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Evaluation of the impact of nurse consultant roles in the United Kingdom: a mixed method systematic literature review

Running head - Impact of nurse consultant roles: systematic review

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Abstract

Aim: This paper reports a mixed methods systematic review examining the impact of nurse consultant roles in adult healthcare settings, with a view to identifying indicators for demonstrating their impact on patient and professional outcomes.

Background: Nurse consultants were introduced in England in 2000 with the intention to achieve better outcomes for patients by improving quality and services. Previous studies have investigated the impact of nurse consultants, but attempts to amalgamate this evidence have been methodologically limited. Since these reviews were published, the importance of demonstrating the contribution of nurse consultants has prompted new research. A robust review of the evidence is now required.

Data Sources: A broad search strategy was adapted for eight databases. Grey literature was sought from various sources.

Review methods: Quantitative and qualitative studies were included. Study quality was assessed using appropriate instruments. Cross-study synthesis combined the quantitative and qualitative findings in relation to the dimensions of impact identified. Measures of impact were mapped against a framework for assessing clinical and professional outcomes.

Results: Thirty-six studies were included. The findings suggest a largely positive influence of nurse consultants on a range of clinical and professional outcomes, which map onto the proposed framework of impact. However, there was very little robust evidence and the methodological quality of studies was often weak.

Conclusion: Further robust research is required to explore nurse consultants' impact on patient and professional outcomes. The proposed framework for assessing impact could be used to guide future research and assist nurse consultants assess their impact.

Keywords: nurse consultants; impact; mixed methods; systematic review

Summary statement

What is already known about this topic

- Nurse consultants were introduced in England in 2000 but research to date has produced limited evidence of the impact of these roles on patient outcomes and experience, or on staff or service outcomes.
- Previous attempts to review the literature on nurse consultant roles have methodological limitations and have provided little evidence of the impact of nurse consultants.

What this paper adds

- The current review provides evidence illustrating that nurse consultants have the potential to influence a range of clinical and professional outcomes.
- A number of key areas are highlighted that nurse consultants could explore to demonstrate their impact.
- Findings from the review confirm the difficulty of evaluating the complex roles that nurse consultants occupy and suggest that both quantitative and qualitative approaches should be used.

Implications for practice and/or policy

- Further robust quantitative research should be conducted to assess nurse consultants' impact on patient and professional outcomes.
- Further qualitative research should aim to explore patients' experiences of the care they receive from nurse consultants.
- An initial framework has been developed to help nurse consultants consider their impact in relation to a range of indicators of clinical and professional significance.

INTRODUCTION

The United Kingdom (UK), alongside many other countries, has seen a proliferation in advanced practice nursing roles in the past three decades. These developments have been in response to the significant challenges facing healthcare systems globally in terms of changing health needs of populations and rising public expectations of healthcare. In particular, ageing populations and an increase in chronic illness, coupled with economic pressures which necessitate the optimal use of all members of the healthcare team have acted as a catalyst to develop new nursing roles (DiCenso and Bryant-Lukosius 2010). Whereas clinical nurse specialist and nurse practitioner roles have developed in many countries and there is a degree of similarity in terms of the role and scope of such posts (Schober and Affara 2006), the role of nurse consultants it less clearly defined.

Although clinical nurse consultants were introduced in Australia in 1986 there remains ambiguity about the role and scope of practice (O'Baugh et al 2007). Indeed, in some Australian states the role is synonymous with that clinical nurse specialist (O'Connor & Chapman 2008). Likewise in the USA, the term 'nurse consultant' is not formally recognised and may be used alongside other advanced practice titles. For example, Popejoy et al (2000) described the gerontological clinical nurse specialist as fulfilling a consultant role. By contrast, the UK is unique in terms of health policy defining the nurse consultant role which is seen to be separate from, and more senior to, clinical nurse specialists and nurse practitioners.

Nurse consultants were introduced into the National Health Service (NHS) in England in 2000 as part of the Government's strategy for nursing professions (DH 1999a). The role was intended to achieve better outcomes for patients by improving quality and services and to enable experienced nurses to remain in clinical practice rather than move into management (DH 1999a). The Department of Health (DH) specified that the role should comprise four core functions: expert practice; leadership and consultancy; education and training; and service development, research and evaluation with a minimum of 50% of the time being spent in clinical practice (DH 1999b). The NHS Plan (DH 2000) set a target of 1000 posts by 2004. NHS organisations were required to implement the role in hospital and community settings and across all nursing specialisms.

At the same time that nurse consultants were being implemented, a growing public concern about the quality of nursing care and a professional aspiration to demonstrate the contribution that nurses make to patient outcomes and improvement in quality led to an interest in measures of nursing impact (Griffiths et al. 2008). With continuing investment in the role, interest has grown in the extent to which the original objectives of improving quality and services leading to better patient outcomes is being realised.

Early published work on consultant roles in the UK reports its implementation (Guest et al 2001) and the role characteristics (Woodward et al 2005). Other publications described initiatives introduced by nurse consultants and through this alluded to the impact that the role may have (e.g. Pottle 2005; Fairley & Closs 2006). A comprehensive evaluation of the role (Guest et al 2004) highlighted some evidence of the impact of nurse consultants in developing services and providing clinical leadership for frontline staff. It was inferred that these activities would impact indirectly on patient outcomes and patient experience, but their direct impact on patient or service outcomes was not captured.

Two syntheses of literature on nurse consultant roles have been published. A narrative review by McSherry et al (2007) identified 10 studies and a systematic review by Humphreys et al. (2007) identified 14 papers. However, both reviews provided limited evidence of the actual impact of nurse consultants on outcomes. In Humphreys et al. (2007), studies were often small and predominantly focused on the implementation of the role rather than evaluating the impact of nurse consultants on patients, staff or services. Where impact was considered, it was assessed in terms of *perceived* impact rather than any actual measures.

Furthermore, both reviews have methodological limitations. McSherry et al. (2007) provide very little detail about their inclusion criteria. Some studies included are not clearly related to nurse consultants (e.g. Carnwell & Daly 2003) and others are international studies of 'clinical nurse consultants' (Dawson & Benson 1997, Happell et al. 2002). The UK nurse consultant role is unique in terms of the four components, and it is unclear whether comparison to international roles is appropriate (Lathlean 2007). Humphreys et al. (2007) focused on UK nurse consultants, but their inclusion criteria included 'studies conducted by nurse/midwives/ allied health professional (AHP) consultants'. In some studies it is unclear whether the nurse consultant formed part of the intervention being evaluated and other papers do not describe

any outcomes assessing impact (Cunningham 2000, Anderson et al. 2004, Bray et al. 2004, Braynion 2004) but instead are descriptive literature reviews written by nurse consultants.

Overall, existing reviews of nurse consultant roles have been limited. The reviews found few studies which explored the impact that nurse consultants have on patient outcomes or on other staff. This may be because it takes at least five years for a new post to develop fully, and therefore assessing impact any earlier is premature (National Nursing Research Unit. 2007). However, since these reviews were conducted the importance of demonstrating the contribution made by nurse consultants on patient and professional outcomes has been highlighted (Griffiths et al. 2008) and further research has been undertaken (e.g. Fairley & Closs, 2006).

A study undertaken by Gerrish et al. (2007) examined the contribution that advanced practice nurses, including nurse consultants, made to empowering front-line staff to deliver evidence-based care. The study drew similar conclusions to Guest et al. (2004), namely that impact is multi-faceted and inherently hard to capture. This may be due to the diversity and complexity of the roles, the difficulty of attributing changes in outcomes to individuals who work as part of a multi-disciplinary team (MDT) and that many nurse consultants work through influencing the practice of other staff (Coster et al. 2006).

As a product of their study, Gerrish et al. (2007) proposed a framework (Table 1) to evaluate the impact of these roles based on the work of Schultz et al (2002). As an alternative to viewing outcomes in terms of statistical significance, Schulz et al. (2002) proposed considering the *clinical significance* of outcomes – i.e. the practical value of an intervention and whether it makes a real difference to patients directly. Gerrish et al. (2007) extended this framework and proposed a parallel framework for judging the *professional significance* of impact. Gerrish et al (2007) asserted that the framework has potential for capturing the impact of nurse consultant roles but that it required further testing and refinement through cross-referencing with the literature and through empirical testing.

