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Effects of Radiation Therapy Knowledge and Misconceptions on Patient Anxiety

by

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Running Head: Knowledge, Misconceptions and Patient Anxiety

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Abstract

Radiation therapy often produces considerable anxiety in patients. One reason for this anxiety is the uncertainty that often surrounds this treatment. Since studies have shown that many patients experience the most distress during times that are uncertain, it is understandable that most individuals with cancer desire information about their disease, its treatment, side effects, etc. Unfortunately, many patients do not receive the information necessary to dispel any of the preconceived misconceptions they may have about radiation therapy. The purpose of this study was to examine levels of radiation therapy knowledge and its influence on patients.

Patients who were about to receive radiation therapy for the first time at the Thunder Bay Regional Cancer Centre were solicited as participants for this study. Twenty-seven patients, 12 males and 15 females, agreed to participate in the present study. Prior to their first meeting with a radiation therapist, participants were approached by a nurse, told about the study and asked to complete the State Trait Anxiety Inventory, the General Health and the Radiation Therapy Questionnaire. The questionnaires were also completed by each

subject on the last day of treatment.

Although state anxiety decreased significantly and Radiation Therapy Questionnaire scores increased significantly at post-treatment, this did not appear to be the result of any relationship between anxiety and radiation therapy knowledge (as measured by the Radiation Therapy Questionnaire). However, this did indicate that patients acquired information about radiation therapy throughout the course of treatment. Further psychometric examination of the Radiation Therapy Questionnaire is necessary before using this measure as a screening instrument of radiation therapy knowledge.

Introduction

Stress and Anxiety

The belief that stress and anxiety affect how we think and act is widely accepted by our society. It is commonplace to hear that individuals experiencing stress may need to reduce their anxiety in order to cope effectively with their situations. But what is the stress and anxiety that has become so common today and how does it affect us?

Stress has been defined as any demand placed upon an individual that causes a mental or somatic reaction (Selye, 1982). As a result of this stress, an individual may experience anxiety, or a state of tension and expectation of disaster (Wolman, 1994). Although the body of the individual appears to react to any stress in a similar manner (ie. biochemical changes), there are a variety of situations which may produce this stress: emotional arousal, effort, fatigue, pain, fear, concentration, humiliation, loss of blood, and great success (Selye, 1982). Selye (1982) categorized these situations into two types of experiences; (1) eventful experiences, which include short-term situations such as a marriage, death of a spouse, and divorce,

and (2) repeated or chronic experiences, which are more persistent, such as marital relations and occupational experience. Selye (1982) argued that the repeated or chronic experiences, such as treatment of cancer, have more of a stressful impact on the individual than the eventful experiences.

Anxiety and stress may have severe consequences for the individual experiencing them. For example, Wolman (1994) reported that anxiety-ridden individuals are continuously unhappy, worrisome, and pessimistic. He also found that anxiety affected their self-esteem, resulting in feelings of weakness, inferiority, and helplessness. Anxiety has also been reported to cause physiological symptoms such as arrhythmia, nausea, loss of appetite, headaches, and sleep disturbances (Wolman, 1994). In addition, Janis (1982) found that stress often affects one's ability to problem-solve and to make decisions. He found that when stress levels are very high an individual is likely to terminate the decisional process prematurely, without generating all of the alternatives or analysing all of the available information. Thus, the notion that society has of stress and anxiety may be correct. Individuals experiencing stressful situations

such as a health problem may need to reduce their anxiety levels in order to make the best decisions regarding their situations.

Anxiety and Medical Patients

Just as psychological factors have been thought to contribute to health problems, health factors have been shown to contribute to psychological problems. Carver, Scheier and Pozo (1992) demonstrated that it is possible for serious health problems to produce a variety of psychological and behavioural responses in the patient. Patients who are confronted with stressful medical procedures often experience considerable anxiety, tension, worry, apprehension, and general discomfort (Kendall, 1983). This is not surprising considering the lack of information given to patients about procedures and side effects, not to mention the fact that many of the procedures invade patients' physical and psychological boundaries. Specifically, patient anxiety has been attributed both to the environment (e.g., hospital, individuals involved) and to procedures (e.g., colonoscopy, cardiac catheterization, etc.) (Kendall, 1983; Welch-McCaffrey, 1985). At times, the intensity of this anxiety may be so severe that it interferes with the proper execution of the procedure (Kendall, 1983; Welch-

McCaffrey, 1985).

Anxiety in Patients with Cancer

Anxiety and Treatment of Cancer

People with cancer have been described as "rather frightened individuals whose lives have become ones of anxiety, uncertainty, pain, and withdrawal" (Mandell, Hazra & Tomlin, 1986-87, p. 79). Several researchers have offered some explanations for the increased anxiety experienced by people with cancer. Welch-McCaffrey (1985) has suggested that since cancer does not usually follow a clear course, anxiety may stem from the patient's inability to know whether it is cancer and, if it is, whether it will reappear. Decker, Cline-Elsen and Gallagher (1992) posit that the treatment itself, which is intended to control or cure the disease, is another potential source of anxiety for the patient. Radiation therapy is an example of such a treatment since it usually involves daily treatment and lasts several weeks. In fact, it may be one of the more physically and psychologically distressing treatments which patients must endure (Graydon, 1988; Decker, Cline-Elsen & Gallagher, 1992).

Some researchers have examined the effect of treatment on the

patient's psychological well-being. Comparisons of inpatients receiving treatment for cancer and inpatients receiving treatment for non-malignant conditions have revealed that the former report greater anxiety and often suffer from depression, insomnia, and irritability (Andersen, Karlsson & Anderson, 1984; Srivastava, Rai, Agrawal & Srivastava, 1987; Cull, 1990). This may be due to the fact that patients with cancer must often deal with several stressful situations, including frequent diagnostic procedures (e.g., scans, radioactive dyes, biopsies), waiting for results, regular visits with physicians, waiting for treatment decisions, hospital stays, nutritional problems, side effects, and isolation due to such treatment procedures as radiation therapy. (Welch-McCaffrey, 1985; Coscarelli Schag & Heinrich, 1989; Holland, 1989). It is also likely that the stigma our society attaches to cancer increases the anxiety of many patients and their families as they worry about being accepted by those around them. (Welch-McCaffrey, 1985; Holland, J.C., 1989).

The emotional state of radiation therapy patients has been the focus of several studies with one group of researchers describing it as a state of shock (Mandell, Hazra & Tomlin, 1986-87). Andersen,

Karlsson and Anderson (1984) found radiation therapy patients to experience distress throughout the course of their treatment. Rather than adapting to treatment, these patients were as anxious about the second and subsequent treatment sessions as they were about the first. Other studies have shown that radiation therapy patients' anxiety levels tend to decrease after the first treatment and increase immediately following treatment (Andersen & Tewfik, 1985; Carpenter, Morrow & Schmale, 1989).

Radiation therapy patients have been thought to progress through various stages or emotional states. Mandell, Hazra and Tomlin (1986-87) used Kubler-Ross' (1969) work to describe three stages through which radiation therapy patients appear to progress: (1) denial and isolation, (2) anger, bargaining, and depression, and (3) acceptance. According to Holland (1989) many patients, upon learning of their cancer diagnosis, recurrence, or treatment failure, experience a period of shock and disbelief followed by a period of turmoil (e.g., anxiety and depressive symptoms, irritability, and appetite and sleep disturbances).

Consequences of Anxiety

Anxiety would seem to be a natural reaction for individuals faced with danger (e.g., a life-threatening illness), however, reducing high levels of anxiety has been shown to benefit patients. Cull (1990) found that patients with low levels of anxiety knew more about cancer and were more likely to engage in health-related behaviours. Some researchers suggest that even moderate levels of anxiety may be beneficial for patients in terms of lengthening periods of survival, maximizing attention to important information, promotion of confidence regarding the availability and skill of their medical team, and warding off feelings of helplessness (Andersen & Tewfik, 1985; Leigh, Percarpio, Opsahl & Ungerer, 1987).

