Manuscript Title: Trial of An Allied Health Workload Allocation Model

1st Author Name (including middle initial): Nadine C Simmons

Qualifications: B Pty

Position: Physiotherapist

Institution or Affiliation: Princess Alexandra Hospital

Address: Princess Alexandra Hospital, Ipswich Road, Woollongabba, Brisbane, QLD 4102

Email: nadine_simmons@health.qld.gov.au

2nd Author Name (including middle initial): Suzanne S Kuys

Qualifications: PhD, BPhy (Hons), PGDip Pub Hlth, BEdSt, BHMS (Ed)

Position: Research Fellow

Institution or Affiliation: University of Queensland/ Princess Alexandra Hospital

Address: Princess Alexandra Hospital, Ipswich Road, Woollongabba, Brisbane, QLD 4102

Email: s.kuys@uq.edu.au

Word Count: 191 words (Abstract)
2996 words (Introduction, Method, Results, Discussion, Conclusion)

Boxes: 5 (2 Tables and 3 Figures)

Source(s) of support: People Plan Initiative 2007/08,
Queensland Health

Competing interests: Nil

Abstract

Allied health (AH) managers need to be able to quantify workloads to effectively manage the increasing demands on the health system. With recruitment and retention a major priority, AH professionals need a workload allocation model that will allow them to monitor, evaluate and determine manageable workloads to improve job satisfaction and prevent staff burnout.

The purpose of this study was to develop and trial an AH workload allocation model incorporating the National Allied Health Casemix Committee Health Activity Classification.

A workload allocation model was developed which included a staff workload mapping tool, data analysis spreadsheet and guidelines for calculating procedure times. The model was trialled across three AH professions (occupational therapy, physiotherapy and speech pathology), in two hospital districts, and across inpatient, outpatient and community settings. A total of 30 participants completed the trial. Staff and managers completed a post-trial survey to provide feedback on the workload allocation model.

Survey results indicated that staff and managers found the model useful for evaluating and quantifying workloads. Managers believed the model would be useful for preparing business cases and benchmarking staff workloads. Recommendations for improvements to the workload mapping tool were also identified.

What is known about the topic?

Workload allocation models have been identified as a valuable means of evaluating and managing AH workloads. Current models do not account for all tasks undertaken by AH clinicians or are only applicable to a specific AH discipline. There is a paucity of workload allocation models suitable for use across AH disciplines.

What does this paper add?

This paper demonstrates the effectiveness of an AH workload allocation model that incorporates the NAHCC Health Activity Classification which can be used across AH disciplines and work sites.

What are the implications?

This new workload allocation model provides AH managers with a tool that can be used to effectively manage staff workloads, benchmark existing services and plan for new services.

Introduction

Workload measurement allows for equitable distribution of duties, resource allocation, workforce planning and cost accountability.¹ In a health care system where increasing service demand is rapidly outgrowing service capability,² it is vital that allied health (AH) managers know the capacity of individual workloads to effectively manage the growing demands placed on their service and staff.³ Being able to effectively manage these demands may potentially assist in decreasing staff burnout and improve staff recruitment and retention.

AH managers need a consistent approach to workload allocation³ to enable comparison of workloads across AH disciplines and ensure an appropriate balance of patient and non-patient related tasks. At present, there is no standard workload allocation model for AH professionals within Queensland Health (QH) to measure, evaluate and predict workloads. Such a model needs to incorporate the National Allied Health Casemix Committee (NAHCC) Health Activity Classification,⁴ the Australian standard for defining the range of activities provided by AH professionals, to enable benchmarking.

Workload allocation models designed specifically for AH disciplines have previously been reported,⁵⁻⁸ however these do not account for non-patient activities,^{5,6} are not designed to be used across all AH disciplines or contain specific work tasks not applicable to the Australian healthcare system.^{7,8} Non-patient activities are recognised as a significant proportion of an AH workload^{1,9,10,11} and as such, should be incorporated into a workload allocation model.

A successful workload allocation model requires a means of gathering accurate data and a method for calculating workload capacity.^{1,3} Workload mapping tools provide a simple and effective method for collecting data and ensure that local variables such as staff experience, hospital acuity and patient complexity are accurately reflected. Existing workload mapping

tools^{7,12,13} also have limited applicability to the Australian healthcare system as they were designed for other disciplines (nursing) or other countries.

