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Title: Interventions for preparing patients for chemotherapy and radiotherapy: a systematic review

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ABSTRACT

Purpose: Undergoing chemotherapy and radiotherapy can be physically and psychologically stressful for people with cancer. Providing preparatory information to cancer patients as they face treatment and its aftermath has the potential to improve patient outcomes. This study assessed the methodological quality and effectiveness of interventions providing preparatory information about chemotherapy and/or radiotherapy to cancer patients in improving patient outcomes.

Methods: MEDLINE, EMBASE, and Cochrane databases were systematically searched from January 1995 until October 2012. Inclusion criteria: i) met Effective Practice and Organisation of Care (EPOC) criteria for study design; ii) included adults with a current cancer diagnosis; iii) delivered preparatory information via a health care provider or was self-directed; iv) examined psychological wellbeing; quality of life, physical symptoms, satisfaction, knowledge, or health service utilisation. Studies were assessed for methodological quality using the EPOC criteria.

Results: Eighteen studies involving 3,443 cancer patients met inclusion criteria. Interventions included written information, audiotapes, videotapes, and computer programs. Interventions improved patient satisfaction (6/7 studies), information needs and patient knowledge (5/6 studies), physical symptoms (3/4 studies) and cost (1/1 study). More than half of the interventions improved psychological outcomes (10/17 studies).

Conclusion: Providing preparatory information can improve patient-reported outcomes in cancer patients undergoing chemotherapy and radiotherapy, especially with respect to satisfaction and knowledge. Some, but not all studies improved psychological outcomes and physical symptoms. There is a need for methodologically rigorous research to determine the most effective timing and method of delivery of preparatory information to improve patient outcomes.

Keywords: Neoplasm, chemotherapy, radiotherapy, patient education, preparatory information, systematic review.
INTRODUCTION

Advances in cancer therapies have improved cancer patients' morbidity and mortality.[1] However, cancer patients still encounter an array of distressing symptoms during and after cancer treatment. Receipt of chemotherapy is associated with nausea and fatigue, emotional distress, and interference with physical functioning.[2] Patients who receive radiotherapy are twice as likely to report unmet patient care and interpersonal communication needs compared with those who have not received radiotherapy.[3] Receipt of radiotherapy is also associated with reduced quality of life across physical, emotional and social domains. For example, patients receiving radiotherapy report poorer physical social and cognitive functioning as well as poorer marital and sexual functioning following treatment.[4] Patients receiving radiotherapy also report greater symptom burden, including pain, sleep disturbance and fatigue.[5] These treatments also reduce patients’ ability to work and participate in social activities.[6] Patients’ also often experience symptoms in anticipation of their cancer treatment. Between 40-62% of people receiving radiotherapy report anxiety prior to commencing treatment,[7, 8] and patients about to commence chemotherapy report anxiety (45%) and depression (25%), as well as pain, fatigue and sleep problems.[9]

More than 50% of newly diagnosed cancer patients’ report that they expect to experience side-effects including fatigue, sleep disturbance, nausea, weight loss, hair loss and pain as a consequence of their cancer treatment.[10] The intensity of side-effects will vary between patients receiving the same cytotoxic agents.[11] The way information about side effects is given to the patients may contribute to patient expectations. Poorly informed patients may overestimate the occurrence or severity of the side-effects they will experience.[12] This is problematic given that negative expectations can then influence the occurrence and severity of side effects.[10, 13] For example, people who indicated that it would be very likely that they would experience severe nausea following chemotherapy were five times more likely to experience severe nausea compared with those who indicated that it would be ‘very unlikely’. [14] Providing accurate information and support about the occurrence and severity of side-effects may optimise expectations and prevent side-effects from developing or becoming more severe. The proportion of cancer patients reporting information needs during the treatment phase ranges from 11-97%.[15] Patients report a range of unmet information needs about how treatment works, the goals of treatment, the schedule of treatment, the effectiveness of the treatment for other patients, common side-effects and coping with side-effects, and how the treatment may affect relationships with their
family.[16, 17] However, the quality and accessibility of information provided to patients may vary. Variation may occur as consequence of the knowledge and skills of the clinician providing information or the resources of the treating centre. For example, the National Cancer Patient Survey in the UK found that the proportion of patients being given written information about their cancer that was easy to understand varied according to cancer type and trust.[18] Similar variation has also been reported in other countries. For example, in Australia the Cancer Institute NSW Patient Satisfaction Survey [19] identified four areas for improvement in relation to cancer outpatients, two of which were related to patient education. Inadequate provision of information has also been identified as an issue of concern for rural and remote cancer patients receiving treatment in South Australia.[20] Patients with access to a cancer care coordinator have been reported as more likely to receive tailored information resources and have the information explained in an understandable manner.[21]

