

# Patients with Cancer Receiving Radiotherapy Health Education: Integrative Literature Review

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## Abstract

**Background:** Currently, radiotherapy is a backbone of cancer therapy and provides cure or palliative care for large numbers of cancer population. Patient information and education are important aspects of treatment which vary depending on the treatment site, length of the treatment, and type of the treatment.

**Purpose:** Assess the effectiveness of patient's educational intervention on the health status and correlated symptoms in patients with cancer undergoing radiotherapy treatment.

**Methods:** An integrative literature review design is used. A literature search is performed using three databases: CINAHL, MEDLINE via PubMed, and Cochrane Library using the combination of four key words. Nine articles were reviewed and considered in this review.

**Findings:** In the reviewed articles, there was a positive relationship between educational interventions and the patient's health status and associated symptoms regarding radiotherapy treatment. There was a consistency in the articles regarding the best time for education to be delivered, the most appropriate formatting for the education interventions, role of nurses regarding the effectiveness of delivering education, and the limitations which came across these studies.

**Conclusion:** Patient education has a positive effect on the general health status for the patient with cancer, and on the related-symptoms associated with radiotherapy.

**Implications:** The role of oncology nurses must be expanded to include nurse educators who are responsible for appropriate education of patient with cancer from the early diagnosis to the late stages of cancer.

**Recommendations:** Further investigations are required toward the patient's understanding about radiotherapy treatment and its related symptoms.

**Keywords:** patient education, health promotion, radiotherapy, cancer

## 1. Introduction

Radiotherapy is a form of treatment which involve the damaging of cancer cells in the region being treated. Evidence-based recommendations suggest that 50 % of all cancer patients and 83 % of breast cancer patients should receive radiotherapy at some stage during their illness (Delaney, Barton & Jacob, 2003). Currently, radiotherapy (RT) is a mainstay of cancer therapy and provides cure or palliative care for approximately 50% of the cancer population (Chen, Chou, Shih, Lau & Gandara, 2004).

In the literature, a broad range of Radiotherapy-related symptoms has been identified including fatigue, pain, sleep disorders, appetite loss, nausea and vomiting, and oral complications (Ahlberg, Ekman, & Gaston-Johansson, 2005; Öz, Ünal, Akdeniz, & Dil, 2004). Patients with cancer are already in a vulnerable situation at the time they enter the radiation therapy department (Halkett & Kristjanson, 2007), and an educational plan is needed in order to manage the treatment course and its related side effects and symptoms.

Patient information and education are important aspects of treatment. Individual requirements for information vary, depending on the treatment site, the length of the treatment and individual characteristics of patients, (Lin & Hughes, 2003).

Nurses could demonstrate an essential role in providing information and teaching patients during these treatment sessions. Application of this education is crucial to test whether the introduction of this intervention will simultaneously reduce patient's treatment-related problems. This intervention will be also effective in reducing patients concerns about radiotherapy and increase patient's knowledge and preparation prior to treatment planning (Halkett & Kristjanson, 2007). The outcomes and benefits of educational interventions are underestimated, there is a need to evaluate the efficacy of education programs to minimize the impact of cancer-related fatigue and to identify optimal delivery timing and approaches for this education (Purcell, Fleming, Burmeister, Bennett, & Haines, 2010).

Even though many radiotherapy centers have implemented pre-radiotherapy patient information sessions, there are still gaps in the delivery in some centers (Department of Health, 2013). "The National Radiotherapy Patient Experience survey highlighted that 16% of patients were not invited to pre-radiotherapy information sessions" (Chapman & James, 2016).

The purpose of writing this scholarly paper is to provide an integrative review regarding the effectiveness of patient education on the health status and correlated symptoms in patients with cancer

undergoing radiotherapy treatment.

### *1.1 Theoretical Framework*

This integrative literature review is guided by Nola Pender Health Promotion Model which will utilize patient's health education as a variable modified through nursing interventions while undergoing radiotherapy. This health promoting action should result in improved health, enhanced functional ability and better quality of life at all stages of radiotherapy treatment.

## **2. Methodology**

A literature search is performed to answer the clinical question, "What are the effects of education on the patients beginning radiotherapy?". Three databases were examined: CINAHL, MEDLINE via PubMed, and Cochrane Library using the combination of four key words: patient education, health promotion, radiotherapy, and cancer.

Articles searched were published between July 2011 & March 2016, and they were included if they were in English Language, had an adult population, contained Full text article, and explore the effect of educational intervention on patient's health. Excluded articles were regarding patients receiving chemotherapy, and about the prevention of cancer.

