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The assessment and management of chemotherapy-related toxicities in patients with breast cancer, colorectal cancer, and Hodgkin's and non-Hodgkin's lymphomas: A scoping review

Patricia Fox [a, *], Andrew Darley [a], Eileen Furlong [a], Christine Miaskowski [b], Elisabeth Patiraki [c], Jo Armes [d], Emma Ream [e], Constantina Papadopoulou [f], Lisa McCann [f], Nora Kearney [g], Roma Maguire [f]

[a] UCD School of Nursing, Midwifery and Health Systems, Health Sciences Centre, Belfield, Dublin 4, Ireland
[b] Department of Physiological Nursing, University of California, San Francisco, CA 94143-0610, United States
[c] Papadiamantopoulou 123, 11527 Goudi, Athens, Greece
[d] Florence Nightingale SchNM, James Clerk Maxwell Building, Waterloo, United Kingdom
[e] University of Surrey, School of Health Sciences, Faculty of Health and Medical Sciences, Guildford, Surrey, GU2 7XH, United Kingdom
[f] University of Surrey School of Health Sciences, Faculty of Health & Medical Sciences, Standard Buildings, Office 2.4, 2nd Floor, 94 Hope Street Glasgow, G2 6PH, United Kingdom
[g] University of Surrey, Faculty of Health and Medical Sciences, Duke of Kent Building, Guildford, Surrey, GU2 7XH, United Kingdom

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ABSTRACT

Purpose: The purpose of the eSMART (Electronic Symptom Management using the Advanced Symptom Management System (ASyMS) Remote Technology) study is to evaluate the use of mobile phone technology to manage chemotherapy-related toxicities (CRTs) in people with breast cancer (BC), colorectal cancer (CRC), Hodgkin's lymphoma (HL), and non-Hodgkin lymphoma (NHL)) across multiple European sites. One key objective was to review the published and grey literature on assessment and management of CRTs among patients receiving primary chemotherapy for BC, CRC, HL, and NHL to ensure that ASyMS remained evidence-based and reflected current and local practice.

Methods: Three electronic databases were searched for English papers, with abstracts available from 01/01/2004-05/04/2014. For the grey literature, relevant clinical practice guidelines (CPGs)/evidence-based resources (EBRs) from the main international cancer organisations were reviewed as were symptom management (SM) protocols from the sites.

Results: After full-text screening, 27 publications were included. The majority (n = 14) addressed fatigue and focused on BC patients. Relevant CPGs/EBRs were found for fatigue (n = 4), nausea/vomiting (n = 5), mucositis (n = 4), peripheral neuropathy (n = 3), diarrhoea (n = 2), constipation (n = 2), febrile neutropenia/infection (n = 7), palmar plantar erythrodysesthesia (PPE) (n = 1), and pain (n = 4). SM protocols were provided by >40% of the clinical sites.

Conclusions: A need exists for empirical research on SM for PPE, diarrhoea, and constipation. Research is needed on the efficacy of self-care strategies in patients with BC, CRC, HL, and NHL. In general, consistency exists across CPGs/EBRs and local guidelines on the assessment and management of common CRTs.
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1. Introduction

In 2013, the European Union (EU) funded eSMART[1]; a study evaluating Electronic Symptom Management using the Advanced Symptom Management System (ASyMS[2]) mobile phone technology

* Corresponding author.
E-mail address: patricia.fox@ucd.ie (P. Fox).

[1] Electronic Symptom Management using the Advanced Symptom Management System.

[2] Advanced Symptom Management System.

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for the management of chemotherapy-related toxicities (CRTs) in people with breast cancer (BC), colorectal cancer (CRC), Hodgkin's lymphoma (HL), and non-Hodgkin lymphoma (NHL)) cancers across multiple clinical sites in Europe. Developed in conjunction with cancer clinicians and people with cancer (Kearney et al., 2006, 2009; Gibson et al., 2009; Kearney et al., 2009; Gibson et al., 2010; Maguire et al., 2015), ASyMS is a mobile phone based remote monitoring system that enables real time monitoring of CRTs through patients' completion of electronic patient reported outcome measures (ePROMs). ASyMS facilitates immediate tailored management of CRTs in the home care setting, automatic and immediate triaging of care when toxicities exceed clinical norms, and the provision of evidence-based self-care advice.

At the outset, a key objective of eSMART was to undertake a review of the published and grey literature (international, national and local clinical guidelines) related to the assessment and management of CRTs among patients receiving primary chemotherapy for BC, CRC, NHL, and HL to ensure that ASyMS (risk algorithms, symptom protocols, self-care advice) was evidence-based, updated,[3] and reflected current and local practice. Consistent with the toxicities assessed and managed using ASyMS, this review was limited to the most common CRTs (i.e., nausea, vomiting, diarrhoea, constipation, mucositis/stomatitis, chemotherapy induced peripheral neuropathy (CIPN), hand-foot syndrome (palmar plantar erythrodysesthesia (PPE)), fever (or febrile neutropenia (FN)), infection, fatigue, pain). The purpose of this paper is to report on the background, objectives, methods, and key findings from the published and grey literature review.