[Table 1 about here]

In summary, nurse consultant roles are diverse and complex. They work in a wide variety of healthcare settings and often their roles span organisational and professional boundaries

(Guest et al 2004). Despite widespread acknowledgement that these roles have the capacity to impact on the experiences of both patients and frontline staff, evidence of their impact is unclear. The extent to which their impact has been assessed using outcome measures of clinical significance (Schulz et al. 2002) or professional significance (Gerrish, et al. 2007) is unknown. The systematic review reported in this paper sought to address this deficit in knowledge by capturing the current state of evidence about the impact of nurse consultant roles in terms of clinical and professional significance. It formed the preliminary stage of a larger study examining the impact of nurse consultants in adult healthcare settings.

THE REVIEW

Aim

To review evidence of the impact of nurse consultant roles in adult healthcare settings. Specifically, the review sought to:

- Explore the impact of nurse consultants on patient and professional outcomes within adult healthcare settings.
- Identify the extent to which existing studies have used quantitative outcome measures which address aspects of clinical and/or professional significance.
- Identify the extent to which existing studies have used qualitative dimensions of impact which address aspects of clinical and/or professional significance.
- Further refine the proposed framework for assessing the impact of nurse consultant roles.

Design

Although systematic reviews have traditionally relied on evidence from quantitative studies the benefits of including qualitative research evidence is increasingly recognised (Centre for Reviews and Dissemination. 2008). The inclusion of qualitative studies which reflect the experiences of the target groups of the intervention is likely to enhance the review (Thomas et al. 2004), especially because it was anticipated there would be limited evidence derived from trials relating to the impact of nurse consultant roles. Furthermore, it was recognised that the nature of nurse consultants' work is often complex and multi-faceted, which may be more

suitably explored by qualitative methods. This review therefore integrated evidence from qualitative and quantitative research and was informed by Oliver et al's (2005) proposed framework.

Search methods

A broad search plan was developed using population terms (e.g. 'nurse consultant') and terms to identify the focus of the study (e.g. 'impact'/'outcome*'). The search was piloted in MEDLINE and CINAHL, but was individually adapted to each database. With the exception of CINAHL, most databases did not have a subject heading for 'nurse consultant' (often classed under 'nurse clinicians' or 'nurse practitioner' instead, but including these broad headings made the search unwieldy), therefore as relevant studies were picked up in the pilot search by using free text keywords, the population search used keywords only. Additionally, the search terms included quantitative (e.g. 'evaluation') and qualitative outcomes (e.g. 'satisfaction' and 'experience*') in order to identify both types of studies.

The databases searched from January 2000 to July 2009 were MEDLINE, PUBMED, PsycINFO, CINAHL, British Nursing Index, Cochrane Library, SCOPUS and Web of Knowledge. Unpublished/grey literature was sought through the Internet (Google advanced search function), British Library, National Research Register, NIHR portfolio and the Current Controlled Trials Register. Authors of grey literature results were contacted to obtain further details, if available. Hand searching of reference lists was also conducted.

Inclusion criteria

All articles were assessed against the following general inclusion criteria: English language, UK-based and studies of nurse consultants defined by the DH. Commentary, anecdotal and review articles were excluded. Papers that were exclusively in children or mental health settings were excluded. The following inclusion criteria were applied, according to study design:

<u>Quantitative</u>

- Population - nurse consultants, patients and/or staff in adult acute or primary healthcare settings
- Intervention - the introduction of nurse consultant-led services or the addition/substitution of nurse consultants to existing services

- Outcomes - patient, staff or service outcomes
- Study design - evaluative study involving a comparison group (e.g. before and after, or comparing to another healthcare professional), or a descriptive survey of impact not including a comparison group

Qualitative

- Population – nurse consultants, patients and/or staff in adult acute or primary healthcare settings
- Study design - qualitative studies whose *a priori* purpose was to explore the experiences or perceptions of patients, staff and/or nurse consultants regarding the impact of nurse consultant-led care

Search outcome

2313 citations were retrieved and organised using Refworks. Titles/abstracts were reviewed independently by two reviewers, who applied the inclusion criteria and recorded the reasons for exclusion. Any discrepancies were resolved through discussion. Full copies of 132 papers were obtained, of which 35 met the inclusion criteria and were included in the review (Figure 1).

[Figure 1 about here]

Quality appraisal

Quantitative studies were appraised using Thomas et al's (2003) framework, the CASP (2006) framework was used to appraise qualitative studies and Rees et al's (2010) checklist was used for descriptive surveys. Two reviewers appraised each study and discrepancies discussed with a third reviewer. For studies that were reported in multiple sources (e.g. published article and study report), the appraisal was based on the published article. No exclusions were made on the basis of a minimum quality threshold.

Data abstraction

Data abstraction forms were developed for each study design. Data extraction was carried out by one reviewer and checked by the second reviewer, both of whom had undertaken the previous study assessments.

Some sources encompassed reports of multiple sub-studies, using different methods (e.g. focus groups, interviews, surveys) and participants. For these, information relating to each sub-study was extracted on separate forms. The report by Guest et al. (2004) was reviewed according to its 4 sub-studies that relate to impact and Kirk (2007) as 2 sub-studies. Quantitative papers that reported minor qualitative comments were jointly extracted but the quantitative results were focused on.

Synthesis

Data synthesis was initially conducted by one reviewer, but discussed regularly with a second reviewer. Quantitative and survey studies were synthesised by collating the study designs, settings, participants, sample sizes, nature of the interventions/surveys, outcome measures and results. Qualitative studies were synthesised using principles of thematic analysis (Ritchie & Spencer 1994), which were originally developed for analysing primary data but can be applied in the meta-synthesis of qualitative studies (Lloyd-Jones 2005). The five stages (familiarisation, identifying a thematic framework, indexing, charting, mapping and interpretation) were applied across the studies in terms of exploring study characteristics and findings.

Additionally, the dimensions of impact were cross-referenced with the proposed framework of impact. This was an iterative process that initially mapped the areas to the proposed definitions (Gerrish et al. 2007). The definitions were subsequently clarified and refined – for example given the inclusion and importance of qualitative outcomes "Quality of life (QoL)" was expanded to include the quality of patient experience, which is in contrast to Schulz et al. (2002) who defined QoL in intervention studies only. Regular meetings of the research team clarified any uncertainties and consensus was reached about any changes. The revised framework was used to classify the dimensions of impact identified in the included studies.

An overarching synthesis combined the quantitative and qualitative findings by constructing matrices to explore how the evidence from the qualitative/quantitative studies added to, challenged or highlighted gaps in the evidence from the quantitative/qualitative studies (Thomas et al. 2004).

RESULTS

The review identified 35 papers: 28 published articles, 6 reports/dissertations (2 of which had a corresponding published article – Coster et al. 2006, McIntosh and Tolson, 2009), and 1 conference abstract. The papers explore 36 primary studies, 21 quantitative (12 with comparison group, 9 descriptive surveys/no comparison) and 15 qualitative.

Study quality

The quality of the studies varied. Given the different study designs and mediums (e.g. study report, published article) meaningful comparisons cannot be made across studies.

Quantitative studies. Overall quality was weak: only 3 studies were rated as 'moderate'. Most studies used uncontrolled before-and-after designs. Most did not describe details of confounding variables. The areas of selection bias, blinding, data collection methods and withdrawals/dropouts varied extensively based on the details provided, which at times were limited (e.g. inadequate detail about intervention participants or inclusion criteria).

Descriptive surveys. Studies varied across the items examined, but the objectives, design and sample were generally clear. It was sometimes unclear whether the sample was representative of the target population. Response rates varied between 36-100% (the majority over 60%), but sample sizes were often small and no studies attempted to explore non-responders, raising questions about the sample's representativeness. Studies often involved non-validated questionnaires or did not provide enough detail to appraise whether the measures were valid, reliable and reproducible. Overall, generalisibility was considered to be limited or not possible.

Qualitative studies. Overall quality was moderate; 10 of the 15 studies met the criteria for at least 6/10 quality categories. Most had clear aims and an appropriate research design. However, several studies did not provide an explicit sampling rationale or did not clearly describe the data collection methods. Only one study included any consideration of reflexivity. Several studies did not explicitly consider ethical issues and data analysis methods were often unclear. However, most findings were presented clearly, were credible

(e.g. more than one analyst or respondent validation) and the research was considered valuable.

