

Making the complexity of community nursing visible: the Cassandra project

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There is a growing body of research evidence showing that staffing levels make a difference to patient experience and outcomes, quality of care and the efficiency of care delivery (Royal College of Nursing (RCN), 2010a; Francis, 2013; National Advisory Group on the Safety of Patients in England, 2013; National Institute for Health and Care Excellence (NICE), 2014). There are significant limitations to the current evidence on skill mix in the global health workforce, and there is a lack of specific literature on nursing workforce tools and models (Buchan and Seccombe, 2012), especially within the community context (Storey et al, 2009). Hurst (2006) predicts

that workforce planning and development will increase in complexity as the variables affecting it proliferate with the pace of services. The critical question is how to positively and progressively support, develop and transform the community nursing workforce in times of change to meet demand as populations overall increase in age, live longer, and as ever more complex comorbidities rise (Buchan and Seccombe, 2012; Smith and Jack, 2012; RCN, 2013, 2015). In addition, the political rhetoric and imperatives currently surrounding health-care provision are compelling workforce planning and development teams and commissioners to implement strategies that will deliver on effectiveness, safety and person-centredness (Francis, 2013).

ABSTRACT

The need to effectively promote safe staffing levels in community settings challenges commissioners and providers of services to find rigorous methods of capturing workforce evidence that can be systematically used to shape effective services and skill mix for the future. This article presents a brief review of current approaches and challenges to measuring community nursing workload activity in England. Specifically, it shows phase 1 pilot results using the Cassandra Matrix activity tool and review of ongoing developments and progress to demonstrate scalability for national implementation. As part of a much larger practice development project to develop community nursing, the pilot used mixed methods to collect 10 days of workload activity data from a self-selected sample of band 5–7 nurses working in general and specialist community nursing roles in three community organisations, and to evaluate their experiences of using the tool via an electronic survey. The findings indicate that the tool has significant potential for capturing the complexity and multiple dimensions of nursing work in community contexts, and phase 2 work has led to a community version of the tool being piloted on a larger scale across six community organisations.

KEY WORDS

- ♦ Community nursing ♦ Safer staffing ♦ Workload activity tools
- ♦ Complexity of care ♦ Workforce modelling

Situating nursing

Nursing work itself is complex (Hall, 1964; Leary et al, 2008; Warren et al, 2012); however, when portrayed in terms of supply and demand, nursing work in the inpatient, specialist or community setting is often represented as a linear series of tasks that are deterministic in nature. These assumptions have led to nursing work being subjected to reductionist research methods using activity analysis that are quite simplistic (e.g. time and motion studies), but such methods do not capture complex work well (De Leon, 1993; Raiborn, 2004). In the research undertaken by Leary (2011) with specialist nurses in oncology settings, for example, a nursing act has eight dimensions, including intervention, context, time, emotional effort and other factors (Breast Cancer Care, 2008; Leary et al, 2008; RCN, 2010a; 2010b; Oliver and Leary, 2012). These aspects are rarely accounted for in any kind of time and motion or work-sampling study, particularly the application of vigilance in order to rescue patients from adverse consequences of disease or treatment (Oliver and Leary, 2012).

Scottish, Welsh and English contexts

The collection of meaningful data in the community nursing context is difficult to coordinate or even access, given that

community nursing occurs in many different contexts or locations and population demographics vary hugely across the country (Leary et al, 2008; Chilton, 2012). In Scotland, local and national workforce planning and the mechanisms used are more centrally coordinated. *Everyone Matters: 2020 Workforce Vision* (Scottish Government, 2013) sets out its priorities for creating an integrated workforce across care settings for the next 5 years. A centralised whole-systems approach to process mapping alongside measurement of demand, capacity, activity and backlog provides the evidence base for service improvement. There are four nationally agreed tools for workload measurement and planning in the following categories (Audit Scotland, 2007):

- ♦ Adult acute care
- ♦ Paediatrics and neonatal nursing
- ♦ Primary care
- ♦ Mental health and learning disabilities

In these areas, authorities are testing and piloting tools until they are fit for purpose and ready to be rolled out on a national basis. There are now seven tools in existence that take a triangulation approach, measuring activity, professional judgement and clinical quality indicators instead of measuring a single value (RCN, 2010a).

In Wales, health organisations submit annual workforce plans to the National Leadership and Innovation Agency for Healthcare (NLIAH) workforce development unit, which then feed into the education commissioning process. However, the quality of these plans appears to be very variable.

