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A clinical trial of nurse practitioner care in residential aged care facilities

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ABSTRACT

Background: Optimising quality of life and reducing hospitalisation for people living in residential aged care facilities (RACF) are important health policy goals.
Methods: A cluster controlled clinical trial of nurse practitioner care in RACF. Six facilities were included: three randomly allocated to intervention where nurse practitioners working with general practitioners and using a best practice guide were responsible for care, and three control. Participants were followed up for a minimum of 12 months unless dead or transferred to another facility.
Results: We enrolled two hundred patients (101 intervention and 99 control) with a mean (SD) follow up of 604 (276) days. There were 98 ED visits by intervention participants, resulting in 56 hospitalisations, compared with 121 ED visits and 70 hospitalisations for controls (risk reduction = 8%, 95% CI = −1% −17%, p = 0.10). For the pre-specified secondary outcomes of transfers within the first 12 months of enrolment, the number of residents making at least one visit (46 in each study arm) and rate of ED attendance (0.66 visits per intervention resident versus 0.70 visits per control resident) was not affected by the intervention. After adjusting for dependency and comorbidity, the intervention group had non-significantly lower transfers (OR 0.7, 95% CI 0.3-1.5, p = 0.34). There was a reduction in the rate of decline in the quality of life of intervention compared to control residents.
Conclusions: Nurse practitioner care coordination resulted in no statistically significant change in rates of ED transfer or health care utilisation, but better maintained resident quality of life.

1. Introduction

Many factors impact on the quality of life (QoL) of older people living in residential aged care facilities (RACF), and clinical care comprises only a small part of a complex and broad Picture (Beer, Bosboom, Almeida, & Flicker, 2009; Chan & Pang, 2007; Kane, 2003). Maintenance of wellbeing and minimising hospitalisation for older people living in RACF is a focus of health policy and research, particularly as it is estimated that a substantial proportion, in the order of one third, of transfers to hospital are avoidable and that this proportion has not declined over the past 20 years (Codde, Frankel, Arendts, & Babich, 2010; Kerr & Byrd, 1991). Qualitative data indicate that many residents, their family and carers would prefer acute care, defined as short term treatment for urgent illness or injury, be delivered in the RACF setting without hospitalisation (Arendts, Reibel, Codde, & Frankel, 2010a). If this preference is to be met, available and coordinated clinical care by dedicated practitioners is required, rather than relying upon existing RACF staff (Shanley et al., 2011).

Nurse practitioners have subspecialist expertise in many clinical disciplines, including geriatric care (Aigner, Drew, & Phipps, 2004). There have previously been quasi-experimental trials of enhanced nurse practitioner (NP) led primary care within RACF, with some promising results (Kane, Keckhafer, Flood, Bershadsky, & Siadaty, 2003).

Although NPs are autonomous and experienced clinicians, in both acute and geriatric care settings their work is augmented by best practice guides for their scope of practice (Roche, Gardner, & Jack, 2017). However, there have been no substantive trials of a coordinated model of NP care delivered by experienced nurse practitioners responsible for resident care informed by a best practice guide for the care processes being delivered and coordinated by those nurses. We

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hypothesised that this approach would reduce transfers to hospital and improve resident QoL.

2. Methods

A full trial protocol including the methodology and content of the best practice guide has been previously published in this journal (Arendts et al., 2014). In brief we conducted an open label cluster controlled clinical trial in six RACF matched on the basis of resident characteristics and staff:resident ratios, with three facilities randomly allocated as intervention and three as control. Within each facility, patients were eligible for the study if they were a permanent (non-respite) resident for the facility aged 65 years or older and with a life expectancy of more than 180 days. A trained researcher identified eligible residents who were individually enrolled after informed written consent (using proxy consent where residents lacked capacity). Thus, not all residents within any one facility were enrolled.

i Consenting residents in the intervention facilities were assigned to NPs that worked with general (primary care) practitioners in a collaborative arrangement. In this study, the NPs had an autonomous scope of practice that included independent diagnosis and prescribing, but conferred with the primary care physician as needed. The NPs: Were responsible for resident care, ranging from care coordination where subacute and chronic care processes developed for individual residents were integrated into ongoing care provided by facility staff and other primary care providers, through to providing unplanned acute care for enrolled residents.

ii Used a best practice resource folder (Appendix A in Supplementary materials) for the care processes being delivered and coordinated as part of the trial (Arendts et al., 2014). This contained guidelines for comprehensive medical assessment; patient +/− family education regarding diagnosis and prognosis; care pathways for specific acute illnesses (Interact, 2012; Ouslander et al., 2011) palliative care plan for management of current and anticipated future symptoms using (WA Cancer and Palliative Care Networks, 2011); advance care planning (Molloy et al., 2000); medication review (Le Couteur, Banks, Gnjidic, & McLachlan, 2011); and a review of unplanned hospitalisations at regular meetings utilising root cause analysis (Ouslander et al., 2009).

