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Randomised Controlled Trial of Transprofessional Allied Health Care in an Acute Medical Setting

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Abstract

As demand for allied health (AH) services increases, attention has turned to the development of alternate models of service delivery which maximise efficiency. These include skill sharing models, in which cross-professional skills are delivered by appropriately trained professionals. The usage of skill sharing models is increasing in AH professions, but little evidence on efficacy currently exists. A transprofessional role, which involved delivery of services from a range of AH domains by an appropriately trained professional, was developed and trialled in the acute medical setting in Toowoomba Hospital, Queensland, Australia.. A single-blind randomised controlled trial examined the clinical efficacy of this skill shared service. Participants were allocated at random to either standard care ($n = 29$) or the new model of care ($n = 29$) groups and compared on a range of patient and service provision outcome measures. Descriptive outcomes indicated that patients receiving the new model of care underwent more comprehensive and prompt AH assessments than those in standard care, and demonstrated more positive health and functional outcomes at one, three and six month follow up. Given the paucity of research on skill sharing in AH, this study provides preliminary evidence of the effectiveness of skill shared AH roles in acute settings.

Key words: Professional skill-sharing, Transprofessional care, Transdisciplinary care, Allied health, Acute medical care, Randomised controlled trial

Introduction

Health workforce redesign is an emerging focus of health service delivery in Australia (Duckett, 2005; Health Workforce Australia, 2011; Wells, 2012). Shifts in socio-demographics correlate to an aging population with a higher incidence of chronic disease, alongside increased consumer expectations of health service delivery from a proportionally smaller workforce (Allied Health Professionals Office Queensland; AHPOQ, 2014; Duckett, 2005; Paans, Wijkamp, Wiltens & Wolfensberger, 2013; Wells, 2012). This has prompted the exploration of alternative workforce models to maximise effectiveness and efficiency of service delivery.

There is growing implementation of transprofessional practice as an alternate model of Allied Health (AH) service delivery. This model utilises ongoing cross-professional education to move away from the traditionally discrete roles of AH and adopt   regulated overlapping roles (Ruddy & Rhee, 2005). Through the skill sharing encompassed in transprofessional care, efficiencies in the assessment and treatment of patients arise (Duckett, 2005; Wells, 2012). Unlike traditional interprofessional and multiprofessional AH models of care, where multiple clinicians may assess a patient simultaneously, frequently reviewing similar areas of functioning, transprofessional practice

enables a single AH staff member to assess across multiple AH domains, and provide treatment and referrals as necessary, within their scope of practice.

Evidence suggests that transprofessional practice is associated with patient-centred goals and improved patient outcomes (Bartleson, 2013; Gordon et al, 2014), as well as anecdotal reports of greater staff satisfaction. Despite these benefits, transprofessional practice within AH challenges the silo approach to traditional AH service delivery, and its implementation can be contentious given the perceived threats to profession specific knowledge, skills and roles (Reeves & Mann, 2004). The broader research into generic working has identified concerns of nursing and AH staff, including role blurring and confusion (Brown, Crawford & Darongkamas, 2000) and role overload (Reeves & Mann, 2004). In terms of the effects of skill-sharing on patient outcomes, it has been argued that generic working fosters improved teamwork and flexibility, with enhanced case management and patient outcomes (Harrison, 2003; Hek, Singer & Taylor, 2004). Conversely, skill-sharing has been perceived to create additional danger for patients (Brown et al, 2000) and some authors have suggested that performing tasks outside of one's normal area of expertise reduces efficiency (Wall, 1998). Evidence on the efficacy of these roles has been slow to develop, with very few published investigations in this area, although a recent randomised controlled trial found that skill-sharing between Physiotherapy and Occupational Therapy in a community setting was as effective as standard multiprofessional care for older people experiencing functional decline (Pighills, Bradford, Bell, Flynn, Williams, Hornsby, Torgersen & Kaltner, 2015).

Background

Toowoomba Hospital is a major regional hospital of over 200 beds within the Darling Downs Hospital and Health Service, Queensland, Australia, responsible for public health care services for a population of approximately 300,000 residents in predominantly rural areas. In-house audits of care within the medical wards at Toowoomba Hospital had identified inefficiencies in AH service delivery, including assessment duplication, delays in referral to and commencement of AH services and delayed or inadequate discharge planning. To address these inefficiencies, the role of Allied Health Clinical Leader (AHCL) - Acute Medical was developed for trial. This role was to primarily function within a clinical scope of practice consistent with that of an Advanced Allied Health Practitioner (refer to AHPOQ 2014 for description of the depth and breadth of functioning of 'advanced' allied health roles in Queensland). The key focus of the position was to be the lead contact across multiple domains of AH (Physiotherapy, Occupational Therapy, Dietetics, Speech Pathology, Podiatry, Social Work and Psychology), providing transprofessional assessment and intervention. The role worked alongside Medical and Nursing colleagues in an acute medical setting in order to plan and manage patient care within the first 48 hours of admission. It was anticipated that the AHCL would have greatest potential to create efficiencies in this setting, given that it is an area of high patient throughput with short lengths of stay and high rates of referral to AH, often for two or more professions. Internal audits indicated that there were 14 new admissions on average to the acute medical setting per day, with over 80% discharged

directly home, and 20% of admissions referred to AH, highlighting the appropriateness of role placement in this setting.

