Development and Testing of a Work Measurement Tool to Assess Caregivers' Activities In Residential Aged Care Facilities

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Abstract

The introduction of computerized information systems into health care practices may cause changes to the way health-care workers conduct their routine work activities, such as work flow and the time spend on each activity. To date the available work measurement tools are confined to activities in hospitals and do not cover residential aged care facilities (RACFs). There is little evidence about the effects of technology on caregivers' work practices, including the distribution of time on activities in a RACF. This requires the measurement of caregivers' activities using a valid and reliable measurement tool. The contribution of this research is to develop and test such a tool. The tool was developed based on literature research and validation in two RACFs. The final instrument contains 48 activities that are grouped into seven categories. They include direct care, indirect care, communication, documentation, personal activities, in-transit and others. This measurement tool can be used to measure the changes in caregivers' work activities associated with the introduction of computerized information systems in RACFs, including the efficiency gains of such systems.

Keywords:

Caregiver, Computerized information system, Residential aged care, Work measurement, Work sampling, Work activity.

Introduction

Computerized information systems are increasingly being introduced in Residential Aged Care Facilities (RACFs) with the expectation of improving the efficiency, quality and safety of care to the elderly. These systems range from stand-alone, hand-held technologies to Web-based applications, with some RACFs using a combination of several systems. However, there is limited evidence about the effects of these systems on caregivers' work performance, because the majority of research in this area has been confined to hospital settings [1, 2, 3, 4]. A clear understanding about the effects of health information systems on caregivers' work is necessary in justifying the need for technology in nursing practice [5]. This requires the availability of a measurement tool that can provide valid and reliable assessment results. Such instruments have been developed for assessing health care workers' activities in hospitals [1, 2, 6, 7]. However, many caregivers' activities in RACFs are significantly different from those in hospitals [8] and appropriate measurement tools are not available. The aim of this project is to develop and test a work measurement tool for use in RACFs.

Methods

The work measurement instrument was developed through a three-stage research process;

1. Literature review to understand the research methods of previous authors with similar aims and to identify activities that may be relevant to a RACF.

2. Development of specific categories of activities in a RACF.

3. Validation of the measurement instrument. The following sections describe the research processes.

Developing the categories of caregivers' activities

The first step of this investigation was to identify and classify caregivers' activities in a RACF. Potential activities were identified from the previously published instruments [1, 2, 9]. Nursing activities can be grouped into six categories. They include direct care, documentation, unit related, personal, personal education and faculty/research time. The following definitions of these categories were suggested by Bosman et al.[1].

- 'Direct care' includes all nursing activities directed at the patient and in the vicinity of the patient, such as administration of drugs, endotracheal suctioning, admission/assessment, hygiene, medication, patient mobility, patient/family interaction and transporting a patient.

- 'Documentation' includes all activities that are related to paper-based or electronic documentation, such as registration of fluids and writing hand over reports.

- 'Unit related activities' are those activities related to general maintenance of the unit such as cleaning the room and ordering supplies.

- 'Personal activities' include those activities that are not related to patient care or unit activities, such as meals breaks and personal phone calls.
- 'Personal education' includes activities that are designed to increase the knowledge and skills in nursing practice.
- 'Faculty/research time' is time spent on activities of research and/or the preparation for and supervision of students.

We believe that the first four categories of work activities reflect caregivers' routine tasks in Australian RACFs based on our research experience in these settings. Existing work measurement tools [1, 2, 9] have three main gaps hindering their immediate application in RACFs. These are:

- The naming of the categories of activities does not conform to the convention used in Australia.
- Some terms in the instrument are not relevant to the activities in RACFs.
- Incomplete coverage of caregivers' activities in a RACF. In our experience, oral communication between caregivers, with allied health workers and with the elderly and their relatives, is a common activity undertaken to meet care requirements of the elderly in a RACF. It is also evidently caregivers' preferred means of communication in aged care facilities [10].

Development of specific categories of work activities in a RACF

Two steps were undertaken in the development of specific categories of work activities in a RACF.

Step 1. The categories of work activities in the previous measurement instruments were screened and those considered relevant to a RACF were adapted into our measurement tool.

Step 2. Amendments were made to the adapted categories of nursing activities: some were re-named to comply with the common vocabulary in RACFs in Australia. For example the term 'unit–related activities' was re-named 'non-nursing activities' and 'patient' was re-placed by 'resident'. The resulting work measurement tool contained 25 activities that were grouped in five categories. Nine activities were grouped under the category of direct care, seven activities under oral communication, five under documentation, three under non-nursing and one activity under the category of personal (See Table 1).

