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Restraint use in acute and extended mental health services for older persons

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Restraint use in acute and extended mental health services for older persons

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Abstract

Restraint of older persons in inpatient and residential care is used to control aggression, prevent falls and other adverse outcomes. Initiatives to reduce these practices are being implemented worldwide. However, there has been little examination of restraint practice in psychiatric services for older persons. This paper reports a retrospective comparative analysis of restraint use in three acute and two extended care psychiatric inpatient wards in Australia. The analysis involved examination of restraint incidents and comparison of restrained and non-restrained patients. There was significant variation in restraint use between wards. On one acute ward, 12.74% of patients were restrained, although restraint use declined during the data collection period. Patients with dementia were restrained at higher rates than patients with other diagnoses, and restrained patients stayed in hospital for a longer duration. Restraint occurred early in admission, and few differences emerged between those restrained once or multiple times. Mechanical restraint was more prevalent than physical restraint, with restraint predominantly used to manage aggression and falls. Findings provide new data on restraint in older persons' psychiatric services. Theories of dementia behaviour and the risky behaviours and unique needs of patients with these disorders may assist in reducing restraint use in these settings. Greater conceptual understandings of behaviours associated with dementia and the unique needs of patients with these disorders may assist in reducing restraint use in these settings.

Keywords: aged; aged, 80 and over; inpatients; psychiatric nursing; restraint

Introduction

In mental health settings, the use of restraint has been receiving increased attention. For the purposes of this paper, restraint refers to the restricting of a patient's movement with devices such as jackets and belts (referred to here as mechanical restraint) and hands-on immobilisation or restriction of the patient's movement by staff (referred to here as physical restraint, but also known as manual or personal restraint). While restraint is considered "an emergency measure to prevent imminent harm to the patient or other persons when other means of control are not effective or appropriate" (Metzner *et al.* 2007, p. 417), complex legal, ethical and safety issues have been raised regarding its use (Cotter 2005, Moylan 2009). Consequently, there has been a worldwide move toward the reduction or elimination of both restraint and other containment practices, such as seclusion, in mental health care (Department of Health 2008, Te Pou 2008). Effective initiatives to reduce restraint are described in the literature (Evans *et al.* 2002, Fisher 2003), but there remain variations in use and attitudes towards containment measures (Bowers *et al.* 2007), and the need for organisational and philosophical shifts in restraint reduction efforts have been identified (Ashcraft & Anthony 2008).

Research into restraint has focused largely on outcomes, and has highlighted the physical and psychological implications for patients (see Fisher 1994). Restraint-related death through asphyxiation, for example, caused by vest strangulation or becoming caught in bedrails have been reported (Evans *et al.* 2003), and the potential for harmful physiological reactions have also been posited (Hick *et al.* 1999, Mohr *et al.* 2003, Paterson *et al.* 2003). Restraint use has been associated with other adverse outcomes including nosocomial infection, falls, increased length of hospitalisation, decreased cognitive functioning, and subsequent mortality (Evans *et al.* 2003,

Engberg *et al.* 2008). Physically restraining a patient may also result in injury to staff members involved in the restraint (Lancaster *et al.* 2008, Stubbs 2009).

Patients often perceive containment measures as punishment and consider these to involve an excessive use of force. They also view these measures as a violation of rights, which may result in feelings of anger, fear, embarrassment, confusion, powerlessness and significant distress (Strumpf & Evans 1988, Meehan *et al.* 2000, Bonner *et al.* 2002, Mayers *et al.* 2010). Nurses have been found to perceive restraint use as a necessary last resort to prevent harm to patients and staff, but they also report conflict between the nursing role of protecting patients from potential harm and the use of this intervention (Marangos-Frost & Wells 2000).

Complex decisions faced by nurses and other health professionals in using restraint are particularly apparent with older consumers of mental health services. Mental health care of older persons can be complex, with co-morbidity of physical and chronic conditions (Hsu *et al.* 2005, Lacro & Jeste 1994, Ng *et al.* 2009, Voyer & Martin 2003). At the same time, the diversity of problematic or agitated behaviours, such as aggression, encountered in older persons' care settings by staff have been well-documented (Cohen-Mansfield *et al.* 1989, Kolanowski *et al.* 2002), and can pose significant challenges to care. The use of restraint with older persons and those with cognitive impairments such as dementia is often high, and in some cases these patients are overrepresented in acute care ward restraint (Lofgren *et al.* 1989, Minnick *et al.* 2007).