Inadequately prepared patients often experience elevated psychological distress which can compromise physical recovery and reduce compliance with treatment.[22] For example, lung cancer patients with elevated anxiety report worse symptoms that reduce chemotherapy adherence.[23] Unresolved treatment-related side effects such as fatigue can also reduce adherence to treatment, which has an adverse impact on patients’ physical and psychosocial wellbeing and even survival.[9, 24, 25] Treatment modifications including dosage reductions or delayed cycles may be necessary if psychological distress and treatment-related side-effects are inadequately managed. Non-adherence and modifications can compromise efficacy of treatment, patient quality of life and survival, as well as health care costs associated with increased hospital admissions, doctor visits and longer hospital stays.[25, 26]

Rather than wait for adverse side effects to develop, interventions might be used to prepare patients for treatment and the expected challenges to quality of life.[27] Providing accurate preparatory information to patients prior to treatment may help address unrealistic expectations about the benefits, risks and potential outcomes of treatment.[11] A 1996 review identified a paucity of methodologically rigorous studies examining the efficacy of information interventions to prepare patients for treatment.[28] Consensus Guidelines were developed in 1996[29] to help educate providers about how to prepare patients for threatening procedures and Clinical Practice Guidelines for the psychosocial care of adults with cancer issued in 2003.[30]

Despite these recommendations, cancer patients frequently report unmet needs for information about the treatment process, efficacy and potential side-effects, which can increase anxiety.[31] Additionally, chemotherapy and radiotherapy are increasingly provided
on an outpatient basis so patients may have less opportunity to receive information. Cancer patients also report unmet information needs related to self-management of treatment effects.[24] This may occur because some patients misinterpret or cannot recall information, or because health care providers are unaware or lack appropriate communication skills to effectively deliver information consistent with preferences.

**Aim:** To assess the methodological quality and effectiveness of interventions providing preparatory information about chemotherapy and/or radiotherapy to cancer patients in improving patient outcomes.

**METHODS**

**Search terms**

MEDLINE, EMBASE and Cochrane databases were searched. Search terms included: neoplasm, chemotherapy, radiotherapy, anxiety, depression, distress, quality of life, satisfaction, knowledge, health care utilisation, resource use, cost, patient education, preparatory information, teaching materials, audio-visual aids, and multimedia. Searches were limited to English language publications published between January 1995 and October 2013. January 1995 was chosen as the cut-off date to include studies published after the Ream and Richardson (1996) review.[28]

**Inclusion and exclusion criteria**

Studies were included if: 1) they met design criteria outlined in the Effective Practice and Organisation of Care (EPOC) methodological criteria.[32] That is, they were randomized controlled trials (RCTs), controlled clinical trials, controlled before and after studies with adjustment for confounders and interrupted time series designs; 2) included adults with a current cancer diagnosis; 3) examined anxiety, depression, distress, physical symptoms satisfaction with care, patient knowledge, information needs, quality of life; or resource utilisation; and 4) preparatory information was delivered by a health care provider, another individual (e.g. volunteer) or was self-directed. Studies were excluded if they: 1) targeted informed consent or decision making processes only; 2) delivered the intervention after the first cancer treatment had commenced; or 3) if the information was directed at a health care provider, caregiver or family member, with the patient excluded.

