

The cost-effectiveness of a nurse-led care program for breast cancer patients undergoing outpatient-based chemotherapy – A feasibility trial

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ABSTRACT

Purpose: To evaluate the cost-effectiveness of a nurse-led care program for breast cancer patients receiving outpatient-based chemotherapy.

Method: An open-label, single-center randomized controlled trial was conducted. Patients receiving the nurse-led care and those receiving the routine care were compared in terms of quality of life, as well as in health service utilizations and total cost of care. A cost-utility analysis was conducted.

Results: A total of 124 patients were recruited. The data of 116 subjects who completed the study were used for the cost-utility analysis. There were 81 unscheduled hospital visits and 43 hospital admissions. The common reasons for utilizing health services were infections and fevers, skin problems, digestive system problems, and mouth/teeth/throat problems. There were no differences in health service utilizations between the nurse-led and routine care groups for subjects receiving four-cycle chemotherapy. For those receiving six-cycle chemotherapy, the estimated number of emergency department visits was 2.188 times (95% Confidence Interval, 1.051 to 4.554) higher for the routine care group when compared with the nurse-led care group ($p = .038$). The incremental cost-utility ratios were £8856 and £18,936 per quality-adjusted life year gained for subjects receiving four-cycle and six-cycle chemotherapy, respectively.

Conclusions: Cancer patients make unscheduled health service visits when receiving outpatient-based chemotherapy, which leads to increased health service costs. The nurse-led care reduces emergency departments visits made by breast cancer patients undergoing six-cycle adjuvant chemotherapy. For breast cancer patients undergoing four-cycle chemotherapy and six-cycle chemotherapy, the nurse-led care could be cost-effective.

1. Introduction

The use of chemotherapy as a cancer treatment has increased in the past two decades due to tremendous advancements in chemotherapy drugs (Kearney et al., 2008). The settings for administering of chemotherapy drugs have changed as well. A large number of cancer patients now receive chemotherapy in outpatient settings. The shift to outpatient-based chemotherapy is a result of efforts to devise a more efficient and economical way of delivering health care to meet the increasing need for chemotherapy treatment.

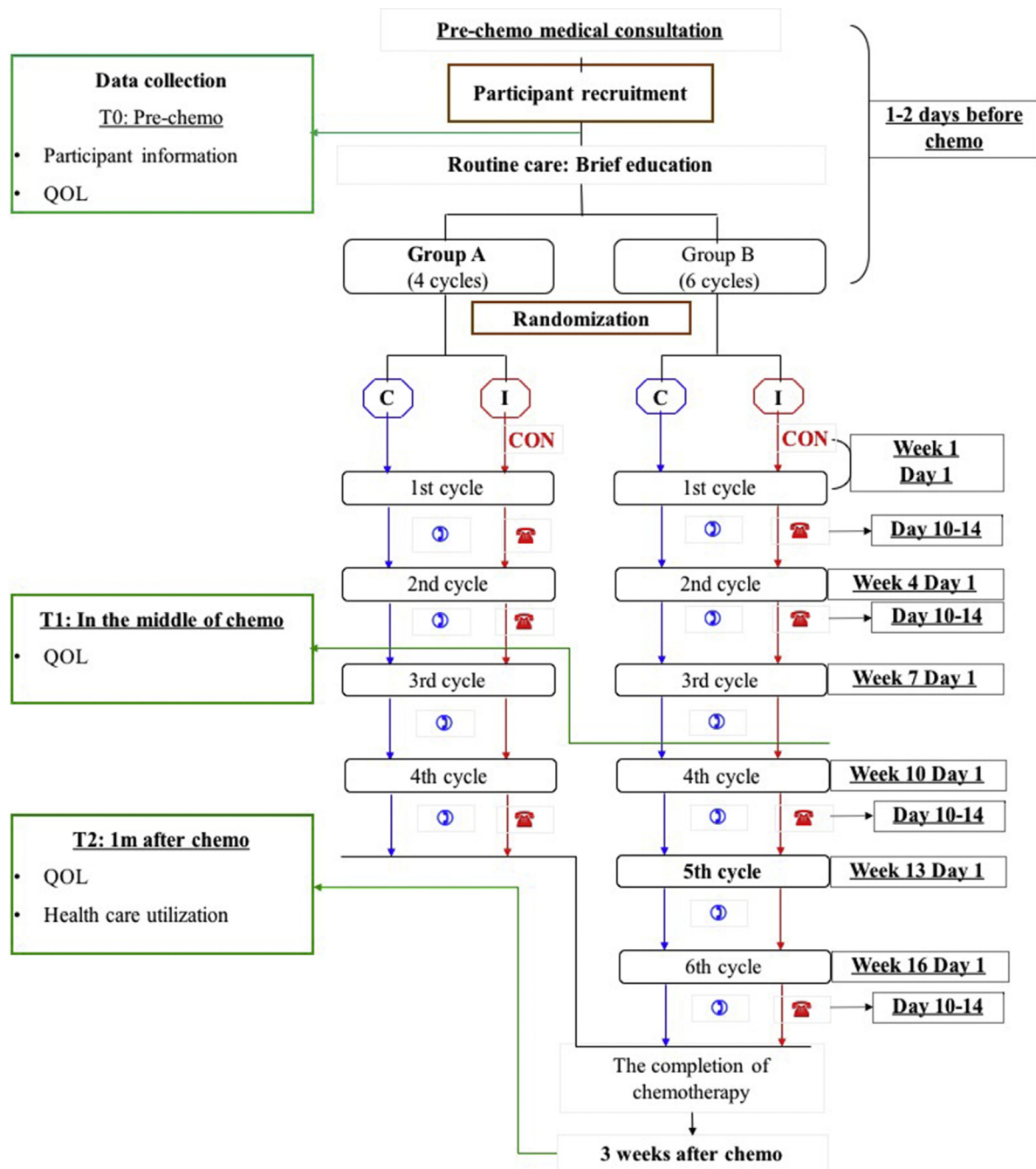
Chemotherapy affects cancer patients in many ways (Denieffe and Gooney, 2011). They can experience multiple side effects, such as mucositis, nausea and vomiting, altered appetite, skin changes, insomnia, pain, and fatigue (Brant et al., 2011; Kurt and Unsar, 2011;