Models currently being piloted in England appear to be looking at the time taken to perform an intervention activity. Examples include:

- ♦ Time and motion studies based on capturing a linear series of tasks (<http://1.usa.gov/1A723GC>)
- ♦ Work on averages like the Safer Nursing Care work (<http://bit.ly/1LqZti8>)
- ♦ Diary-based examples making assumptions about what people are doing but which are not transferable because they are only sensitive to the diaries being monitored.

While it is important to develop a variety of tools to map workload activity and workforce requirements according to local health context needs, the limitation of these approaches is that they could underestimate and misrepresent the complexity and multiple dimensions of the community care episode, the time taken to provide it and the skill mix required to deliver it. It is important to acknowledge that there may not be one tool that will provide all the answers, but instead focus should be placed on testing tools for validity and reliability so that they reflect the multiple dimensions of care and are able to calculate the workload activity of the whole workforce to create a systematic evidence base to promote whole-systems working across the local health economy.

In 2013 and 2014, the England Centre for Practice Development piloted the Cassandra Matrix tool, a data collection tool originally designed for the specialist nursing community to help them articulate their activity to non-nurses (Leary, 2011). This article presents the initial findings of the phase 1 pilot study and highlights the benefits and

challenges of using a new approach to capturing workload activity as well as providing a snapshot of the story so far in terms of phase 2 and 3 work.

Current themes in workload planning and measurement

The current understanding of how to provide safe staffing levels in order to provide the right care in the right place at the right time has been identified by the RCN (2010b) in their *Safer Staffing Guideline* report. These recommendations are currently being addressed by NICE as well as the Centre for Workforce Intelligence and professional organisations and regulatory bodies. Workforce planning at a national level presents a number of challenges because, as the RCN (2010a) suggests:

- ♦ It has generally not been done well across the UK and has led to 'boom to bust' scenarios
- ♦ Changes in demand (increasing capacity, move to community) and changes in supply (ageing workforce), and the relationship between the two are not well reflected in workforce plans
- ♦ With the exception of Scotland, local and national workforce planning is not systematically integrated
- ♦ Effective workforce planning requires commitment to matching supply to demand (with an accurate assessment of both) and the authority to translate the results of the agreed approach into workforce plans.

Workload measurement tools may capture workload demands in order to plan staffing levels, but few give a clear idea of the mix of employees or skills needed to deliver safe, quality and effective patient care specifically in the community setting. The first fundamental issue is that there is a lack of national consensus around the definitions being used to describe nursing interventions and activities, starting with the service itself (what is being done and how frequently it involves contact with clients) and the population served (and its density) (RCN, 2010a). It is further compounded by variation in how 'caseloads' are defined; therefore, it is almost impossible to arrive at consistently defined data that allows averages to be produced and comparisons to be drawn because of population demographics and differences in skill mix across the country.

If the level and mix of staffing is not well matched to what is needed, it is not just the volume of care that is affected, but the quality of each and every nursing action or interaction could be affected by excessive workloads—the net effect being increased stress, sickness and low staff morale as well as a higher rates of staff leaving the profession (RCN, 2010a). From a community perspective it is vitally important to have accurate data to underpin decisions regarding commissioning skill mix and services so that the duration of each individual care episode provides the highest quality of interaction possible for both the practitioner and the client at home. In some parts of the country, directors of nursing are reporting variance in the contact time allocated by patients, but there is currently no systematic evidence to support a standardised approach. From anecdotal evidence it is not difficult to determine the potential impact on the quality of care and

tasks that may be omitted or missed due to lack of time.

Levels of workforce planning

Workforce planning is undertaken at different levels (national, regional and local) and can be categorised into three main types of activity by level and purpose.

1. Workforce modelling

Workforce modelling uses current provision to predict future care needs to anticipate the demand for nursing staff. Also known as workforce flow, calculations are made on the basis of flow into and out of the labour market to predict the number of nurses needed to meet demand (a demand-driven model to inform workforce training plans).

2. Establishment setting

Establishment setting is a commonly used approach to determine or review the funded establishment of nursing posts required to deliver a specific service.

3. Daily planning/rostering

Daily planning or rostering is an approach used to match the staff deployed to variation in workload. It requires a regular review of patient mix (a predictor of associated workload) to ensure that supply meets demand for care anticipated. For example, the workload may be higher during flu vaccination season to meet the demands of the local population.