A total number of 52 articles were found retrospectively pertinent to the clinical question and met the inclusion and exclusion criteria. After skimming the title of the articles, and removing duplications the total number of articles were reduced to 24 articles. Finally, after reading the abstracts the total number of articles retrieved downed to nine articles.

### *2.1 Methodological & Sample Characteristics*

Nine articles are reviewed and considered in this integrative literature review which are a Quantitative type of studies. Some of these studies are Descriptive and some are Randomized Clinical Trial, one Prospective Survey is included. Countries in which most of the reviewed articles conducted were in Canada, Australia, United Kingdom, United States, Brazil, and China. The sample size included in these studies ranged from 38 to 350 adult and adolescent patients with cancer, and with a range of age from 16 to over 75 years old mostly were females (see Table 1). The settings for these studies varied from radiation treatment departments to outpatient clinics and home based surveys.

Table 1. Summary of literature review for included articles

Year and author of article	Type of research methods	Sample size and characteristics	Country of origin	Aim of study	Major findings
Carmen WH Chan et al. (2012)	Combination of qualitative & quantitative methods	70 lung cancer patients. Ages Over 16 years old.	China-Hong Kong	Examine the integrity of intervention delivery and identify precursory factors that contribute to successful delivery and the effectiveness of the PEI.	Process evaluation can add rich and comprehensive information to our understanding of the integrity of intervention delivery and the factors that contribute to the effective delivery of psycho-educational interventions (PEI) in cancer care settings.
K. Chapman & S. James (2016)	Qualitative methodology adopted Questionnaire	103 Patients with cancer. Ages (in years) Over 75 =21pt 46-74=79 pt. Less 45 = 3pt	United Kingdom (UK)	Check that group pre-radiotherapy information sessions met patients' needs.	Almost all patients were happy to receive their radiotherapy information in a group setting and the information provided meets their needs, and the implementation of these sessions has seemed to be both feasible and an efficient use of staff time.
Georgia Halkett et al. (2014)	Multiple-baseline methodology (time series design)	200 Patients with breast cancer. Ages Not defined.	Australia	Describes the protocol for an evaluation of a radiation therapist led education intervention delivered to patients with breast cancer in order to reduce psychological distress.	The proposed intervention package uses an innovative approach, which optimizes radiation therapists' involvement in preparing patients for radiotherapy prior to treatment planning and prior to treatment, to meet patients' information needs and reduce their levels of psychological distress.
Jill Sutherland & Lauren Mclaughlan (2013)	Retrospective Quantitative design	350 Women only with Breast cancer. Ages More than 18 years old.	Canada	Explore whether the timing of patient education sessions influences levels of satisfaction in women treated for breast cancer.	Patient preference for the timing of education sessions should be accommodated whenever possible; however, it also is reasonable to consider the operation requirements of the department when scheduling education sessions.
Mervi Siekkinen et al. (2015)	Single-blind randomized controlled study	128 Women with Breast cancer. Ages 18-75 years old.	Finland	Evaluate the effects of the e-Re-Know on knowledge level and to identify associations with preference for information and sociodemographic and medical characteristics.	The study results led to the conclusion that the E-Feedback-Knowledge implemented for women with breast cancer before their first Radiotherapy (RT) did improve knowledge of RT, especially on side-effect self-care, after adjustment for baseline knowledge level.
Skye Dong et al. (2014)	Prospective Observational Study	56 Patients with any type and stage of cancer. Ages 27-90 years old.	United States (US)	Adapt an observational tool for assessing patient-centeredness of radiotherapy consultations.	Patient-centered communication (PCC) is an important predictor of patient outcomes in radiotherapy and obviates some negative aspects of radiation therapists' experience on patient trust. As in other studies, there is a weak association between self-reported and observational coding of PCC.
Gulsum Nihal Guleser et al. (2011)	Descriptive study	345 Patients with cancer. Ages more than 20 years old.	Turkey	Determine the symptoms and information needs of cancer patients receiving Radiotherapy.	Evidence-based studies can be planned by health professionals on the most suitable methods to be used in preventing or reducing the possible RT-related side effects, considering the site where RT is applied.
Wilfredo Alejandro Gonzalez-Arriagada et al. (2013)	Longitudinal controlled clinical study	38 Patients with head & neck cancer Control group. mean =57.9 y Video group mean =59.7 y	Brazil	Assess the effect of an educational video on improving the understanding of head and neck cancer patients undergoing radiotherapy about treatment complications.	The present study showed that an educational video may improve patient understanding of head and neck radiotherapy and its side effects despite their education level.
Kitty Chan & Caroline Davey (2013)	Prospective Survey cohort study	49 Patients with head & neck or Thyroid cancer. Ages more than 40 years old.	Canada	Examine the distribution and the usefulness of the booklet from both perspectives of patients and the health-care providers (staff).	This booklet was useful as an orientation tool for the patients to navigate the hospital system. Patients and staff have similar opinion regarding the most useful sections in the booklet.

