
The Healthy Ageing Unit: A Comparative Controlled Intervention

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ABSTRACT

This article describes the second stage of a three-stage pilot research project to establish and evaluate a Healthy Ageing Unit, in a private hospital in Western Australia, based on a multi-disciplinary model of transitional rehabilitation for the elderly acute patient. The objective of the second stage and thus this study was to compare clinical outcomes of patients admitted to the Unit to those on a conventional post-acute care ward. The clinical outcomes included length of stay, patient functional status, confidence and emotional state. One hundred and sixty-eight inpatients participated in the study. One hundred and thirty-five (80.4%) patients were transferred to the Unit and formed the *intervention group* and 33 (19.6%) patients receiving conventional care formed the *control group*. Results analysed using appropriate parametric and non-parametric statistics revealed that the Healthy Ageing Unit had a positive impact on the set of *a priori* determined patient outcomes. Moreover, the staffing model adopted, where enrolled nurses trained as therapy assistants provided the majority of care under the direction of clinical registered nurses, supported good use of beds and improved labour costs per patient day. In addition, the Healthy Ageing Unit was seen to raise the profile of care of the older person within the health care organisation, as well as providing staff with an opportunity to develop alternative nursing roles that were more closely

aligned with the humanistic approach to practice.

Key Words

healthy ageing, multi-disciplinary, transitional rehabilitation, intermediate care, therapeutic nursing, acute aged care

INTRODUCTION

Aged care has received much attention since the Commonwealth of Australia released 'Australia's National Strategy on Ageing: An Older Australia, Challenges and Opportunities for All', in 2002. This National Strategy called on all States and levels of government to take a leadership and facilitation role to ensure older Australians are able to lead healthy, active fulfilling lives. The latest phase of this strategy has seen the development of government sponsored pilot programs to improve bed management and hospital-based care for older Australians, such as the National Demonstration Hospitals Program – Phases 2 and 4 (Australian Government Department of Health and Ageing, 2004) and The Transitional Care Packages Project (School of Population Health, 2004). The goal for healthy ageing and improving age-sensitive health services, however, is not limited to the public area. The private health care sector has also pursued initiatives to address this strategy.

In one of Australia's largest faith-based, not-for-profit private health care providers, an acute aged care transitional rehabilitation unit was established in metropolitan Perth, called the Healthy Ageing Unit (HAU). The HAU was considered a strategy capable of addressing the challenges outlined in Australia's National Strategy, such as the extended length of stay in this population. Transitional rehabilitation was also identified as a model of acute aged care that would support this health care organisation's Strategic Plan 2001-2011 for the Care of the Older Person and Marginalized Groups.

THE HEALTHY AGEING UNIT

Goals of the Unit

The HAU was identified as an *intermediate care nurse-led unit*, whose aim was to offer therapeutic or transitional nursing to prepare medically stable elderly patients for return to their home environment. The Unit however, not only focused on ensuring successful return to one's pre-admission abode but also to improve older patients' confidence, functional ability and emotional adjustment/quality of life post-discharge, as well as reducing the length of stay in hospital and frequency of re-admissions.

Staff on the Unit

The ten-bed transitional rehabilitation unit was opened for eleven months in 2004, closing only to allow for the commencement of a major hospital refurbishment program. The Unit was *nurse-led*, directed by a registered nurse (RN), with enrolled nurses (ENs) trained as therapy assistants providing the majority of patient care and support. The skills mix was 3.47 ENs to 1.89 RNs, which was essentially the reverse of the hospital's usual pattern and accordingly offered the potential for achieving labour costs per patient day. The HAU was also supported by a consultant geriatrician and professionals from allied health services, such as pharmacy, physiotherapy, occupational therapy, social work, speech pathology and clinical psychology. A weekly multi-disciplinary meeting was held to ensure a holistic approach to patient care was maintained. Overall management of the Unit was provided by a clinical registered nurse (CN), whose role also included assessment and discharge planning.