**Data Extraction**
The titles and abstracts of all papers identified in the literature search were assessed for relevance and rejected on initial screening if the reviewer could determine that the study did not meet inclusion criteria. Studies meeting all criteria were retained for full review (See Table 1 and Table 2). Data extracted from each study included: 1) sample characteristics; 3) type of intervention and comparison group; 3) outcomes and measures; and 4) main findings.

**Assessment of risk of bias**

Included studies were classified by two authors (AW, SM) using EPOC criteria[32] (Table 1). All differences were resolved by mutual discussion between coders and with a third-party (JB), where necessary.

**RESULTS**

**Methodological quality of studies**

A total of 1,612 studies were identified through database searches and hand searching of references lists (see Figure 1). Thirty-six intervention studies were identified, of which eighteen [2, 22, 33-48] met inclusion criteria and were assessed against EPOC design criteria. Table 1 presents the assessment of risk of bias for each of the 18 included studies. All studies were assessed as unclear or high risk on at least one of the criteria.

**Study characteristics**

Table 2 presents the outcomes of the eighteen included studies which involved a total 3,443 patients. The sample sizes for the studies ranged from 50[45] to 495.[41] Eleven studies targeted people receiving radiotherapy,[33, 34, 37-40, 42, 43, 45, 48, 49] five studies targeted people receiving chemotherapy[2, 22, 36, 44, 46] and two studies[41, 47] targeted people receiving chemotherapy and radiotherapy.

**Effectiveness**

*Psychological outcomes*

Seventeen studies examined the benefits of providing preparatory information about treatments on psychological outcomes. Seven of these studies found benefits of preparatory information for patient anxiety and depression.[34, 35, 38, 41, 45-47] Thomas and colleagues found patients who watched a video reported significantly lower anxiety and depression three weeks later compared to usual care group.[47] In fact, depression was found to increase over time for the usual care group.[47] Similarly, Poroch found that patients who received both
sensory and procedural information in an education session were significantly less anxious than patients who received standard information.[45] Patients who received written information and teaching sheets reported lower anxiety.[35] Chan and colleagues found benefits of a psycho-educational intervention on patterns of change in a symptom cluster of anxiety, breathlessness and fatigue.[34] Halkett and colleagues also found significantly lower anxiety as a result of face-to-face consultations.[38] Ream and colleagues found patients who received supportive intervention reported significantly less anxiety and depression and displayed more adaptive coping.[46] Finally, Jones and colleagues reported that fewer patients who received personalised information via computer were anxious at 3 months compared to patients who received generalised information only.[41]

Benefits for quality of life and psychological distress were reported in two additional studies. Patients who received information via a videotape, written booklets and verbally from their health care provider reported higher quality of life than patients who received either verbal information or written booklets only.[36] However, no differences were found for anxiety.[36] In a sub-group analysis of patients with high baseline distress, patients in the intervention group reported a significant decrease in distress at prior to their first treatment cycle compared to patients in the control group. The authors recommend examining the impact of the intervention in highly distressed patients.[2]

One study directly compared receiving information in a single session to receiving information across multiple sessions. D’haese and colleagues found that patients who received information across multiple sessions were significantly less anxious than patients who received information in a single session.[35] Another study examined whether personal characteristics of patients mediated the impact of information on psychological morbidity. Providing concrete objective information had benefits for mood in less optimistic patients. The remaining studies found no benefits for additional written or audio-visual information on psychological outcomes.[22, 33, 37, 39, 42, 43, 48]

**Satisfaction and acceptability**

In addition to the benefits for psychological outcomes, patients who received information across multiple sessions reported higher satisfaction compared to patients given information simultaneously.[35] Two other studies that reported benefits for psychological outcomes also reported improvements in satisfaction.[45, 47] Even in studies where no psychological benefits were seen, patients reported higher satisfaction as a result of the additional information provided.[22, 37, 44] Overall, these studies suggest that receiving
information is important to patients and does not have a detrimental impact on psychological wellbeing.

