

Dimensions of clinical nurse specialist work in the UK

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Abstract

Aim To model the work of clinical nurse specialists (CNSs) in the UK.

Method This article examines data mined as part of a national project. The Pandora database was initially collected on a Microsoft™ Office Access database and subsequently, a Structured Query Language database in several iterations from June 2006 to September 2008. Pandora recorded CNS activity as a series of events with eight dimensions to each event. Data from this were mined to examine the complexity of CNS work.

Results This study represents the work of 463 CNSs over 2,778 days in England, Scotland and Wales. Clinical work, including physical assessment, referral, symptom control and 'rescue' work, accounted for a large part of the CNS's role. Administration was the second highest workload, with about half of these administrative tasks identified as being suitable for secretarial staff to undertake. Research, education and consultation accounted for less time. The telephone was a significant context in which clinical work was performed by the CNS.

Conclusion CNSs in this study spent much of their time doing complex clinical work. Payment by Results (Department of Health 2006) should recognise the work undertaken by CNSs, particularly that done on the telephone. Complex clinical work by CNSs takes place in many different contexts using a wide range of interventions. The role of the CNS is complex and diverse, making comparisons of it difficult. More research needs to be done in relation to quality, safety and efficiency.

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Advanced practice; Clinical nurse specialist; Nurse specialist

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IN THE PAST FEW YEARS articles in the nursing press (Hill 2006) have reported how the value of the work of clinical nurse specialists (CNSs) in the UK has been called into question. There is anecdotal evidence of CNSs being replaced by other members of staff and of CNSs being asked to leave their caseloads for one day or more each week to work in clinical areas other than their own (Harrison 2006). This is not a new phenomenon. Specialist nursing roles have attracted much interest, discussion and controversy in the past (Baker 1979, Fox 1982, Hill 2006).

Increasingly this group of nurses have been seen as an expensive resource (Hill 2006) and as a result they have begun to feel undervalued and under threat (Harrison 2006). It is possible that this situation has arisen because CNSs have not been able to articulate the work they do fully. While there are many descriptive studies of the role, little quantitative research has been published examining the work of CNSs in the UK.

The concept of specialist clinical nursing was first described by De Witt (De Witt 1900) and later by Francis Reiter in the 1940s who used the term 'nurse clinician' to refer to nurses in advanced and specialist roles (Reiter 1966). The specialist nurse role in the UK evolved in the 1970s (Castledine 2003), but still lacks a clear definition (Llahana 2005).

The work of CNSs in the UK is often described as a combination of four elements: clinical, education, research and consultation (Hamric and Spross 1989, Information Services of NHS Scotland 2004, Ball 2005). However, describing the role in this way risks oversimplifying it and does not allow for the articulation of much of the hidden work that CNSs perform, such as improving and redesigning services, clinical 'rescue' work, the co-ordination of care and brokering on behalf of patients to ensure appropriate and timely care (Silber *et al* 1992). Rescue work is performed primarily by nurses to prevent negative patient events. For example, a nurse might detect breathing difficulties in a patient and then rescue them by taking appropriate steps.

Reports received by the authors from researchers and clinicians in the UK indicate that

much of the quantitative data that have been collected in local contexts are also primarily one-dimensional. Reductionist approaches, for example audit of one dimension of the role or work sampling, frequently fail when used to examine complex phenomena (Finkler *et al* 1993, Burke *et al* 2000). Specialist nursing is a complex phenomenon – the whole is not the sum of the parts but rather the sum of parts and its connectedness (Wheeler 2007). In other words breaking nursing down into parts, trying to measure it and then using that to gain a picture of what nursing is, is unlikely to be successful.

Background to the study

In an attempt to articulate the complexity of CNS work to a primarily non-nursing audience, a project was established to model CNS work at a large NHS foundation trust. The principles of mathematical modelling were applied to recorded CNS work assuming it to be a complex phenomenon. Such techniques have been described elsewhere (Giordano *et al* 2003, Wolfram Research 2008) and are common in science disciplines. Modelling uses simplification of real-life situations and the application of mathematics. In this instance, it was used principally in the form of transformation and logic in iterative fashion to allow pattern recognition, grouping and description of the real-life situation (Boas 1983, Vickers 1989, Giordano *et al* 2003, Wolfram Research 2008).