Patients on the Unit

Medically stable acute patients aged 60 years and over were referred from conventional care wards by the treating doctor, case manager, or on the recommendation of the Unit's CN. Medically stable patients were those who had no major biological changes for at least 72 hours, no changes in medical management anticipated, and had no major tests planned. Patients were assessed as suitable candidates for therapeutic nursing and hence, HAU admission, if they had the expected ability to improve/rehabilitate within a two-week time frame, and were willing to complete a questionnaire on admission, discharge and follow-up. A key exclusion criterion was a diagnosis of dementia or severe cognitive impairment unrelated to hospital admission and acute illness (refer Michael et al., 2004, p.15 for full criteria). Such a diagnosis was deemed incompatible with the short-term (two-week) rehabilitative aim and nursing capabilities of the Unit. Patients who were assessed as unable to make this progression remained on the conventional care wards for the standard care, support and discharge planning and were not involved in the study.

In addition, doctors could be called to the HAU in an emergency, and nurses could send a patient back to the original conventional care ward for medical attention. However, these patients subsequently became ineligible for re-admission to the Unit and further participation in the study.

Functions of the Unit

On admission to the Unit, a comprehensive multi-disciplinary care and discharge planning process commenced for the patient. This involved the CN obtaining detailed information about the patient's current strengths and weaknesses, such as a review of the home environment to meet patient needs; the

assessment of domiciliary social supports; confidence in coping; functional ability and difficulties, and patient goals. Individual allied health services were involved directly with patients as indicated by the CN's pre- and post-admission assessments. However, the pharmacist reviewed all patient medications and provided a *medilist* as required to ensure safe self-administration. An occupational therapist also assessed all patients and developed individual therapy plans as appropriate. Tailored education, developed by the multi-disciplinary team, was provided to the patient about specific medical conditions; surgical procedures; drug regimes; nutrition and food preparation, and physical activity. Specific issues relating to task simplification/modification were also addressed as required. Therapy assistants and RNs reinforced the components of the education programs when supervising the daily activities of the Unit. Staff also reinforced issues of healthy lifestyle by encouraging healthy food choices at the mealtime buffet and by encouraging incidental physical activity (e.g., activities of daily living, walking to the dining room five times a day and by encouraging visitors / family members to walk with the patient). The need for purposeful activity was also addressed by scheduling strength and balance exercise classes conducted by the physiotherapist. Contact with appropriate community exercise and social clubs was also facilitated prior to discharge. All elements of care were focussed on establishing a sense of normality and encouraging patients out of the 'sick' role. Important elements included a policy of open visiting, single-bed rooms, the use of day clothes, encouraging patient involvement in food and drink preparation (from components sent from the kitchen), and in small cleaning tasks.

AIM

To explore the feasibility, effectiveness and acceptability of the Healthy Ageing Unit a three-stage pilot research project was proposed in collaboration with the School of Nursing and Midwifery and the Centre for Research into Aged-Care Services (CRACS), at Curtin University of Technology. The aim of the first stage of the pilot was to conduct a Needs Assessment to inform the development of the HAU, using a qualitative descriptive approach (Michael, et al, 2004). The second stage combined qualitative and quantitative methodology in a controlled intervention. A pre-test and post-test design compared a set of *a priori* clinical outcomes of patients admitted to the HAU with a *control* group from a conventional post-care ward at the organisation's other metropolitan hospital. The final stage of the study involved follow-up at three months in order to examine clinical outcomes of patients in the *intervention* and *control* group beyond discharge.

This article describes the second stage of the three-stage project – the HAU, the comparative controlled intervention, where the patients' quantitative clinical outcomes will be presented. The final stage of the pilot project will be presented in a subsequent article.

Table 1 Living arrangements of entire sample

	Frequency	Valid per cent
Live alone	87	51.8
Live with spouse	42	25.0
Live with family	25	14.9
Have resident carer	7	4.2
Have non-resident carer	3	1.8
Other	4	2.4
Total	168	100.0

METHOD

Participants

The sample included 168 inpatients from two of the health care organisation's hospitals located in metropolitan Perth, Western Australia. The *intervention* group included 135 patients referred from general, medical and surgical/orthopaedic wards who met the selection criteria for admission to the HAU (site one). Thirty-three inpatients from conventional post-acute wards at site two were required to meet the same criteria as the *intervention* group, prior to acceptance as the *control* group for the study. The sample size for both groups was achieved through ongoing recruitment.