Overview of included studies

Tables 2-4 present details of included studies according to study design. All quantitative (n=12) and survey (n=9) studies were set in England, whilst one qualitative study was conducted in Northern Ireland and one in Scotland. The studies covered various speciality areas, including cardiology (4 quantitative, 1 qualitative, 2 descriptive surveys), critical care (3 quantitative, 1 qualitative), pain (2 quantitative), and urology (2 descriptive surveys). Seven qualitative studies spanned more than one specialty and four did not disclose the speciality.

[Table 2 about here]

Quantitative studies often evaluated the introduction of a nurse consultant-led service (Ryan et al. 2007) or educational programme (Butler-Williams et al. 2005). The extent of the nurse consultant input into these initiatives ranged from running a whole diagnostic procedure (Currie et al. 2004) to initiating/supporting a nurse-led process (Crocker 2002). Outcomes were often retrospectively compared to patient records during the previous doctor-led model of care, with little indication that patients were matched for case-mix. In contrast, 2 quasi-experimental studies set in critical care compared the intervention group to similar ward patients who were not exposed to the intervention, and 2 uncontrolled studies compared the same patients before and after attendance at the nurse consultant clinic (Ryan et al. 2007, Ryan et al. 2008). Several studies failed to adequately describe comparison groups (Ayers 2005, Crocker 2002; Currie et al. 2004; Kirk 2007; Mason, 2009; Warner et al. 2005).

Survey studies explored nurse consultants' impact or evaluated a consultant nurse-led initiative, for example a clinical nursing round (Jarman 2009) by asking stakeholders (hospital staff, GPs, patients) and/or nurse consultants to rate impact. Five studies explored patients' views of the role or services (Porrett & McGrath, 2003; Pottle 2005; James & Eastwood, 2007; James & McPhail, 2008; Tonkin, 2007).

Qualitative studies often involved collecting data from nurse consultants (n=5), the nurse consultant plus their stakeholders (n=6), or only professional stakeholders (n=4). Only 2

studies involved patients, one exclusively (Tough 2006) and in another patients and staff were interviewed (Ryan et al. 2006).

Outcomes and indicators of impact

Clinical significance

Improvements in symptomatic outcomes were evident in several quantitative and survey studies, including both physical (Pottle 2005, James & McPhail 2008, Mason 2009) and psychological outcomes (e.g. Warner et al. 2005), such as reduced anxiety (Marshall et al. 2005). Two qualitative studies proposed that the nurse consultant had an impact on patient's physical outcomes (Fairley & Closs 2006, Manley et al. 2008).

Several studies identified QoL and patient experience outcomes, including improved understanding and confidence (Marshall et al. 2005), patients feeling prepared for treatment (James & McPhail 2008) and being satisfied with explanations or the new clinic overall (Pottle 2005, Tonkin 2007). Similar broad positive outcomes in patient experiences and satisfaction with care were described qualitatively, although only two collected data directly from patients (Ryan et al. 2006, Tough 2006).

Clinical social significance outcomes were captured in quantitative evidence, including reduced mortality (Priestley et al. 2004), waiting times (Currie et al. 2004) and service/ appointment utilisation (Ryan et al. 2007, Ryan et al. 2008). From a broad perspective this was also suggested qualitatively, for example developing services, improving care, reducing waiting times (Guest et al. 2004).

Amongst each study design there was some evidence of social validity in terms of the acceptability and value of the intervention or nurse consultant amongst patients (Porrett & McGrath 2003, Marshall et al. 2005, Ryan et al. 2006, Tough 2006, James & Eastwood 2007, Tonkin 2007, James & McPhail 2008, Mason 2009).

Professional significance

Only 4 quantitative studies assessed professional outcomes (e.g. competence of staff), which included improvements in recording respiratory rates (Butler-Williams et al. 2005), quality and frequency of recording observations (Ryan et al. 2004), staff alcohol awareness (Mason

2009). However, Crocker (2002) identified on-going delays in the decision to wean. The survey by Kirk (2007) indicated increased GP accuracy of diagnosis through the nurse consultant service. Similarly, Jarman (2009) reported that a nurse consultant-led clinical nursing round impacted on staff's knowledge, decision-making and documentation skills. Influence on staff competence and practice featured in several qualitative studies (Drennan et al. 2004, Guest et al. 2004, Fairley & Closs 2006).

Jarman (2009) suggested that attendees of the clinical nursing round felt supported, indicating a possible impact on staff's work experiences. Limited qualitative evidence indicated that nurse consultants impacted positively on staff's QWL, particularly increasing staff/team/ nursing morale (Guest et al. 2004, McIntosh et al. 2002, McIntosh & Tolson 2009). However, a few negative indicators were mentioned relating to staff's working lives, specifically staff feeling threatened (Fairley & Closs 2006) and inter-staff conflicts (Unsworth & Cook 2003).

Several qualitative studies suggested the impact of nurse consultants in the professional social significance category, such as contributing to role extension (Guest et al. 2004), the development of new nursing roles (McIntosh & Tolson 2009), recruitment and retention (Drennan et al. 2004), reducing others' workload (Drennan et al. 2004, Guest et al. 2004, Redwood et al. 2007), and contributing to meeting the education needs of staff (Unsworth & Cook 2003).

In terms of professional social validity, several qualitative studies indicated that staff valued nurse consultants' contribution (Guest et al. 2004, Abbott 2007) and three surveys illustrated the usefulness of nurse consultant-led services amongst GPs (Pottle 2005, Kirk 2007) and nursing staff (Jarman 2009).

Synthesis of the findings across the quantitative and qualitative studies

The following cross-study synthesis excluded Coster et al's (2006) study because the survey was developed from focus group research already included (Guest et al. 2004). The survey by Avery & Butler (2008) assessed various items relating to nurse consultant performance, some of which relate to indicators of impact, but due to the limited detail provided these have been omitted. By their nature the qualitative studies identified broad indicators of impact and the matching of quantitative indicators to these required some interpretation.

Table 3 presents the synthesis of clinical significance indicators. This highlights that some indicators suggested in qualitative studies have been explored quantitatively (e.g. service outcomes; resolution of patient problems/symptoms), whereas others have had very limited (e.g. patient satisfaction) or no exploration in quantitative/intervention work.

[Table 3 about here]

Table 4 illustrates that most professional indicators captured qualitatively have not been evaluated in quantitative/intervention work. This also highlights the limited amount of quantitative evidence exploring nurse consultants' impact on staff outcomes.

[Table 4 about here]

DISCUSSION

Methodological limitations

This review had a thorough search strategy, rigorous inclusion/exclusion criteria, and systematic data extraction and quality assessment processes. However, it is acknowledged that some limitations may have biased the review.

Firstly, some retrieved articles explored nurse-led services. Although some of these were written by nurse consultants, it was unclear who was involved in the service and it was considered inappropriate to include studies based on speculation about the nurse consultant's involvement. Hence, some nurse consultant-led service evaluations may have been overlooked. Equally, services that nurse consultants set up and passed to other nurses to deliver may not have been identified if they were not explicitly affiliated to a nurse consultant. A nurse consultant study by Manley (2000) was also excluded because it was conducted in the mid 1990s, prior to the introduction of nurse consultants by the DH and it was uncertain whether the criteria for defining the role would be comparable.

Secondly, the quality assessment highlighted several issues. Several studies would have been excluded if a minimum threshold for quality had been imposed, but in the current review it

was considered valuable to illustrate comprehensively the extent to which the impact of nurse consultants has been explored to date. This also met the objective of the review to refine the proposed framework of impact. However, this inclusivity has implications for the findings of this review. Studies described as research, audit or service evaluation were included. The latter two often lacked rigour in terms of study design and reporting within the papers was often inadequate.

However, inadequate reporting was a feature of all papers, including research studies. This inevitably influenced the ability to appraise the studies. The included studies were also presented in a variety of formats. Given that the nurse consultant role is a relatively new development, grey literature was an important source (7 of the 15 qualitative studies were only available as a study report or dissertation), but comparing these studies with the peer-reviewed published articles involves a potential bias, particularly in assessing quality since reports are often longer and may include more methodological detail.