Although the anxiety levels experienced by patients with cancer may vary, there are many patients who experience serious anxiety. Coscarelli Schag and Heinrich (1989) suggest that although minimal anxiety may result in few, if any, negative consequences for the patient, high anxiety levels may have severe consequences. Some of these consequences include: decreased psychological well-being, decreased quality of life, work problems, missed appointments, and

noncompliance in terms of treatment (Masur, 1981; Gill, 1984; Wellisch, 1984). Graydon (1988) found the level of emotional distress at the beginning of radiation therapy to be the only variable which predicted patient functioning following treatment. His findings showed that patients who were highly distressed (e.g., anxious) when they began radiation therapy were likely to function more poorly after treatment than those who were not distressed when they began treatment (Graydon, 1988). In addition, severe anxiety has been shown to interfere with immune functioning and may have an impact on survival (Herberman & Ortaldo, 1981; Riley, 1981; Locke, Kraus, Lesserman, Hurst, Heisel & Williams, 1984). An examination of specific sources of patient anxiety would enable professionals to develop strategies for reducing this anxiety.

Factors that Influence Patient Anxiety

Psychological factors. Psychological factors such as prior emotional adjustment and coping skills may influence the level of anxiety experienced by the patient. For example, patients with pre-existing general anxiety disorders or phobias, especially those related to needles, physicians, and hospitals, may experience intensified

anxiety during treatment (Holland, 1989). Holland (1989) also suggested that patients with claustrophobia may experience difficulty with procedures which involve confined spaces (e.g., scanning devices, radiation therapy rooms) and that patients with hypochondriasis may experience higher levels of anxiety due to misinterpretation of every sensation, especially side effects and symptoms. Additionally, cancer treatment may activate the anxiety component of post traumatic stress in patients who have had a close encounter with death (Holland, 1989).

The individual's ability to cope with previous stress-provoking situations and the coping strategies used may greatly affect the way in which he/she deals with the cancer experience. Individuals experiencing serious illness have been found to utilize a variety of coping strategies including denial, information seeking, avoidance, thinking about past good times, learning illness related procedures, blaming others, and seeking the support of others (Weisman & Worden, 1976; Moos & Tsu, 1977; Cohen & Lazarus, 1979). Krause (1993) suggested that there are four types of coping: active-cognitive, active-behavioural, problem-focused, and emotion-focused.

Active-cognitive coping involves attempts to manage one's appraisal of a stressful event, such as considering several alternative methods of handling the situation, while active-behavioural coping involves overt behavioural attempts to deal with the problem (e.g., talking with an expert) (Krause, 1993). Any efforts to eliminate the sources of stress would be considered problem-focused coping while attempts to manage emotional stress and to maintain equilibrium would be emotion-focused coping (Krause, 1993).

Lev (1992) examined coping strategies used by patients undergoing cancer treatment and found that these patients could be divided into three groups according to coping strategies used: preparers, avoiders, and suppressors. Preparers tended to use specific strategies, such as breathing techniques, dissociation, prayer, imagery, and yoga to prepare themselves for treatment. They also tended to confront their diagnoses and to create meaning by comparing themselves to others worse off than they, by describing an area of better functioning, or by believing that something positive would result from the experience. Avoiders used more social supports and tended to think about their treatment more. They also used

avoidance and denial as coping strategies and were unable to describe how they dealt with previous stress. Suppressors tended to use strategies to avoid thinking about treatment and used less social support. They did not see themselves as preparing for treatment. Identifying the coping strategies used by the patient in the past would allow professionals to anticipate how the patient might cope with the cancer experience and enable them to provide effective support.

Social factors. Individuals with cancer often turn to friends, family, and other significant individuals for support as they progress through the various stages of their illness. However, some patients would like health care professionals to recognize the importance of these individuals and to involve them in the treatment process. For example, Corney, Everett, Howells, and Crowther (1992) found that 38% of the women in their study felt that an effort should be made to include spouses in discussions about illness and treatment. Sixty-six per cent of these women reported being alone when they received the cancer diagnosis and two-thirds of them indicated that they would have preferred to be accompanied by a friend or relative. This study suggests that in order to help the patient through this situation, health

care professionals who know they will be giving a cancer diagnosis should advise patients to bring a friend or relative. Some of these women also suggested that the patients and relatives should be given some time to recover from the diagnosis in a quiet room and allowed the opportunity to ask questions at a later time (Corney, Everett, Howells, & Crowther, 1992).

While many patients may be satisfied with the support provided by friends and relatives, others do not have this support or they require additional support. Some patients seek support from health care professionals and other patients, while others prefer more formal support in the form of counselling. Forester, Kornfeld and Fleiss (1985) posit that psychotherapeutic intervention can reduce physical and emotional symptoms thereby improving quality of life. However, there are many types of psychological interventions, each differing in terms of goals and techniques. The most appropriate approach depends upon the specific problems of the patient and the type of disease (Trijsburg, van Knippenberg, & Rijpma, 1992). Trijsburg, van Knippenberg and Rijpma (1992) found psychological treatment to benefit patients with cancer in many ways.

Medical factors. Much of the anxiety experienced by patients with cancer can be attributed to medical factors. Holland (1989) identified poorly controlled pain as one of the primary sources of anxiety for these patients. Abnormal metabolic states, such as hypoxia, sepsis, hypoglycaemia, and hormone secreting tumours have also been associated with patient anxiety (Holland, 1989). Occasionally, medications that are used to treat cancer have also been known to produce anxiety symptoms. Cortico-steroids, for example, can produce such symptoms as motor restlessness and agitation (Holland, 1989). If a patient requires hospitalization, experiences such as having strange roommates, multiple nurses, being confined to a bed, being hooked up to various tubes, call lights not being answered, and infusion pumps beeping may contribute to increases in anxiety (Welch-McCaffrey, 1985).

Side effects are often a source of considerable anxiety among patients receiving radiation therapy. These side effects depend upon the treatment site and often include such symptoms as fatigue, skin irritation, anorexia, sore throat, cough, changes in saliva, difficulty swallowing, diarrhea, and nausea (Eardley, 1988). Although many

patients experience side effects as a result of radiation therapy, Eardley (1988) found that one-third of her sample were unaware that they would experience any side effects. If these side effects are interpreted as signs of treatment failure or the spread of cancer, the patient may experience considerable distress (Mandell, Hazra & Tomlin, 1986-87; Christman, 1990). Furthermore, patients who are not warned of possible side effects may become disappointed or angry thereby making it difficult to question their physicians or to accept their explanations (Peck & Boland, 1977). If patients are prepared prior to their first encounter with radiation therapy, they may be more likely to correctly interpret side effects thereby decreasing their uncertainty and anxiety (Mandell, Hazra & Tomlin, 1986-87; Christman, 1990).

Uncertainty. Uncertainty, or "the inability to determine the meaning of events," has been identified as a source of distress for many patients and has been shown to affect patients' social relationships, the meaning of their lives, their values, their attitudes, and future expectations (Mishell & Braden, 1988; Corney, Everett, Howells & Crother, 1992). Holland (1989) suggested that anxiety

may be a by-product of patients' uncertainty about the future or the effectiveness of treatment. Since patients have been shown to experience the most distress during times of uncertainty (Corney, Everett, Howells & Crother, 1992), it may be helpful to identify the situations during which patients are most likely to be uncertain in order to alleviate some of the distress.

Welch-McCaffrey (1985) identified the period around the time of diagnosis as being anxiety provoking since the patient is likely wondering whether it is cancer. Corney, Everett, Howells and Crother (1992) reported that 39% of the women with gynaecological cancer in their study found the period between realizing something was wrong and the actual diagnosis to be most distressing while 37% considered the period between diagnosis and surgery to be most distressing. Another study (Lilley, 1991) found that during the time between finding out they needed radiation therapy and beginning treatment, patients described feelings of moderate anxiety or concern as well as more negative feelings such as frightened and petrified. Since 36% of these patients did not know what to expect and 14% expected the treatment to be worse than it was (Lilley, 1991), it is possible that the

anxiety may have been due to patient uncertainty.