Ultimately, due to the lack of research and literature in the area of health workforce planning and development, and in community nursing more generally (Curson et al, 2010), there are real opportunities to lead on research and development, with the possibility of effective tools, models and conceptual frameworks providing exemplars for best practice locally, nationally and internationally. Equally, the challenge is to develop visionary methodologies, methods and tools by designing them to allow for a filtering of context and a responsiveness to wider sociocultural, socioeconomic and sociopolitical subjectivities (Hurst, 2006; Reid et al, 2008; Holloway et al, 2009; Kelly et al, 2009; Curson et al, 2010; Masnick and McDonnell, 2010; Parsons, 2010; Fraher and Jones, 2011; Haycock-Stuart and Kean, 2011; Leach and Segal, 2011; Buchan and Seccombe, 2012; Chilton, 2012; Farmer et al, 2012; Tomblin Murphy et al, 2012; Centre for Workforce Intelligence, 2013).

The Cassandra Matrix tool

'Cassandra' was originally designed as a paper-based tool to capture what nurses do (interventions), where their actions occur (contexts), who the work is done for (patients or carers), and what the nurses do not have time to do (work left undone) (Leary, 2011). The tool's robustness is derived from the fact that it is based on 50 million hours of activity analysis. Some 65 000 interventions have been captured to provide detailed information about specialist nurse contributions in the field of oncology over a 9-year period. The research team had previously worked with the tool to measure the specialist nurse contribution in a large NHS acute trust that was undergoing a significant programme of workforce remod-

elling. Based on the authors' experiences, the aim of the present project was to evaluate whether it could be piloted in the community nursing context.

The electronic version of Cassandra is designed to be used in 'real time' as practitioners carry out their daily work using computers, phones or tablets to input their activity. The interventions are grouped into four main types:

- ♦ Physical interventions
- ♦ Psychological interventions
- ♦ Social interventions
- ♦ Case management and administration

The tool will provide an accurate picture of how an individual practitioner spends most of their working time provided that a minimum of 70–100 hours of work are recorded. The electronic version of the tool generates individual reports (for a practitioner to judge their own workload) and annual appraisal negotiations. This information would also be useful for personal development planning and career progression. The organisational-level report demonstrates the spread and complexity of work across professional career bands as well as demonstrating what work has been left undone.

Methods

Purpose and objectives

The phase 1 pilot was commissioned by NHS England Kent and Medway local area team and North Kent clinical commissioning groups between September and December 2013 to determine the suitability and applicability of the Cassandra workload activity tool for the community nursing context. Project commissioners' critical questions guiding the study were:

- ♦ What tools are already in existence and what are their strengths and limitations? Where are the gaps?
- ♦ What would a community nursing workforce look like to deliver this model?
- ♦ How can existing tools be used as a benchmark for effective workforce development planning for nursing services?
- ♦ How can a benchmark tool be used by commissioners to lobby for nursing skill mix, delivering value for money, effectiveness and economic benefits for patient outcomes?

A regional project steering group consisting of representatives from NHS England local area team, Health Education England, directors of nursing and quality in community nursing organisations and local NHS trusts was established to monitor and review project progress.

Testing

In order to test the validity of the tool for the community nursing context, a regional integrated mental health trust agreed to test it prior to the pilot with one of its community nursing teams to ensure that it appropriately described community nursing activities and interventions. A paper-based version of the tool was then piloted with three self-selected organisations working with a designated champion in each who recruited a sample of self-selected band 5–7 community

nurses willing to pilot the tool (*Appendix 1*). The total sample size for the pilot was 24 self-selected participants. Data were captured by each individual participant over a period of 10 working days. Using the paper-based tool, an activity was ticked every time it occurred against an inventory of pre-determined interventions. Each participant was responsible for completing daily record sheets and then adding up the total number of activities for each day. Once 10 days' data capture had been completed, the data sheets were returned to the research team and inputted into a Microsoft Excel spreadsheet. This provided an instant analysis of key activities, generating an individual report of workload activity as well as an organisational-level report of the spread of workload across the bands participating in the pilot.

A Bristol Online Survey (BOS) (BOS, 2013) was launched to provide an opportunity for participants to capture their evaluation in a pre-test/post-test design format. Using a claims, concerns and issues framework derived from fourth-generation evaluation (Lincoln and Guba, 1985), the survey asked what positive statements participants would like to make about using the tool, what concerns they had and what questions they would like to be addressed. This information was taken with a simple cognitive mapping tool asking participants to make a judgment regarding how effective they were at measuring what they did both pre- and post-pilot. This enabled comparison before and after the workload activity data collection.