The *demographic profile* of the sample revealed that 131 (78%) patients were female and 37 (22%) were male. The average age of the patients was 81.7 years, with a range from 61 years to 99 years. An estimated one third (31.1%) of patients were married, 89 (53.3%) were widowed and a further 18 (10.8%) patients had never married. Sixty per cent of patients indicated they were born in Australia.

On examining the living arrangements in Table 1, there were found to be 87 patients (51.8%) living alone, 42 (25%) living with a spouse, and 25 (14.9%) living with their family. Ninety per cent of patients reported they were living independently, of whom 118 (71.1%) lived in a private residence and 29 (17.5%) resided independently in a retirement village.

The *diagnostic profile* of the sample was categorised into four areas: medical, orthopaedic, spinal, and general. Approximately one half of the patients (49.1%) were admitted for treatment of a primary *medical diagnosis*, such as *respiratory conditions*, cardiac investigations, renal failure, cancer, diabetes, leg ulcers, and cellulitis. Other major categories included *orthopaedic* procedures (23.3%); *spinal surgery* and management (15.3%); and *general surgery* (12.3%). There was also a range of co-morbidities found in both groups, as indicated in Figure 1.

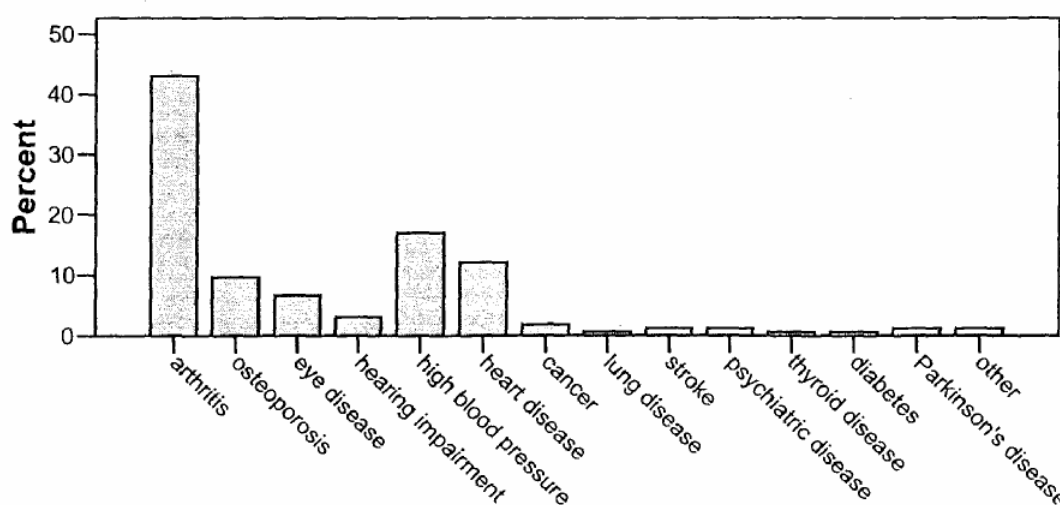


Figure 1 Co-morbidities of entire sample

Materials

To determine patients' clinical outcomes in regards to functional status and emotional state, the Modified Barthel Index (BI) and the Revised Philadelphia Geriatric Center Morale Scale (PGCMS) were used, respectively. Both instruments were selected based on their use in the aged and intermediate care literature, and their published psychometric properties (Bowling, 1997).

The BI is designed to measure functional independence, with pre- and post-intervention scores used to indicate the amount of care required following discharge. The scale is internally consistent with reported alpha reliability coefficients of .95 to .97. Validation studies that have compared the BI with the PULSES profile, have reported correlations of -.74 to -.90. The BI is scored from zero (dependent) to 100 (independent) (Bowling, 1997).