A randomised controlled trial was undertaken to examine the efficacy of this newly developed transprofessional AHCL role in the acute medical setting at Toowoomba Hospital as compared to standard care. The study was designed to address both the practice issues of the hospital alongside the evidence gap in the AH skill sharing literature. The trial was designed as a non-inferiority investigation to explore any differences between treatment types.

Methods

Design

A single-blind parallel randomised clinical trial (RCT) , congruent with CONSORT guidelines (2010)) was commenced to examine the clinical efficacy of the new model of AH service delivery by comparing standard care (SC) to the new AHCL model of care (intervention) on patient and service provision outcomes. Data collection at all points was were undertaken by an individual who was blind to group allocation. Group allocation was also not disclosed to patients, though may have been inferred by those patients whom had an understanding of traditional AH practice.

Interventions

Tasks to be performed by the AHCL were defined using the Calderdale Framework (Smith & Duffy, 2010), which enables the identification and competency development of skills appropriate for sharing between AH

disciplines. Transprofessional assessments and interventions appropriate for skill sharing in the acute medical setting were identified via this method, with an occupational therapist and physiotherapist employed in a job-sharing capacity trained in each of these skills. The competency of the AHCL in each transprofessional task was assessed prior to implementation of the role. The resulting role provided transprofessional AH assessment and intervention in the acute medical setting during business hours on week days. Where AH interventions or assessments were outside of their level of competency, the AHCL generated referrals for profession specific AH assessment.

Participants

Eligible patients admitted to the acute medical setting at Toowoomba Hospital between Monday and Friday in February, March and April 2013 were approached for consent to participate in the study. Eligibility was determined by clinical suitability (i.e. likely multiple AH need), age (above 18), cognitive function to comprehend study information and provide informed consent, not residing in a high-care nursing home, and usual geographic residential location within the bounds of the Darling Downs Hospital and Health Service to enable follow up data collection. Upon consenting, baseline participant data including demographic and social variables, previous admissions, diagnosis, comorbidities, medication use, and outcome measures were collected.

Randomisation

A web-based randomisation method was utilised to allocate participants to either AHCL or SC conditions. Patients then received the format of care to

which they were assigned.Baseline data was collected prior to randomisation to ensure blinding of data collector. Subsequent data was collected by an independent blinded research assistant (RA) via face-to-face interviews and assessments at the participants' place of residence at 1 month, 3 months and 6 months post-randomisation.

Outcomes

The outcomes analysed to examine clinical efficacy of the AHCL role at the three time points included:

Primary outcome measure:

1. Independence in Activities of Daily Living (ADL), using the Modified Barthel Index (MBI) (Shah, Vanclay and Cooper, 1989).

Secondary outcome measures:

2. Quality of life using the Euroqol scale (The Euroqol Group, 1990).

3. Disability using the World Health Organisation Disability Assessment Scale (WHODAS 2; World Health Organisation, 2001).

4. Functional mobility using the Timed Up and Go (TUG, Podsiadlo & Richardson, 1991), including identification of high falls risk participants (Shumway-Cook, Brauer and Woollacott, 2000). It should be noted that the TUG was assessed at follow up time points only, given the practical difficulties for participants with acute illness at baseline.

5. Rate and duration of Toowoomba Hospital readmissions using existing databases. Data were collected for all patients over the full 6 month follow up period.

Although mortality was a factor of interest, the hospital records which were accessed for the study did not enable identification of all cases of mortality and, therefore, this data could not be examined.

A service-focused analysis of patient care involving review of patient medical records was also conducted at discharge for all participants, with the following factors compared between groups to examine the service impact of the AHCL role:

- Referrals to AH professions by medical and nursing staff at baseline recruitment
- Delay between acute medical ward admission and initial AH assessment
- Comprehensiveness of AH assessment within 48 hours of admission. s Standard assessments wereidentified through consultation with AH staff as being typically relevant for patients in this setting. Comprehensiveness was then calculated as the percentage of standard AH assessments that were completed for each patient Data was also recorded for additional assessments which AH staff completed that were not regarded as standard assessments for the patient group in the acute medical setting (e.g. cognitive assessment, dysphagia screen, vestibular screen).
- Nature and number of AH interventions performed within 48 hours of admission

- Clinical AH activity, examined through the number of AH professions involved in care (including AHCL as a separate profession), occasions of service (OOS) and total activity time for whole of admission
- Number of inpatient and outpatient cross-AH referrals and non-AH referrals generated during admission
- Delays between acute medical admission and referral to the Geriatric Evaluation and Management Service (GEMS), and subsequent transfer to GEMS
- Length of stay

Clinical safety incident (PRIME) reports were also collected for all participants, covering the full period of their hospital admission.