The period immediately following active treatment is also fraught with ambivalence as the patient is often uncertain about the status and outcome of their illness and may also worry that the cancer may recur (Carpenter, Morrow & Schmale, 1989; Holland, 1989). This may be particularly evident in radiation therapy patients since the effects of the radiation may not be determined until months after the completion of treatment (Andersen & Tewfik, 1985). In a recent study (Carpenter, Morrow & Schmale, 1989), patients who had just completed radiation therapy reported having more difficulty adjusting to their illness than patients who were further away from treatment. Peck and Boland (1977) also found that many of the patients in their study experienced a significant degree of anxiety following treatment. However, they suggest that the actual experience of treatment (e.g., procedures and examinations) may have taxed the individual's ability to cope with stress thereby adding to his/her prior level of anxiety and depression (Peck & Boland, 1977).

Radiation therapy concerns. In terms of radiation therapy, several studies have examined the underlying concerns, or

misconceptions, which may contribute to anxiety in radiation therapy patients. Peck and Boland (1977) found that many patients believe radiation therapy to be reserved for the unlucky and the advanced cases. Andersen, Karlsson and Anderson (1984) and Eardley (1988) identified some of the most common concerns expressed by radiation therapy patients. These include being burned, becoming radioactive, radiation sickness, sterility, whether the treatment will cause cancer, hair loss and other side effects, whether the treatment hurts, lying under the machine, and feeling tense during treatment. The anxiety caused by these concerns or misconceptions may be alleviated by proper identification and accurate information.

Effect of Information on Patient Anxiety

Krause (1993) has noted that one of the most important goals for professionals involved with patients with cancer may be to decrease their uncertainty and to instill in them a sense of hope. Providing patients with information relevant to their illness and its treatment may well be a means of achieving this goal. Information provides patients with a structure for interpreting their cancer experiences (McHugh, Christman & Johnson, 1982) and has been

shown to benefit patients in several ways. Jacobs, Ross, Walker and Stockdale (1983) found education to decrease the incidence of depression, treatment problems, and "feelings of life disruption" among patients. In addition, informed individuals have been shown to work cooperatively with their physicians and other medical personnel to achieve positive outcomes and tend to be more hopeful (Harris, 1992). Furthermore, patients' levels of stress, anxiety, and fear have been shown to decrease as a result of information (Cassileth, Zupkis, Sutton-Smith & March, 1980; Wallace, 1984; Dodd, 1987). Most patients with cancer desire information about their disease and its treatment and will approach all possible sources to receive that information (Newall, Gadd & Priestman, 1987). However, many do not acquire or retain the information they need and the resulting, ongoing emotional distress may negatively affect the patient's health and quality of life (Dodd, 1982).

Examinations of whether patients feel they received enough information about their condition have revealed that few feel well-informed (Cassileth, Volckmar & Goodman, 1980; Harris, 1992). A study of hospital outpatients and caregivers found that 54% of their

subjects felt they knew enough about their situation while 42.3% wanted to know more and 3.6% were generally curious (Harris, 1992). In other words, 46% of these patients would have preferred more information. In an earlier study, few new patients felt well-informed about radiation therapy regarding its side effects and the purpose of treatment. In fact, both experienced and new patients wanted more information about this treatment (Cassileth, Volckman & Goodman, 1980). Lilley (1991) found that fewer than 10% of the radiation therapy patients in her study had any meaningful or accurate information about the treatment before it began. Sixty percent of these patients were in favour of receiving a small information booklet outlining exactly what radiation therapy is and what it does, what treatment is like (including procedures and routines), how the machines work, possible long-term effects, side effects, and self-care techniques. The results of these studies indicate that many patients need more information than that which is presently available and that this information is more useful if provided before the onset of treatment (Lilley, 1991).

Having discovered, in an earlier study, that the majority of

radiation therapy patients had been surprised by some aspects of the treatment (Eardley, 1985), Eardley (1988) provided another sample of radiation therapy patients with an information booklet. She found that more patients who had received the booklet were satisfied with the amount of information obtained than the patients who did not receive the booklet. Less than one in five of the patients who did not receive the booklet felt they knew enough about radiation therapy and when given the opportunity to obtain a booklet, 89% did so. This researcher suggests that patients' desire for information may be a psychological coping mechanism rather than a result of their lack of information. For example, these patients may actually be seeking concern, support of their hopes, and confirmation of their level of knowledge (Eardley, 1988). Regardless of the reasons patients desire information, improved information may alleviate anxiety experienced due to treatment, tests, and procedures (Lilley, 1991).

While many patients want honest and complete information about their illness and its treatment, there are some who want just the basic information and others who prefer little or no information at all (Jones, McClelland, Shani, Pellegrini, Grover, & Engstrom, 1982;

Lilley, 1991). Other patients would rather receive the information through a significant other such as a spouse (Welch-McCaffrey, 1985). Consequently, rather than assuming that all patients want to be fully informed, asking them what they want to know about their illness and treatment would likely result in patients receiving more of the facts they desire (Reynolds, Sanson-Fisher, Poole & Byrne, 1981). Patients, family members, and professionals in one study (Jones, McClelland, Shani, Pellegrini, Grover & Engstrom, 1982) suggested some types of information which patients may find beneficial: reasons for treatment, professionals and procedures involved, side effects, expected outcomes, when they can expect results, common concerns of patients and family members, and support services available for psychosocial issues. Some radiation therapy patients suggested that it would be helpful to provide information about what the treatment is like and what it does, procedures and routines, how the machines work, long-term effects, side-effects, and self-care (Lilley, 1991). McHugh, Christman, and Johnson (1982) also outlined the type of information that should be given to patients: physical sensations should be described not evaluated (e.g., aching or burning not

dreadful), patients should be told what causes the sensation, and patients should only be prepared for the aspects of the experience noticed by the majority of the population.

It is generally accepted that providing patients with information about their illness is helpful in many ways, however, there are several methods of disseminating that information. Video tapes, booklets, verbal communication with experts (e.g., physicians, nurses), interaction with computers, as well as combinations of the above are examples of these methods. Peck and Boland (1977) found that patients appear to be "stunned" and reluctant to ask questions during their first visit, which may be due to high levels of anxiety interfering with their ability to understand and retain information (Welch-McCaffrey, 1985). Therefore, it may be helpful for the radiation therapist to allow plenty of time for the initial meeting and to plan opportunities for repetition (Peck & Boland, 1977). Hansen (1990) also suggests that many patients may prefer a reference manual over an educational program because they can have access to important and relevant information when they require it. Any of these approaches may be useful to different patients, depending upon their

information preferences and their learning styles (Watson, 1982). Watson (1982) suggests that asking a patient to describe how they would go about learning something new is an effective method of selecting an appropriate educational approach for that person.

Summary

It is generally accepted that medical patients, especially those with cancer, tend to experience anxiety as a result of their illness and its treatment. However, the levels of anxiety appear to vary according to the individual's ability to cope with his/her condition (Weisman & Worden, 1976; Moos & Tsu, 1977; Cohen & Lazarus, 1979; Lev, 1992; Krause, 1993), available support and information (Cassileth, Zupkis, Sutton-Smith & March, 1980; McHugh, Christman & Johnson, 1982; Jacobs, Ross, Walker & Stockdale, 1983; Wallace, 1984; Forester, Kornfeld & Fleiss, 1985; Dodd, 1987; Corney, Everett, Howells & Crowther, 1992; Harris, 1992; Trijsburg, van Knippenberg & Rijpma, 1992), as well as severity of illness. Although low to moderate levels of anxiety may be beneficial to the patient, high levels may negatively affect the patient in terms of physical symptoms, ability to retain information, immune functioning, overall functioning,

and possibly even survival (Herberman & Ortaldo, 1981; Mazur, 1981; Riley, 1981; Gill, 1984; Locke, Kraus, Lesserman, Hurst, Heisel & Williams, 1984; Wellisch, 1984; Graydon, 1988; Coscarelli Schag & Heinrich, 1989). Therefore, there appears to be a need for identifying patients who are experiencing, or are at risk for experiencing, high levels of anxiety in order to improve patient functioning by reducing anxiety.