The PGCMS is designed to measure dimensions of psychological wellbeing in older individuals. The test-retest reliability coefficients for the scale are reported in the range of .75 to .91, with a Kuder-Richardson coefficient of internal consistency of .81. Factor analysis of the items provided alpha internal consistency coefficients of between .81 and .85. Validity testing with various Neugarten indexes range from .57 to .79. In this study, the overall morale scale was used, which is scored from zero (low morale) to 14 (higher morale) (Lawton, 1972; 1975).

Procedure

There were three time points in the project (pre-test, post-test1 and post-test2) at which the patients were required to complete a questionnaire. The pre-test was administered to patients within 24 hours of their acceptance into the study – those who met the admission criteria and were willing to participate. Post-test1 occurred at discharge. Stage three of the pilot (post-test2) occurred at three-months post-discharge and will be described in a subsequent article. At each of the time points a set of *a priori* clinical outcomes were compared between those patients allocated to the *intervention* group, and those patients allocated to the *control* group, who had no intervention. The instruments were administered by the Unit's CN, or a trained nominated person.

Design

A controlled comparative descriptive design was employed for Stage Two of the pilot project. This approach was deemed appropriate, as there were insufficient patient numbers to conduct a randomised trial.

Analysis

A significance level of alpha equal to 0.05 was used for all statistical tests and the Statistical Package

for Social Sciences (SPSS) default settings were used unless stated otherwise. Descriptive and inferential statistical analyses of the data were undertaken, including the appropriate parametric and non-parametric tests. Chi-square (χ^2) test was used to determine if differences in frequency existed across response categories. Within-group and between-group comparisons were performed using paired and independent *t*-tests, respectively. An analysis of variance (ANOVA) was used to determine differences between three or more groups, where appropriate. A logistic regression analysis was conducted to compare the groups controlling for any difference in age with their functional ability, and a Pearson's correlation was used for correlation between age and the PGCMS with admission, discharge and follow-up.

RESULTS

The sample consisted of 135 patients (80.4%) in the HAU *intervention* group and 33 patients (19.6%) in the *control* group. In performing a number of tests to compare specific elements in the demographic profile of the two groups it was found that whilst more females than males participated in the study, the actual proportion of females and males between the two groups was not significantly different ($\chi^2 = 1.5$, *df* = 1, *p* > .05). Moreover, there was no significant difference in the mean age between the *intervention* group and *control* group (*t*(163) = 1.88, *p* > .05).

Major diagnoses

On examining the diagnostic profile of patients in the *intervention* and *control* groups it was found that there was a significant difference between the groups in terms of major diagnosis on admission ($\chi^2 = 9.7$, *df* = 3, *p* < .05). Most of this difference was a result of more patients in the *control* group being admitted for medical conditions (*control*: 70.0% vs. *intervention*: 44.4%), whereas more of the *intervention* group were admitted for orthopaedic procedures (*control*: 13.3% vs. *intervention*: 25.6%), spinal surgery and management (*control*: 3.3% vs. *intervention*: 18.0%).

Using analysis of variance to examine the relationship between the diagnostic categories and the age of participants, it was revealed that age was significantly associated with diagnosis on admission (*F*(3) = 6.25, *p* < .01). Those patients admitted with a spinal diagnosis were younger than those admitted with other conditions (spinal: 76.6 years; medical: 82.7 years; surgical: 84.5 years and orthopaedic: 81.8 years). Further analysis of these variables in the *intervention* and *control* groups showed that the association held true for patients in the *intervention* group but not the *control* group (*F*(3) = 6.00, *p* < .01).

Length of stay

Overall, the average length of stay was 21.2 days (*SD* = 11.1) with a range from five to 60 days. The patients in the *intervention* group spent an average of 21.6 days (*SD* = 11.1) in hospital, with approximately

half that time spent in the HAU ($M = 10.2$ days, $SD = 5.7$). The patients in the *control* group spent on average 19.5 days in hospital ($SD = 11.1$). A comparison of length of stay between the two groups showed that the difference between the two groups was not statistically significant ($t(166) = -1.0$, $p > .05$).

