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## The Sheffield Caseload Classification Tool: testing its inter-rater reliability

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### Background

Community Nurses are key to managing patients' long term conditions by delivering care in people's own homes. They use a wide range of skills to assess, diagnose and manage a multitude of conditions, including wound care, pain management and end-of-life care to help maintain an individual's independence (NHS England 2015). Evidence from some high profile enquiries and reviews attribute low staffing levels with adverse outcomes and poor patient experience (Francis 2010, Keogh 2013, Griffiths, Ball et al. 2016). So as patient and population needs change, new and innovative approaches to health care and support systems are needed (Department of Health 2013). This care is becoming more complex, with increasing levels of acuity and dependency in patient care (McDonald, Frazer et al. 2013) and a corresponding need to undertake caseload management (Reid, Kane et al. 2008). Caseload management has been defined as a management system where care is delivered to a defined caseload according to patient need, whilst ensuring equity and cost-effectiveness (Pye 2011). Bain and Baguley (Bain and Baguley 2012) view caseload management as a way to ensure patients' individual needs are met with the appropriately trained clinician at the right time. The focus on caseload classification within community nursing is reinforced by government policy that prioritises care closer to home (Department of Health 2012, NHS England, Public Health England et al. 2014, NHS England 2015) and the provision of services that enable community care. However there is also an apparent paradox between health policies which promote more care within and closer to home, and the reported decline in community nursing services.

Workforce planning is integral to delivering efficient and high quality services and a number of methods have been described to undertake this, including: professional judgement, population and health needs-based methods, caseload analysis and dependency-acuity methods (Reid, Kane et al. 2008). The National Quality Board (NQB) improvement resource for the district nursing services (David and Saunders 2018) recommends that a robust method for classifying patient acuity, frailty and dependency should be used, and sets out the requirements of an effective caseload tool. This process should help identify a safe caseload and aid in planning future workforce requirements in terms of skill mix and capacity.

A literature review found that there was no single validated tool to distinguish caseload classification (Roberson 2016) but consideration should be given to caseload analysis, measurement of workload and allocation and workforce planning. It has been stated that Caseload profiling is a sub-set of caseload management (Harper-McDonald and Baguley 2018) and this has been defined as a process to describe the number of variables in a community nursing caseload to show the complexity and type of caseload (Kane 2009). However, a systematic review of caseload profiling (Harper-McDonald and Baguley 2018) also found confusion as a number of different terms are used interchangeably in the literature, including caseload analysis, profiling and audit.

In Sheffield, an audit undertaken in 2016/17 found an average of 59,964 face-to-face contacts per 100,000 population by community nurses, representing an increase from an average of 1,482 to 1,541 contacts per whole time equivalent nurse in the last year (NHS Benchmarking Network 2017). Once on the caseload, each service user is seen approximately 21 times for around 5 months, with the most common activity being wound care, followed by administration of medication (NHS Benchmarking Network 2017).

As nursing caseloads have a wide range of complexities, there is a need to determine the most appropriate skill mix to deliver the right care. Currently there are no clear tools to determine staff capacity and skill mix in these community settings. To help understand and manage demand in a busy city wide service the Sheffield Caseload Classification Tool (SCCT) was co-produced by a group of community nurses and managers (Chapman, Kilner et al. 2017). It was designed using a nominal group approach to define areas of care and the levels of complexity of care needs (Figure 1). The staffing skills required to deliver care within each group were also considered, based on grade and level of assigned responsibility. The tool consists of 12 care packages and three complexities of care (Table 1). A manual was produced with a series of working examples to help nurses standardise their responses when defining the level of complexity of care needed by each patient. The nurse classifies the patient's nursing need in terms of the area of care (i.e. care package) required, and the level of complexity. The level of complexity is based on a number of factors related to wellbeing, including the social situation that surrounds the patient. The data is then entered onto the electronic patient record allowing the live daily capture of interventions and patient need across the whole community nursing caseload.

Once designed, the SCCT was then piloted by 70 nurses, health care support workers and administrators, who were trained to use the tool to categorise over 3000 patient nursing needs during their assessment. Evaluation of the pilot demonstrated that it was possible to use the tool to organise community nursing caseloads according to complexity and needs of each patient whilst making use of an established electronic patient record (Chapman, Kilner et al. 2017). The tool supports service leads to gain a more detailed understanding of the community nursing caseload enabling the articulation of demand and complexity.