Once patients who are experiencing high levels of anxiety have been identified, steps may be taken to reduce this anxiety. Patients can be taught to use assertion skills, stress management, problem-solving, imagery, positive self-talk, self-hypnosis, relaxation, distraction, and meditation to successfully deal with anxiety (Lev, 1992; Coscarelli Schag & Heinrich, 1989). Holland (1989) suggests that several medications are also very effective in reducing anxiety. Many patients prefer to cope with a stressful event by rehearsing, sharing concerns, expressing feelings, requesting support, communicating with health care professionals, and seeking information (Krause, 1993; Holland, 1989). However, the patient's ability to cope with cancer and the coping strategies used may not

only be influenced by his/her feelings about cancer prior to diagnosis but also by the strategies used to deal with previous anxiety (Welch-McCaffrey, 1985).

Since patient uncertainty has been associated with high levels of anxiety, providing patients with accurate information about their illness and its treatment would appear to be beneficial. Many patients have been found to report dissatisfaction with the amount of information they have received about their illness (Cassileth, Volckmar & Goodman, 1980; Lilley, 1991; Harris, 1992). This could be attributed to a lack of information provided by the professional or to the patient's inability to retain information as a result of high levels of anxiety (Welch-McCaffrey, 1985). However, some patients prefer to receive little or no information about their illness and the professional must be careful to assess the patient's informational preferences (Reynolds, Sanson-Fisher, Poole & Byrne, 1981; Jones, McClelland, Shani, Pellegrini, Grover, & Engstrom, 1982; Welch-McCaffrey, 1985; Lilley, 1991). Patients who do not receive the amount of information they desire often turn to family and friends for the information. Unfortunately this may result in the dissemination of inaccurate

information, or misconceptions, and the nature of this information may be anxiety provoking in itself.

Aims of the Present Study

The purpose of the present study is two-fold: 1) to determine whether there is a relationship between patients' misconceptions about radiation therapy and their levels of anxiety and 2) to determine the usefulness of a brief screening instrument in the identification of patients currently experiencing high levels of anxiety or who may be at risk for experiencing high levels of anxiety. Several studies have identified concerns and beliefs of many radiation therapy patients including being burned, becoming radioactive, sterility, that the treatment is painful, and that the treatment is reserved for the advanced cases (Eardley, 1988; Peck & Boland, 1977; Andersen, Karlsson & Anderson, 1984). Anecdotal reports from radiation therapists indicate that many new patients enter treatment with numerous concerns and beliefs, many of which are unfounded or erroneous. It is hypothesized that as patients' knowledge about radiation therapy increases, as measured by the Radiation Therapy Questionnaire, their levels of anxiety will decrease, as measured by

the State Trait Anxiety Inventory.

Methods

Characteristics of the Sample

Patients with cancer who were about to receive radiation therapy for the first time at the Thunder Bay Regional Cancer Centre were solicited as participants for this study. Although 154 patients were eligible to participate in the study, fifty patients actually agreed to take part. Many of the patients reported feeling too ill or upset to complete the questionnaires at that time. Other patients did not receive radiation therapy after seeing the radiation oncologist while some failed to complete the post-treatment questionnaires (e.g., did not have time, missed a significant number of items, missed by the radiation therapists). In total, twenty-seven participants completed both pre- and post-treatment questionnaires and were included in this study.

The twenty-seven participants had a mean age of 64, were fluent in verbal and written English, and were receiving external radiation therapy only. Fifteen females and 12 males participated in the study. The mean scores for the General Health Questionnaire

indicated that the sample did not report more psychiatric symptoms than expected for the population.

Measures

State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Luchene, 1983)

This test consists of two twenty-item questionnaires which assess state anxiety and trait anxiety. State anxiety is an emotional reaction which tends to vary in every situation while trait anxiety is a personality characteristic and tends not to vary over time (see appendix A). One might expect a relationship to exist between higher state anxiety and limited patient knowledge of radiation therapy.

The General Health Questionnaire (GHQ; Goldberg, 1978)

This measure assesses an individual's ability to function and the level of distress experienced as a result of changes in one's condition. The four elements of distress are depression, anxiety, social impairment, and hypochondriasis. This is a self-administered instrument which consists of 30 items (see appendix A). This measure was included to evaluate the extent of psychiatric symptoms present in this sample.

Radiation Therapy Questionnaire (RTQ)

This instrument consists of 20 items and was developed for this study in conjunction with an experienced radiation therapist. Prior to the onset of this study, this questionnaire was administered to five patients who were receiving radiation therapy to ensure that none of the items were upsetting for the patients or difficult to read or understand. This questionnaire was used to assess patients' knowledge and beliefs about radiation therapy (see appendix A).

Procedure

Patients arriving for their first appointment with a radiation oncologist were approached by one of two nurses and asked if they would be interested in participating in the study. Interested patients were handed a package containing a letter of consent (see appendix B) and the three questionnaires, which they completed prior to meeting with the radiation oncologist. On the last day of treatment, each patient's radiation therapist asked them to complete the same questionnaires again. Patients who did not complete the questionnaires at that time received them in the mail, some of which were completed and returned.

Results

The mean pre-treatment state anxiety level of the females in this sample was significantly higher than that of the working adult (female) population as reported in the Manual for the State-Trait Anxiety Inventory (Spielberger, 1983), $z(464) = 2.90$ $p<0.05$ (Table 1). The mean state anxiety did not differ significantly for the males of these samples nor did it differ between the males and females of the present sample. T-tests revealed that pre-treatment state anxiety scores were significantly higher than post-treatment state anxiety scores $t(23) = 2.17$ $p<0.05$ (see Table 2 for means).

State anxiety correlated significantly with the General Health Questionnaire both at pre-treatment $r(27) = .6946$ $p<.001$ and at post-treatment $r(22) = .6143$ $p<.05$ (Tables 3 and 4).

Item-total correlations were used to examine the Radiation Therapy Questionnaire more closely (see Table 5). Items six, eight, nine, and 12 did not correlate significantly with the total score. These items were removed and the new total scores (e.g., correct, don't know, and incorrect) were used in further analyses.

No significant correlations were found between pre-treatment

state anxiety and pre-treatment correct scores on the Radiation Therapy Questionnaire and the same was true for post-treatment measures. However, significant differences were found between pre- and post-treatment scores on the Radiation Therapy Questionnaire. The number of correct responses increased significantly following treatment $t(25) = -6.66$ $p < .000$. Although the number of "don't know" responses decreased significantly following treatment $t(25) = 4.99$ $p < .000$, pre- and post-treatment incorrect responses did not differ significantly (see Table 2 and Figure 1 for means).

Table 6 outlines the frequency of correct responses for each item of the Radiation Therapy Questionnaire. An increase in the frequency of correct responses, from pre- to post-treatment, was observed in 19 of the 20 items. One item, item two, did not change from pre- to post-treatment. Items one, three, five, six, seven, eight, nine, ten, 11, 12, 13, 14, and 20 showed a larger increase at post-treatment than the other items (see table 6).

Patients were asked, both at pre- and post-treatment, to indicate whether they had questions about radiation therapy (e.g., none, very few, some, quite a few, or many). Although patients

reported fewer questions about radiation therapy after treatment (Figure 2; see Table 7), the number of questions did not differ significantly from pre- to post-treatment. The number of questions patients had about radiation therapy at pre-treatment correlated significantly with the pre-treatment General Health Questionnaire score $r = .4676$ $p < .05$ but not with any other measure. However, at post-treatment the number of patient questions correlated significantly with state anxiety, $r = .4489$ $p < .05$, alone (Table 4).

Six of the 27 subjects recorded comments on the Radiation Therapy Questionnaire. The pre-treatment comments appeared to pertain to patients' uncertainty about the treatment (e.g., "I have very little knowledge about radiation therapy.") and their reluctance to receive it (e.g., "I would prefer not to have radiation therapy--if I had a choice."). The post-treatment comments appeared to indicate that patients were wondering if the treatment was effective (e.g., "When will I know if the tumour has shrunk?", "I just hope that the treatment is effective." and "I feel that the treatment has accomplished its aim.").

Discussion

It is interesting to note that the mean state anxiety level of the females in the present sample was higher than that of the females in Spielberger's (1983) working adult population, but that the males' mean state anxiety level did not differ significantly. On the other hand, the males and females in the present study did not differ significantly regarding state anxiety. Although the present sample size was small, the results of this study appear to suggest that the males in this sample were less anxious than the females. However, it is also possible that they were less likely to recognize or acknowledge their anxiety.