A procedure-based approach is recommended as the most suitable method for calculating workload capacity for AH disciplines.^{1,14,15} This approach calculates the amount of labour (in time) required to perform a specific work procedure; called the procedure time. The use of procedure times to determine and predict workloads was successfully employed in a Canadian occupational therapy department.⁸ However, the categories used in this model were specific to occupational therapy and therefore would not be applicable across other AH disciplines or directly transferable to the Australian healthcare system.

This study aimed to develop and trial a workload allocation model that:

1. Incorporates the NAHCC Health Activity Classification;
2. Can be applied across AH disciplines, hospitals and inpatient/outpatient/community settings;
3. Includes a workload mapping tool; and
4. Provides guidelines for calculating procedure times.

Method

Development of mapping tool

Existing mapping tools and workload allocation models were identified via a literature review and expert panel. Semi-structured interviews were conducted via purposive sampling of AH staff who had previously used these workload allocation models and/or been involved in developing and implementing them.

Common issues identified of previously trialled models were:

- Need to capture what actually happens, not what was scheduled
- Need to provide further breakdown of non-patient tasks from the categories of the NAHCC Health Activity Classification, to provide more specific information
- Need to develop a user friendly mapping tool that can be easily carried by staff

- Need to record data prospectively on at least a daily basis
- Staff to be encouraged to provide an accurate record of overtime
- A list of tasks is preferable to a timetable format for a mapping tool

Other factors considered were applicability across AH disciplines and settings, incorporating the NAHCC Health Activity Classification, and ensuring that the tool could fit on an A5 page so that staff could easily carry it during the day. A group of five physiotherapists of varying experience and clinical settings (inpatients, outpatients, rehabilitation and an emergency department) piloted the draft mapping tool for one day. Feedback was provided and modifications made.

Implementation trial

Five groups of AH staff were identified to trial the mapping tool across a range of disciplines, settings and patient mixes (Box 1). Staff experience level was recorded as either HP3 or HP4 at the time of the trial. HP4 staff were those working in a supervisory capacity with or without a clinical role, responsible for managing up to 12 staff members. HP3 refers to clinical staff ranging from new-graduates to those with more than 10 years experience. Guidelines were developed for staff and training sessions were held at each of the five sites to assist with accuracy and consistency of data collection. Each participant completing the trial received a standard package consisting of guidelines, a sample completed tool, NAHCC Health Activity Classification resource material and 20 blank mapping tools.

The workload allocation model was trialled over a four week period during April and May 2008. This length of time was selected to optimise the accuracy of data collected (long enough to incorporate rostered days off, monthly meetings etc) while maintaining compliance with the mapping tool. The mapping tool was designed to be implemented over a short period and not as a continuous data collection method. A total of 30 AH staff completed the trial. Following the trial, participating staff completed an online survey regarding the mapping tool. A four-point Likert scale with options of strongly agree, agree, disagree and strongly disagree was used to gather responses.

Collated information for each discipline at each site was presented to site managers in the form of a spreadsheet and graphical display. In addition, managers were provided with guidelines to assist them to interpret the collated data and calculate procedures times to determine workload capacity. Following this, managers also completed an online survey to provide feedback on the entire workload allocation model.

Outcome measures

Workload for each participant and site was evaluated using three outcome measures commonly used for benchmarking purposes; clinical care ratios,¹¹ the amount and frequency of unpaid overtime and number and type of tasks unable to be completed in paid hours.

Clinical care ratios refer to the time spent on non-patient activities compared to the time spent on patient care activities, expressed as a percentage of total time worked. The mapping tool recorded non-patient activities under the headings: Clinical Service Management (CSM), Teaching and Training (TT) and Research (R) as defined in the NAHCC Healthy Activity Classification; and patient care activities under the headings: Non-Patient Attributable (NPA) and Individual Patient Attributable (IPA). In addition, non-patient activities that fell under CSM, TT and R, were further broken down into 13 specific categories and one “other” category to detail how non-patient time was distributed. Unpaid overtime was calculated as the amount of overtime worked in minutes per day. The frequency of overtime was expressed as the percentage of days that any amount of unpaid overtime was worked out of total days worked. Tasks unable to be completed in paid hours were recorded in an open format and later collated into common groups.

Analysis

Descriptive analyses were conducted for clinical care ratios, unpaid overtime, and tasks unable to be completed. Individual sessions were held with site managers to ensure accurate interpretation of results, ability to work with the data and ability to calculate capacity. Managers were advised to look for

variations from the norm for each outcome measure. These were identified as “flags”, indicating that the caseload may warrant further examination. Managers were warned that these outcome measures are co-dependent and should not be reviewed in isolation. They were also instructed on the calculation of procedure times to determine workload capacity of staff. Survey responses were collated for staff and managers separately and presented as percentage agreement or disagreement.