2. Methods

2.1. Search strategy (published literature)

With the assistance of a college librarian, a search strategy with five search strings (Fig. 1, Appendix 1) was designed. This search was conducted within three electronic databases (i.e., PubMed, CINAHL, PsycARTICLES) using specific Boolean operators, truncation markers, and MeSH headings. All searches were limited to English papers, involving human participants over 18 years of age, with an abstract available dating from January 1st, 2004 to April 5th, 2014. Given the recent literature review[3] it was deemed sufficient to target empirical literature published within the previous ten years. The results were exported into WebEndNote© and articles were screened in two stages. First, titles and abstracts of all retrieved articles were screened for eligibility by two reviewers (CP1, AD). Where relevance was unclear from the title or abstract, a copy of the full text was obtained.

One hundred and eighty articles met the inclusion criteria (see Table 1) and full text versions were obtained. The second phase of screening involved assessment of the full texts (N = 180) by five reviewers (CP1, AD, EF, PF, AM). Studies were selected if they met the inclusion criteria. To further ensure the quality of the included literature, articles were required to meet the criteria outlined by the UK's Department of Health (DoH) 'Typology of Supportive Evidence' (UK DoH, 2011) (Table 1). Once all of the articles were screened, the eligibility outcomes were cross-checked and examined by a sixth reviewer (CP2). This reviewer was given 10% of the full text articles to compare her rating of outcomes with those of the original screening team. Seven discrepancies were identified and three reviewers (CP1, CP2, AD) made the final decision regarding relevance. A PRISMA diagram of the systematic review process that depicts the reasons for inclusion and exclusion criteria of articles is presented in Fig. 1.

Once the final set of relevant papers were identified (N = 27), key data were extracted and tabulated (see Appendix 2).

2.2. Methods adopted to review the grey literature

This scoping review included a focused appraisal of the relevant grey literature to minimise the omission of important information which is not published (Blackhall and Ker, 2007). This approach included a review of symptom management protocols across the participating clinical sites (N = 13) in the study to achieve consistency with reference to the symptom management and self-care advice utilized for ASyMS. More specifically, relevant clinical practice guidelines (CPGs)/evidence-based resources (EBRs) from the main international medical and nursing cancer organisations were reviewed (i.e., the European Society for Medical Oncology (ESMO), the American Society for Clinical Oncology (ASCO), the National Comprehensive Cancer Network (NCCN), the Multinational Association for Supportive Care in Cancer (MASCC), the Oncology Nursing Society (ONS), the European Oncology Nursing Society (EONS)). While acknowledging that some were published, CPGs/EBRs were included under the grey literature heading to decrease the likelihood of omitting guidelines that were not published in journals (e.g., EONS guidelines and ONS Putting Evidence into Practice (PEP) online resources). The United Kingdom Oncology Nursing Society (UKONS) was the only national organisation with symptom management guidelines available in English. In addition, each clinical site involved in the study was asked to provide copies of their symptom management protocols and/or guidelines if they were available in English.

3. Results

The findings from this review are structured around each of the symptoms, that is, each symptom is discussed with reference to the relevant published and grey literature. For the published literature, the initial search strategy elicited 7268 unique publications. After a full-text screening process, 27 publications were included in this review. The majority of the papers were either reviews (n = 7, including four systematic reviews (SR)) or RCTs (n = 7). With the exception of a single arm pilot study, the remaining studies were descriptive utilising a quantitative (n = 9), qualitative (n = 2), or mixed methods (n = 1) approach (Appendix 2). The majority of the papers (n = 14) addressed fatigue (either as a primary or secondary endpoint in intervention studies or in addition to other symptoms in the reviews and descriptive studies) and these papers primarily focused on patients with BC. Nine papers addressed multiple symptoms while CIPN was the focus of three papers. Chemotherapy-induced nausea and vomiting (CINV) were addressed separately in two papers and together in one paper. Oral mucositis (OM) and pain were both the focus of two separate papers. None of the papers focused on symptom management for diarrhoea, constipation, or PPE. The majority of the studies addressed various interventions for symptom management. Only three papers (Chou et al., 2007,[4] Speck et al., 2012; Spichiger et al., 2012) addressed self-care strategies.

Relevant CPGs/EBRs were found for fatigue (n = 4), CINV (n = 5),

[3] The content of the existing system was rigorously developed following systematic reviews of the literature and expert clinician consensus in the UK and Australia in 2011.

[4] According to Chou et al. (2007), approximately 2–3 self-care strategies were used to manage each symptom reported in their study. While the specific self-care strategies were not identified, they were reported to be of low to moderate effectiveness.

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