Sample size

Calculations were based on the primary outcome measure of ADL independence to identify a significant difference scores of 0.5, which necessitated 128 participants. Hospital admission numbers were reviewed to set timelines to recruit the required sample size within the study funding period. Unfortunately, eligible participant referrals were lower than anticipated, and trial length was ultimately dictated by organisational need and funding conditions, which only allowed a three month recruitment window.

Analysis

As a result of the abovementioned limitations in recruitment impacting upon study power, analysis was restricted to descriptive statistics.

Ethical considerations

All data were collected in identified form, and de-identified for storage using participant identification numbers as linkage variables. Appropriate ethical approvals were obtained prior to the commencement of the study.

Results

Participant flow

During the 3 month time frame allocated for the trial, 59 eligible participants were recruited to the trial. An additional 9 eligible patients approached for consent declined to participate, yielding an acceptance rate of 87%. Data from 1 participant was excluded from analysis as the participant's cognitive status was not sufficiently stable throughout the trial to enable data collection. The remaining 58 participants were randomly allocated to the SC ($n = 29$) and AHCL ($n = 29$) groups. Study attrition throughout the follow up periods of 1 month ($n = 13$ from SC, 9 from AHCL; 38% total attrition), 3 months (additional $n = 2$ from SC, 4 from AHCL 48% total attrition) and six months (additional $n = 3$ from SC; 53% total attrition) resulted in a total $n = 18$ attrition from SC, $n = 13$ attrition from AHCL. Attrition was attributable to participants decliningongoing participation ($n = 11$), ill health and cognitive decline preventing completion of study measures ($n = 8$), death ($n = 7$), contact not able to be made ($n = 3$) and change in geographic location ($n = 2$).

Baseline patient characteristics

Baseline patient characteristics are presented in Table 1. The majority were born in Australia (86.2%) and spoke English as their first language (96.6%). Primary presenting diagnoses on admission varied, and most patients reported multiple co-morbidities. Functional limitations of the patient population were reflected by MBI scores which equated to an average classification of moderate dependence for both groups (ie; MBI score = 61-90).

Table 1. Baseline participant characteristics

Characteristic	SC	AHCL	Total Sample
Mean Age (years)	74.1	78.7	76.4
Age Range (years)	46 - 91	54 - 95	46 - 95
Male:Female	11:18	16:13	27:31
Admission diagnoses (%)			
Cardiac	15.5	19.0	34.5
Infection	5.2	8.6	13.8
Neurological (not CVA)	5.2	6.9	12.1
Respiratory	5.2	5.2	10.3
Number co-morbidities (mean)	7.6	7.0	7.3
ADL performance (MBI) (mean) **	85.5	84.4	84.9
Disability (WHODAS) *	38.4	34.4	36.4
Euroqol Quality of Life (mean) **	0.45	0.47	0.46

NB. Total sample scores documented may not reflect SC and AHCL subset scores due to the influence of rounding.
* Higher score indicates poorer outcome
** Higher score indicates better outcome

AH Services During Inpatient Stay

There were existing AH referrals made by medical or nursing staff for 38 (65.5%) of the 58 participants, mostly for Physiotherapy (73.7% of patients), Occupational Therapy (68.4%) and Dietetics (28.9%). The majority of the participants with existing referrals (n=27: 71.1%) had referrals for two or more AH professions. A comparison of the SC and AHCL inpatient AH care pathway is presented in Table 2.

Identification of AH need. Of the AHCL group, 19 participants had pre-existing AH referrals by medical/nursing staff. The 10 patients without pre-existing referrals were identified by the AHCL as having likely need for AH services. Nine of these 10 patients were referred on by the AHCL for additional inpatient or outpatient AH services, with an average of 3.3 referrals for each referred patient.

Of the SC patients, 19 had pre-existing AH referrals. An additional 3 patients were subsequently identified as requiring AH involvement through standard care processes. A further 7 patients were not identified as having AH needs. Finally, there were 3 patients who had referrals that were not actioned by SC AH staff.

Initial AH assessment. AHCL participants received initial AH assessment, on average, 11 hours earlier, or within 62% of the time period, as compared to SC patients. Assessments were more comprehensive than those received in SC; mean percentage of standard domains assessed was higher in AHCL participants (93.5% compared to 32.7%), and more non-standard AH

assessments were received by AHCL participants than by those in SC (25 versus 8 occasions). There were 10 participants in the SC group who did not receive any AH during their inpatient admission.