An analysis of variance revealed that diagnosis on admission was significantly associated with length of stay ($F(3) = 2.88$, $p < .05$). Results of *t*-tests showed that patients admitted for general surgery were found to have had a significantly longer length of stay ($M = 27.5$, $SD = 13.2$) than those admitted with all other diagnoses (medical: $M = 20.0$, $SD = 10.5$; orthopaedics: $M = 20.6$, $SD = 9.9$ and spinal: $M = 19.4$, $SD = 10.4$). A Pearson's correlation showed a very small but significant negative association between the age of participants and length of stay ($r = -0.16$, $p < .05$), with younger patients having a longer length of stay.

In view of the difference between the two groups in terms of diagnostic composition, an analysis of variance was conducted to further examine any difference in length of stay between the groups. When controlling for diagnosis and age as covariates, there was no significant difference between the two groups ($F(1) = 1.93$, $p > .05$).

Functional ability

The *intervention* and the *control* groups were asked on admission to the study, on day of discharge and on follow-up to complete the Barthel Index. On admission to the study the average BI was 87.3 ($SD = 12.7$). At discharge this had risen to 96.0 ($SD = 7.2$). In performing a one-sample *t*-test it was found that this was a statistically significant increase ($t(162) = 15.16$, $p < .05$). Since one of the aims of the HAU is to restore patients to an independent status, patients were categorised as *independent* if their BI was 100, and *dependent* if it were less. On admission 17.3% of patients admitted to the study were classed as independent, with 46.6% independent at discharge. Age was significantly associated with independence at admission ($\chi^2 = 8.94$, $df = 1$, $p < .01$). There was no association between independence at admission and diagnosis.

A comparison of the *intervention* and *control* groups showed that there was no significant difference in the proportion of patients independent on admission between the groups ($\chi^2 = 2.2$, $df = 1$, $p > .05$). At discharge, there were significantly more *intervention* patients considered independent according to the BI (52%) than *control* patients (25%) ($\chi^2 = 7.8$, $df = 1$, $p < .01$).

The results presented above suggest that the HAU was effective in enabling patients to regain their independence more quickly than those who were treated as conventional inpatients. In view of the influence of age on the achievement of independence, a logistic regression analysis was conducted to compare the groups controlling for any

difference in age. This indicated that there continued to be a significant difference between the two groups ($\chi^2 = 5.6$, $df = 1$, $p < .05$).

At discharge an analysis of the BI using analysis of covariance showed a difference in scores between the two groups, with the *intervention* group having a mean score of 96.9 and the *control* group a mean score of 91.1. Both BI on admission ($F(1) = 39.0$, $p < .01$) and group membership ($F(1) = 23.6$, $p < .01$) were significant predictors of BI on discharge. Age was not a predictor of the BI at discharge.

Overall, all patients showed an improvement of 8.6 points on their mean BI, equating to a 10 per cent improvement in functional ability. However, the *intervention* group showed an improvement of approximately 12% and the *control* group improved by approximately 4% between admission and discharge.

Emotional adjustment

On admission to the study patients showed an average Revised Philadelphia Geriatric Moral Centre Morale Scale score of 10.07 ($SD = 3.6$) out of a maximum of 14. By discharge this had risen to 11.03 ($SD = 3.5$). There was no significant difference between the groups in morale on admission ($t(166) = -0.89$, $p > .05$). However, at discharge, the *intervention* group had a significantly higher morale score ($M = 11.3$, $SD = 3.4$) than the *control* group ($M = 9.7$, $SD = 3.9$) ($t(166) = -2.44$, $p < .05$). These results suggest that the HAU intervention was effective towards enhancing patients' morale.

Further analysis, using an analysis of variance, revealed that there was no association between the PGCMS and gender at any stage in the study. Age also was not significantly associated with morale at admission or discharge.

DISCUSSION

The aim of the pilot study was to explore a multi-disciplinary model of health care by comparing the management approaches to the rehabilitation of aged acute patients on the HAU with those from conventional post-care general, medical and surgical /orthopaedic wards at another site. This purpose being to evaluate alternative models of care for 'difficult to discharge' older patients.