Ethical approval for the study

Ethical approval for the study was provided by the University Ethics Committee. Anonymity for community nurse participants was clarified in a participant information sheet and consent was informed by self-selected participant uptake. Participants received a letter of thanks following their participation to enable them to request a copy of their personalised Cassandra Matrix work profile data for their own records and interest and to determine whether they wished to receive a full copy of the report. Individual participant data was not readily identifiable in the organisational analysis provided for each community organisation in the data analysis charts provided. It was made clear to employers of the participant organisations that individual community nurses' Cassandra activity profiles were confidential to the participants to avoid individuals being readily identifiable.

Results

Phase 1 pilot findings

Some 24 out of 26 participants returned 10 days of complete data, providing a 92% response rate. Individual reports were produced for each participant showing their overall intervention totals by the context in which they were carrying them out. The organisational charts provided an opportunity to see the profile for a whole set of employees' activity, and for some inferences to be made from observation of an organisation's profile. This enabled comparison between activities and ratios relating to employment bands at an organisational level. The pilot also generated a cross-organisational analysis report that showed the consolidated

interventions for the whole cohort of participants according to the context in which the care took place. This offered the opportunity to understand where the concentration of care activity lies, both in terms of interventions made and context. It also enabled the identification of some work overlap and repetition between band 5 and band 7 practitioners.

The data demonstrated that participating community nurses were involved in significantly more procedural and holistic assessment work over and above anything else, followed by (in order of significance): care planning and evaluation, caseload management, symptom control and advice, promoting self-management, reassessment of needs, handovers, and administration. The largest spike in the data identified that a significant amount of travelling was done in order to manage caseloads, with the majority of travel being scheduled as opposed to unscheduled. The majority of care activity took place in domiciliary settings, and although there was evidence of some telephone and clinical activity, the minority of activity occurred within a multi-professional context.

The data also indicated that practitioners engaged less (although still significantly) in providing health education, risk assessment and reviews, hospital avoidance, coordinating care, clinical risk assessment, and the chasing up of referrals and results. A less significant part of the overall work consisted of rescue work, carer support, dealing with distress, anxiety management, anxiety rescue, social assessment, safeguarding the vulnerable, mediation of relationships, social advice, psychological assessments, advocacy, communicating significant news, and joint assessments.

In summary, the data from this small pilot demonstrated that community nurses are required to draw on a broad spectrum of skills; however, the emphasis upon which of those skills is put into action differs according to the working environment.

User responses to the tool

The survey indicated overwhelmingly that participants felt that the tool would make visible the contribution of community nurses and is useful for both peer review and benchmarking care standards. One participant stated:

'It clearly highlights what we do each day as well as the scope and impact of my role'.

The pilot demonstrates that participants found the tool easy to engage with and use, and that it has:

'...potential to provide evidence of what I do, the skills and knowledge I use daily as well as inform staffing levels and admin support'.

The survey also identified for participants that managing time is a major concern that:

'...at times can be difficult due to the number of visits or shortness of staff. This in turn makes it difficult to measure what I do consistently'.

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Home : Data Collection

Start

0 of 5 Complete

1. Start

2. Interventions, Physical

3. Interventions, Psychological

4. Interventions, Social

5. Case management & Admin

Welcome to Cassandra for community teams.
This is a specialist data collection tool used as part of a study looking at the complexity and workload of specialist practice.
You can download the instructions [Here](#)
At the end of the day please tell us how much unpaid overtime you have worked.

Date: 22 August 2014

Is this data entry for: Please select

Where/how did this take place? Please select

How many hours did you work today? Include any unpaid overtime or worked through lunch breaks 0

Next

Figure 1. Screenshot of the Cassandra Matrix tool at the beginning of the data entry process

Participants also identified the potential for the tool to be used to support integrated service delivery:

'It has the potential to promote more understanding of different roles and who does what in the multidisciplinary team.'

Discussion

The purpose of this initial phase 1 project was to test whether the Cassandra Matrix tool had the potential to be adapted for and used more extensively within community nursing organisations and settings. Therefore, our results and conclusions with a small sample size are not sufficiently generalisable to make broader recommendations regarding workforce design. However, they are useful in demonstrating that the tool is potentially valuable, that it is scalable and easy to use and that it promotes quick and easy comparative analysis of workforce activity for individuals, teams and organisations.