Ongoing management. Cross-AH referrals were made for 86.2% of AHCL patients (with an average of 2.6 referrals for each referred patient), as opposed to 6.9% of SC patients. In the AHCL group, the majority of referrals were made to Physiotherapy (24 patients), Occupational Therapy (17) and Speech Therapy (7). Both referrals made for SC patients were for outpatient Physiotherapy. In addition, 4 non-AH outpatient referrals were made for patients in the AHCL group (Geriatrician 2, Neurologist 1, ACAT assessment 1) but none for SC patients.

Referrals to the inpatient GEMS for the AHCL group were made earlier and more frequently than the SC group. When transferred to GEMS, AHCL patients were transferred on average 33 hours and 58 minutes sooner than the SC group (or 75% of the time period taken for SC transfers).

Length of stay. Mean length of inpatient stay showed a variance of approximately 19 hours between the 2 patients groups (SC > AHCL). Further analysis including only those patients who received any AH service showed a much larger skew, with AHCL patients discharged on average more than 3 days earlier than SC patients (62.7% of the time period taken for SC patients). Finally, a comparison of patients discharged within 48 hours identified that all 11 AHCL patients were discharged with AH assessments completed. By

contrast, only 1 of the 10 SC patients discharged within 48 hours had any form of AH assessment and 4 had existing AH referrals that had not been actioned.

Patient safety. Seven PRIME incidents were reported for participants during the course of their stay. Only 3 PRIME reports on participants were identified as potentially relevant to AH service, featuring either falls ($n = 2$) or pressure injury ($n = 1$), with the remainder relating to medication and bed management. Each of these 3 incidents involved SC participants.

Table 2. Comparison of AH Service Received Between SC and AHCL groups

Variable	AHCL patients (n=29)	SC patients (n=29)
Patients with existing AH referrals	19	19
Patients seen by any AH	29	20
Delay medical admission to AH assessment (mean hours:mins)	17:33	28:33
Percentage standard AH domains assessed in first 48 hours (mean)	93.5 (n=29)	32.7 (n=20)
Number of AH interventions in first 48 hours (mean)	3.2	1.3
AH service (for admission duration)		
• mean number AH prof..	2.6[1]	2.5
• mean OOS	7.9	8.9
• mean total time of clinical activity (hours:mins)	8.09	7.31
Total number cross-AH referrals	64 (n=25)	2 (n=2)
• number inpatient cross-AH referrals	27 (n=15)	0
• number outpatient cross-AH referrals	37 (n=18)	2 (n=2)
Referrals to GEMS	7	3
• delay to referral (mean hrs:mins)	36:57 (n=7)	86:43 (n=3)
• delay to transfer (mean hrs:mins)	98:32 (n=6)	132:30 (n=4)

Length of stay (LOS) (mean hrs:mins)		
• all patients	138:22 (n=29)	157:37 (n=29)
• patients assessed by any AH	138:22 (n=29)	220:36 (n=20)
Patients discharged within 48 hours	11	10
• with any AH assessment	11	1
• with unmet AH referrals	0	4

[1] AHCL included as a profession

Patient Outcomes at 1-, 3- and 6- month Follow Up

Patient outcome measures included standardised assessments as presented in Figures 1-3. Data collated at each assessment point subsequent to baseline (1 month, 3 months and 6 months) was reflective of participant subsets at each point. Data describing patient outcomes from baseline to 1, 3 and 6 month follow-ups are presented in Figures 1-3, comparing AHCL and SC participants on the MBI, the Euroqol, and the WHODAS. Rates and duration of hospital re-admission (Figure 4) and data from the TUG (mean scores in seconds and percentage of patients in each group classified as being at high falls risk, whereby TUG greater 13.5 seconds) are presented in Figure 5.