The results reveal that patients admitted to the HAU had positive outcomes in terms of functional ability and independence, and psychological wellbeing. This highlighted the need for a HAU involving a multi-disciplinary model of care with nurses and allied health professionals specialised in the area of gerontology and community-based care.

Consistent with previous research (Griffiths, 2002; Steiner, et al, 2001; Griffiths and Wilson-Barnett, 2000), there was no difference in *length of stay* between the two groups with the average length of

stay being 21.2 days. However, there was a significantly greater improvement in clinical outcomes for the *intervention* group than for the *control* group. This supports the previously implied notion that the many benefits claimed for the intermediate care model, of which the HAU is a form, can resemble a hierarchy of competing priorities. That is, the intermediate care model involves many variables that may be manipulated to produce the philosophically desired result. For example, a focus on staffing and skills levels may reduce labour costs per patient day but will not necessarily reduce the length of stay or frequency of re-admission, nor will it necessarily improve clinical outcomes or post-discharge quality of life (Griffiths, 2002; Michael, et al, 2004).

Unlike most recent evaluations, which usually report longer stays actually translate to a higher cost overall (Steiner, et al, 2001; Griffiths, et al, 2001; Richardson, et al, 2001; and Griffiths, et al, 2000), the HAU was found to support good use of the beds, produce sufficient revenue to cover the costs of the research project, absorb costs of allied health services, and produce an earnings before interest and tax depreciation amortisation (EBITDA) comparable with that of a conventional care general, medical or surgical /orthopaedic ward. This result supports the conclusion that the innovative staffing model adopted was an important element in the Unit's ability to meet the health care organisation's business goals. Moreover, in light of these results the organisation has planned for the re-opening of the Unit in 2004/2005, based on the same model of care.

Analogous with previous research, the establishment of the HAU also provided opportunities for nurses (in particular ENs) to develop enhanced therapeutic roles within the organisation. It also provided all staff involved with the HAU the opportunity to develop roles that were more closely aligned with the humanistic approach to practice (Pearson, 2003; Wiles, et al, 2001).

Limitations of the study were in main due to the small numbers within the *control* group and the limited timeframe imposed upon the study to overcome this problem. Consequently, results should be interpreted with caution in view of the smaller sample size. The initial implementation of the study was also affected by the need for a paradigm shift within the health care organisation in understanding the philosophical underpinnings of the HAU. Although there were numerous educational sessions provided to staff, there was some hesitation and confusion when referring patients to the Unit at the commencement of the study, resulting with small numbers in the early stage. This was overcome in time and consequently led to a raised profile in care of the older person within the health care organisation.

In spite of these limitations, the pilot study has supplied evidence to successfully address, in part, the health care organisation's strategy of Care of the Older Person and Marginalized Groups and Australia's National Strategy on Ageing, whilst

addressing challenges posed by its long stage population

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Colonoscopies are no joke, but these comments during this exam were quite humorous. A physician claimed that the following are actual comments made by his patients (predominantly male) while he was performing their colonoscopies:

- "Take it easy, Doc. You're boldly going where no man has gone before!"
- "Find Amelia Earhart yet?"
- "Can you hear me NOW?"
- "Are we there yet? Are we there yet? Are we there yet?"
- "You know, in Arkansas, we're now legally married."
- "Any sign of the trapped miners, Chief?"
- "You put your left hand in, you take your left hand out..."
- "Hey! Now I know how a Muppet feels!"
- "If your hand doesn't fit, you must quit!"
- "Hey Doc, let me know if you find my dignity."
- "You used to be an executive at Enron, didn't you?"

And the best one of all...

- "Could you write a note for my wife saying that my head is not up there?"

USEFUL/INTERESTING WEBSITES

Appraising non-RCT studies – this tool was developed in Canada by McMaster University and may assist with appraising the non-RCTs. Go to www.fhs.mcmaster.ca/rehab/ebp

How to put evidence into practice: implementation and dissemination strategies (N H & M R C)
www.health.gov.au/nhmrc/publications/cphome/htm

Absence of evidence is not evidence of absence