After initial building of the model more CNSs across England, Scotland and Wales contributed data to the Pandora database for the purposes of refining the model and building a series of richer databases. This data collection was done initially on a Microsoft™ Office Access database and subsequently a Structured Query Language database (a database designed to manage data). This took place between June 2006 and September 2008.

Aim

The aim of the original study was to model CNS work in the UK. This article presents information generated as a result of mining data from the model of CNS work. Data mining is a common technique in knowledge discovery (Fayyad *et al* 1996). Mining involves examining data to find relationships in it.

Method

The Pandora database, which was created during the original unpublished study, contains data from 463 self-selected CNSs across

different specialties. These are: cancer, palliative care, diabetes, neurological including multiple sclerosis, gynaecology/women's health, tissue viability, rheumatology, emergency nursing, intermediate care, respiratory, non-malignant haematology, heart failure, gastrointestinal nursing and paediatrics/adolescents. Geographical locations included 448 in England, 12 in Scotland, three in Wales and none in Northern Ireland.

The Pandora database mined contains more than two million points of data: 2,778 days and 111,120 events. The mean events per day per CNS was 40 (range 25-60) and the average period of data collection for each CNS was six working days (range 1-18). This amount of data cannot be reported entirely because of its volume, but a summary of key themes is presented in this article.

Data mining is a technique of knowledge discovery used by many different professionals, such as statisticians and information systems specialists (Fayyad *et al* 1996). Data mining enables large amounts of data to be analysed for patterns and relationships using specified search parameters. The parameters used for this study were based on eight dimensions of CNS work recorded in the Pandora model.

The eight dimensions from the modelling work are:

- ▶ Event: CNS work is recorded as a series of events. Not all CNS work is related to patients (for example, service redesign) and one patient episode might contain several events.
- ▶ Date: everything happens at a point in time.
- ▶ Context: each event has a context, for example new outpatient, travel, telephone, inpatient and follow up.
- ▶ Temporal: each event occurs during a period of time.
- ▶ Intervention: interventions are divided and subdivided to provide detail.
- ▶ Form: each event takes a form, for example, brokering and clinical expertise.
- ▶ Outcome: for example, symptom control, information needs met, achieved desired place of care/death.
- ▶ Emotional effort: from low to very high.

Mining these data might also describe empirically the multidimensional work and relationships between context, temporal aspects, interventions and form that the event took, and the other dimensions of the event.

Ethical considerations Approval for the original study was obtained from the local research ethics

committee. All data were anonymised. No confidential data were contained in the database, CNS contributions were only identified by specialty and geographical location, for example cancer network, unless they requested specific feedback about their own work.

Results

The working day A number of patterns characterised a CNS's working day. The day appeared divided into five sections where shifts in time, context and intervention featured.

Types of intervention The majority of the work was clinical representing 68% (75,561/111,120 events) of events (range across specialties 64-78%) and 24% (26,668) of events were administrative (range 13-27%) (Figure 1). The division of types of intervention ranged across specialty, but only by a small amount.

Clinical work Figure 2 shows a breakdown of the clinical component of CNS work in the database (75,561 events). The largest component (48%) of this work was that classified by the CNSs as 'physical' (36,269 events). In this dimension physical assessment, recommending specialist care to other professionals, specialist symptom control and rescue work featured strongly. A total of 13% of the CNS clinical dimension was making referrals (9,823 events).

Administration work This intervention was defined on average as clinical administration 50% of the time (38-60% mean and the median time was 50%). This means that, although the intervention could be administrative, it still required a clinician to do it, for example dictating a clinical letter. The corollary is that 50% of the administration was not related to clinical work and could be done by secretarial staff. Although this aspect of administration work represented 12% of the overall interventions, it still represented 13,334 events in this study.

Most administration work fell into the 0-15 minute time category. This equated to 3,333.5 hours that could have been used for clinical time if such support had been available. This equated to 7.1 hours per CNS per six working days on average. There was some variance in this and it would be interesting to study this further in a larger group of CNSs. About 4,000 events were coded as 'chasing up', for example transport, results and letters or other events necessary for a co-ordinated patient pathway.

The context of CNSs' work Respondents worked

in different contexts. Combined, working in the outpatient setting (new and follow up) was the largest context (34%), although there was some variation in this (20-48%). The largest single context was telephone work (36,700 events approximately). CNSs spent 33% of their time on the telephone in clinical work and this varied little across specialties with the mode being 33%. The different contexts can be seen in Figures 3 and 4.