No significant differences were reported between two different versions of written information on satisfaction in Zissiadis and colleagues study.[48] However, patients found the information useful and acceptable.[48] More than 90% of patients receiving written information reported that it was useful and helpful for recall of information,[22] and 81% of patients watching a video about treatment thought it was helpful.[47]

**Physical symptoms and side-effects**

Four studies assessed the effect of preparatory information on physical symptoms and side effects. Ream and colleagues found less fatigue, lower associated distress and less impact of fatigue on valued pastimes in patients who received a supportive group intervention.[46] Chan and colleagues reported significant effects on changes in breathlessness, fatigue, anxiety and functional ability for the intervention group.[34] Kim and colleagues reported benefits of concrete information for fatigue and sleep, but not the other symptoms.[43] Aranda and colleagues found benefit of the ChemoEd intervention for vomiting, but no other chemotherapy side-effects.[2]

**Patient knowledge and Information needs**

Six studies assessed the impact of additional information on patient knowledge and information needs. Aranda and colleagues reported that patients receiving the ChemoEd intervention reported fewer sensory/psychological needs, as well as information and support unmet needs compared to patients receiving usual care.[2] Improvements in subjective understanding about radiotherapy were found for patients receiving information via audi-tapes.[33] Similarly, patients receiving written information felt better informed.[22] Halkett and colleagues reported higher knowledge in patients who received the intervention face-to-face consultations.[38] Patients receiving personalised information reported that the booklets were more likely to tell them something new; however there was no significant difference in understanding.[41] Patients reported higher recall than control patients in information about fever, mouth problems, low red cell count and prevention of constipation.[44]

**Cost**

Only one study explored the impact of a computer-based information intervention on economic cost. Jones and colleagues (1999) reported that written booklets were twice as expensive as their computer based approach to information provision.[41]
DISCUSSION

In the eighteen studies reviewed, patients consistently reported higher satisfaction when provided with preparatory information and reported that preparatory information was acceptable and useful. More than half of studies found that receiving preparatory information improved psychological outcomes including anxiety, depression, quality of life, distress and mood. Fewer studies examined the benefits of preparatory information on physical symptoms and side-effects; however the findings from the small number of studies were positive.

All studies were assessed as unclear or high risk on at least one of the EPOC criteria. The most common limitation of the included studies was a failure to report whether patients and providers were blind to group allocation, although this can be difficult to achieve if there is no credible placebo available. Other criteria which were poorly reported included concealment of allocation and generation of the allocation sequence. A number of studies were also at high risk of contamination between intervention and control groups, which compromises the strength of the evidence from the trials. All studies were free from selective outcome reporting.

The studies reviewed varied considerably across sample, type of intervention tested and the comparator group, making it difficult to determine the benefits of different content, dose and delivery methods of intervention. In some studies, the information provided to the usual care group was extensive, which may have limited benefit finding for the intervention group. For example, patients in the usual care group already received a one hour education session with nurses about chemotherapy.[44] There was also a difference in content of the information provided to patients.[50] For example Iconomou and colleagues describe the inclusion of only cognitive information as a limitation of their intervention.[22] The inclusion of only emotional information may also limit benefit. Bennenbroek and colleagues found that those who received the emotional tape had a higher negative mood.[33] The combination of both cognitive and emotional information thus may offer greatest benefit.[51] Of the studies reviewed, four reported sample sizes of less than 100 people. Small sample sizes may reduce chance of finding positive outcomes.[52] Studies do not always take into account treatment differences such as dose and fractionation for radiotherapy, and dose and regimen for chemotherapy.[53] The dose and duration of the intervention may impact on benefits. Poroch argued that the positive effect of information on anxiety and satisfaction was maintained as a result of the multiple information sessions provided.[45] Iconomou and colleagues suggested that in their study the 30 minute session and shorter term follow-up period may not have been sufficient to improve outcomes.[22]
The impact of interventions on patient reported outcomes as well as health service utilisation are reported in this review. None of the interventions examined hard endpoints such as survival and recurrence. Preparing patients for treatment may improve psychological outcomes, and compliance with treatment regimens. However, evidence of the predictive value of these psychological outcomes on survival and recurrence is inconclusive. Findings from previous studies of similar interventions, including psycho-educational interventions, are mixed in terms of impact on time to recurrence and survival. Further studies are needed to draw firm conclusions about the effect of this type of intervention on these outcomes.