During this review the appropriateness of assessing quality based on published information only and the problems that this gives rise to were highlighted. It could be argued that quality is inadequate if insufficient methodological detail is provided in the published account. This is justified on the basis that poor reporting probably reflects lack of methodological rigour (Juni et al. 2001). However, studies may have legitimate constraints on the detail they report (e.g. journal word limits). This is also a consequence of including grey literature, because any absent or inadequate description of methods may have been addressed during peer-review. The approach taken in this review was considered the most appropriate given the importance of including grey literature, but the possibility of bias is recognised.

Findings of the review

The review findings provide little robust evidence of the impact of nurse consultants. Thirty-six studies were identified, which exceeds the number reported in previous reviews and reflects growing interest in this topic. However, methodological quality was often weak, especially in the quantitative studies, which were predominantly uncontrolled before-and-after designs with different, unmatched patients.

Only one study provided statistical evidence showing a significant change in outcome (mortality) following the introduction of a nurse consultant service. The remaining

quantitative studies did not present or defend the magnitude of the effect. Most quantitative studies also had small sample sizes and were heterogeneous in the outcomes measured, which prevents a more conclusive comparison and synthesis of the evidence. Furthermore, no studies attempted to capture the cost-effectiveness of services provided by nurse consultants. This is a significant omission bearing in mind current emphasis on the need to demonstrate that new nursing roles add value to healthcare: without convincing evidence such roles may not be sustainable (NNRU 2007).

In several qualitative studies, the length of time the nurse consultant had been in post was not described. However, a few specified that data were collected whilst nurse consultants were relatively new in post, for example between 9-24 months (McIntosh & Tolson 2009; Redwood et al. 2007). This raises questions about whether they had had time to establish themselves and their services, and previous authors have emphasised the danger of premature evaluation (Redfern, 2008).

Furthermore, the qualitative studies rarely explored patient's views. Some authors defended their decision not to involve patients because in the early stage of the nurse consultant development it is "unlikely that service improvements and benefits to patients would have reached their full impact" (Redwood et al. 2007, p37). However, as posts become more established, it will be important to determine patients' views on the difference nurse consultants make to their care and the outcomes they value.

The qualitative studies also identified an array of *processes* which nurse consultants engaged in such as providing leadership. These processes may lead to impacts on patients, staff or services, for example, providing teaching, or supervision to staff could impact on their skills and job satisfaction. However, the data provided did not capture this eventual impact. Future evaluations need to examine the actual impact of these processes. This would provide more conclusive and effective evidence of the impact and added value of nurse consultants in the NHS.

The survey studies provided little strong evidence of nurse consultants' actual impact on patient or professional outcomes. However, preliminary evidence of the perceived benefits and satisfaction amongst patients (Pottle 2005, James & Eastwood 2007, Tonkin 2007, James & McPhail 2008) and GPs or other staff was evident (Pottle 2005, Kirk 2007, Jarman 2009).

Therefore, these studies provided additional information to strengthen the proposed framework of clinical and professional significance.

Despite the limitations, this review suggests a largely positive influence of nurse consultants on patient and professional outcomes, although areas of potential difficulty - for example staff conflict (Unsworth & Cook 2003), or staff feeling threatened (Fairley & Closs 2006), should be considered when establishing new posts.

Although the evidence is somewhat limited, the indicators of impact identified readily mapped onto the proposed framework of clinical and professional significance, which appears comprehensive in capturing the range of outcomes studied to date. Only minor amendments were made to the framework definitions. It was important that relevant qualitative and patient-valued indicators were captured and the revisions to the framework contribute to this objective, although further refinement may be needed when the framework is applied empirically to nurse consultant roles in the next stage of the project.

CONCLUSION

Demonstration of the impact of nurse consultant roles is important for role development, effective workforce planning and to inform the educational preparation and support required for nurses taking up such roles. Although this review has determined that there is limited evidence evaluating the impact of nurse consultants on patient and professional outcomes, it presents tentative evidence of the range of areas that nurse consultants potentially influence. The proposed framework for identifying impact in terms of clinical and professional significance may help nurse consultants, and potentially other advanced practice nurses, identify areas of impact in their own practice as well as provide a framework for researchers to assess impact. Several recommendations for research arise from the current review:

- Further research is required to measure nurse consultants' impact on patient outcomes. Quantitative designs should use an appropriate control group and provide explicit detail about the study sample and interventions. Assessment of cost-effectiveness should form part of the study design.
- The influence of nurse consultants on professional outcomes, including knowledge, skills, confidence and job satisfaction of other staff requires further inspection.

- Future qualitative studies should explore the ultimate impact of the processes that nurse consultants engage in on patient and professional outcomes.
- Further qualitative research should involve patients who receive care from nurse consultants to explore their experiences and the outcomes that they value most.

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Figure 1 - Flowchart of overall systematic review results

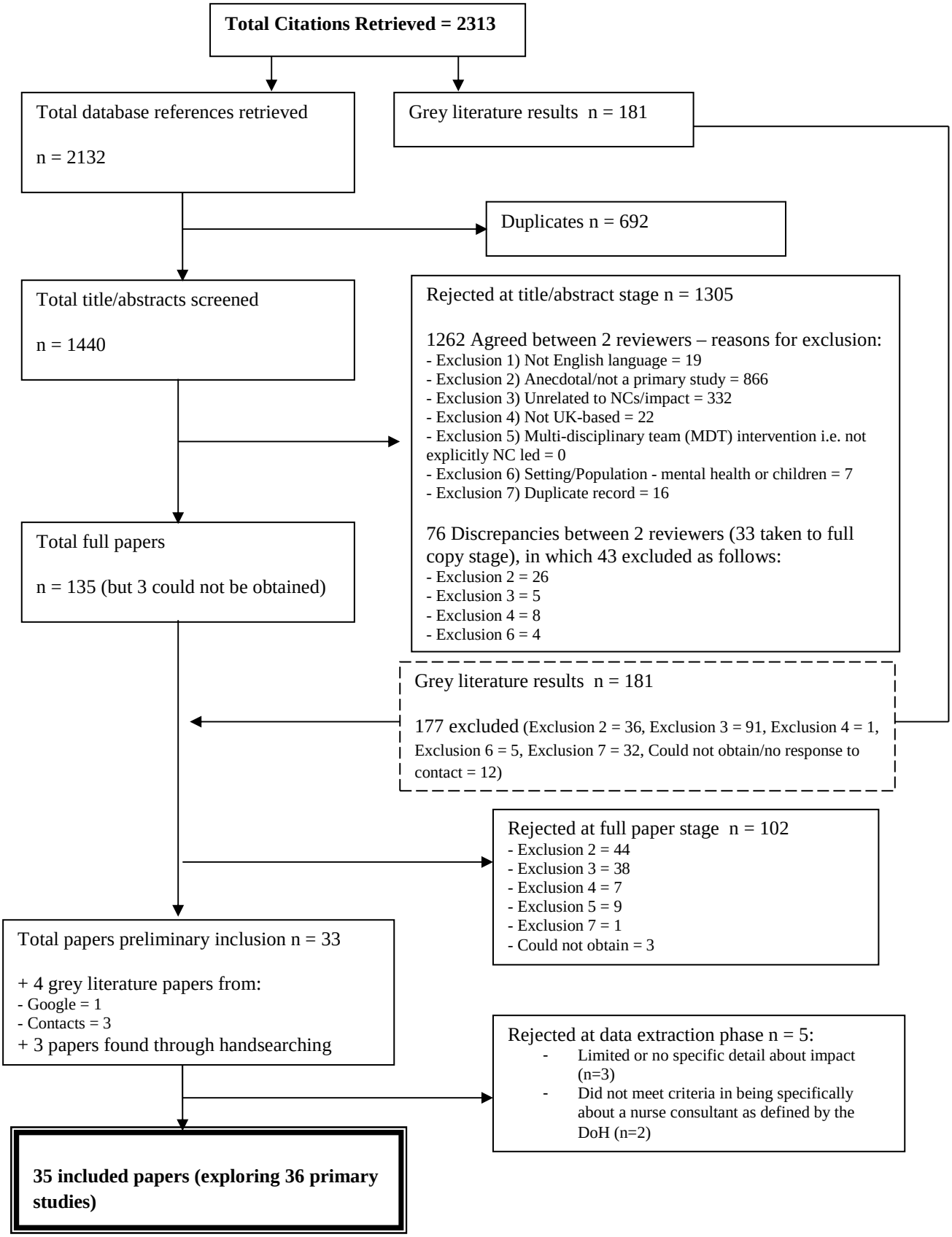

Table 1 – Proposed framework of indicators of impact (Gerrish et al 2007)