Results

An AH workload allocation model (Appendix 1) which included a staff workload mapping tool (Appendix 2), data analysis spreadsheet and guidelines for calculating procedure times was developed. Of the 30 staff involved in the trial, 28 completed four weeks of data, and one staff member each completed two and three weeks of data due to recreational leave.

The data has been grouped across all five sites in order to show general trends. In addition, an example from an individual site is presented for each outcome measure to illustrate the type of analysis possible with the workload allocation model. It is important to note that it is not advisable to group data across different sites and disciplines without careful consideration due to the variation in caseloads and work practice factors eg hospital acuity, community vs inpatient vs outpatients.^{1,14}

Clinical Care Ratios

Clinical care ratios across all sites (Box 2) and for an individual site (Box 3) for each experience level are presented. Overall, HP4 staff spent a greater proportion of their time on non-clinical activities (average 60%) than HP3 staff (29%). An example of non-patient activity for one staff member who was supervising students illustrates that the majority of non-patient time was related to interactions with students and little time was spent on other non-patient activities (Box 4).

Overtime – Amount and Frequency

Average time (in minutes) per day spent on unpaid overtime and average frequency of days in which unpaid overtime was completed (as a percentage of total days worked) across all sites are shown in Box 2. Staff with supervisory responsibilities (HP4) worked on average a greater amount of overtime (73 vs 23 mins) more frequently (97% vs 79% of days worked) compared to HP3 staff. The workload allocation model allows individual overtime to be monitored as illustrated in the sample site (Box 5) where staff member three performed a large amount of overtime on a daily basis.

Tasks not able to be completed in paid hours

Across the five sites there were a range of tasks reported as unable to be completed during a day. Tasks were first collated into common classifications and then the percentage of days these occurred was calculated. The most commonly reported tasks unable to be completed were statistics, patients not seen and patient documentation tasks. However, there was a wide range of variability across the sites with respect to how frequently these tasks were not completed. For example, statistics were not completed by four sites on average 26% to 31% of days worked. However, one site did not complete statistics on most of the days worked (86%).

Survey Results

The online survey was completed by 83% (25/30) of staff and 100% (5/5) of site managers.

(i) Mapping Tool Efficiency, Ease of Use and Data analysis

Staff agreed or strongly agreed (96%) that the mapping tool was easy to complete with 88% saying they would recommend this tool to others. Both staff (88%) and managers (100%) agreed or strongly agreed that the guidelines and materials provided helped them use the tool and interpret the data. Staff were divided on whether they thought the tool was efficient with 52% agreeing or strongly agreeing that they were able to complete the tool in an efficient timeframe.

(ii) Staff evaluation of workload

92% of staff agreed or strongly agreed that the tool was a good way to reflect on their workload and 80% of staff agreed or strongly agreed that the tool could help them identify areas of concern to discuss with their manager.

This was further supported by several comments from the staff survey:

- "...it was interesting to see that a VERY LARGE percentage of my hours was with clients or directly client related. Not much time was used for admin, research, or service improvement etc"
- "Good way to monitor amount of time spent on specific CSM activities and record these"
- "Never realised I spend a third of my time on non-clinical tasks"
- "The tool was very effective in highlighting CSM areas of concern"

(iii) Manager evaluation of workloads

All managers (100%) believed the tool accurately measured and was useful for evaluating staff workloads. All agreed (80%) or strongly agreed (20%) that the model identified when workloads were unmanageable. Furthermore, 100% of managers agreed that the model prompted the implementation of strategies to help make workloads more manageable.

(iv) Planning for new services and benchmarking workloads

All managers agreed (80%) or strongly agreed (20%) that this model would be useful to plan future services and agreed (60%) or strongly agreed (40%) that it would be useful in preparing business cases. 100% of managers agreed the data collected was able to be used to benchmark against like services.

Participants were also asked to make recommendations for the mapping tool. Potential areas for improvement were identified including more space to record overtime and tasks unable to be done, a section for recording patient groups and greater clarity regarding clinical time spent with new versus review patients.