Results over time indicated consistent trends toward lower performance in the SC group compared to AHCL group in ADL function (Figure 1), quality of life (Figure 2), and functional mobility (Figure 5). Ratings of disability (Figure 3) and length of hospital re-admissions over the 6 months subsequent to baseline (Figure 4) were higher for SC participants.
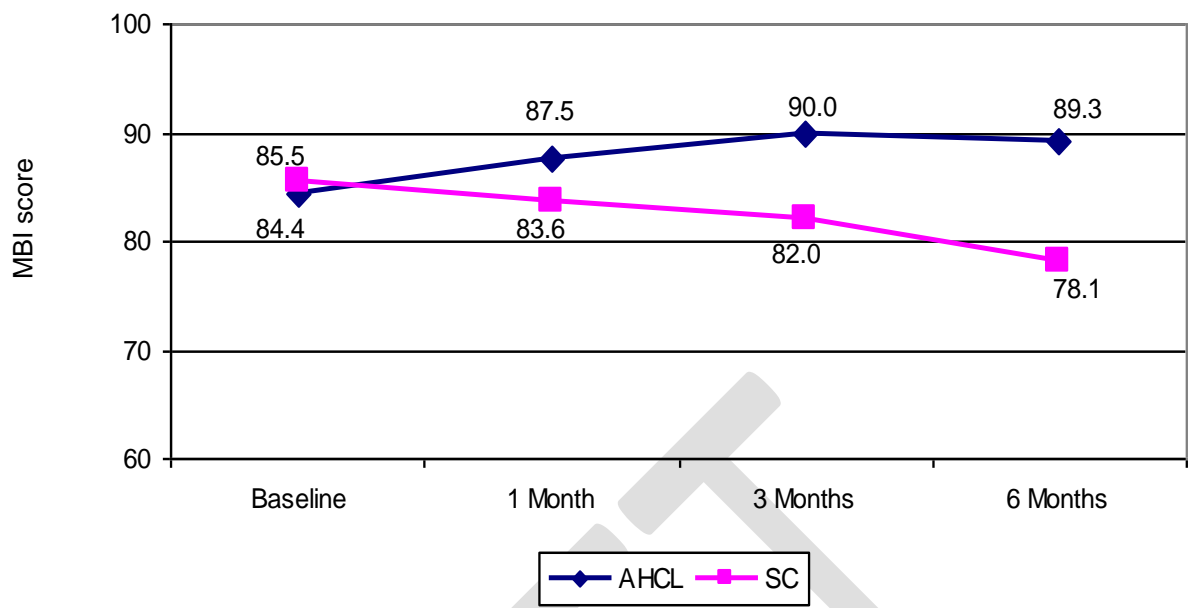
Figure 1. ADL performance (MBI) by Group

Figure 2. Euroqol Quality of Life (mean score/1) by Group
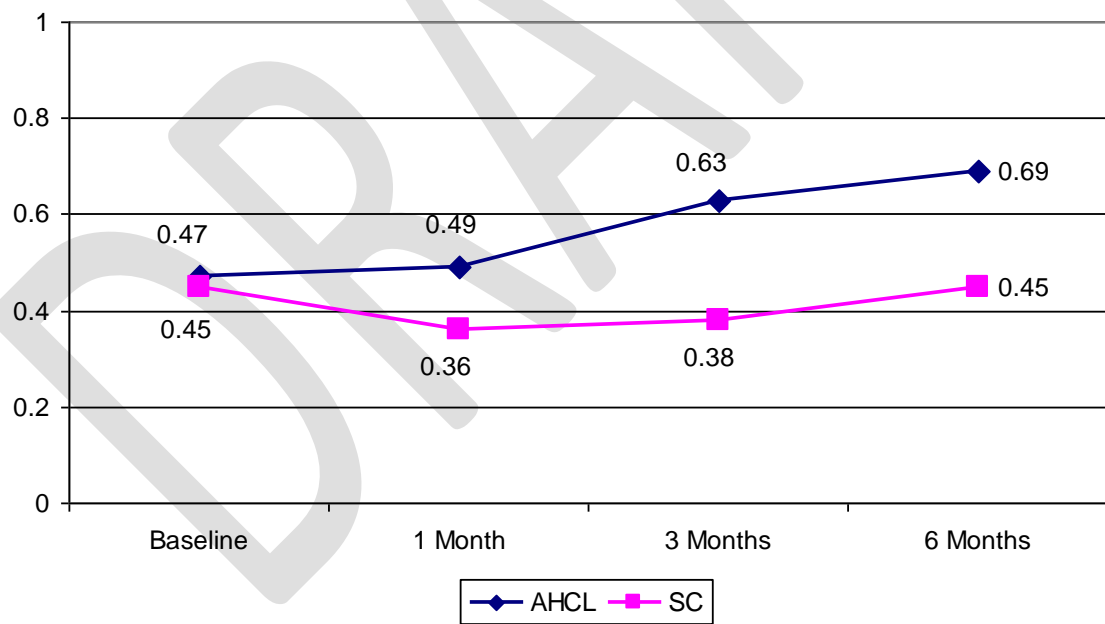

