



## Review

## Characteristics and effectiveness of complex nursing interventions aimed at reducing symptom burden in adult patients treated with chemotherapy: A systematic review of randomized controlled trials



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## ABSTRACT

**Objectives:** The multiplicity and complexity of symptoms in patients treated with chemotherapy requires multifaceted symptom management interventions. The aim of this systematic review was to describe the characteristics and evaluate the effectiveness of complex nursing interventions that target multiple symptoms in patients receiving chemotherapy.

**Design:** We searched Medline, Embase, Cinahl and the Cochrane Central Register of Controlled Trials for randomized controlled trials that compared complex nursing interventions to usual care and that provided data on symptom prevalence, severity, distress or limitations. Characteristics of the interventions were described in a narrative way. Regarding the effectiveness of the interventions, ratios of means were calculated in order to present data in a comparable and clinically interpretable way.

**Results:** We included 11 studies, some with considerable risk of bias. Despite being heterogeneous, the interventions have patient education, symptom assessment and coaching in common. Although some interventions fail to show significant effects, others significantly reduce aspects of symptom burden by 10–88%.

**Conclusion:** Although some complex nursing interventions in this systematic review produce clinically meaningful and statistically relevant reductions in symptom burden, based on the available data it is not possible to make definitive conclusions about the vital parts, circumstances or preferred target population of the interventions. Quality of the studies and modeling and piloting of the interventions are important challenges for future research.

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### What is already known about the topic?

- Nursing interventions aimed at reducing symptom burden in cancer patients treated with chemotherapy generally focus on one symptom, such as fatigue.
- The multiplicity and complexity of treatment-related symptoms in cancer patients demand for multifaceted symptom management interventions.

### What this paper adds

- Despite heterogeneity of the nursing interventions in this systematic review, patient education, symptom assessment, and coaching are common parts of the interventions.
- While studies present mixed results, some of the nursing interventions in this systematic review produce clinically important reductions in symptom burden.
- In order to advance the potential of these complex interventions and our understanding of the intervention effects, intervention development, piloting and mixed methods evaluation are priorities for future research on this subject.

## 1. Introduction

Although cancer treatments are known to be associated with side effects, symptom management remains very poor. A national survey conducted in the USA found that the proportions of patients treated for a side effect were consistently and considerably lower than proportions of patients experiencing it (Henry et al., 2008). Fifty percent or less of the patients experiencing treatment-related diarrhea, constipation, insomnia or fatigue reported receiving treatment for these side effects (Henry et al., 2008). Smaller yet important and consistent disparities between symptom prevalence and symptom treatment were found for nausea and/or vomiting, mucositis and pain (Henry et al., 2008). Morasso et al. (1999) found that nearly two-thirds of patients with advanced cancer failed to receive adequate symptom management, adding to their psychological and symptom distress.

Treating side effects is not only a matter of pharmacological interventions. A meta-analysis of psychosocial interventions in cancer patients found an average effect size (standardized difference between means) of 0.41 for treatment- and disease-related symptoms (Meyer and Mark, 1995). Such symptom management interventions generally focus on either a single cancer site or a single symptom (Doorenbos et al., 2005; Given et al., 2004; Sherwood et al., 2005), mostly fatigue, pain or insomnia (Miaskowski et al., 2004; Oliver et al., 2001; Pickett et al., 2002; Quesnel et al., 2003). Yet these symptoms rarely occur alone (Dodd et al., 2001; Doorenbos et al., 2005). Moreover, the presence of other symptoms may influence the implementation and effects of a symptom management program targeting one specific symptom. In a study evaluating an intervention that focused on pain self-management in patients with cancer, most patients experienced treatment-related symptoms, such as nausea, that affected their pain self-management (Koller et al.,

2013). Therefore, the authors argued that a future intervention should integrate these symptoms (Koller et al., 2013). Given the diversity of symptoms in cancer patients, meaningful improvement in quality of life can only be achieved by multifaceted symptom management programs (Doorenbos et al., 2005). This consideration has led to the development and study of symptom management interventions targeting multiple symptoms.

The aim of this systematic review was (1) to describe the characteristics of complex nursing interventions aimed at reducing symptom burden in adult cancer patients treated with chemotherapy, and (2) to evaluate the effectiveness of these interventions on symptom burden compared to usual care.

## 2. Methods

We conducted this systematic review according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) Statement (Liberati et al., 2009). The protocol for this systematic review was registered on PROSPERO (CRD42012002050), an international prospective register of systematic reviews (Coolbrandt et al., 2012). The protocol is summarized below and is available as online Appendix A.

### 2.1. Eligibility criteria

Eligible studies were randomized controlled trials (RCT) which were reported in any language and published between January 1995 and August 2012. Studies included adult (>18 years) cancer patients treated with chemotherapy regimens requiring hospital stays no longer than necessary for the administration of the treatment protocol. Studies in cancer patients in general were eligible if they reported separate results for the subgroup treated with chemotherapy.

Eligible interventions comprised complex (i.e. multi-modal) nursing interventions aimed at reducing symptom burden due to two or more chemotherapy-related symptoms. Multi-modality refers to the number (two or more) of components in the intervention and the interaction between these components (MRC, 1998, 2000).

Outcome measures related to the different dimensions of the symptom experience were as follows:

- symptom occurrence;
- symptom severity or the intensity of experienced symptoms (Lenz et al., 1997);
- symptom distress or the “degree to which the person is bothered by it” (Lenz et al., 1997);
- symptom limitations or the symptoms’ impact on or interference with daily life (Doorenbos et al., 2005).

Studies were considered if at least one of these outcome measures was extractable from data presented in the article.

### 2.2. Search

Studies were identified by querying Medline, Embase, Cinahl and the Cochrane Central Register of Controlled

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