Programs should be clinically effective; however there are calls to also show evidence of cost-effectiveness given the increasing number of people that will be diagnosed and treated for cancer. None of the studies reviewed here conducted formal cost-effectiveness analyses. Preparing patients for treatment has the potential to improve physical and psychological outcomes. Patients experiencing anxiety and depression may be less likely to comply with treatment, which can compromise cancer outcomes. This also has implications for health care utilisation, with studies showing both increased and decreased use of services.[54] Research examining these economic analyses comparing the costs of information programs and the savings to the health care system are required.

Amount and content of information

Providing information in a way that enables patients to have control over the type and amount of information they access is beneficial. Patients preferred personalised information that was based on their medical record to generic information.[41] Patients found automatically produced written information more overwhelming than being able to interactively choose information they wanted to view, even though the automatic information was found to be more useful.[42] Optimism may help to identify patients more vulnerable to negative emotional responses; and concrete objective information may be useful as a first step to assisting patients avoid negative responses.[40] Providing self-management strategies may be beneficial for symptoms such as fatigue.[24] The need to consider the variation in patient preferences is consistent with established Consensus Guidelines,[29] and previous literature which reports that some patients will seek out as much information as possible (monitors) while others will avoid threat relevant information (blunters).[55] Too little information may exacerbate anxiety in some patients; while others may feel overwhelmed by too much information, especially if the information is not relevant.

Delivery method
Verbal information provided during consultations is often generic which may not address different patient care needs. Written and audio-visual materials provide standardised information that can augment verbal information and address potential variation across providers. However, there is evidence to suggest that the format in which information is presented should be tailored toward the different learning styles of patients. Patients high in avoidance were less satisfied with receiving additional written and audio-visual information compared to verbal information.[37] Patients who received both sensory and procedural information reported greater benefits to their physical and psychological wellbeing.[51]

While written information materials may assist in patient recall, written materials often require high literacy levels. This places patients with limited health literacy at a disadvantage. Poor health literacy has been linked to poorer health status and treatment adherence; as well as increased hospital admissions and medical errors.[56] Information provided in face-to-face sessions either individually or in a group are beneficial for a range of outcomes including anxiety, breathlessness, fatigue and satisfaction.[22, 34, 37, 45, 46, 57] However, not all patients are willing to attend these sessions, and this approach may be limited by the resources of individual organisations. Audio-visual formats have the potential to address some of these literacy issues, but are expensive to update. Web-based platforms can be updated easily and allow patients to maintain control over the information they access. Underserved populations, including elderly and less affluent minority groups, have been found to benefit from computer based programs.[58] Web-based platforms may also offer an alternative source of information and support for people from geographically isolated areas, who often have less access to some face-to-face health services.[59] However, the potential benefits of using interactive technologies to deliver preparatory information to cancer patients, especially these underserved groups requires further examination.

Timing of information

Implementing interventions immediately prior to treatment should be weighed against giving patients sufficient time to cope with and reflect on the information.[27] Delivering interventions before the threatening procedure has taken place may be more beneficial.[45] Providing information in a stepwise fashion may be more beneficial than information all at once.[35] The optimal duration and timing of information that is provided to patients about treatments is still unclear.

Limitations

We were not able to perform a meta-analysis due to the methodological heterogeneity of studies. While every effort was made to identify eligible publications, resource constraints
meant that this search was restricted to English language publications. We also did not consider non-published studies or grey literature. These restrictions may have resulted in some relevant publications being missed.

