International Journal of Nursing Studies 81 (2018) 61–80

Contents lists available at ScienceDirect

International Journal of Nursing Studies

journal homepage: www.elsevier.com/locate/ijns

Clinical and economic outcomes of nurse-led services in the ambulatory care setting: A systematic review

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ARTICLE INFO

Keywords:
Nurse-led care
Nurse-led services
Health-related quality of life
Chronic conditions
Economic outcomes
Process outcomes
Ambulatory care setting
Systematic review

ABSTRACT

Background: With the increasing burden of chronic and age-related diseases, and the rapidly increasing number of patients receiving ambulatory or outpatient-based care, nurse-led services have been suggested as one solution to manage increasing demand on the health system as they aim to reduce waiting times, resources, and costs while maintaining patient safety and enhancing satisfaction.
Objectives: The aims of this review were to assess the clinical effectiveness, economic outcomes and key implementation characteristics of nurse-led services in the ambulatory care setting.
Design: A systematic review was conducted using the standard Cochrane Collaboration methodology and was prepared in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.
Data sources: We searched the Cochrane Central Register of Controlled Trials (CENTRAL) on The Cochrane Library, MEDLINE EBSCO, CINAHL EBSCO, and PsycINFO Ovid (from inception to April 2016).
Review methods: Data were extracted and appraisal undertaken. We included randomised controlled trials; quasi-randomised controlled trials; controlled and non-controlled before-and-after studies that compared the effects of nurse-led services in the ambulatory or community care setting with an alternative model of care or standard care.
Results: Twenty-five studies of 180,308 participants were included in this review. Of the 16 studies that measured and reported on health-related quality of life outcomes, the majority of studies (n = 13) reported equivocal outcomes; with three studies demonstrating superior outcomes and one demonstrating inferior outcomes in comparison with physician-led and standard care. Nurse-led care demonstrated either equivalent or better outcomes for a number of outcomes including symptom burden, self-management and behavioural outcomes, disease-specific indicators, satisfaction and perception of quality of life, and health service use. Benefits of nurse-led services remain inconclusive in terms of economic outcomes.
Conclusions: Nurse-led care is a safe and feasible model of care for consideration across a number of ambulatory care settings. With appropriate training and support provided, nurse-led care is able to produce at least equivocal outcomes or at times better outcomes in terms of health-related quality of life compared to physician-led care or standard care for managing chronic conditions. There is a lack of high quality economic evaluations for nurse-led services, which is essential for guiding the decision making of health policy makers. Key factors such as education and qualification of the nurse; self-management support; resources available for the nurse; prescribing capabilities; and evaluation using appropriate outcome should be carefully considered for future planning of nurse-led services.

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https://doi.org/10.1016/j.ijnurstu.2018.02.002
Received 11 August 2017; Received in revised form 12 February 2018; Accepted 15 February 2018
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What is already known about the topic?

- Previous systematic reviews showed the effects of nurse-led care were comparable to physician-led care in several settings.
- However, majority of these systematic reviews **focussed** on single specialty settings, were conducted over 10 years ago, and did not provide a detailed synthesis of economic and process outcomes.

What this paper adds?

- This paper provides an updated systematic review of the literature, confirming that nurse-led care produce equivalent or better outcomes compared to physician-led/standard care in managing chronic conditions in the ambulatory care setting.
- This paper also suggests a number of important process outcomes such as education and qualification of the nurse; self-management support; resources available for the nurse; and prescribing capabilities. These factors should be carefully considered for future planning of nurse-led services.
- This paper highlights a lack of high quality economic evaluations and provides direction for future economic evaluations of nurse-led services.

1. Background

With the increasing burden of chronic and age-related diseases, and the rapidly increasing number of patients receiving ambulatory or outpatient-based care, nurse-led clinics or services have been suggested as one solution to manage increasing demand on the health system as they may reduce waiting **times**, resources, and costs while maintaining patient safety and enhancing satisfaction (Barkauskas et al., 2011; Bergman et al., 2013). Nurse-led services developed as an advanced practice role for primary chronic disease management during the 1990s (Ndosi et al., 2011). They are now common in a wide variety of clinical and specialist areas and are well established in the USA, UK and Canada in diseases such as: **rheumatoid arthritis; diabetes; hypertension; cardiac conditions; musculoskeletal disorders; cancer; and dermatology**.