Discussion

The workload allocation model was successful in assisting staff and managers to evaluate and manage workloads. The mapping tool developed was easy to use, was able to be carried by clinicians and provided an accurate record of their workload. Managers were able to review workloads across staff and identify areas for concern such as excessive amounts of overtime or tasks that were not being completed. Managers were also able to use the guidelines to develop procedure times and calculate workload capacity for their staff and services if desired.

The workload mapping tool was developed to be applicable to all aspects of a clinician's workload, regardless of AH discipline, years of experience or position. Providing prompts and the NAHCC specific categories enabled very detailed and specific information to be collected, including both clinical and non-clinical duties. This is one of the few mapping tools available to AH clinicians that provides this level of detail and can be used across multiple AH disciplines, thus allowing organisations to use a common tool.

Clinical care ratios have traditionally been used to benchmark caseloads.¹⁹ Despite this, there are no agreed quantifiable guidelines for ratios for each staff experience level. Indeed, it is more likely that clinical care ratios would vary depending on type of service, discipline and setting. The trial participants varied significantly in their clinical care ratios across disciplines and experience levels (HP3 vs HP4), (see Box 2). This may be due to variations in the patient caseload, management and service improvement responsibilities of staff. The large variation amongst the HP3 staff is also likely to be due to the diverse range of experience within this staffing classification (new graduate to >10 years experience). It is also important to consider that these clinical care ratios are reflective of the entire minutes worked (including overtime) and can be significantly skewed by any unpaid overtime. The large variation amongst staff highlights the need to analyse these ratios on an individual basis and at a local level. With increasing emphasis on evidence based practice, research and service improvement requirements; time spent on non-patient activities needs to be quantified so that time can be adequately

allocated when managing workloads. This model used thirteen specific categories within the NAHCC Health Activity Classification to collect more detailed data on non-patient activity distribution. The detailed information presented from this analysis is highly valuable to AH managers who are more often asked to justify non-patient time, than patient time.

Unpaid overtime also varied significantly in the implementation trial. In general, those staff with supervisory responsibilities (HP4) worked a higher incidence and amount of overtime than HP3 staff. This is likely to be due to the greater number of service improvement and managerial responsibilities that this level of staff is accountable for. Consideration should also be given to the fact that junior (HP3) staff may not feel as comfortable reporting unpaid overtime as evidenced by one site manager expressing this concern: “unfortunately, junior staff members did not record their real unpaid overtime”.

The tasks unable to be completed in paid hours were most commonly statistics, patients not seen and patient documentation tasks. Due to the open format of this section of the mapping tool, the information gathered was heavily reliant on staff motivation as to how much or little detail was written. In addition, there were several instances where staff did not specify any tasks in this section despite having completed overtime. For this reason, percentages are likely to underestimate the actual frequency of tasks not able to be done in paid work hours. This section of the tool needs more structure (specific tasks printed as options) to become a reliable measure. The tool could then be tailored to gather specific data that a work group had identified as relevant. For example, a work group that had recently introduced several additional assessment forms might find it useful to map how often patient documentation tasks were unable to be completed.

One limitation of the mapping tool was that only 52% staff agreed or strongly agreed that they were able to complete the tool in an efficient timeframe. Survey comments revealed that those who felt they were *not* able to complete

the tool in an efficient timeframe felt this was due to either a busy caseload or existing statistical requirements. However, this tool is not intended to be used as a continuous data collecting system, but rather as a mapping tool for a defined time period such as 4 weeks. Therefore, overlap with current statistical systems should not be a major issue.

Conclusions

The workload allocation model developed demonstrated that one model can be used successfully across professional disciplines, hospital sites, inpatient and outpatient services, community settings and specialty work areas. To the authors' knowledge it is the only workload allocation model to incorporate the NAHCC health activity classification and provide guidelines for calculating procedure times, making it very applicable to the Australian health care setting. It also appears that this workload allocation model can assist AH staff and managers in accurately quantifying staff workloads, to identify when workload management strategies need to be implemented, and can be used to more accurately plan for new services and to benchmark workloads. It should be recognised that this model is designed to assist managers in identifying when changes to workload allocation are required. It does not propose to prescribe strategies for implementing such changes, as this is encompassed by existing demand management toolkits.

Acknowledgements

This study was made possible through funding provided by the Queensland Health People Plan Initiative 2007/08. I would like to acknowledge the skills and experience of Glenys Cockfield, Kathy Grudzinskas, Roxanne Healy, Cherie Hearn, Geoffrey Lau, Wendy Rintala, Gai Rollings, Prue Smeaton, Judith Wilson and Angela Wood, who provided advice and direction throughout this study.