The significant decrease in state anxiety which was noticed after treatment appears to indicate that something about the standard treatment process resulted in lower anxiety levels. Although this finding is inconsistent with the research of Andersen, Karlsson and Anderson (1984) who found that patient anxiety increased following treatment, other studies have observed a decrease in patient anxiety after the first radiation therapy session (Andersen & Tewfik, 1985; Carpenter, Morrow & Schmale, 1989). It may be that the patients in

the present study no longer had to wonder exactly what radiation therapy would be like or that they finally felt as though something was being done about their cancer. In addition to the treatment itself, a decrease in anxiety may also have occurred as a result of patients receiving support from friends, family, or other professionals regarding their medical situation. It is also possible that time itself resulted in decreased anxiety levels for these patients. However, it is difficult to ascertain exactly what each patient experienced during the time between testings and to determine which experiences may have contributed to this decrease in anxiety.

The significant correlation found between the General Health Questionnaire and state anxiety was to be expected since part of this questionnaire measures anxiety (Goldberg, 1978). The fact that the pre- and post-treatment correlations did not differ significantly suggests that it may be possible to use the General Health Questionnaire in place of the State Trait Anxiety Inventory. However, more research is necessary before making this determination.

The significant pre-treatment correlation between the General Health Questionnaire and the number of radiation therapy questions

reported by patients is an interesting finding since the number of questions did not correlate with state anxiety at pre-treatment. This finding appears to indicate that the number of patient questions may be related to an element of distress other than anxiety (e.g., depression, social impairment, and hypochondriasis) (Goldberg, 1978). However, post-treatment correlations indicate the reverse, that there may be a relationship between state anxiety and the number of patient questions but not a relationship between the number of questions and the General Health Questionnaire. Future research may serve to clarify this issue.

It seems as though the Radiation Therapy Questionnaire may have been capturing two different constructs: knowledge as measured by the 20-item questionnaire and uncertainty as measured by the number of patient questions. Though the present study found no significant relationship between patient knowledge and state anxiety, these results suggest that a link may exist between uncertainty and distress, including anxiety.

It is important to more closely examine the change in radiation knowledge that was noticed in this study. The elevated post-

treatment scores on the Radiation Therapy Questionnaire appear to indicate that the patients acquired information about radiation therapy through their treatment experience. It was also interesting to note that although these patients chose "I don't know" for fewer items after treatment, they still tended to respond incorrectly to the same number of items. These patients may have realized that they were lacking specific radiation therapy knowledge (ie., the "don't know" items) and either actively searched for the information (e.g., by asking somebody, reading, etc.) or payed closer attention to specific information during treatment. In addition, it is possible that the number of incorrect responses did not change because patients thought the information was correct and did not seek clarification.

A qualitative examination of the Radiation Therapy Questionnaire items also indicated that patients acquired information about radiation therapy by experiencing the treatment. It appears that the greatest increases in knowledge (ie., correct responses to the items) involved the items which captured aspects of radiation therapy which are likely to be experienced by most patients receiving the treatment. For example, item number nine "There are special steps I

must take to care for my skin during treatment." and item number ten "Radiation therapy is not painful." would be easily answered once an individual has experienced radiation therapy. In order to learn more about patients' learning processes, further research should include in-depth interviews which focus on the specific changes in patient knowledge. Specific items might be shown to the patient in order to determine how the individual obtained or did not obtain the correct information, and why.

The fact that these patients reported having fewer questions about radiation therapy after treatment appears to indicate that they increased their knowledge about radiation therapy during the course of treatment. However, since there was no correlation between this and the Radiation Therapy Questionnaire it may simply show that the patients believed that they increased their knowledge. Before treatment began, 77.7% of the patient had questions about radiation therapy (Table 7) which is higher than the findings reported in other studies (Harris, 1992). After treatment, 55.5% of the patients had questions about radiation therapy. Although this decrease was not significant, the trend was apparent and a larger sample size may have

resulted in a significant finding. However, from a clinical perspective, 55.5% still seems high. Why did more than half of the patients still have questions after completing the treatment? In addition, the comments recorded by patients at post-treatment indicated that some of the patients had serious concerns and questions about the effectiveness of treatment. One might expect the patients who did not record comments to have similar concerns and we cannot be certain that these had been addressed. It is imperative that future research examine patients' informational needs and the resulting implications for improved patient care.

Although it was originally hypothesized that anxiety was related to knowledge about radiation therapy, the results of the present study appear to indicate that increased knowledge about radiation therapy does not necessarily result in lower anxiety levels in patients. However, since the Radiation Therapy Questionnaire has not yet been established as a valid measure of radiation therapy knowledge, these results must be interpreted cautiously. In addition, it is possible that further contact with the patients would have revealed an increase in anxiety later as reported in other studies (Andersen & Tewfik, 1985;

Carpenter, Morrow & Schmale, 1989).

It is important to note that this study was limited in a number areas. Firstly, the sample size was small due to low accrual and high attrition rates. Since many patients were quite ill and/or upset, few were able to complete the questionnaires. Also, patients were not included in the study if they did not eventually receive radiation therapy or if they did not complete the post-treatment questionnaires (e.g., did not have time, missed a significant number of items, missed by the radiation therapists).

Another limitation of this study was the fact that there were only two testings, pre- and post-treatment. Several testings throughout the course of treatment and beyond may have provided a more accurate picture of what happens to patient anxiety and knowledge levels as they experience the treatment. Further research might also include the gathering of more detailed information regarding the patients' personal experiences (e.g., journals) in order to examine how different experiences may relate to such factors as anxiety and knowledge.

The third limitation of this study was the use of the Radiation

Therapy Questionnaire as a measure of radiation therapy knowledge. Since an item-total correlation was the only analysis used to examine the questionnaire (due to small sample size), one cannot be certain that it is actually measuring this type of knowledge. Further research is needed regarding the psychometric properties of this instrument. Also, the focus of this questionnaire appears to be objective knowledge (e.g., "Side effects that patients may experience depend upon the site of treatment.") as opposed to subjective knowledge (e.g., feelings, beliefs, etc.) about the treatment. A questionnaire containing items that address both areas may be related to patient anxiety since it may be more likely to capture how patients feel about their knowledge of radiation therapy. Once this questionnaire has been validated, it may serve as a screening tool for identifying the type of information desired by patients.

It may be beneficial for future research to actively educate a group of radiation therapy patients about the treatment and to compare this group's anxiety levels with those of patients not receiving additional education. In addition, adding a group who receives both emotional/social support in conjunction with education

might also yield interesting results.

Although this study just touches the surface, its findings suggest that there is little or no relationship between patient anxiety and radiation therapy knowledge. The utility of indiscriminantly educating patients regarding health care issues (ie., treatment, diagnosis, etc.) needs to be examined more closely. Perhaps identifying those patients who desire information, as well as the type of information required, would be more beneficial to the patient and more cost effective for the health care system. A screening instrument may be an effective method of gathering this information.

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Table 1

Mean state anxiety for the present sample and Spielberger's samples

	Present Sample			Working Adults			
Gender	Mean	SD	Cases	Mean	SD	Cases	Z-Stat.
Male	38.33	13.48	12	35.72	10.40	1387	0.669
Female	48.60	17.79	15	35.20	10.61	451	2.900*

*$p<0.05$

Note. Working adults data are from "Manual for the State-Trait Anxiety Inventory" by C.D. Spielberger, 1983.

Table 2

Pre- and post-treatment means for all measures

Measures	Pre-treatment		Post-treatment	
	Mean	SD	Mean	SD
State	42.79	16.62	37.96	14.92
GHQ	6.48	6.31	5.68	6.54
RTQ-cor.	8.84	3.45	12.88	2.23
RTQ-wron.	2.12	1.63	1.58	1.14
RTQ-d.kno	4.88	3.85	1.46	2.14
# RTques.	1.82	1.18	1.18	1.26

Note. RTQ-cor = RTQ-correct responses. RTQ-wron. = RTQ-incorrect responses. RTQ-d.kno. = RTQ-don't know responses.