### Aims

The purpose of this study was to test inter-rater reliability of the tool to ensure that the tool was robust.

### Methodology

A one day table top validation exercise was designed using a handbook containing 69 different case studies to cover all the packages of care and complexity of need. These case studies were produced by nurse teams across the city and were based on real examples (Figure 2 which illustrates the pre-determined answers in red).

### Participants

Six community nurses from the same hospital trust were recruited via an email invite sent to all the staff. They then assessed 69 different case studies using the SCCT and graded each case against two criteria: care package (1 of 12) and complexity of need (routine = 1, additional = 2, significant = 3).

This group of nurses has not been previously involved in designing the tool. All gave written informed consent prior to commencing with the validation exercise. Each nurse also supplied information relating to the length of time (in years) since qualification; and the length of time (in years) that they had worked in a community setting. Their responses were then compared against a pre-determined answer. There were varying levels of familiarity with the tool and the accompanying manual shown by the raters involved in the study. This ranged from no previous experience to a full working knowledge and understanding of using the tool. All raters were provided with a copy of the manual on the day, but were given no further introduction or training on the tool.

### Analysis

The nurses conducting the ratings were considered to be representative members of the community nursing team: hence the model derived was a two-way random model with results that could be generalised to other nurses. The internal consistency of the average rating of the case study by the nurses, as measured by the Cronbach's alpha statistic. Alpha values were also determined for the set of nurses with each nurse's ratings deleted in turn; to identify any nurses whose ratings were detrimental to the overall reliability measure.

Fleiss's kappa statistic (an extension of the Cohen's Kappa statistic applied to the assessments of 3 or more raters) was determined to assess the reliability of care package ratings, and the ratings of complexity of the case studies.

For each case study, the number of care package and complexity ratings given by each nurse which tallied with those pre-determined answers were analysed. Also the extent of any correlation with years of nursing experience or years employed in the community was also noted.

### Ethical considerations

The study was approved by Sheffield Hallam University ethics committee.

### Results

A total of 69 cases studies were assessed by the community nurse raters. The nurses had been qualified between 2 months and 15 years; and had worked in the community for between 2 months and 9 years. All nurses except Nurse 1 had only worked in the community since qualification.

The average consistency coefficient (Cronbach's alpha) for the care package was calculated to be 0.979 (using average measures); representing very good inter-rater reliability. Alpha statistics for the data with each nurse's rating removed in turn ranged from 0.972 to 0.983; with reliability being marginally improved only by the deletion of the ratings of Nurse 1 (deletion of ratings from all other nurses resulted in a slight reduction in overall reliability).

Fleiss's Kappa coefficient for the care packages was determined to be 0.771; representing substantial agreement between the nurses and was 0.423 for complexity ratings representing moderate agreement between the nurses.

Analysis of the agreement with the case studies pre-determined revealed that on average 4.84 out of 6 nurses (SD 1.87) agreed with the care packages assessment that were pre-determined for each type of care package. The only care package which did not achieve agreement by at least 3 nurses was care package 10, for which a mean of 3.50 nurses agreed with the assessment which was pre-determined. However, only 2 instances of this care package were included in the list of case studies. The care packages showing the best agreement with the as-written assessment were numbers 1, 4,

5, 8 and 12. For all of these care packages, a mean of 5 or more nurses agreed with the as-written assessment (Table 2).

Some of the above care packages were considered to exhibit a certain level of self-similarity, to a degree that did not necessitate merging of categories; but to a degree such that an assessment by a nurse of a care package which did not align exactly with the pre-determined assessment, but identified a similar care package, could be considered greater alignment than selection by a nurse of a care package unrelated to that of the pre-determined assessment. Such groupings were defined to comprise:

- *Administration of Intravenous Medication, Administration of Medication and Long Term Conditions & Holistic Care Planning*
- *End of Life Care and Long Term Conditions & Holistic Care Planning*
- *Prevention, Treatment & Management of Pressure Ulcers and Wound Management*

If “near misses” are considered to be correct care package classifications, the mean number of nurse agreement would be expected to improve slightly. There were 9 instances of clinician assessments of a care package as being *Administration of Intravenous Medication* instead of *Administration of Medication* or vice versa. There were 4 instances of clinician assessments of a care package as being *Treatment & Management of Pressure Ulcers* instead of *Wound Management* or vice versa. There was 1 instance of nurse assessments of *End of Life Care* as being *Long Term Conditions & Holistic Care Planning*. However, the total number of such “near miss” assessments is less than 3.5% of the total number of nurse assessments made; hence improvements to the above reliability levels would be expected to be marginal.