We can report with confidence that the tool clearly captured the full range of nursing activities across band 5–7 self-selected participants, verified by expert groups of community nurses. Furthermore, the tool demonstrated that band 5 practitioners were engaged more significantly in procedural work, care planning, and travelling. It was not possible given the small sample size to identify or infer the management activity of the band 7 practitioners. The phase 1 pilot demonstrated that the tool required some amendments in order to pick up additional community nursing interventions. A series of stakeholder workshops were established quickly to undertake consultation and consensus on what inclusions and additions needed to be made.

Future directions

Following a series of dissemination events at regional and national level, and further funding from Health Education England (Kent, Surrey and Sussex), the team is finalising a phase 2 pilot, testing an electronic community nursing version of the tool more widely with six community organisations across Kent, Surrey and Sussex to capture the workload activity of band 5–8 generalist and specialist community nurses on a larger scale (Figure 1). In addition, work is currently taking place with an integrated mental health and social care organisation to develop a mental health version of the tool for pilot in 2015 with a range of professional groups.

There now exists the national appetite and widespread support from NHS England, the Queen's Nursing Institute and the Royal College of Nursing to scale the use of Cassandra across a number of implementation sites in England in 2015. This will enable activity data to continue to be gathered using a grounded approach until saturation is achieved. Following this, the data will be mined for patterns in order to develop a representative optimum caseload simulation model ready for testing. This has not previously been achieved in the community context. It is hoped that this will enable a representative 'whole system' to be built that injects realism into practice, accurately reflecting the management of complex work instead of trying to measure the component parts in isolation. Developing an understanding of the interrelationships between care interventions, context and multiple users is an iterative process that involves working with large data to look for patterns that will enable the development of a representative model that reflects activity in all its dimensions in order to simulate the optimum caseload. By mining data and modelling the rela-

tionship that is assumed to exist, it may be possible to build more accurate data capture tools that provide increased insight into the relationship between complex nursing care and patient safety factors (and subsequent cost effectiveness). It is hoped that this will allow predictive modelling in future. Furthermore, the approach will help to identify how much work is planned and how much is unplanned. This is an important aspect to explore in detail since it enables the analysis of reactive versus proactive workforce activity and to balance the supply-and-demand-driven model currently pervading workforce planning. It is also an important factor in estimating the cost of care, or the cost of poor care.

Conclusion

Phase 1 and 2 testing has demonstrated that the community nursing version of the tool can quickly and accurately capture a representative picture of how community and district nurses spend their time. The electronic version of the tool has enabled more complex data to be collected that describes what people are doing and what breakdown of activity types is occurring within organisations and across NHS career grades within the workforce. Evidencing the complexity of community nursing enables practitioners, services, organisations and service users to reflect on its tangible value, and also to understand and appreciate that complexity alongside a fluid health economy in such a way that it is possible to plan future workforce development in a more comprehensive and inclusive way. **BJCN**

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KEY POINTS

- ♦ Community nursing work is complex, multidimensional and varies across the country and by population mix
- ♦ Cassandra models a complex system and relies on understanding relationships as well as tasks that occupy time
- ♦ Workload activity data can be used to construct an optimum caseload model for community nursing and to identify workforce resourcing patterns
- ♦ In the future we will identify how much community nursing work is planned and unplanned and place an economic cost on care left undone

Appendix 1. Original adapted Cassandra Matrix tool

Daily record for practitioner 1					
	Domiciliary visit	Clinic visit	Telephone	Multi-professional meeting	Total
Holistic assessment					
Symptom control advice					
Symptom control referral					
Symptom control management					
Performing procedures					
Hospital avoidance intervention					
Promoting self-management					
Providing health education					
Providing rescue work					
Providing vigilance admission					
Risk assessment and review					
Reassessment of needs					
Psychological assessment					
Joint assessment					
Care planning and evaluation					
Coordinating care					
Caseload management					
Handover					
Safeguarding vulnerable					
Clinical risk management					
Anxiety management					
Anxiety rescue work					
Dealing with distress					
Communicating significant news					
Social assessment					
Mediation of relationships					
Carer support					
Advice (social)					
Advocacy					
Referral					
Chasing up results/referrals					
Travel (scheduled)					
Travel (unscheduled)					
Other administration work (non-clinical)					
Total					

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