Table 3

Pre-treatment intercorrelations between measures

	RTQ	State	GHQ	No. Ques.
State	-.2605	--		
GHQ	-.2882	.6946**	--	
No. Ques.	-.2049	.2176	.4676*	--

*$p<.05$ **$p<.001$

Table 4

Post-treatment intercorrelations between measures

	RTQ	State	GHQ	No. Ques.
State	-.2602	--		
GHQ	-.0788	.6143*	--	
No. Ques.	-.0500	.4489*	.3055	--

*$p<.05$

Table 5

Radiation Therapy Questionnaire (pre- scores) item-total correlations

Items	Total Score	
	r	p
1	.3751	.013
2	.5525	.000
3	.5626	.000
4	.5613	.000
5	.4323	.004
6	.2676	.087
7	.3927	.009
8	.0865	.581
9	.2578	.095
10	.6312	.000
11	.5126	.000
12	.2369	.126
13	.3066	.048
14	.3139	.040
15	.5599	.000
16	.5508	.000
17	.5256	.000
18	.6541	.000
19	.4317	.004
20	.4182	.005

Table 6

Frequencies of pre- and post-treatment correct responses for each Radiation Therapy Questionnaire (RTQ) item

RTQ Items	Freq. of correct resp.	
	Pre	Post
1. It is my understanding that radiation therapy patients usually experience radiation sickness.	11 (40.7%)	17 (63%)
2. Radiation therapy does not necessarily cause patients to lose the hair on their head.	15 (55.6%)	15 (55.6%)
3. I am worried that radiation therapy might cause cancer.	16 (59.3%)	24 (88.9%)
4. After receiving treatment, I should avoid contact with others.	25 (92.6%)	27 (100%)
5. I am afraid of radiation therapy.	13 (48.1%)	26 (96.3%)
6. Fatigue, nausea, and decreased appetite are some of the possible side effects of radiation therapy.	17 (63%)	23 (85.2%)
7. Side effects that patients may experience depend upon the site of treatment.	8 (29.6%)	19 (70.4%)

RTQ Items (con't)	Freq. of cor. resp.	
	Pre	Post
8. Watches and other jewellery should not be worn during treatment as they may be harmed by the radiation.	5 (18.5%)	16 (59.3%)
9. There are special steps I must take to care for my skin during treatment.	5 (18.5%)	26 (96.3%)
10. Radiation therapy is not painful.	16 (59.3%)	24 (88.9%)
11. Radiation therapy patients are allowed to maintain their previous levels of activity while they are receiving treatment.	13 (48.1%)	21 (77.8%)
12. I believe that the longer the length of treatment, the worse the cancer.	4 (14.8%)	13 (48.1%)
13. Some radiation therapy patients are required to adjust their eating habits.	6 (22.2%)	22 (81.5%)
14. I will be receiving a permanent mark on my skin that will not wash off.	6 (22.2%)	14 (51.9%)
15. I am completely isolated during treatment. If I felt nauseous while on the table no one would be there to help me.	20 (74.1%)	25 (92.6%)
16. Radiation therapy patients must have routine blood tests.	16 (59.3%)	18 (66.7%)

RTQ Items (con't)	Freq. of cor. resp.	
	Pre	Post
17. It takes only minutes to administer this treatment.	21 (77.8%)	23 (85.2%)
18. I would rather receive another form of treatment.	17 (63%)	20 (74.1%)
19. The radiation therapists are qualified to answer many of the questions that I may have.	24 (88.9%)	25 (92.6%)
20. The radiation therapists are out of the room during treatment in order to avoid exposure to radiation.	13 (48.1%)	21 (77.8%)

Table 7

Number of reported pre- and post-treatment radiation therapy questions

No. of questions	Pre-treatment	Post-treatment
None	4 (14.8%)	9 (33.3%)
Very few	7 (25.9%)	8 (29.6%)
Some	8 (29.6%)	4 (14.8%)
Quite a few	4 (14.8%)	1 (3.7%)
Many	2 (7.4%)	2 (7.4%)

Appendix A

Measures

SELF-EVALUATION QUESTIONNAIRE

Developed by Charles D. Spielberger
in collaboration with
R. L. Gorsuch, R. Lushene, P. R. Vagg, and G. A. Jacobs

STAI Form Y-1

Name _____ Date _____ S ____

Age _____ Sex: M ____ F ____ T ____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	①	②	③	④
2. I feel secure	①	②	③	④
3. I am tense	①	②	③	④
4. I feel strained	①	②	③	④
5. I feel at ease	①	②	③	④
6. I feel upset	①	②	③	④
7. I am presently worrying over possible misfortunes	①	②	③	④
8. I feel satisfied	①	②	③	④
9. I feel frightened	①	②	③	④
10. I feel comfortable	①	②	③	④
11. I feel self-confident	①	②	③	④
12. I feel nervous	①	②	③	④
13. I am jittery	①	②	③	④
14. I feel indecisive	①	②	③	④
15. I am relaxed	①	②	③	④
16. I feel content	①	②	③	④
17. I am worried	①	②	③	④
18. I feel confused	①	②	③	④
19. I feel steady	①	②	③	④
20. I feel pleasant	①	②	③	④

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name _____ Date _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	①	②	③	④
22. I feel nervous and restless	①	②	③	④
23. I feel satisfied with myself	①	②	③	④
24. I wish I could be as happy as others seem to be	①	②	③	④
25. I feel like a failure	①	②	③	④
26. I feel rested	①	②	③	④
27. I am "calm, cool, and collected"	①	②	③	④
28. I feel that difficulties are piling up so that I cannot overcome them	①	②	③	④
29. I worry too much over something that really doesn't matter	①	②	③	④
30. I am happy	①	②	③	④
31. I have disturbing thoughts	①	②	③	④
32. I lack self-confidence	①	②	③	④
33. I feel secure	①	②	③	④
34. I make decisions easily	①	②	③	④
35. I feel inadequate	①	②	③	④
36. I am content	①	②	③	④
37. Some unimportant thought runs through my mind and bothers me	①	②	③	④
38. I take disappointments so keenly that I can't put them out of my mind	①	②	③	④
39. I am a steady person	①	②	③	④
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	①	②	③	④

GENERAL HEALTH QUESTIONNAIRE

We would like to know how you have been feeling, in general, over the past few weeks. For each of the following questions, please circle the answer that best describes how you have been feeling. Remember that we want to know about present and recent complaints, not those that you experienced in the past. There are no right or wrong answers. Please try to answer each question. If you have any questions, please ask.

HAVE YOU RECENTLY:

1. **Been able to concentrate on whatever you're doing?**

   Better than usual | Same as usual | Less than usual | Much less than usual

2. **Lost much sleep over worry?**

   Not at all | No more than usual | Rather more than usual | Much more than usual

3. **Been having restless, disturbed nights?**

   Not at all | No more than usual | Rather more than usual | Much more than usual

4. **Been managing to keep yourself busy and occupied?**

   More so than usual | Same as usual | Rather less than usual | Much less than usual

5. **Been getting out of the house as much as usual?**

   More than usual | Same as usual | Less than usual | Much less than usual

6. **Been managing as well as most people would in your shoes?**

   Better than most | About the same | Rather less well | Much less well

7. **Felt on the whole you were doing things well?**

   Better than usual | About the same | Less well than usual | Much less well

8. **Been feeling mentally alert and wide awake?**

   Better than usual | Same as usual | Less alert than usual | Much less alert

9. **Been able to feel warmth and affection for those near to you?**

   Better than usual | About same as usual | Less well than usual | Much less well

10. Been finding it easy to get on with other people?

Better than usual | About same as usual | Less well than usual | Much less well

11. Been feeling full of energy?

Better than usual | Same as usual | Less energy than usual | Much less energy

12. Felt that you are playing a useful part in things?

More so than usual | Same as usual | Less useful than usual | Much less useful

13. Felt capable of making decisions about things?

More so than usual | Same as usual | Less so than usual | Much less capable

14. Felt constantly under strain?

Not at all | No more than usual | Rather more than usual | Much more than usual

15. Felt you couldn't overcome your difficulties?

Not at all | No more than usual | Rather more than usual | Much more than usual

16. Been finding life a struggle all the time?

Not at all | No more than usual | Rather more than usual | Much more than usual

17. Been able to enjoy your normal day-to-day activities?

More so than usual | Same as usual | Less so than usual | Much less than usual

18. Been taking things hard?

Not at all | No more than usual | Rather more than usual | Much more than usual

19. Been getting scared or panicky for no good reason?

Not at all | No more than usual | Rather more than usual | Much more than usual

20. Been able to face up to your problems?

More so than usual | Same as usual | Less able than usual | Much less able

21. Found everything getting on top of you?

Not at all | No more than usual | Rather more than usual | Much more than usual

22. Been feeling unhappy and depressed?

Not at all | No more than usual | Rather more than usual | Much more than usual

23. Been losing confidence in yourself?

Not at all | No more than usual | Rather more than usual | Much more than usual

24. Been thinking of yourself as a worthless person?

Not at all | No more than usual | Rather more than usual | Much more than usual

25. Felt that life is entirely hopeless?

Not at all | No more than usual | Rather more than usual | Much more than usual

26. Been feeling hopeful about your own future?

More so than usual | About same as usual | Less so than usual | Much less hopeful