Yamagishi et al., 2009), as well as a range of manifestations of psychological distress (Yamaguchi et al., 2012). All of these can cause patients to feel that chemotherapy is difficult to cope with (Ellis et al., 2013).

Cancer patients undergoing outpatient-based chemotherapy may encounter more challenges if adequate health care support is not provided during chemotherapy intervals. The severity of the side effects peaks in the first week after the infusion of drugs and decreases to the lowest level before the next cycle (Jim et al., 2011). Patients usually receive chemotherapy in an outpatient setting and experience these side effects in a home environment when they are discharged on the day that they have completed the treatment. Most of the time, they have to cope with chemotherapy-related problems on their own. Therefore, the provision of community-based health care support during

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Abbreviations: Chemo, chemotherapy; C, control arm; I, intervention arm; CON, pre-chemotherapy nursing consultation; ☎ Nurse-led telephone follow-up; ☎ Patient-initiated hotline service.

Fig. 1. Flowchart of the study.

chemotherapy intervals is particularly helpful to these patients. They want to receive home visits from health care providers (Gozum and Akcay, 2005) or from a primary health care provider who can answer their questions (Lei et al., 2011) during the chemotherapy intervals. Inadequate support from health care providers can lead to increased level of distress (Bergkvist and Wengstrom, 2006). Distressing experiences and unmet needs will eventually impair the quality of life (QOL) of cancer patients (Cheng et al., 2011; Chou et al., 2007; Denieffe and Gooney, 2011). Poorly managed chemotherapy-related problems may also increase health care utilizations during the period when patients are receiving chemotherapy. Baena-Cañada et al. (2012) reported that 42.2% of breast cancer patients required more than one unscheduled

encounter with health care services during outpatient-based chemotherapy due to the side effects that they experienced. The need to provide extra health care services may represent an additional burden at a time when health care resources are limited.

Nurse-led care has been explored as a potential solution to providing better support to such cancer patients, since it has been recommended as a possible way to improve the quality of cancer care (Farrell et al., 2011), and because there is empirical evidence of its safety, effectiveness, and high level of patient satisfaction (Corner, 2003; Lai et al., 2017a). A randomized controlled trial (RCT) (NCT02228200) was conducted to examine the effects of a nurse-led care program on cancer patients receiving outpatient-based

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