In sum, especially those patients who are at higher risk for experiencing psychological distress can benefit from an information booklet that is provided after treatment with radiotherapy.