27. Been feeling reasonably happy, all things considered?

More so than usual | About same as usual | Less so than usual | Much less than usual

28. Been feeling nervous and strung-up all the time?

Not at all | No more than usual | Rather more than usual | Much more than usual

29. Felt that life isn't worth living?

Not at all | No more than usual | Rather more than usual | Much more than usual

30. Found at times you couldn't do anything because your nerves were too bad?

Not at all | No more than usual | Rather more than usual | Much more than usual

RADIATION THERAPY QUESTIONNAIRE

We would like to learn something about your understanding of radiation therapy. Please read the following statements carefully and answer to the best of your ability. Circle the answer T if the statement is true or mostly true or F if the statement is false or mostly false. Circle DON'T KNOW only if you truly do not know how to respond to the statement. However, if you have any idea (e.g., have heard something from friends, family, media, etc.) please try to answer true or false.

1.	It is my understanding that radiation therapy patients usually experience radiation sickness.	T	F	DON'T KNOW
2.	Radiation therapy does not necessarily cause patients to lose the hair on their head.	T	F	DON'T KNOW
3.	I am worried that radiation therapy might cause cancer.	T	F	DON'T KNOW
4.	After receiving treatment, I should avoid contact with others.	T	F	DON'T KNOW
5.	I am afraid of radiation therapy.	T	F	DON'T KNOW
6.	Fatigue, nausea, and decreased appetite are some of the possible side effects of radiation therapy.	T	F	DON'T KNOW
7.	Side effects that patients may experience depend upon the site of treatment.	T	F	DON'T KNOW
8.	Watches and other jewellery should not be worn during treatment as they may be harmed by the radiation.	T	F	DON'T KNOW
9.	There are special steps I must take to care for my skin during treatment.	T	F	DON'T KNOW

10.	Radiation therapy is not painful.	T	F	DON'T KNOW
11.	Radiation therapy patients are allowed to maintain their previous levels of activity while they are receiving treatment.	T	F	DON'T KNOW
12.	I believe that the longer the length of treatment, the worse the cancer.	T	F	DON'T KNOW
13.	Some radiation therapy patients are required to adjust their eating habits.	T	F	DON'T KNOW
14.	I will be receiving a permanent mark on my skin that will not wash off.	T	F	DON'T KNOW
15.	I am completely isolated during treatment. If I felt nauseous while on the table no one would be there to help me.	T	F	DON'T KNOW
16.	Radiation therapy patients must have routine blood tests.	T	F	DON'T KNOW
17.	It takes only minutes to administer this treatment.	T	F	DON'T KNOW
18.	I would rather receive another form of treatment.	T	F	DON'T KNOW
19.	The radiation therapists are qualified to answer many of the questions that I may have.	T	F	DON'T KNOW
20.	The radiation therapists are out of the room during treatment in order to avoid exposure to radiation.	T	F	DON'T KNOW

COMMENTS

Please check one(1) of the following statements:

- ☐ I have **NO** questions or concerns about radiation therapy.
- ☐ I have **VERY FEW** questions or concerns about radiation therapy.
- ☐ I have **SOME** questions or concerns about radiation therapy.
- ☐ I have **QUITE A FEW** questions or concerns about radiation therapy.
- ☐ I have **MANY** questions or concerns about radiation therapy.

Please use this paper to record any comments you may have about the statements you have just read. If you have any questions about radiation therapy that were not addressed in the questionnaire please note them here.

Appendix B

Letters of Consent

Dear Participant,

I would like to request your participation in a study that I, Kristine Lake, am conducting in partial fulfillment of my Masters degree in Clinical Psychology under the supervision of Dr. S.M. Sellick and Dr. J.F. Kotalik. Dr. Gulavita and Dr. Tai are co-investigators of this study and you may direct any questions you may have about this study to them as well. The researchers would like to learn more about you and your experiences with radiation therapy.

All participants will be required to complete three short questionnaires which will be administered before treatment begins and once treatment is completed. These questionnaires will take approximately 20 minutes to complete.

We do not anticipate any risks to those who participate in this study. However, research has shown that you may benefit from the information you receive.

All results will be kept confidential and the findings will be reported only in terms of group data. Also, a number, rather than your name, will be used to identify the documents used in this study. A list matching the numbers to the names will be kept in the department of psychosocial services at the Cancer Centre.

Should you decide not to participate in this study, your treatment at the Centre will not be affected. If you do decide to participate, you may withdraw from the study at any time.

If you have any questions about this study, please feel free to leave a message for me at 343-1680. If you would like to receive a summary of the results of this study, please include your address on the attached form.

Sincerely,

K Lake

Kristine Elizabeth Lake
M.A. Candidate
Psychology Department
Lakehead University

Consent Form

I,_____ agree to participate in the research project of Kristine E. Lake which is being supervised by Dr. S.M. Sellick and Dr. J.F. Kotalik. My consent indicates that I understand and agree to the following:

1) I will be asked to provide information about myself and my experiences with radiation therapy,

2) I will be required to complete three short questionnaires,

3) all information I provide will be kept completely confidential, and

4) I may withdraw from the study at any time.

Signed:_____

If you wish to receive a report of the findings, please print your name and address below.

_____

_____

_____

_____

Dear _____

I would like to thank you for participating in this study which I am conducting in partial fulfillment of my Master's degree in clinical psychology at Lakehead University. Dr. Gulavita and Dr. Tai are participating in this study and I am being supervised by Dr. S.M. Sellick and Dr. J.F. Kotalik, director of the Thunder Bay Regional Cancer Centre. We would like to learn more about you and your experiences with radiation therapy.

Before you began treatment, you completed three questionnaires. I have sent these questionnaires to you and hope that you will be willing to complete them again. Once you have completed these questionnaires, please place them in the envelope provided and mail them to the Thunder Bay Regional Cancer Centre. I would like to remind you that all results will be kept confidential and that the findings will be reported only in terms of group data.

If you have any questions about this study, please feel free to leave a message for me at 343-1680. Dr. Sellick can also be reached at this number.

Once again, thank you for your assistance.

Sincerely,

K Lake

Kristine Elizabeth Lake, H.B.A.