Conclusion

There is evidence to support the use of preparatory information and education to improve outcomes in cancer patients undergoing chemotherapy and radiotherapy. Preparatory information may be more beneficial when it is tailored to patient preferences, is presented in multiple formats and provides both procedural and sensory information. Further work is needed to determine the most effective timing and method of delivery of information required to improve patient outcomes. Future research with larger sample sizes and greater standardisation of interventions to facilitate replication is suggested.
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**Conflict of Interest**
Disclosures: None. The authors have declared no conflicts of interest. The authors have full control of all primary data and agree to allow the journal to review their data if requested.
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**Figure Legends**

**Figure 1**: Inclusion and exclusion of studies  
**Table 1**: Quality of intervention studies meeting EPOC design criteria (Low, High, Unclear)  
**Table 2**: Study characteristics of included intervention studies
<table>
<thead>
<tr>
<th>Study</th>
<th>Allocation sequence</th>
<th>Allocation concealment</th>
<th>Baseline outcomes</th>
<th>Baseline characteristics</th>
<th>Incomplete outcomes</th>
<th>Blinding</th>
<th>Contamination</th>
<th>Selective reporting</th>
<th>Other bias</th>
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Studies with high risk are designated with “H”, those with low risk are designated with a “L” and those studies that did not provide sufficient information to assess risk of bias are designated with “U”. * Criteria were assessed in relation to patient characteristics.
Table 2. Study characteristics of included intervention studies