Nurses make up the largest workforce in healthcare and can play a fundamental role in redesigning healthcare models (Institute of Medicine, 2010). Nurse-led services are complex interventions involving multiple care components (Craig et al., 2008). They usually follow structured protocols, guidelines and algorithms for decision making and are thus associated with adherence to best practice. They aim to facilitate increased follow-up for patients and improve concordance with guidelines. They are considered to provide safe care, which may result in improved outcomes and potentially lower healthcare costs (Kilpatrick et al., 2014). Commonly, in a nurse-led service, nurses assume their own patient case-loads, work autonomously and manage a patient's health through assessment, monitoring, nursing interventions, and provision of education and support to patients to empower them to manage their own health needs (Wong and Chung, 2006). To provide a nurse-led service, nurses generally require educational preparation and training specific to each context of practice. The International Council of Nurses recommends that a Master's degree is required for entry level (International Council of Nurses, 2017). The nurse-led care model relies on the adept nurse to have the attributes, skills, and knowledge to competently and comprehensively deliver care (Bergman et al., 2013). Identifying and training such nurses requires careful and considered workforce planning. Policy directives, funding and education opportunities are required to ensure nurses can assume this role and are able to deliver effective and equitable healthcare services (Chiarella, 2008). One of the most important considerations for a nurse-led service is requirements of appropriate qualifications and ongoing professional development; this underpins a competent service. Careful planning, implementation, accountability and evaluation is required to ensure the service is effective (Hatchett, 2008).

Several reviews examined nurse-led services for certain health conditions, and suggested these services may be beneficial (Schadewaldt and Schultz, 2011; Page et al., 2005; Phillips et al., 2005; Craig, 2005; Kuethe et al., 2013). In some settings, studies evaluating substitution of physicians by nurses have found no differences in health outcomes, with some evidence of improved satisfaction (Schadewaldt and Schultz, 2011; Page et al., 2005; Phillips et al., 2005; Craig, 2005; Kuethe et al., 2013). However, the majority of these reviews are either over 10 years old, focussed on single condition/practice settings or did not include economic and process outcomes as part of the reviews. The focus of this current review was to examine evidence for nurse-led services across all chronic conditions in the ambulatory care setting, where the nurse assumed primary responsibility for patient management and care. Furthermore, this review also synthesised key information regarding implementation of services and examined the economic outcomes of such services.

2. Aims

The primary aim of this review was to assess the clinical effectiveness of nurse-led services in the ambulatory or community care setting. The secondary aims of this review were to examine the economic outcomes and to characterize the nurse-led services by describing (i) the training and qualification requirements of the nurses; (ii) whether self-management support was a component of the nurse-led intervention; (iii) whether the interventions were delivered by nurse practitioners. These three characteristics were perceived to be critical for informing development of future nurse-led services during the design of this systematic review.

3. Methods

This systematic review was prepared in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and was prospectively registered in PROSPERO (ID 42016036924).

3.1. Identification of studies and inclusion criteria

We searched the following electronic databases: Cochrane Central Register of Controlled Trials (CENTRAL) on The Cochrane Library (Issue 4, 2016), MEDLINE EBSCO (1966–April 2016), CINAHL EBSCO (1982–April 2016), and PsycINFO Ovid (1967–April 2016). The searches were restricted to humans and to studies in English. Search terms included combinations of terms to describe the intervention (e.g. nurse-led, nurse practitioners, nurse, nursing) and the setting (e.g. primary care, community, outpatient, ambulatory, clinics) (See Supplementary material 1). The reference list was also hand searched to further identify relevant studies for inclusion.

Only comparative quantitative evaluative studies were included. Study designs included in this review are: randomised controlled trials; quasi-randomised controlled trials; controlled and non-controlled before-and-after studies. The population of interest were people who received nurse-led services in an ambulatory or community care setting. There was no limitation on diagnosis. Studies that evaluated nurse-led services provided as part of an inpatient service or midwife-led services were excluded. The reviewed interventions were nurse-led services as a model of care where the registered nurse has primary responsibility for patient management and care for a cohort of patients located in an ambulatory or community care setting. Studies that used usual care or any other alternative model of care (e.g. physician-led services) as the comparator were included. The primary outcome was health-related quality of life (HRQoL). For the purpose of this review, the authors believed that this was an appropriate primary outcome as it provides a composite measure of issues that are important to a variety of patient

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