Clinical significance	*Symptomatology* - the extent to which individuals return to normal functioning or experience a change of symptoms. It is concerned with the physical or psychological outcomes of the intervention to patient, and/or carer. *Quality of life (QoL) / quality of patient experience* - whether the intervention broadly improves an individual's quality of life and self-efficacy. *Social significance* - clinically oriented outcomes relating to the service organisation, delivery and resources, and that are important to society. Societal concerns are often translated into health care policy, e.g. relating to hospital admission rates or length of stay but may also include aspects of health behaviour and health status, e.g. self-management of chronic illness. *Social validity* - the social importance and acceptability of the intervention procedures, whether the intervention addresses one or more meaningful or important problems in the patient's/carer's life, and whether the outcomes are meaningful to patients/carers/others.
Professional significance	*Professional impact* - the extent to which the nurse consultant has an impact on the competence and confidence of the health care workforce (e.g. effecting knowledge, skills, behaviour, attitudes). *Quality of working life (QWL)* - the health care workforce's perspective on the impact on their QWL arising from the nurse consultant intervention. This might include enhanced job satisfaction and fulfilment. *Professional social significance* - the extent to which the nurse consultant interventions are important to staff societal outcomes. Staff social significance can refer to outcomes relating to the policy objectives relating to the staff within the organisation. This might include, for example, reducing workload of GPs or improving the turnover rates of junior nurses. *Professional social validity* - the social importance and acceptability of the intervention procedures for the health care workforce, whether the intervention addresses one or more meaningful or important problems that health care staff encounter, and whether the outcomes are meaningful to the workforce/others.

Table 2 – Overview of included studies

	Study design	Speciality	Aim	Study participants	Results N.B. In survey and qualitative studies, only the findings relating to impact/outcome are reported
Ayers (2005)	Uncontrolled before and after	Heart Failure (HF)	To evaluate the effect of setting up a nurse-led HF service led by a NC.	450 HF patients	Medication rates were higher following the introduction of the nurse-led service (approx 425 versus 280 for angiotensin converting enzyme inhibitors, 20 versus 5 for alpha blockers, 380 versus 90 for beta blockers). Patients were previously on suboptimal dose (no figures presented).
Butler-Williams, Cantrill & Maton (2005)	Uncontrolled before and after	Mixed in-patients	To audit the recording of respiratory rate on observation charts following hospital wide education/initiatives by outreach service (NC and staff nurse).	Mixed in-patients on single day: 341 pre-intervention/ 325 post-intervention	Respiratory rate recording was higher (61.2%; 199/ 325), compared with previous audit (7.03%; 24/341).
Crocker (2002)	Uncontrolled before and after	Critical Care	To explore whether nurse-led weaning (initiated and supported by NC) protocol reduced the no. of ventilator days and the delay in initiating weaning decision.	500 patients ventilated for 7 or more days in one intensive care unit (before); no detail of any comparison group.	Number of ventilator days in the monthly audits following the initiative (range 7-32 days, Sept 01 = 11.3, Oct = 13.6, Dec =13.8, Jan 02 = 13.6, Feb = 8) were lower compared to the previous annual audit (range 7 and 50 days. Mean = 16.8). Crude ICU mortality lower: 28% compared to 35%. Delay in weaning decision was still evident in some (no detail of if this was improved or not).
Currie et al. (2004)	Uncontrolled before and after	Cardiology	To audit the introduction of a single point of contact NC led direct current (DC) cardioversion service.	143 patients needing DC cardioversion; no detail of comparison group.	No serious complications (3 admitted to hospital - 2 hypertensive discharged within 6 hours, and 1 sinus bradycardia discharged the next day. 8 week waiting time, compared to 27 wks previously.
Kirk (2007)	Uncontrolled before and after	Community HF Service	To explore effect of Medway Community HF Project (led by the NC) on hospital admissions.	Not described	No specific figures presented but states that: - 'admission prevention saved more than 530 hospital bed days'. - Length of stay (LOS) 'reduced in first year, but stabilised at around 12 days'.
Marshall, Nelson & Sykes (2005)	Uncontrolled before and after	Rapid access chest pain clinic (RACPC)/ Angina	To pilot / evaluate the Angina Plan (a brief cognitive behaviour intervention introduced by a NC) with patients in a RACPC.	24 patients with stable angina.	All those who scored ≥8 HADS had reduced anxiety. All had at least 1 positive behavioural, psychological or physiological outcome. 88% reported being active after (only 12% reported being active before). Other areas indicated by the patient evaluation include: understanding (fewer misconceptions), confidence, easier to relax, positive communication and positively valued by patients.
Mason (2009)	Uncontrolled before and after	Alcohol-related problem service	To explore the effectiveness of interventions (run by NC alcohol specialist) to meet the needs of people with alcohol-related problems.	Hospital in-patients, A&E patients and users of primary care clinic; no detail of sample numbers.	LOS, hospital admission (necessity for and actual) and A&E attendance were reported reduced (no further detail/figures provided). Alcohol consumption was reportedly decreased (no further detail/figures). 96% patients perceived benefit from service; 99% preferred seeing a nurse.
Priestley et al. (2004)	Cluster RCT	Critical care outreach team (CCOT)	To explore the impact of introducing a CCOT service and training led by NC on in-hospital mortality and LOS.	Hospital in-patients: 1475 intervention/ 1428 control	Reduction in-hospital mortality at patient level (Odds ratio 0.56, 95% CI 0.38-0.82) and cluster level (Odds ratio 0.52, 95% CI 0.32-0.85). Findings on LOS equivocal.
Ryan, S et al. (2008)	Uncontrolled before and after.(same patients)	Pain service (fibromyalgia patients)	To identify any change in primary care appointments for symptoms relating to fibromyalgia in the 12 month period before and after attendance at the NC led pain clinic.	49 fibromyalgia patients who had previously been audited from various GPs.	Patients had 295 GP consultations. 196 (66%) in year prior to the NC-led clinic, whilst 99 (33%) in the 12 months after attendance at NC led clinic. 38/49 (78%) patients reduced their visits to their GP in the 12 months after clinic attendance, 8 (16%) increased their visits and 3 (6%) patients' consultation habits had remained unchanged. Main areas where reduction in consultation had occurred were pain (57.2% fewer attendances occurred) and mood (56.5% fewer attendances occurred). Reduction in non-musculoskeletal symptoms was less marked - 22% fewer attendances.
Ryan, H. Cadman & Hann (2004)	Quasi-experimental study	CCOT	To evaluate the 'Amber Project' (education and new 'amber' tool introduced by NC), aiming to identify at-risk of deterioration patients.	Orthopaedic ward versus surgical & medical wards not in the project - no detail of sample numbers.	Approximately 3 observations in 24 hours and 80% patients had a modified early warning score (MEWS) in the last 24 hours, in control wards 2.3-2.5 observations and 10-15% patients had MEWS. No clinical incidents or complaints.