The emotional effort required of specialist nursing work was one of the dimensions cited by CNSs during the study. Each event involved a degree of emotional effort. This is a subjective term but it was articulated by the CNSs taking part in the early iterative rounds of data collection and a simple interquartile range of low, medium, high and very high was used to describe it.

Emotional effort was therefore included in the modelling as a dimension of CNS work. Overall, 55% (61,116) of events were recorded as low in emotional effort, 31% (34,447) as medium, 11% (12,223) as high and 3% (3,333) very high. Contexts were spread across emotional effort with inpatient unplanned day care, new outpatient and multidisciplinary team meetings as rating the highest in emotional effort. Clinical expertise, clinical leadership and administration events were generally recorded as involving

FIGURE 1

Types of intervention

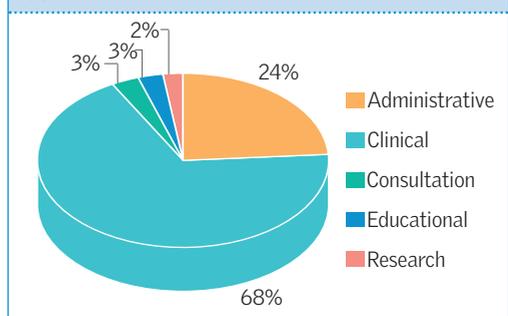
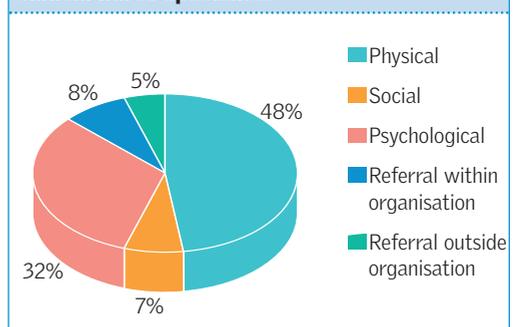


FIGURE 2

Breakdown of clinical work provided by clinical nurse specialists



medium, high or very high emotional effort. This classification was specific to each CNS.

Figure 5 illustrates the time taken per event against emotional effort. The longer events took the greater the emotional effort associated with them. Nursing time as a concept has been described elsewhere (Gibson 1994, Jones 2001).

Discussion

Mining is limited to only a few relationships and modelling requires data based on real-life situations. This model is not, therefore, predictive or explicative in other groups. Another group would need to collect data about their own work. However, Pandora is a tool for CNSs to articulate the complexity of their work.

The complexity of CNS work was apparent from the multidimensional nature of their activity and the different levels apparent in the data. These data were not linear and should not be approached as such. There are complex layers of data that interconnect and represent the work of the CNS. There is a limit to the amount of data that can be discussed in this article and the database could be mined further for different perspectives on the work of CNSs.

The iterative process used to model the work of the CNS demonstrated its complexity. The intervention dimension alone had five sub-groups – clinical, administration, research, education and consultation – and many items in each group. The variety of work that CNSs undertook in different contexts and forms, the emotional effort required, the variation in time taken and the intensity of the work demonstrated that current descriptors of CNS work (clinical, education, research and consultation) formed part of one dimension. This study demonstrates that the role of the CNS has been oversimplified.

The work of the CNS is often invisible because much of it contributes to the management of patients through increasingly complex care pathways. CNSs also act as ‘fail safes’ in preventing injury, detecting symptoms and preventing sequelae, preventing or dealing with iatrogenic events and often dealing with issues before they become complaints.

This kind of rescue work was recorded by the CNSs who supplied data for this study. Rescue work was first examined by Silber *et al* (1992) in their work on the consequences of ‘failure to rescue’. Previous studies have demonstrated a significant relationship between higher levels of nurse staffing and lower failure to rescue in hospitals (Aiken *et al* 2002, 2003, Rafferty *et al* 2006). From these data it can also be seen to be a substantial part of CNS workload.