### 3. Findings

The nine studies showed that patient education had a positive effect on both: the health status, and correlated

symptoms of those patients diagnosed with cancer who are receiving radiotherapy treatment.

### *3.1 Timing*

The time of demonstration and application for education is mainly performed prior to the start of radiotherapy or during the first three sessions. Intervention was delivered before beginning the first session of radiotherapy (Chan, A. Richardson, & J. Richardson, 2013; Siekkinen, Kesänen, Vahlberg, Pyrhönen, & Leino-Kilpi, 2014). While Chan and Davey (2013) provided that the majority of patients (n=45, 94%) received the education before their first radiotherapy treatment. While in preference for the timing of education sessions, Sutherland and McLaughlan (2013) showed that the majority of the patients indicated "the same day as my CT stimulation" as their preference.

### *3.2 Format*

In terms of educational formatting, most of the formats consisted of a written information provided in a form of booklet or leaflet, and a media consisting of audiotapes or PowerPoint presentation. (Siekkinen et al., 2014; Güleser, Taşci, & Kaplan, 2011) used written materials and booklets about RT and its side effects to deliver for patients.

Audiotaped materials were utilized in the educational sessions in (Dong, Butow, Costa, Dhillon, & Shields, 2014; Chan et al., 2012). A 6-min video about radiotherapy and its treatment was produced by the oncology team which was displayed on a laptop screen (González, Andrade, Ramos, Bezerra, Santos, & Lopes, 2013). An interview one-on-one educational session was delivered to women with breast cancer by radiation therapist (Halkett, O'connor, Aranda, Jefford, Spry, Shaw, & Schofield, 2014).

Chapman and James (2016) started the sessions of education using a series of PowerPoint slides with photographs in a group setting, and 102 (99%) patients responded that they were happy in receiving their radiotherapy information.

### *3.3 Role of The Nurse*

It has been proved throughout the literature the use of oncology nurses as educators in the process of delivering education to patients with cancer. Nurses play an important role in providing support and information, and nursing interventions can significantly reduce the perception of illness and maintain quality of life for these patients (Wengström, 1999). Halkett et al. (2014) mentioned that radiation oncology nurses guide patients with cancer in managing side effects and also play a role in providing education.

Chan et al. (2012) used the term "interveners" to describe the support nurses who were recruited to deliver the intervention of education in a way of introducing an element of variability to be examined.

Oncology nurses also have the potential for developing an education material suitable for those patients undergoing radiotherapy. Chan and Davey (2013) constructed a team consisted of radiation oncology nurses, radiation oncologist, and radiation therapist to develop the contents of the educational booklet. Many measures related to patient communication were modified from those developed in the context of physician-or nurse-patient's communication in the procedure of intervention (Dong et al., 2014).

## **4. Limitations**

Specific information is important regarding: the environment and setting of where the education should be delivered, and the detailed time frame regarding radiotherapy sessions.

Most studies collected materials only from the prospective of the staff (provider) or the patient (learner) while it should be collected from both (Chan & Davey, 2103).

Chapman and James (2016) reported a limited staff availability for the introducing of the education intervention provided in the education sessions. Another limitation is the use of written materials for the education in low-literacy or illiterate patients, which suggests that future instruments should accommodate patients' needs of low-literacy and different languages (Chan & Davey, 2013).

## **5. Conclusion**

When delivered efficiently at the right time, in the appropriate formatting, and by the qualified health provider, patient education is effective in reducing symptom-related treatment and improving health status for patients with cancer receiving radiotherapy. Oncology nurse role is crucial in patient education, patient assessment, symptom management and supportive care (Güleser et al., 2011).

## **6. Implications for Nursing**

The role of oncology nurses must be expanded to include nurse educators who are responsible for appropriate education of patient with cancer from the early diagnosis to the late stages of cancer. In order to be effective educators; nurses need to involved in continuing education and updated researching regarding radiotherapy

treatment new trends.

## 7. Recommendations

Further investigations are required toward the patient's understanding about radiotherapy treatment and its related symptoms, which gives us insight for developing a comprehensive patient education program suitable for patients with cancer undergoing radiotherapy.

Evidence-based studies can be planned by health care providers on the most suitable methods in order to reduce or prevent possible radiotherapy-related side effects, considering the site of the applied radiotherapy (Güleser et al., 2011).

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