Ryan, S. et al (2007)	Uncontrolled before and after (same patients)	Chronic musculo-skeletal pain patients	To evaluate the utilisation of hospital services before and after the introduction of new NC led holistic service for chronic musculoskeletal pain in community hospital.	60 patients with chronic musculoskeletal pain attending NC led clinic.	Median post-attendance = 2 (range 1-20), pre-attendance = 12 (range 1-76) 1-11 specialities (median 1), compared to 1-16 specialities (median 5). 53 patients reduced the number of specialities they attended, 7 continued seeing same. Services not being accessed after attendance at the NC clinic included: rheumatology (n=39), A&E (n=15), orthopaedics (n=30), gynaecology (n=15).
Warner, Thomas & Martin (2005)	Uncontrolled before and after (although unclear)	Multiple Sclerosis (MS)	To evaluate and improve the service delivery for relapse management in MS. A new day case nurse-led service introduced and facilitated by NC.	100 MS day case patients, compared to 33 patients prior to the new service (although unclear).	85% treatment within 10 days of reporting symptoms, compared to 24 days (range 4-64) in control group and only 15.2% having treatment within 10 days. Patients reported symptoms to nurse sooner (within 10 days onset, comp to 51 days to GP). Neurologist appointment in mean 6 days and treatment commence from appointment in 4.78 days, compared to GP equivalent of 13.8 and 5.16 days. Both access routes (nurse/GP) saw 30% reduction in psychological impact of MS following treatment. Nurse route had greater range of MSIS-29 (MS impact) scores, 25% in highest score range (whereas no GP patients were high), which reduced to 6.7% following treatment.
Avery & Butler (2008)	Survey	Diabetes	Evaluation of diabetes NC role from a individual and national perspective using a 360-degree feedback evaluation tool (web-based survey).	9 diabetes NCs (in various hospitals, in post for 2+ years), 12 managers, 40 colleagues, 35 team members and 9 other individuals.	- Expert practice - positive patient/carer/user outcomes; develops pathways that are patient focused; identifying opportunities and effecting change. - Practice/service development - promotes and disseminates new ways of working; facilitates/supports monitoring of service . - Professional leadership/consultancy - clinical leader; strategic planning; local, regional & national consultative role; develops/encourages inter-disciplinary and interagency collaboration. - Education and development - educate others; close theory/practice gap; contribute to training strategy; monitors/acts on effectiveness of education. - Self-leadership - manages workload effectively; sustainable life/work balance for self/others.
Coster et al. (2006) – relates to Guest et al. (2004) survey sub-study	Survey	Various	To explore NCs perceived impact from the indicators that were previously identified in the focus groups (see Guest et al. 2004 focus groups).	153 nurse, midwife or health visitor consultants in Feb 2001; 370 consultants 6 months later and 419 in Sept 2003.	- staff access to advice/support - identifying areas for change/improvement - services better meeting patient needs - more protocols/guidance in place - patients better informed - increasing consultation time - impacting financial resources - introducing patient centred culture - improving staff motivation - improve standards of care received by patients
James & Eastwood (2007)	Survey	Prostate Cancer	To evaluate patients views of a new weekly evening clinic (5-7pm) run by a NC in a urology department.	157 male follow-up prostate cancer patients who attended the clinic in the urology department at one hospital.	- 83% happy to attend clinic (easier to park, less busy, less waiting, not requiring time off work, outpatients more relaxed/ quieter in evening) - 90% felt availability of evening clinics should be increased for patients. - 17% not happy to attend (difficulties attending in evening e.g. travel, carers unable to attend and general preference to attend during the day).
James & McPhail (2008)	Audit and survey	Prostate Cancer	To explore the development and evaluation of a NC-led, one-stop evening clinic for suspected prostate cancer.	Suspected prostate cancer (PC) clinic at urology department at one hospital - safety audit 147 patients - patient experience survey 33 patients	Excellent cancer detection rates (43%), high end of doctor published data. Quality of tissue sampled 'excellent', and prostatic tissue found in 100%. 3% (4/147) were admitted post-biopsy for minor complications. Patients reported being well prepared 96%, no pain 87% /less pain than expected 88%, being well afterwards 88.5%. Most patients were happy with length of wait for appointment and results, 10% would have preferred to see medic, all given adequate information, well-prepared for biopsy, happy for NC to give results and reported good communication of results.
Jarman (2009)	Survey and	Emergency	To evaluate the impact of	24 nursing staff who had	- Most staff were adequately informed of the purpose of the CNR (92%), were able to discuss

	records of the clinical nursing round (CNR)	Department	participation in the CNR on nurses' invididual practice	participated in the CNR during the review period, based in one emergency department.	their patient (96%) and own learning needs (92%). - 83% felt the CNR had changed their practice – e.g. improved documentation, knowledge of condition, decision-making and prioritisation skills. 23 of 24 felt the CNR had a positive impact on their practice. - All staff felt the facilitators had the necessary skills to meet their learning needs and 96% felt supported during the CNR. Most frequent learning (CNR records) included documentation, pathophysiology of shock, significance of observations, dependency scoring, appropriate use of oxygen therapy/devices.
Kirk (2007)	Survey	Community Heart Failure (HF) Service	To establish how GPs used the community HF service (including request of new test) and benefits	36 GPs who had used the HF service.	Most GPs (90%) indicated that the test had helped to improve the accuracy of diagnosis and 80% rated the test's usefulness in managing patients as at least 7 out of 10.
Porrett & McGrath (2003)	Survey	Gastro-enterology department; NC in coloproct-ology	To assess both patient and staff understanding of the role of the NC in coloproctology in gastroenterology department, to establish if the current service provided by the NC met the needs of patients and staff, and to elicit suggestions for future service development.	19 patients who had seen the NC in previous 3 months 19 staff in the gastroenterology department	- Only 15% of patients knew of NC role; after seeing 89% felt they understood the role - 95% felt able to discuss their medical problem - 95% given enough information; 89% had enough time with the NC - 100% found the NC attentive and felt listened to - 100% felt NC was competent, 95% felt confident about seeing the NC and 95% would be happy to see again - Most staff felt the NC post was a positive move for nursing profession - 90% felt it improved professional status of nursing and would increase career pathway (100%) - 83% felt it raised opportunities for further posts; 95% raised profile of nursing at the hospital - 90% felt the NC would improve the range of services offered to patients, and this would support & enhance medical services (95%) - It was not felt it would endanger doctors' experience (85%) or be detrimental to medical colleagues' roles or work opportunities (85%).
Pottle (2005)	Two surveys	Rapid access chest pain clinic (RACPC)	To establish patients clinical outcomes and satisfaction with the new RACPC service. To explore GPs satisfaction with the new RACPC service.	173 angina patients who had attended the clinic and were 6 months post-attendance 13 GPs who used the service in first 6 months.	99.4% were very satisfied/satisfied with service; over 95% were happy with explanation of test (2.3% no response); 83.2% were happy with explanation for the cause of chest pain (3.5% no respond). No patients had any further cardiac outcomes (except 1 diagnosed with angina). Ease of referral (5 very good, 5 good, 2 satisfactory); speed of report (3 very good, 2 good, 6 satisfactory); quality of information (3 very good, 6 good, 2 satisfactory); overall satisfaction (4 very good, 4 good, 2 satisfactory). No services were reported as poor.
Tonkin (2007)	Survey	Haemato-oncology	To evaluate the new NC-led follow-up telephone service	65 patients with stable haematological disease in one hospital.	90% preferred new telephone clinic. Most found clinic convenient (e.g. save transport/time/ parking/waiting) and viewed the information provision positively. Some were concerned about obtaining tests/prescriptions from their GP.
Abbott (2007)	Qualitative interviews	Various primary care disciplines	To elicit stakeholders views of the establishment and early progress of the new NC posts, and lessons learnt. Paper focuses on theme: 'leadership across boundaries'.	4 NCs, 5 directors, 1 project director, 1 clinical director, 3 assistant directors, 2 managers, 3 joint commissioning officers.	Child Protection Post – Consultancy, advice and support to other staff; supervision of other staff; training programme for organisation. Learning Disabilities Post – Improving mainstream capacity; advice to other staff; service development; value of NC to healthcare professionals. Public Health Post (most narrowly defined and had least impact) – Help/advise/facilitate other staff; no evidence of leadership; educational programme for staff. Intermediate Care Post – General staff training; service development.
Department of Health, Social Services &	Multiple methods (e.g.	Not specified	To determine how the NC posts were being developed and supported, and clarify any issues about the future	5 NCs and up to 30 key stakeholders and 1 chief nursing officer.	- Role modelling/support/advice in clinical practice to other professionals - Education of staff - Maintaining and developing networks in their area of interest