FIGURE 3

The context of clinical nurse specialists' work

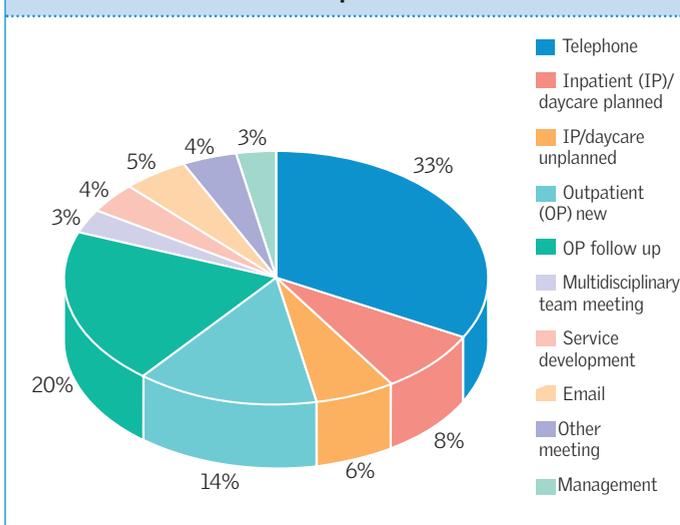


FIGURE 4

The main contexts in which interventions are performed

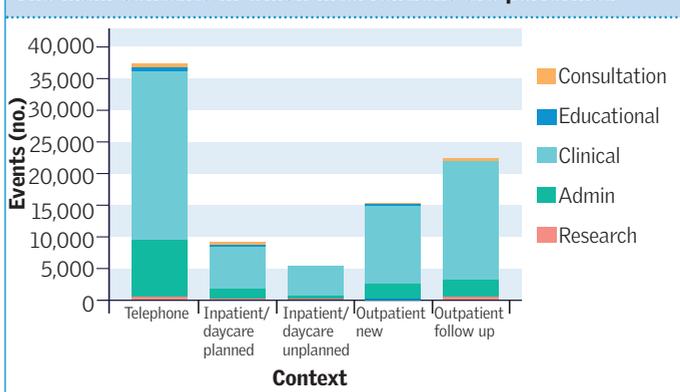
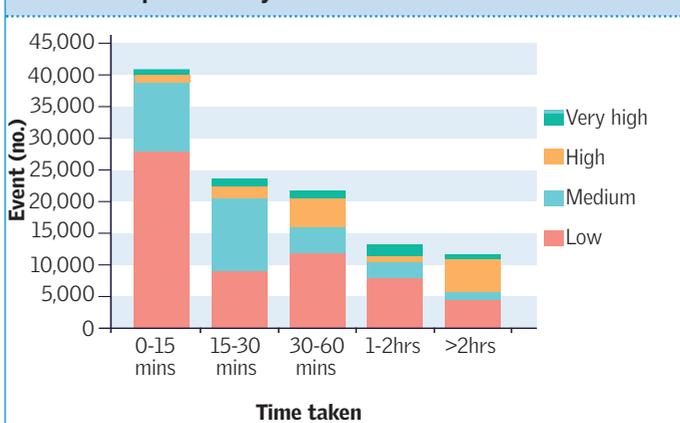


FIGURE 5

Time taken per event by emotional effort



An interesting finding was the consistency in the amount of clinical telephone work that CNSs undertook. This has implications in terms of

funding in England. In England Payment by Results (Department of Health (DH) 2006) does not recognise telephone work as discrete clinical activity. It is considered an overhead and is not reimbursable (DH 2006).

Conclusion

The work of CNSs across specialties was complex and diverse and therefore made a close comparison of roles difficult. However, patterns existed. For example the consistent use of telephone work as a context was common across all the CNSs in the study, no matter what specialty. The variety and complexity of work undertaken in one or more dimensions was a marker of specialist practice **NS**

IMPLICATIONS FOR PRACTICE

- ▶ Clinical nurse specialists (CNSs) spend a large proportion of their time on complex clinical work.
- ▶ Payment by Results (Department of Health 2006) needs to recognise CNS work, particularly telephone work.
- ▶ Complex clinical work by CNSs takes place in many different contexts using a wide range of interventions.
- ▶ Managers should recognise the CNS role as complex.
- ▶ More research needs to be undertaken. The role of the CNS is complex and needs to be further articulated.
- ▶ CNSs regularly work unpaid overtime (Leary *et al* 2008). It is vital to patient care and service efficiency, for example the 'rescue' work and complex care co-ordination identified in the eight dimensions of CNS work.

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