References

1. Human Capital Alliance, Department of Human Services Victoria. Workload Capacity Measures for Use in Allied Health Workforce Planning; 2006.
2. Queensland Health. People Plan 2007 – 2012; 2007.
3. Scottish Executive National Health System. Allied Health Professions: Workload Measurement and Management; 2006.
4. National Allied Health Casemix Committee. Health Activity Hierarchy Version 1.1: An Australian standard describing the range of activities provided by health professionals; 2001. School of Management, RMIT University.
5. Adams R. Progress in the development of recommended staffing levels for rural physiotherapy services. Proceedings of the Services for Australian Rural and Remote Allied Health National Conference; 2004: Alice Springs, Northern Territory.
6. Christie HJ. Physiotherapy caseload guidelines. *Physiother Can.* 1999; 51: 186-190.
7. Ogilvie L. The National Physiotherapy Workload Measurement System. *Physiother Can.* 1994; 46 (1): 51-3.
8. Wright M, Scott E, Cockerill R. Surviving the management game: workload measurement systems in a cost-conscious environment. *Can J Occup Ther.* 1993; 60 (1): 23-8.
9. Murchland S, Wake-Dyster W. Resource allocation for community-based therapy. *Disabil Rehabil.* 2006; 28(22): 1425 -1432.
10. Aspinall B. The allied health paediatric workload distribution benchmarking project. Proceedings of the 2003 National Allied Health Conference; 2003: Adelaide, South Australia.
11. National Allied Health Casemix Committee. Standards for Benchmarking Allied Health Services; 2003.
12. Oddone E, Weinberger M, Hurder A, Henderson W, Simel D. Measuring activities in clinical trials using random work sampling: implications for cost-effectiveness analysis and measurement of the intervention. *J Clin Epidemiol.* 1995; 48 (8): 1011-8.
13. Byrne G, Brady A, Horan P, Macgregor C, Begley C. Assessment of dependency levels of older people in the community and measurement of nursing workload. *J Adv Nurs.* 2007; 60 (1): 39-49.
14. Queensland Health, Southern Area Allied Health Workforce Project. Defining Allied Health Workforce Requirements, A Business Planning Framework; 2007.
15. Hearn C; Queensland Health. Physiotherapy Recruitment and Retention Project Report, A Southern Area Health Service Allied Health Action Plan Initiative; 2007.
16. Queensland Health. Clinical Services Capability Framework, Public and licensed private health facilities, version 2.0; 2005.
17. Allied Health in Rehabilitation Consultative Committee. Guidelines for Allied Health – Resources required for the provision of quality rehabilitation services, version 10; 2007.

18. Calder D. Physiotherapy caseload guidelines: Summary of a report prepared for the Canadian Physiotherapy Association. *Physiother Can.* 1986; 38 (1): 43-7.
19. Dutton T. How Much is Too Much? Understanding Staff Workload Manageability. World Confederation of Physical Therapists Congress; 2007: Vancouver, Canada.
20. Queensland Health. Managing Demand on Allied Health Community and Outpatient Services; 2005.
21. Queensland Health. The Business Planning Framework: Nursing Resources, 2nd Edition; 2002.

1 Trial Group Demographics

Site	Discipline	Hospital	Clinical Unit	Patient Type	No of Staff
1	Occupational Therapy	A	Geriatric Rehabilitation Unit	Inpatient, Outpatient	5
2	Occupational Therapy	A	Brain Injuries Unit	Inpatient, Outpatient	5
3	Physiotherapy	A	Aged Care	Inpatient	4
4	Physiotherapy	B	Whole Department	Inpatient, Outpatient, Community	13
5	Speech Pathology	B	Whole Department	Inpatient, Outpatient, Community	3

2 Mean and range for clinical care ratio and amount and frequency of overtime across all sites

Staff level	Clinical Care Ratio (Non-Patient Care: Patient Care (%))		Amount of overtime (mins per day)		Frequency of overtime (% days occurred)	
	Average	Range	Average	Range	Average	Range
HP4	60:40	34:66 – 73:27	74.4	25 - 154	97.4	93 – 100
HP3	29:71	7:93 – 59:41	23.4	2 - 42	78.56	7 – 100

3 Clinical Care Ratios of One Site

4 One staff member's Non-Patient Activity

5 (a) Average time (mins) and (b) frequency of days (%) of unpaid overtime at one site