Public Safety (DHSSPS 2005) – study report only	structured interviews, diaries, focus groups)		development of the NC role in Northern Ireland.		- Development of services/practice - Leadership - Developing national policy - Encouraging staff own professional development - Promoting evidence-based care - Strategic initiative involvement
Drennan, Goodman & Levenson (2004) – study report only	Interviews (most on telephone).	Various primary care settings	To evaluate the cohort of primary care NCs over 3 years, including the views/perceptions of senior managers/medical consultants.	2 chief executives, 2 directors of nursing, 2 senior managers, 1 medical director and 5 medical consultants	- Perception of remit/role of NC - Direct clinical work/improving care; directly deal with patient needs and enabling other nurses; services focus on patient experience; clinical leadership; transferring skills; developing quality standards/ services; support senior nurse retention; motivate/guide other nurses in research; taking on new roles/substitution of medical roles - Benefits of NC - transfer skills/morale boosting; improve standards of care - Relationships of NC with other professionals - positive relationship with doctors (but juniors can feel threatened); remit/workload of others; little data re impact on other nurses - Education implications of NCs - benefits to other nurses of NC expertise - Resource implications of NCs - cost-effective/value of NCs; quality as important as cost; patients more satisfied as longer appointments; recruitment and retention (indirect saving) - Criteria for evaluating the success of NCs - improving standards/outcomes/performance; caseload management/demands on junior doctors; care across boundaries (e.g. diff. referral pathways); improving patient satisfaction; teaching others; evidence-based policies/procedures adoption; value for money; improving career options for nurses; increased job satisfaction of NCs; better support by NCs to junior nurses leading to greater confidence.
Fairley & Closs (2006)	Diary and field notes.	Critical care	To describe the actual clinical activities undertaken by a critical care NC in adult surgical high dependency unit (SHDU) to demonstrate the influence on patient outcome.	1 critical care NC located in an 8 bed adult SHDU in a large teaching hospital	- Clinical reasoning – patient problem resolution; suggestions/advice to other healthcare staff - Clinical instruction – deliberate teaching/explaining to other staff; improve outcomes for, or reduce risk to, patients; clinical supervision/support/education In validation of findings, ward sisters indicated potential role overlap/feeling threaten among ward staff.
Guest et al. (2004)	Four face-to-face focus groups. Monthly telephone interviews Sponsor interviews (telephone or face-to-face).	Various	To explore the impact of the nurse/ midwife or health visitor (NMHV) consultants on patient care. To explore the impact of the NMHV consultants on patient care. To explore the impact of the NMHV consultants.	22 NMHV consultants in focus groups (3-7 per group) 32 NMHV consultants with at least 12 months experience 11 sponsors of NMHV consultants (e.g. director of nursing)	- Leadership and consultancy – development of staff; providing leadership; changing culture; empowering staff (e.g. confidence building; encouraging role extension); providing supervision. - Service development, research and evaluation – service development - Education, training and development – updating staff skills; encouraging staff to engage with research and development - Expert practice – advice and support to staff; role model; complex cases Achievements – Development of processes/performance; leadership to improve efficiency/ quality/practice; networking and engaging others; improving patient care; research/presentations and sharing knowledge - View of impact – service development/improvement; reduction in mortality/ morbidity; meet targets; reduce patient waiting time; patients acceptance of NC - Training and professional impact – staff skills training; provision of supervision; contribute to staff morale; valued role model
Manley et al. (2008)	Action research using a 6 month co-	Older people	Explore how the leadership function of the NC role was reflected in day-to-day working, identify strategies, factors that enable and trigger the	4 NCs in older people, mainly based in acute settings	- Leadership linked to patient - NC working with nursing team, modelling nursing expertise and enabling others to develop expertise, mediating between staff, patient and family, supporting all stakeholders, and working across boundaries - Leadership linked to team - helping team become self-sufficient; facilitating support and

	operative inquiry approach.		need for leadership strategies, and the outcomes.		participation towards a common vision; developing practice - Leadership linked to organisation - building relationships at strategic level, developing networks, addressing risk and using existing governance frameworks - Outcomes of leadership - achieving right outcome for patients/family; continuity of care; enabling staff to learn and develop their practice; better caring for older people through systems /processes that embed older people care and minimise risk.
McIntosh, Tolson & Wright (2002) study report & McIntosh & Tolson (2009), publication	Multiple methods (e.g, interviews, focus groups).	Not specified - but various	To evaluate the extent to which the overall aims of the posts were achieved and to assess the contribution made by the NCs. Furthermore, the Directors of Nursing wished to explore whether a NC brought added value.	Study report - 3 NCs, their directors of nursing and 13 stakeholders Publication - 4 NCs (but 1 not in focus group), 3 directors of nursing, 1 nurse manager, 1 director of nurse education, and 18 stakeholders	- Added value of NC from leadership/consultancy - role model (develop skills, confidence); offer vision and leadership; converting policy to practice; raising profile of service; increase morale; changing medical attitudes; raising nurses aspirations (e.g. undertake further education) - Added value of NC from practice/service development - service improvements; successful cross boundary work; impact on patient QoL; getting staff talking about evidence-based care - Leadership activity of NCs - implementing new initiatives; developing practice; guiding practitioners; contibuting to local/national/policy groups - Leadership processes within NC activity - transformational leadership; providing vision and identifying steps to pursue vision; concern for wellbeing/reactions of staff - Value of the NC leadership to the service - service delivery; valable professional role model; developing skills and confidence; converting policy into reality
McSherry, Mudd & Campbell (2007)	Qualitative semi-structured interviews.	Various	To evaluate the perceived impact of the NC role using a 360-degree feedback evaluation approach through the lived experience of the staff.	3 NCs and 27 stakeholders (e.g. managers, medical & nursing colleagues)	Many of themes were more focused on expectations rather than actual impact/achievements: - Providing advice/guidance to colleagues - Supporting modernisation through facilitation of change - Develop multi-professional collaboration - Catalyst for change
Redwood et al. (2007) – relates to McSherry et al 2007	Qualitative semi-structured interviews.	Various	To evaluate the impact of the NC role.	14 NCs (9 acute, 5 mental health) and undisclosed number of stakeholders (e.g. clinical/academic colleagues, managers)	- Role aspirations and lived reality - lead, promote and develop services for patients and staff; positive contribute to nursing profession; well respected/credible/valued; good working relationships and communication; influencing policy at national level; political influence - Challenging boundaries - practice development; implications for workload - Impact and outcomes - service improvements; develop communications/ inter-agency working/processes; strategic/policy iniatives at a national level
Ryan et al. (2006)	Qualitative semi-structured interviews.	Rheumatology	To identify the perceptions of peers and patients regarding the role and impact of one NC in rheumatology.	5 rheumatoid arthritis patients 7 peers (1 manager, 2 consultant rheumatologists, 2 outpatient nurses, 1 ward sister, 1 consultant physiotherapist)	- Holistic person-centred care (including physical and social concerns) - Valued by the patient/preference to see NC - Feeling cared for/important - Positive consultation with NC - Satisfaction with care - Service development/new model of care - Patients taking ownership of symptoms - Cultural change - Leadership (clinical/political) - Education - Clinical mentorship role
Tough (2006) – dissertation only	Qualitative semi-structured 'discovery'	Rapid access chest pain clinic (RACPC)	To evaluate the development of NC-led RACPC and compare from a patient's perspective their perceptions and satisfaction with both nurse &	10 RACPC attendees in each group (NC vs doctor led) who did not require secondary or tertiary care	- Waiting times - Acceptance - preference/happy to see either doctor or nurse - Positive explanations/experiences - Cost effectiveness

	interviews.		doctor-led clinics.	(i.e. discharged back to GP)	- Reassured after attending - Satisfied with care (slightly higher in NC group) - Adherence to follow-up appointment - Understanding among patients
Unsworth & Cook (2003) – study report only	Multiple methods (e.g. focus groups, interviews, diaries).	Not specified	To evaluate the impact NCs have on clinical practice, particularly how the NC conceptualised clinical practice, others perceptions of their impact, and contribution to strategy formation, policy and modernisation agenda (the latter point from senior managers/executives).	Focus groups: 7 NCs Interviews: 10 NCs (but only 9 completed diaries and follow-up interview) 4-5 stakeholders (e.g. manager, director of nursing, nursing/medical colleagues) of each NC	- Changing, developing or extending practice (e.g. identifying best practice/gaps) - Role modelling/shadowing/supervision/giving advice & knowledge to others/supporting others - Developing new services - Consultant on nursing matters within organisation - Skill development and identifying education/training needs of others - Inter-organisational/multi-agency activities - Take forward trust-wide remits to improve nursing and enhance patient care - Clinical leadership - Move nursing forward and raise standards of nursing - Inter-staff conflict - Resource for development of health care team
Woodward, Webb & Prowse (2005, 2006) – two articles	Qualitative unstructured interviews.	Various	To explore the work of the NCs, with particular reference to research aspects and NCs characteristics and achievements in the role	10 NCs from various hospitals in one region	- Empowerment of front-line staff - Support provided to others - Raising awareness and taking nursing forward - Encourage/nurture cultural change - Facilitating other nurses undertaking research