<table>
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<tr>
<th>Study Country Design</th>
<th>Sample</th>
<th>Control</th>
<th>Intervention</th>
<th>Outcomes</th>
<th>Results</th>
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<td>Aranda[2]</td>
<td>Country: Australia Design: 2 arm RCT</td>
<td>N=192</td>
<td>Nurse-led education session</td>
<td>Session 1: DVD; question prompt list; education; drug information; self-care brochures Session 2: Telephone Session 3: Face-to-face</td>
<td>Primary: Distress (HADS) Secondary: Information and support needs (CaTS); Symptoms (C-SAS)</td>
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<td>Bennenbroek[33]</td>
<td>Country: Netherlands Design: 4 arm RCT</td>
<td>N=226</td>
<td>Standard care</td>
<td>Procedural tape: Diagnosis, radiotherapy, side-effects, follow-up Emotional tape: Positive and negative emotional reactions Coping tape: How patients coped</td>
<td>Subjective understanding of RT (2 items) Recognition of emotions (3 items) Self-efficacy (3 items) Mood (POMS)</td>
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<td>Chan[34]</td>
<td>Country: Hong Kong Design: 2 arm RCT</td>
<td>N=140</td>
<td>5-7 minute discussion of procedure and side effects.</td>
<td>Psycho-educational nurse-led education on symptom management and PMR</td>
<td>Primary: - Breathlessness (VAS) - Fatigue: Piper Fatigue Scale - Anxiety: STAI Secondary: Functional Ability: SF-36</td>
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<td>D’Haese[35]</td>
<td>Country: Belgium Design: 2 arm RCT</td>
<td>N=68</td>
<td>Information booklet and teaching sheets provided during first appointment</td>
<td>Information booklet provided at first appointment. Teaching sheets provided on 3rd-4th day of treatment</td>
<td>Primary: - Anxiety (STAI) - Satisfaction</td>
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<tr>
<td>De Lorenzo[36]</td>
<td>Italy</td>
<td>3 arm</td>
<td>N=300</td>
<td>Verbal information from the oncologist (OI)</td>
<td>Verbal information and two booklets (OI+B)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RCT</td>
<td>Any cancer</td>
<td>OI+B and videotape (OI+B+VT)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Chemotherapy</td>
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<tr>
<td>Haggmark[37]</td>
<td>Sweden</td>
<td>3 arm</td>
<td>N=210</td>
<td>Standard information (SI) in conference with physician</td>
<td>Standard information plus brochure (SIB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RCT</td>
<td>Breast, bladder or prostate</td>
<td>Standard information plus group and individual information (SIGI)</td>
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<td></td>
<td>Radiotherapy</td>
<td></td>
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<tr>
<td>Halkett[38]</td>
<td>Australia</td>
<td>2 arm</td>
<td>N=122</td>
<td>Written and verbal information from clinician</td>
<td>Usual care plus 2 face-to-face consultations with a radiation therapist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RCT</td>
<td>Breast cancer</td>
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<td></td>
<td>Radiotherapy</td>
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</tr>
<tr>
<td>Harrison[39]</td>
<td>United Kingdom (UK)</td>
<td>2 arm RCT</td>
<td>N=274</td>
<td>Written information only</td>
<td>Written information and videotape</td>
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<td></td>
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<td>Head, neck, bladder or prostate cancer</td>
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<td>Radiotherapy</td>
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<tr>
<td>Study, Country, Design</td>
<td>Sample, Intervention Information</td>
<td>Control, Description</td>
<td>Intervention, Description</td>
<td>Outcomes, Description</td>
<td>Results, Description</td>
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<tr>
<td><strong>Iconomou [22]</strong>&lt;br&gt;Country: Greece&lt;br&gt;Design: 2 arm RCT</td>
<td>N=145&lt;br&gt;Sample: Solid malignancy&lt;br&gt;Control: Chemotherapy</td>
<td>Routine verbal information by medical oncologist</td>
<td>Presentation session delivered by an oncology nurse plus booklet to take home.</td>
<td><em>Primary:</em> Satisfaction  &lt;br&gt;<em>Secondary:</em>  - Quality of life (EORTC QLQ-C30)  - Psychological distress (HADS)  - Information quantity and quality</td>
<td>Intervention group significantly more satisfied with information and care; greater quantity and quality of information; greater emotional functioning on EORTC QLQC30.  - No differences in other QoL scales, anxiety or depression.</td>
</tr>
<tr>
<td><strong>Johnson [40]</strong>&lt;br&gt;Country: United States of America (USA)&lt;br&gt;Design: 3 arm RCT</td>
<td>N=62&lt;br&gt;Sample: Prostate cancer&lt;br&gt;Control: Radiotherapy</td>