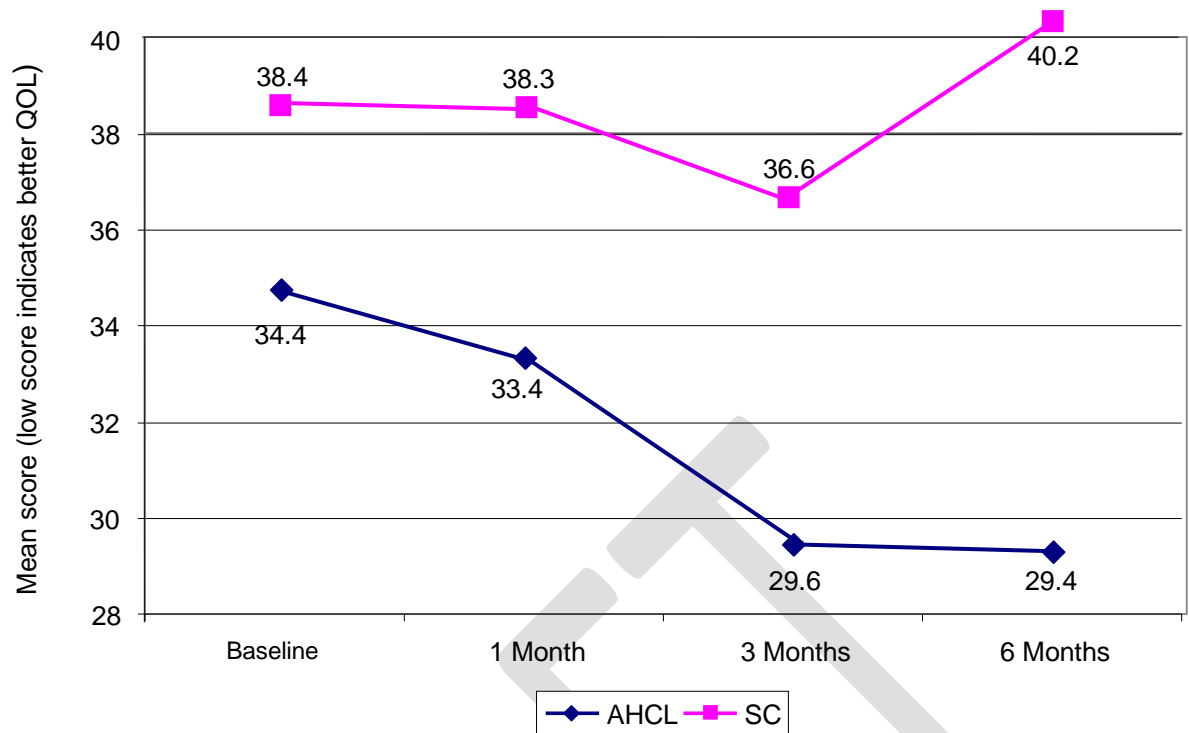*Figure 3. WHODAS Disability Rating by Group*

Figure 4. Number of patients and mean duration in days of hospital readmissions by Group
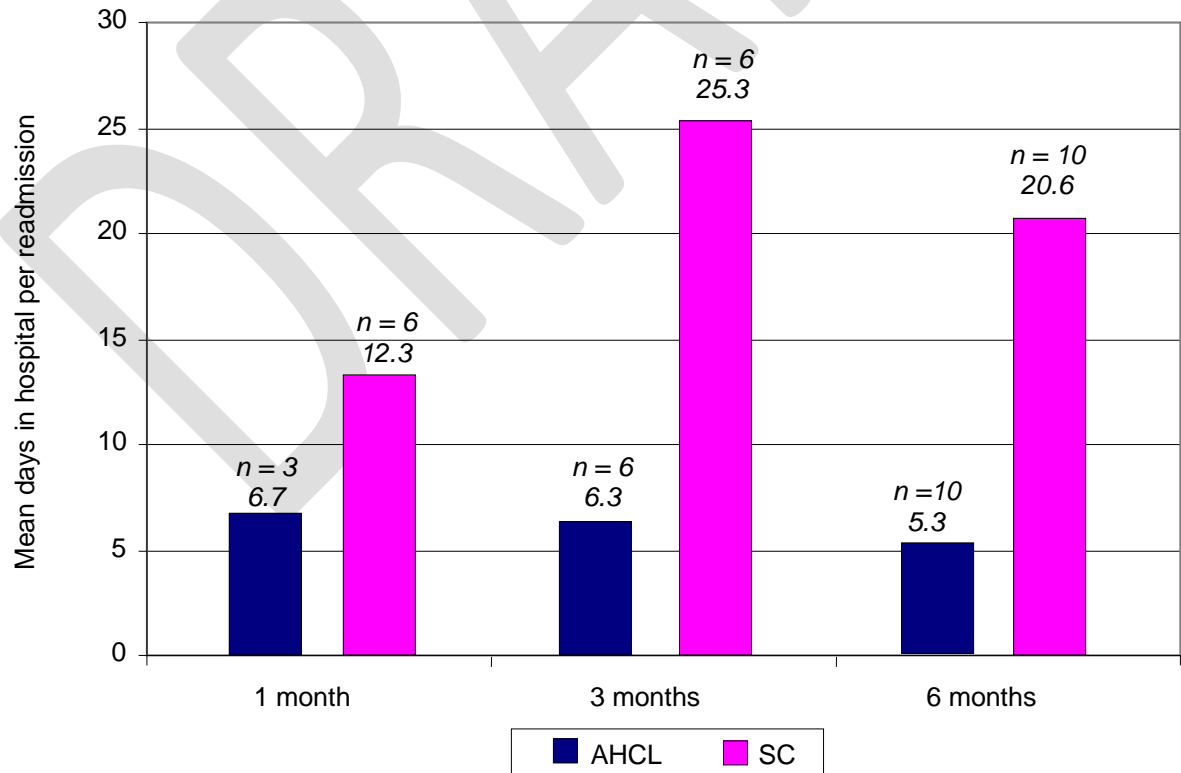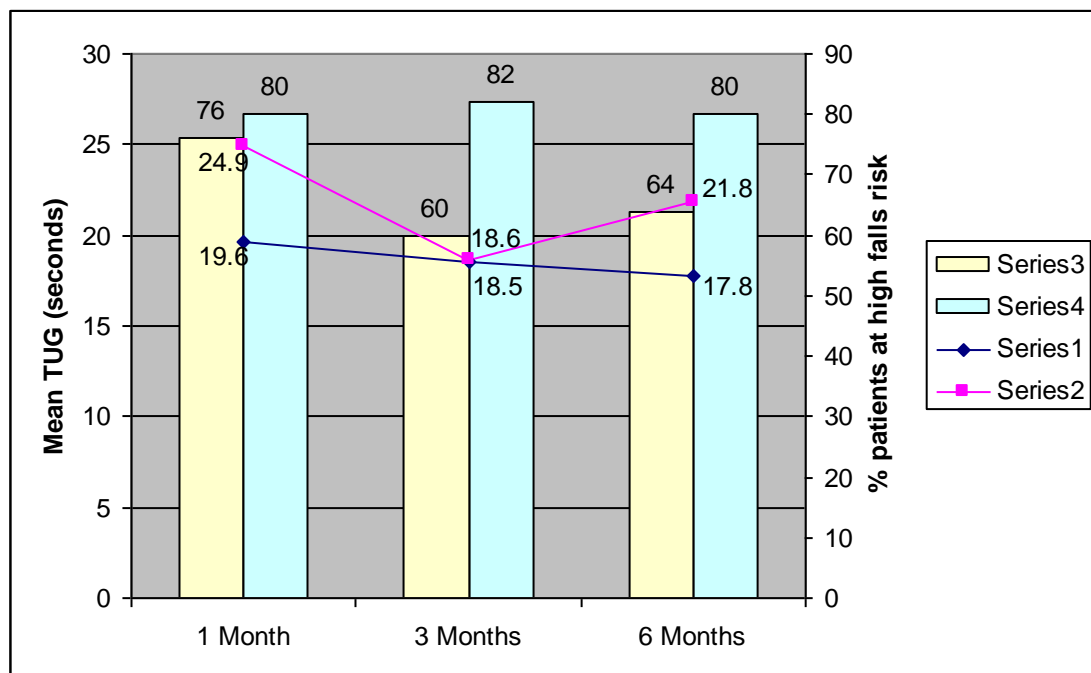