Table 3 - Clinical significance qualitative and quantitative synthesis

Clinical categories	Evidence of impact identified in the qualitative studies	Evidence of impact identified in the quantitative/survey studies
Symptomatology	Resolution of patient problems/symptom control (SC), improved clinical outcomes (CO) and reduced risk (RR) (Fairley & Closs 2006; Manley et al 2008)	Reduced alcohol consumption (Mason 2009; CO); Clinical recovery (e.g. fatigue – Fatigue Severity Scale; UK Disability Scale - Warner et al 2005; CO); Clinical outcomes (Pottle 2005; CO); Self-reported activity levels (Marshall et al 2005, survey; CO); Well/not well after procedure (James & McPhail 2008, audit/survey; CO); Low complications (Currie et al 2004; James & McPhail 2008, audit; CO); Reduced anxiety (HADS) (Marshall et al 2005, survey; CO); Reduced psychological impact (Warner et al 2005, MS Impact Scale – MSIS-29; CO); No/less pain than expected (James & McPhail 2008, survey; SC)
QoL/quality of patient experience	Improve/impact on patient care (Guest et al 2004)	None
	Direct impact on patient QoL (McIntosh et al)	Finding it 'easier to relax' (Marshall et al 2005, survey)
	Patient satisfaction with care (including feeling cared for/important) (Drennan et al 2004; Ryan et al 2006; Tough 2006)	Patient satisfaction with service (Pottle 2005, survey); Patients happy with length of wait for appointment or results (James & McPhail 2008, survey)
	Positive/improved patient understanding (Tough 2006)	Increased understanding/less perceived misconceptions of angina (Marshall et al 2005, survey)
	Taking ownership of symptoms (Ryan et al 2006)	Increased patient confidence (Marshall et al 2005, survey)
	Positive explanations/information (Tough 2006)	Patients satisfied with explanation of tests and cause of chest pain (Pottle 2005, survey); Well prepared for procedure, e.g. information provision (James & McPhail 2008, survey)
	Holistic/patient centred care/services (Drennan et al 2004; Ryan et al 2006)	Patients view new clinic as convenient - e.g. saving time, travel, parking, waiting (Tonkin 2007, survey)
	Patient experience of seeing NC – e.g. feeling reassured after attending/seeing (Tough 2006)	Various single item questions – e.g. able to discuss problem, given enough time, confidence in NC, felt listened to (Porrett & McGrath 2003, survey)
Social significance	• Service developments (Abbott 2007; DHSSPS 2005; Guest et al 2004; Manley et al 2008; Redwood et al 2007; Ryan et al 2006; Unsworth & Cook 2003) • Improve standards of care/quality/performance/ efficiency/practice (Drennan et al 2004; Guest et al 2004; Manley et al 2008; McIntosh et al; Redwood et al 2007) • Impact on care across boundaries (Drennan et al 2004) • Development/introduction of processes/ procedures/guidelines/initiatives (Guest et al 2004; McIntosh et al) • Convert policy into practice (McIntosh et al) • Execute/progress trust-wide remits to improve standards of nursing to enhance patient care (Unsworth & Cook 2003) • Raising profile of service (McIntosh et al) • Supporting modernisation through facilitation of change (McSherry et al 2007) • Meeting targets (Guest et al 2004)	Reduced ventilator days (Crocker 2002); Increased medication rates (Ayers 2005); Reduced or equivocal results on length of stay (Kirk 2007; Mason 2009; Priestley et al 2004); Reduced hospital admission rates (Kirk 2007; Mason 2009); Reduced A&E attendance (Mason 2009); Reduced GP attendance (Ryan, S et al 2008); Reduced no. of appointments (Ryan, S et al 2007); Reduced no. of specialities attended (Ryan, S et al 2007) Staff views that the NC role would improve range of services offered to patients and support/enhance medical services (Porrett & McGrath 2003, survey)
	Reduced mortality/morbidity suggested by sponsors (Guest et al 2004)	Crocker (2002); Priestley et al (2004)
	Reduced waiting times/seen quicker (Guest et al 2004; Tough 2006)	Currie et al (2004); Warner et al (2005)
	Cost effectiveness of clinic (Drennan et al 2004)	None
	None	No clinical incidents and complaints (Ryan H et al 2004)
	Adherence to appointments (Tough 2006)	None
	Developing networks (Manley et al 2008)	None
Social validity	Patients acceptance/preference of NC/clinic	Mason (2009); James & McPhail (2008), survey;

	(Guest et al 2004; Ryan et al 2006; Tough 2006)	Marshall et al (2005), survey; Tonkin (2007), survey; James & Eastwood (2007), survey; Porrett & McGrath (2003), survey.

Table 4 - Professional significance qualitative and quantitative synthesis

Professional categories	**Evidence of impact identified in the qualitative studies**	**Evidence of impact identified in the quantitative/survey studies**
Professional impact	• Develop clinical practice of staff (DHSSPS 2005) • Enabling other nurses to deal directly with patient needs (Drennan et al 2004) • Transferring/updating/guiding/ developing skills (Drennan et al 2004; Guest et al 2004; McIntosh et al; Unsworth & Cook 2003) • Nurses benefit from expertise of NC (Drennan et al 2004) • Teaching/explanations/instructions to health professionals to reduce risk - thus impact on competence of behaviour (Fairley & Closs 2006) • Helping team become self-sufficient in problem solving (Manley et al 2008) • Helping others to develop their practice/expertise (Manley et al 2008)	Increased respiratory rate recording (Butler-Williams et al 2005, audit); Increased quality and frequency of observation recording (Ryan, H et al 2004, audit); Delay in decision to wean (Crocker 2002, audit); Improved GP accuracy of diagnosis (Kirk 2007, survey) Learning in various clinical tasks and positive change in practice (e.g. documentation, knowledge, decision-making and prioritisation skills – Jarman 2009, survey)
	None	Single question on endangering doctor experience /roles (i.e. deskilling) (Porrett & McGrath 2003, survey, but for most was not an issue)
	Range and quality of services offered by other nurses (Drennan et al 2004; Guest et al 2004)	None
	Changing staff attitudes/behaviour (Guest et al 2004; McIntosh et al)	None
	Facilitate/encourage research engagement (Guest et al 2004; Woodward et al 2005/6)	None
	Increasing staff understanding/confidence-building (Drennan et al 2004; Guest et al 2004; McIntosh et al)	Improved staff alcohol awareness (Mason 2009)
Quality of working life	Enhanced/increased team/staff morale (Drennan et al 2004; Guest et al 2004; McIntosh et al)	Feeling supported during clinical nursing round (Jarman 2009, survey)
	Other staff feeling threatened/unrecognised (Drennan et al 2004; Fairley & Closs 2006)	None
	Greater involvement of all/healthy team working/ relationships in team (doctors/nurse) (Drennan et al 2004; Redwood et al 2007)	None
	Improved communication (Redwood et al 2007)	None
	Inter-personal/inter-staff conflict (Unsworth & Cook 2003)	None
	Job satisfaction among NCs (Drennan et al 2004)	None
Professional social significance	Implications for workload/remit of others (Drennan et al 2004; Guest et al 2004; Redwood et al 2007)	Single question on impact on medical colleagues' roles or opportunities (Porrett & McGrath 2003, survey)
	Encourage extension to roles/influence and lead development of new posts/nursing roles (Guest et al 2004; McIntosh et al; Unsworth & Cook 2003)	Single question on raising opportunities for further posts (Porrett & McGrath 2003, survey)
	Impact on caseload management (Drennan et al 2004)	None
	Retention/recruitment/sickness (Drennan et al 2004)	None
	Influencing training/education needs of others (Unsworth & Cook 2003)	None
Professional social validity	Value/acceptance of NC/service to staff (Abbott 2007; Guest et al 2004; McIntosh et al; Redwood et al 2007; Woodward et al 2005/6)	GP satisfaction with service (Pottle 2005, survey); GP usefulness of service (Kirk 2007, survey); Perceived value/impact & acceptance of CNR among staff (Jarman 2009, survey)