<td>Written summary and 3 audiotapes: 1) Detailed description of RT 2) Organisation of the Cancer Centre 3) Design of Cancer Centre</td>
<td>Written summary and 3 audiotapes:  &lt;br&gt;Coping group: 1) Coping/self-care 2) Management and review of side-effects  Concrete objective group: 1) Description treatment, Experience 6-7 weeks of RT; Changes in side-effects</td>
<td>- Optimism (LOT)  - Emotional status (POMS)  - Disruption usual activities (SIP)</td>
<td>Concrete objective information had benefits for mood in less optimistic patients.  - Self-care instruction had no effects on mood or usual activities.  - Concrete objective group had less disruption in last week and 2 weeks after RT.</td>
</tr>
<tr>
<td><strong>Jones [41]</strong>&lt;br&gt;Country: United Kingdom (UK)&lt;br&gt;Design: 3 arm RCT</td>
<td>N=525&lt;br&gt;Sample: Breast, cervical, prostate or laryngeal cancer&lt;br&gt;Control: Radiotherapy</td>
<td>Group 1: Written/booklet information</td>
<td>Group 2: General information with a printout provided  Group 3: Personalised information with a printout provided</td>
<td>- Anxiety and depression (HADS)  - Mental adjustment to cancer  - Information preferences  - Costs</td>
<td>Personalised group more likely to use computer than general group; lower anxiety at 3 months.  - No sig. change in depression or mental adjustment.  - Computer system cost 40% of the cost of the booklets.</td>
</tr>
<tr>
<td>Study Country Design</td>
<td>Sample</td>
<td>Control</td>
<td>Intervention</td>
<td>Outcomes</td>
<td>Results</td>
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<tr>
<td>Jones[42] Country: United Kingdom (UK) Design: 2x2x2 RCT (8 groups)</td>
<td>N=400  Breast, prostate cervical or laryngeal cancer Radiotherapy</td>
<td>General information (CancerBACUP) and either: interactively chosen or automatic by patients with or without anxiety mgmt.</td>
<td>Personalised information and either: interactively chosen or automatic by patients with or without anxiety mgmt.</td>
<td>- Computer and booklet use  - Anxiety and depression (HADS)  - Social support (HSSQ)</td>
<td>- No differences between the groups in anxiety, depression, social support or cancer understanding</td>
</tr>
<tr>
<td>Kim[43] Country: USA Design: 2 arm RCT</td>
<td>N=152  Prostate cancer Radiotherapy</td>
<td>4 min tape-recorded message in clinic</td>
<td>Usual care + 8 min tape-sensory messages about pre, during and post treatment phases</td>
<td>- Severity of side-effects  - Negative affect (POMS)</td>
<td>- Intervention reduced fatigue and sleeping problems (marginally sig.)  - No reduction in negative affect, diarrhea, skin problems, urinary problems</td>
</tr>
<tr>
<td>Kinnane[44] Country: Australia Design: 2 arm RCT</td>
<td>N=60  Newly diagnosed breast or colorectal Chemotherapy</td>
<td>Standard education session by nursing staff plus written information</td>
<td>Usual care plus video demonstrating self-help concepts</td>
<td>- Information recall (15 items)  - Number of calls to centre</td>
<td>No significant difference between groups.  - Higher number of general calls to clinic from control group</td>
</tr>
<tr>
<td>Poroch[45] Country: Australia Design: Quasi-experimental time series</td>
<td>N=50  Any cancer Radiotherapy</td>
<td>Standard procedures for RT preparation plus time with researcher about cancer experience so far</td>
<td>2 preparatory patient education (PPE) sessions and individual information</td>
<td>- Anxiety (STAI)  - Satisfaction (PPSQ)</td>
<td>- Intervention group significantly less anxious; greater satisfaction with information and nursing care</td>
</tr>
<tr>
<td>Study</td>
<td>Country</td>
<td>Design</td>
<td>Sample</td>
<td>Control</td>
<td>Intervention</td>
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<tr>
<td>Ream [46]</td>
<td>UK</td>
<td>2 arm RCT</td>
<td>N=103</td>
<td>Non-Hodgkin’s lymphoma, gastrointestinal, lung, colorectal, breast or unknown primary cancer</td>
<td>Ad hoc education and assessment only.</td>
</tr>
<tr>
<td>Thomas [47]</td>
<td>UK</td>
<td>2 arm RCT</td>
<td>N=220</td>
<td>Any cancer</td>
<td>BACUP booklet and verbal information</td>
</tr>
<tr>
<td>Zissiadis [48]</td>
<td>Australia</td>
<td>2 arm RCT</td>
<td>N=194</td>
<td>Any cancer</td>
<td>CCWA radiotherapy booklet</td>
</tr>
</tbody>
</table>

CaTS= Cancer Treatment Scale; CCWA=Cancer Council WA; CIPS=Cancer Inventory Problems Scale; C-SAS=Chemotherapy Symptom Assessment Scale; EORTC=European Organisation for Research and Treatment for Cancer; HADS=Hospital and Anxiety Depression Scale; HSSQ=Helgeson’s Social Support Questionnaire; IES=Impact of Events Scale; ISQ= Information Satisfaction Questionnaire; LOT= Life Orientation Test; PDI= Psychological Distress Inventory; POMS=Profile of Mood States; PPSQ=Pienschke Patient Satisfaction Questionnaire; RA=Research Assistant; RCT= Randomised Controlled Trial; RT=Radiotherapy; SF-36= SF-36 Health Survey; STAI=State Trait Anxiety Inventory.