Figure 5. Functional mobility on TUG (mean scores and percentage of patients with high falls risk).

Mortality rates did not differ markedly between AHCL (5 of 29) and SC (4 of 29) participants. Patient satisfaction (measured using a standard 5-point Likert scale) with their inpatient AH care was also similar between groups (mean scores: AHCL 1.55; SC 1.63).

Discussion

Catering for an ageing population with increasing demands on AH requires innovative and novel approaches to address patient needs. The current study evaluated one such innovative AH workforce model by using a RCT methodology to examine outcomes for patients receiving SC as compared to patients receiving a new transprofessional model of AH service delivery. Although previous literature has described the conceptual function of transprofesisonal AH practice (eg. Gordon et al., 2014; Smith & Duffy, 2010; Wells, 2012), this study represents one of the few evaluations of the efficacy of skill sharing AH roles to date.

The study demonstrated the capacity for an AHCL role to respond to acute medical patients with enhanced identification of AH needs, more comprehensive AH assessment and greater levels of AH intervention within the first 48 hours of admission. Compared to SC therapists, AHCL therapists identified markedly more patients with AH needs who had not been referred through standard mechanisms. Additionally, on average within the first 48 hours of admission, patients receiving AHCL care were assessed across a broader range of AH domains, AH assessments were commenced 11 hours earlier and twice as many AH interventions were delivered compared to SC. Likewise, all AH assessments were completed prior to discharge for all short stay patients receiving the new model of care. Furthermore, there was improved ongoing management for AHCL patients, with higher rates of referral to GEMS and subsequent earlier transfer for those referred, higher rates of referral to inpatient and outpatient AH services, and higher levels of referral for non-AH consultation eg; medical specialists. Of particular note was the finding that average LOS for patients receiving AHCL intervention was more than 3 days shorter than those receiving SC. This is likely to reflect efficacy of the AHCL in terms of both; (1) comprehensively assessing, treating and supporting discharge for short stay patients, and (2) facilitating more efficient ongoing inpatient management for long stay patients.