Table 1- Caregivers' categories of activities

Category	Work activities
Direct care	Admission/assessment, hygiene/oral care/toileting/shaving, medication preparation/administration, nutrition/feeding
Oral communication	Information about a resident, staff orientation, resident/family interaction
Documentation	Taking records from the storage place, flipping through to identify the correct page
Non-nursing activities/miscellaneous	Supplies check/re-stock, room cleaning/bed-making
Personal	Personal errands/off unit chores/meal breaks

Validating the content of the measurement instrument in a RACF

A three-step approach was undertaken to test the preliminary five classifications of work activities with the aim to determine their validity and accuracy for measuring work activities in RACFs.

Step 1. The face value of the measurement instrument was validated with the Residential Service Manager (RSM) of a RACF. The RSM agreed with the classification of activities. She suggested minor changes in the nursing activities, for example, the addition of 'entero-feeding system' under the activity of 'nutrition' in the category of direct care activities.

Step 2. A further refinement of the tool was carried out with two Registered Nurses (RNs), one Endorsed Enrolled Nurse (EEN) and five Personal Carers (PCs).

Step 3. The measurement tool was further validated in a pilot study at a RACF through a work sampling study using the tool to record caregivers' activities. The observation lasted 3.5 hours per day for three days in a week. A tabular data collection tool was used to collect caregivers' observed activities for three weeks (See Table 2).

Table 2 - Data collection tool for the observed activities

Date_____Day_____Time_____Section of the house_____

Observed work activities					
Participants					
Round of observation					
1					
2					
Comments					

The instrument contained information about the day and date of observation, the time period and the section of the house under observation. A section for comments allowed the observer to record any significant events that could assist during interpretation of data, for example staff shortages.

Procedures for data collection using the work measurement instrument

Using the developed data collection tool, an observer started each round of observation from a specific point in the facility. Following the same route within the facility, the observer recorded all the observed tasks for each caregiver on every round of observation using a code number allocated to each task. A unique code number was also used to identify each caregiver on the data collection tool. This was necessary for ensuring anonymity of participants and to facilitate longitudinal comparison of caregivers' task time and pattern of work. Caregivers were observed at an interval of 20 minutes. This gave the observer time to rest before starting the next round of observation, thus avoiding errors introduced due to observer fatigue. A caregiver who was missing at the time of observation was denoted by a dash (-). This pilot study led to the clarification and validation of caregivers' activities in a RACF.

Validation of the measurement tool in a second RACF

Validation of the work measurement tool was conducted in another RACF with the aim of further testing the generalisability of the instrument. A focus group discussion was conducted with the RSM, four senior RNs and two EENs. This was followed by a direct observational work sampling study using the modified instrument. Besides agreeing with the five categories of activities in the original work measurement tool, the group recommended the addition of two new categories of activities, 'in-transit' and 'others'. 'In-transit' includes the time caregivers spend between tasks, for example time spent walking to access medication in the store. 'Others' covers all activities that are not included in the identified categories of activities, for example, faxing medication orders.

Inter-rater reliability of observations was tested by two observers who independently observed the same activities. A training session was given by the first author (EM) to an RN with residential aged care work experience. Following the same procedures for work sampling, EM and the RN independently recorded activities of four caregivers for a period of two hours. Comparison of recordings suggest that a minimum agreement of more than 90% was achieved, which was adequate according to Pelletier et al. [9].

Results

Work categories and activities

Inter-rater reliability achieved 93% agreement. The remaining 7% was for the activities initially grouped together, which include 'recreational' and 'active' exercises. Observers agreed that these activities should be recorded separately to achieve accurate recordings.

The structure and content of the work measurement instrument

The initial testing of classifications and activities in the first RACF resulted in the development of a work measurement tool that includes 30 activities that were grouped into five categories. There were eight activities in the category of direct care, seven activities in communication, nine in documentation, five in indirect care and one in personal activities.

The following are the amendments to activities specified in the previous work measurement instruments [1, 2, 9]. The activity of 'palliative care/care for the deceased' was added to the category of direct care activities. 'Family interaction' and 'resident interaction' were recorded as separate activities in the category of communication, as the RSM was interested in the separate time spent on these activities. Four computer related activities were added to the category of documentation. They include; locating the correct window/resident's name, inputting a username and password, typing progress notes/care plans and closing the system. 'Room cleaning' was omitted from indirect care as the activity was not undertaken by caregivers in a RACF.

The results of further validation in the second RACF

Validation of the tool in the second RACF resulted in a measurement instrument with 48 directly observable activities that can be grouped in seven main categories (nine in direct care, 13 in communication, 12 in documentation, 11 in indirect care and the remaining three activities in separate categories of personal, in-transit and others) (See Table 3).