Residents in the control facilities received usual care and were assigned to general practitioners who were responsible for their care. Neither NPs nor the resource folder of best practice guidelines was available.

The primary outcome measure was unplanned transfer to a hospital via the emergency department (ED). Secondary outcome measures were:

1 Health-related QoL. Measured every 6 months using the Health Utilities Index Mark 2/3 (HUI2/3) (Horsman, Furlong, Feeny, & Torrance, 2003) and the EuroQol (EQ-5D-3L) (Feeny, Furlong, Boyle, & Torrance, 1995) instruments.
2 Functional status. Measured every 6 months using the modified Barthel Index (MBI)
3 Death.
4 Hospital inpatient admissions and total hospital bed-days.

A trained research assistant was responsible for outcome measurement. Episodes of care including ED attendance and hospitalisation were recorded on a daily log at each facility. Hospital data were used to determine hospital bed day occupancy. Individual participants underwent MBI and Psychogeriatric Assessment Scale (PAS) assessments. Participants (or in cases of severe cognitive impairment, their closest relative acting as proxy informants) completed the QoL instruments. All data were recorded in a de-identified fashion in an electronic spreadsheet, with analysis performed by the first author blinded to the allocation status of the patient.

Previous research in the setting of this study showed an incidence of 75 transfers for each 100 RACF residents per year (Codde et al., 2010). However as transfer rates are as low as 30/100 RACF residents/year in some jurisdictions, we based our sample size estimates on this, with an assumption that halving this to 15 transfers/100 residents/year (i.e. relative risk = 0.5) would be clinically meaningful. Based on an estimated mean exposure time of one year, 250 patients would have 80% power to detect this risk difference at a significance level of 0.05.

We used SPSS v21 (IBM Corp, USA) for data analysis. Descriptive statistics included means, medians and their distributions. We used Pearson's χ^2 test for dichotomous outcomes and, depending on distributions, parametric or non-parametric tests for continuous outcomes. Kaplan-Meier survival curves were estimated for unplanned transfers to a hospital via ED stratified by intervention and control groups. A log-rank test was conducted to test differences between these curves. We also conducted a logistic regression analysis adjusting for gender, number of comorbidities and medications, treatment group and baseline MBI and PAS on the likelihood of ED attendance.

The study was approved by the University of Western Australia Human Research Ethics Committee (RA/4/1/5123) and registered with the Australian and New Zealand Clinical Trials Registry (12611000933954).

3. Results

Across the six sites there were 352 beds, of which two were unoccupied. At the commencement of the study, each eligible resident was approached for consent which formed a 'baseline' enrolment group of 142 people (Fig. 1). Over the subsequent two years, new admissions to

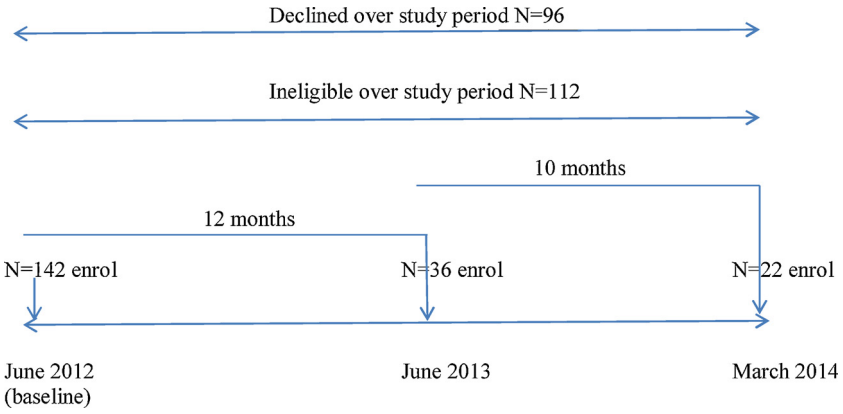

Fig. 1. Timeline of enrolment.

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