Appendix C

Figures

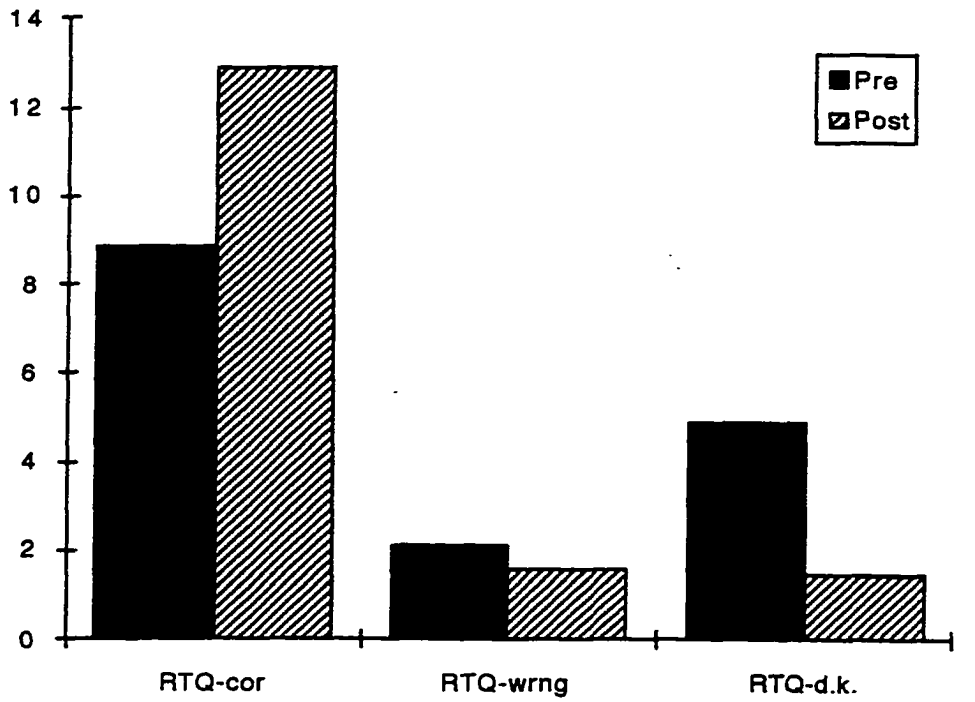


Figure 1. Mean pre- and post- Radiation Therapy Questionnaire responses. (Note. RTQ-cor = RTQ-correct responses. RTQ-wrng = RTQ-incorrect responses. RTQ-d.k. = RTQ-don't know responses.)

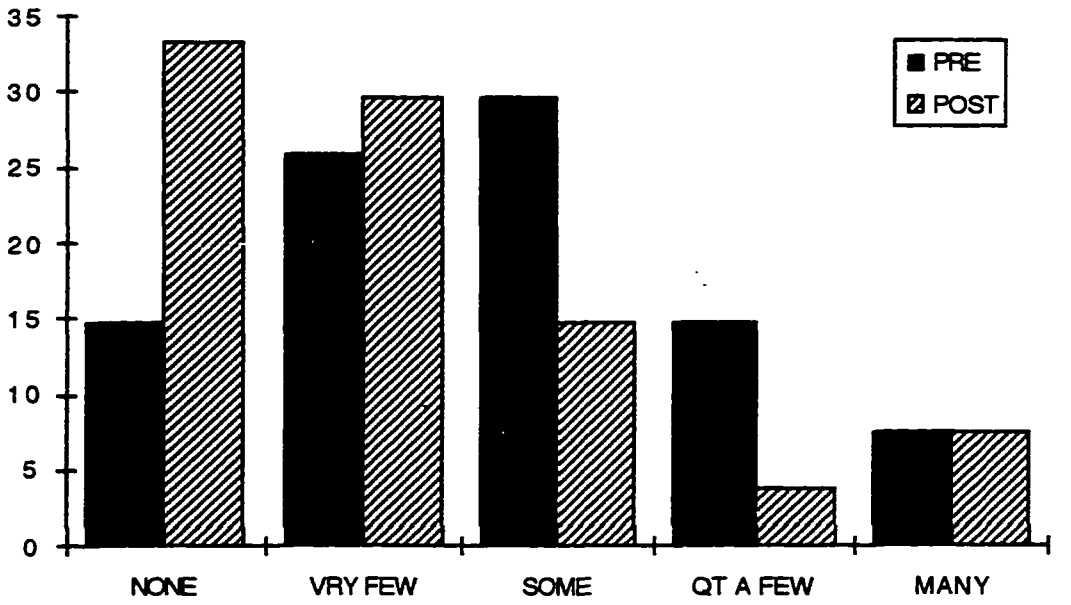
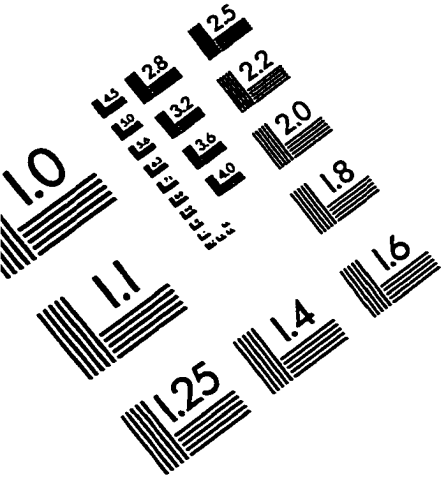
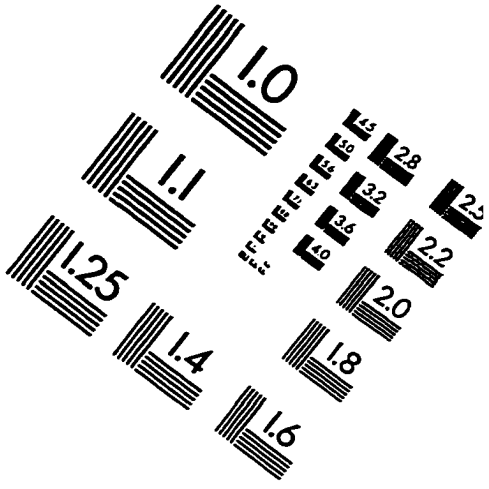
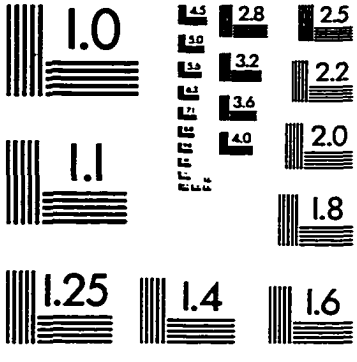


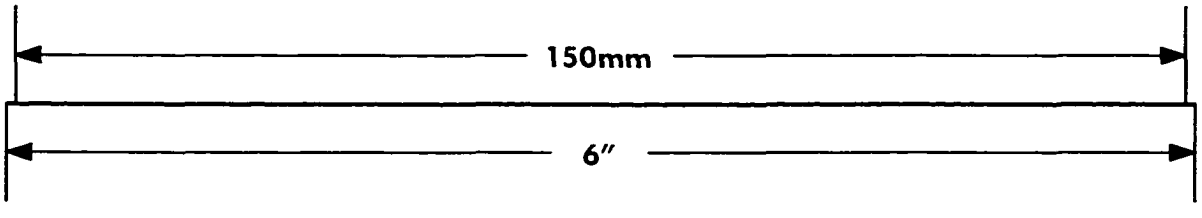
Figure 2. Percentage of reported pre- and post- radiation therapy questions.

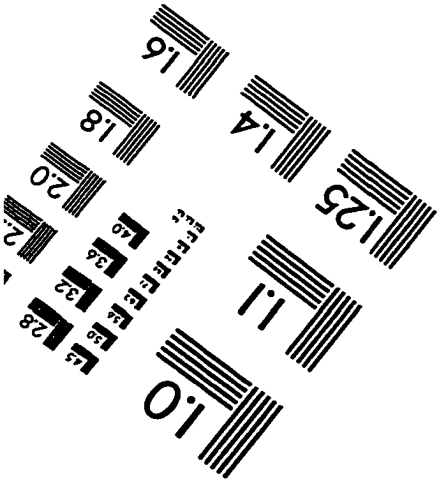
IMAGE EVALUATION TEST TARGET (QA-3)

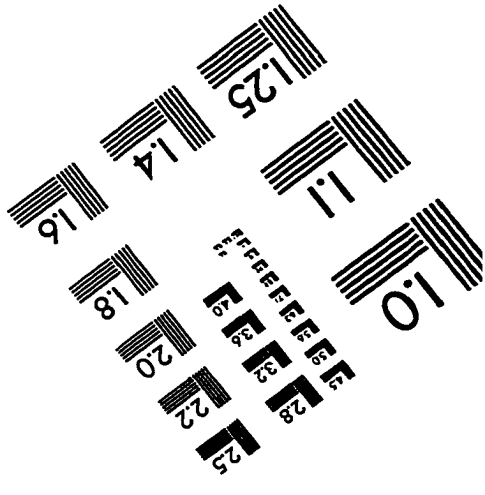












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