AHCL patients consistently reported greater functional performance (MBI), quality of life (EuroQOL) and less disability for up to 6 months post baseline. There was also evidence that functional mobility (TUG) outcomes were

slightly enhanced for the AHCL patients. Furthermore, although identified re-admissions to hospital at 3 and 6 months were equal across both groups, duration of readmission was substantially lower in the AHCL group compared to SC at each post baseline assessment point. Patient safety as measured by PRIME reports did not appear to be compromised by the AHCL model of care. This is particularly significant given the perceived risks which could be associated with skill-sharing and working outside of traditional professional boundaries, as have been articulated in overviews of contentious issues in transprofessional AH care by others (Wells, 2012). It is also notable that despite thorough earlier assessment within the transprofessional AHCL model of care, mean AH activity duration over the course of the AHCL patient admissions were similar to those of SC, suggesting that care provided was of increased efficiency rather than less volume.

Previous research has highlighted the importance of interprofessional collaboration in enhancing patient care and service outcomes, as well as staff satisfaction (Kraft, Blomberg, & Hedman, 2014; Booth & Hewitson, 2002; Zwarenstein, Goldman & Reeves, 2009). This previous research has, however, also signalled potential risks in collaboration, such as role overlap (Booth & Hewison, 2002), role overload (Kraft et al, 2014), and loss of professional identity, particularly when generic skills are utilised (Booth & Hewison, 2002). Moreover, the quality of collaborative practice may be dependent upon team skills, such as leadership, mutual performance monitoring, adaptability, team orientation (Moyers & Metzler, 2014), communication (Bainbridge, Nasmith, Orchard & Wood, 2010), time

availability (Kraft et al, 2014) and the standard of interprofessional education and awareness (Harrison, 2003; Moyers & Metzler, 2014).

It appears that a transprofessional model of care - with one therapist taking responsibility for the interprofessional assessment and care planning of the patient - may offer a means to circumvent dependencies inherent in a standard collaborative approach involving multiple team members.

The brevity of admission may be a particular barrier to effective collaborative interprofessional practice in the acute medical setting. In the current study, approximately one third of patients within the SC group were discharged before they had been assessed by all of the AH professions to whom they were referred. The transprofessional model may also have been particularly advantageous in the acute medical setting given that care was primarily focussed on assessment and management planning, rather than providing AH treatment, an aspect of care that has been associated with higher levels of role overlap, role overload and negative patient outcomes amongst physiotherapists and occupational therapists (Booth & Hewison, 2002). These factors may help to explain the marked advantages of transprofessional care identified in the acute medical setting, whereas Pighills and colleagues (2015) found that transprofessional care was equivalent but not superior to standard care for community-based patients receiving rehabilitative AH.

There are a number of methodological limitations relating to the study. Recruitment was lower than anticipated, with resulting group numbers limiting the ability to undertake inferential statistical analysis. Subsequent attrition

further reduced the power of the study, although this attrition was roughly equivalent between AHCL and SC conditions, and thus was unlikely to bias comparative results between the groups.

Despite the fact that numbers recruited and retained to the study were below the sample size required to power the analysis to detect differences of statistical significance, clear inferences for clinical practice can still be made. Given the similar patterns of divergence from baseline across 1-, 3- and 6 month follow-ups demonstrated on the main patient outcome measures (MBI, Euroqol, Whodas), it seems likely that these effects would have reached significance had additional participants been included to enhance power for statistical analysis. The study results suggest potentially large differences between groups in care received and outcomes which are likely to have financial and practical impacts at both individual patient and organisational levels. Clearly, further research with larger samples is required to quantify these effects statistically. Nonetheless, the study utilised a gold standard blinded RCT approach to collect data, and the trends observed are suggestive of considerable improvement in both inpatient care processes and patient outcomes for patients receiving AHCL care.

Although not presented in this paper, it is also notable that additional qualitative data including focus groups and staff satisfaction were collected to evaluate the new model of care. This data indicated that the model was well received by AH colleagues, senior medical and nursing staff, who consistently

reported enhanced efficiency, communication, and AH presence, further supporting the findings of the study.

Concluding comments

Creating AH service efficiencies is particularly important in regional and rural settings, where flexible and responsive solutions to workforce limitations are necessary to meet increasing demand. The outcomes of this study support the implementation of a transprofessional AHCL role in an acute medical setting, and provide pioneering evidence on the clinical efficacy of these roles which support the conceptual descriptions of transprofessional practice provided in previous literature (Gordon et al., 2014; Smith & Duffy, 2010). Improved patient outcomes were demonstrated alongside the implied financial implications for service providers due to increased efficiency of AH service delivery and reduced LOS for patients in both the short and long term. Further research would be useful to scope the viability of the transprofessional AHCL role across alternative clinical settings (e.g. Emergency Department, acute stroke care, community settings) as well as developments to the existing model (e.g. expansion of AHCL position to provide AH weekend cover to multiple hospital wards). Despite its limitations, this study is one of the first to provide evidence of the efficacy of a skill sharing AH role. Given the lack of research evidence on such innovative AH roles, the implications for AH service design are significant.

Declaration of interest: None declared.

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