



Review article

Assessing the quality of economic evaluations of clinical nurse specialists and nurse practitioners: A systematic review of cost-effectiveness



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ABSTRACT

A limited number of randomized controlled trials (RCTs) including economic analysis have supported the cost-effectiveness of nurse practitioners and clinical nurse specialists delivering care in a variety of settings. Our objective was to examine the quality of economic evaluations in this body of literature using the Quality of Health Economic Studies (QHES) tool, and highlight which questions of the quality assessment tool are being addressed adequately or require further attention within this body of literature. Of 43 RCTs included in our systematic review, the majority (77%) fell in the poor study quality quartile with an average total QHES score of 39 (out of 100). Only three studies (7%) were evaluated as high quality. Inter-rater agreement (prior to consensus process) was high (83% agreement). Four criteria for the quality of economic evaluations were consistently addressed: specification of clear, measurable objectives; pre-specification of subgroups for subgroup analyses; justified conclusions based on study results; and disclosure of study funding source. A clear statement of the primary outcome measures, incremental analysis, and assessment of uncertainty were often unclear or missing. Due to poor methodological quality, we currently lack a solid evidence base to draw clear conclusions about the cost-effectiveness of nurse practitioners and clinical nurse specialists. Higher quality economic evaluations are required to inform these questions.

Abbreviations: QHES, Quality of Health Economic Studies; RCT, randomized controlled trial

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Introduction

Two top priorities within the current health care environment are the reduction of costs without deteriorating the quality of health care, and the improvement of patient outcomes while maintaining reasonable costs (Gerkens et al., 2008; Ofman et al., 2003). As a result, to help formulate health policy decisions there is a growing interest in economic evaluations comparing costs and outcomes within a wide range of health care programs (Gerkens et al., 2008; Spiegel et al., 2004). One of the decisions health policy makers face is whether and how they should integrate nurse practitioners and clinical nurse specialists in the health care system and they often request evidence about the cost-effectiveness of these roles.

Review of literature

Clinical nurse specialists and nurse practitioners are considered advanced practice nurses (International Council of Nurses, 2009). Clinical nurse specialists are registered nurses with a graduate degree in nursing who have expertise in a clinical specialty and perform an advanced nursing role that includes practice, consultation, collaboration, education, research, and leadership (Affara, 2009). Nurse practitioners are defined as registered nurses who have additional education, preferably at the graduate level with advanced competencies to autonomously diagnose, prescribe medications and treatments, order and interpret diagnostic tests, and perform specific clinical procedures, as authorized by legislation and their regulatory scope of practice (International Council of Nurses, 2009).

Studies on the effectiveness of nurse practitioners consistently demonstrate high quality care and patient satisfaction (Horrocks, Anderson, & Salisbury, 2002; Newhouse et al., 2011), and studies on the effectiveness of clinical nurse specialists have shown reductions in hospital length of stay, readmissions, emergency room visits and associated costs (Fulton & Baldwin, 2004; Newhouse et al., 2011). However, questions often arise about the cost-effectiveness of these roles. Few attempts have been made to consolidate and evaluate the quality of this specific body of evidence. If we assume that higher quality health economic analyses lead to better health care decisions, then the methodological quality of health care studies is important (Au, Prahardhi, & Shiell, 2008). To this end, it is essential for evaluators and users of this evidence to have a way to assess the quality of these studies (Ofman et al., 2003).

We selected the Quality of Health Economic Studies (QHES) instrument to evaluate the quality of cost-effectiveness analyses of randomized controlled trials (RCTs) of nurse practitioners and clinical nurse specialists. We selected this tool because it addresses specifically questions about study quality of health economic analyses and was designed by health economics experts to assess three types of health economic analysis: *cost-minimization*, *cost-effectiveness*, and *cost-utility* (Chiou et al., 2003; Ofman et al., 2003).

The purpose of our study was threefold. First, to highlight which questions of the QHES are being addressed within this body of literature and which require further attention; second, to assess inter-rater agreement using the QHES tool on nurse practitioner and clinical nurse specialist health economic studies; and third, to evaluate study quality in three areas of nurse practitioner and clinical nurse specialist health care economics: in-patient, out-patient and transition care.

Materials and methods

Study identification

This paper is one of a series of papers reporting findings from our systematic review entitled, *A systematic review of the cost-effectiveness of nurse practitioners and clinical nurse specialists: 1980 to July 2012* (Donald et al., 2015; Donald et al., 2014; Kilpatrick et al., 2014). The methods for our systematic review are described in detail elsewhere (Donald et al., 2014). Briefly, we searched electronic databases and relevant websites, hand-searched key journals, reviewed reference lists of relevant papers, and contacted authors to identify all relevant published and unpublished RCTs of nurse practitioner or clinical nurse specialist cost-effectiveness reported from 1980 to July 2012 with no restrictions on jurisdiction or language. RCTs met inclusion criteria if they evaluated nurse practitioners or clinical nurse specialists, if the impact of the nurse practitioner or clinical nurse specialist could be isolated (e.g., if part of a multi-component or multi-disciplinary intervention), and if the study included any objective measures of health system utilization. These included length of stay, re-hospitalization, costs of health care (e.g., hospital, professional, family costs) and health resource use (e.g., diagnostic tests, prescriptions).

Relevant studies were categorized into six groups in which the nurse practitioner or clinical nurse specialist was working in an inpatient setting, outpatient setting (including primary care and long-term care) or in a transition role. Transitional care referred to the role of a nurse practitioner or clinical nurse specialist in providing a range of health services designed to promote the safe and timely transfer of patients between one level of care to another or between health care settings (Naylor, Aiken, Kurtzman, Olds, & Hirschman, 2011).

Study assessment using QHES

The QHES has been validated and shown to be simple and reliable (Ofman et al., 2003). This tool includes 16 questions answered as “yes” or “no” and each question has an assigned value ranging from 1 to 9 (Ofman et al., 2003). It assesses several economic study criteria including whether the stated objectives, analytical perspective and time horizon, outcome measures, data abstraction methods, and analysis (incremental analysis and handling of uncertainty) are clearly stated; the appropriateness of selected economic models and associated cost measurements; and whether a clearly defined process to reduce the risk of bias was included (Table 1). Questions answered “yes” receive the full point value and those answered “no” receive no points. The sum of these points generates a summary score on a scale of 0–100, with 0 indicating extremely poor quality and 100 indicating high quality.

Two research assistants (SL [BSc with a background in actuarial science and statistics] and KR [MSc with a background in the conduct of systematic reviews]), trained by a health economist investigator (DM), independently assessed the quality of each study with respect to health economic analyses using the QHES tool. Prior to implementing the QHES tool, the criteria for each question were reviewed by the two assistants together with the health economist investigator to determine whether more specific guidance was necessary to ensure consistent interpretation for each question. These elaborated descriptors are noted in Table 1 in italics. The QHES tool was also pilot-tested on four studies by the two research assistants prior to completing the evaluations.

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