Analysis of the agreement with the complexity ratings pre-determined revealed that mean agreement was better for those case studies written to be significant complexity (mean 3.95 out of 6 correct assessment) than for those case studies written to be routine or additional complexity (Table 3).

The number of care package assessments given by each nurse which tallied with those pre-determined for the study ranged from 52 to 60 out of 69 (i.e. 75.4% – 87.0% agreement), with a mean number of correct assessments of 55.7 (SD 2.49). The number of complexity assessments given by each nurse which tallied with the pre-determined ones for the study ranged from 29 to 43 out of 69 (i.e. 42.0% – 62.3% agreement), with a mean number of correct assessments of 36.3 (SD 4.23).

Hence the proportions of case study care package assessments which tallied with those pre-determined for the study was substantially higher than the corresponding proportions of complexity ratings which tallied with those pre-determined for the study; despite the greater number of options available in the classification of care packages (Table 4).

There was no clear relationship between the proportion of correct care package assessments and the proportion of correct complexity rating assessments by a particular nurse; except that Nurse 1 scored the lowest correct number of both care package and complexity rating assessments. There was no correlation between the number of correct assessments and the time since qualification or time spent working in community.

## Discussion

Effective caseload management ensures patients receive the right care by the appropriate grade of nurse at the right time. Community nursing caseloads are constantly changing in complexity and size which makes it difficult to measure caseloads accurately. The SCCT, using 12 classes of need and 3 levels of complexity, is reliable between raters, with a high level of concordance to the patient need/demand and a very similar understanding of acuity. It covers the main themes that have already been identified in a previous literature review of caseload management classifications where the system that is used (preferably electronic), workload, staff time available and skill mix, delegation process and prioritisation process should all be considered (Roberson 2016). The Quest acuity tools (David and Saunders 2018) have also been developed to measure acuity and frailty in district nursing, but these consist of a number of different measurement systems and have been used to audit current practice and assess the gap in nursing provision. By comparison the SCCT can be used to determine the capacity and skill mix that is needed to meet the community nursing caseload needs on a daily basis. However, as agreement was higher across the sample of nurses for determining which package of care compared with the complexity, there may need to be more training and clearer criteria in the future to help identify complexity more accurately.

There was differing lengths of experience from the nurses working in the community setting, from a newly qualified nurse to one who had worked for up to 15 years. Given this variable, the level of concordance achieved reflects the simplicity of the tool and its application in practice.

#### Strengths and limitations

The method to test the reliability of The SCCT was simple using 69 written cases which were all based on real examples. However, a paper-based appraisal may not totally reflect complexity of practice and **six nurses carried out the validation, which is a relatively small sample**. Further study is needed into the reliability of the tool across clinical settings to investigate whether the tool is reliable in different service contexts.

The classification tool is easy to apply and is integral to the electronic patient record, allowing live use and reporting. The tool is able to assess the dependency of patients and indicate the staff grade required along with the predicted duration of time needed and cost of care. This is a very valuable tool to determine clinical demand and skill mix in a community setting. The classification tool lends itself to further research by allowing specific targeted investigation of the caseload population; for example, the use of the tool to focus on the severity and complexity of wound management in community nursing.

#### Conclusion

The SCCT demonstrates good inter-rater reliability when assessing care packages for an individual patient, and moderate reliability when assessing the complexity of care. Based on these results a number of modifications will be made to the accompanying guide to help nurses when using the tool to further improve reliability. This tool provides a method to prioritise and plan workload on a community nursing caseload ensuring the most efficient use of staff time to deliver the appropriate care to patients with very differing needs.

No conflict of interest has been declared by the author(s).

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