The following amendments were made to the work measurement tool developed in the first RACF. The activity of 'transporting a resident' under the category of direct care was replaced by 'preparing a resident for transfer'. Several activities were added to the category of oral communication, including 'discussion with allied health workers', class training and 'receiving a phone call'. Medication-related documentation was recorded under documentation. Additional activities under indirect care included 'answering to buzzers', 'personal hygiene set-up', 'cleaning up spills' and 'transporting waste/clinical waste'.

Discussion

The purpose of this project was to develop a work measurement tool that can be used in work measurement studies in RACFs. To our knowledge, this work measurement tool is the first of its kind in the setting of a RACF. Our research achieved a higher score of inter-rater reliability (93%) than the recommended level of 90% [9]. This implies that the work measurement tool is implementable in measuring caregivers' activities in a RACF.

Inadequate coverage of caregivers' activities appears to be one of the factors hindering the application of work measurement tools designed for hospitals into RACFs. Through developing and validating the work measurement tool in RACFs, our approach has potential to alleviate this problem and provide a more comprehensive instrument that is applicable in different aged care settings such as nursing homes and aged care facilities in hospitals. The major challenge is getting caregivers to participate in this process of developing a work measurement tool as their time is often limited because of staff shortages in these settings [11].

Table 3 – Caregivers' activities included in the validated instrument

Categories	Work activities
Direct care	All nursing care activities performed in the presence of the resident and/or relative, for example assessments/ sub-sequent assessments, hygiene/oral care/toileting, resident mobility, medication preparation/ administration, assisting with procedures/wound care, specimen collection/urine collection, nutrition/entero-feeding system, preparing a resident for transfer and palliative care/care for the deceased.
Communication	All activities related to oral communication such as sharing information about a resident/de-briefing, discussing with allied health workers, receiving a phone call/making a phone call, staff orientation, on-job training/induction, class training, co-ordination of care/care planning, staff meeting, resident interaction, family interaction.
Documentation	All activities related to paper-based or electronic documentation including taking records from the storage place, flipping through to identify the correct page, reviewing resident information, writing progress notes/charts/forms/care plans, putting records back to filing area, medication documentation, admission documentation, locating the correct window/resident's name , inputting a user name and password.
Indirect care	All activities that are not resident specific for example identifying correct supplies, packing supplies to a trolley, restocking supplies in a residents cupboard, equipment set up, bed making and de-bulking.
Personal	All personal activities unrelated to residents' care such as meal breaks, making telephone calls.
In-transit	Time between tasks
Others	Tasks not included above

In our development of the instrument from those previously formulated for use in hospitals, the categories of work activities increased from five to seven and directly observable work activities increased from 25 to 30 and then to 48. These increases in the classifications and activities are partly due to the differences in caregiver activities in different health care settings including hospitals and RACFs, as described earlier. The increases may also have been caused by the increased attention by caregivers in the second validation group to the rigor of the instrument, motivated by their strong interest in having accurate results about time on their activities. A further reason may be that care practices in different aged care facilities are different. The second RACF that participated in this project is vast in its layout and caregivers found it necessary to measure their time in-transit between tasks, in contrast to their counterparts in the first RACF.

These points suggest the need for the current work measurement instrument to undergo revision before its application in any other long term care facility. Based on our experience with this process, the following suggestions may be useful in modifying the tool.

- Have a clear research objective. The objective is important in determining the activities and classifications to be included in the measurement tool, for the purpose of answering the research questions.
- Understand caregivers' work flow. Aged care facilities may have different work flows including those that are run by the same management group, as was the case in our project. The work flow may have significant im-

plications on activities to be included in the measurement tool. An understanding of the work flow may be achieved through discussion with the facility' managers and the caregivers in different job roles. Their views are necessary in obtaining a deeper understanding of work practices, including the layout of the facility and what may be termed as 'normal' activities in a shift, including their definitions. To confirm the completeness of these activities, it may be necessary to conduct a pilot study using the modified instrument.

Conclusion

To date, there is a lack of reliable and valid work measurement tool that can be used to measure caregivers' activities in a RACF. This project has led to the development of such an instrument. It can be used by researchers to measure how care staff members work and their proportion of time spent on each task in the settings of aged care facilities. This measurement is important in contributing to our understanding about the effects of electronic information systems on nursing practice. As demonstrated in our research, work activities in different RACFs may vary by layout of the facility and also the terms used for various activities in different countries or regions. Therefore, further validation of the work measurement tool is required in any future application of our measurement instrument.

Acknowledgements

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