While restraint use with older people in medical (e.g. Strumpf & Evans 1988) and nursing home (e.g. Engberg *et al.*, 2008) settings have been investigated, there has been little examination of the use of containment practices with older persons in psychiatric settings. In a Swedish study of different older persons' care settings, the highest rate of restraint for a one-week period was for a psychogeriatric clinic

(Karlsson *et al.* 1996). O'Connor *et al.* (2004) found that restraint use and types of restraint implemented differed substantially across five acute care psychiatric wards for older persons in the same region of Melbourne, Australia. DeSantis *et al.* (1997) explored the use of mechanical restraint in a psychogeriatric acute care unit in the U.S.A., where restraint use in the first two weeks of admission was found to be 27.1% (36 of 131 patients admitted over a six month period). A diagnosis of dementia, impaired mobility, and disruptive problem behaviours predicted the use of restraint. Nurses also reported that unsteady gait/falling risk were primary reasons for their use of restraint.

In Australia, the reduction and potential elimination of restraint and seclusion practices and associated adverse events have been identified as one of four key national priority areas for increasing safety and reducing harm in mental health care (National Mental Health Working Group 2005), and this is in line with principles formulated by the United Nations (1991). Examination of psychiatric unit practices and care of older persons has been identified as lacking in the literature (Minnick *et al.* 2007, Moore & Haralambous 2007), but is needed for continued practice improvement and to evaluate changes over time as a result of new legislation – both local and international – and calls for reduction in the use of containment strategies.

The purpose of the present study was to examine the use of restraint in psychiatric inpatient wards for older persons. In particular, the study investigated rates of restraint, documented reasons for its use, how the practice was carried out, and analysis of patient characteristics such as diagnosis and detention status. This study provides baseline information required to evaluate changes in use and nature of restraint with older persons accessing psychiatric services at the study site.

Materials and methods

Design

The study was retrospective and comparative in design, in order to provide a case study of restraint incidents on one hospital campus in Australia.

Data collection

Admission and restraint data

Data on all admissions and restraint incidents during the period 1/1/2006 to 6/30/2009 (42 months) were provided to researchers from hospital databases in a non-identifiable form.

Included wards

Five open (i.e. not locked) wards of a metropolitan psychiatric hospital were included. The wards made up all mental health state wide inpatient services for older persons at the hospital during the data collection period. The acute care service consisted of two wards (Ward A had 20 beds 2006, 23 beds 2007 onwards; Ward B 18 beds) and a specialist 15-bed ward for older persons with mental health issues who required medical treatment (Ward C). Wards A and B had high occupancy rates (Ward A 88% in 2006 and 80% from 2007 onward, Ward B 86%), while Ward C had occupancy of 45%. The extended care service consisted of two wards (D and E), both with 24 beds. Occupancy for Wards D and E was 93% and 85%, respectively. From 2007 onward, acute care services were provided only by Ward A, due to an amalgamation of patient services and integration into community services. The data from Wards B (12 months) and C (9 months) for 2006 were included, however, given the substantial patient and ward data (e.g. occupancy) that existed for these two wards, and because this allowed examination of practices in all older persons units within one hospital.

Restraint policy

Restraint was defined in hospital policy as restriction of movement through physical means (e.g. hands-on immobilisation) or mechanical devices. Medical officers and, in the case of emergencies, registered nurses or other clinicians can authorise restraint either as a risk behaviour management technique (mental health related restraint) or to prevent fall-related injury (non-mental health related restraint). The senior registered nurse leads the intervention, with staff and security staff (if needed) briefed regarding their role prior to initiation.

Patients are monitored at least at 15 minute intervals (mental health related restraint) or as determined by clinical assessment (non-mental health related restraint), and have restraints removed regularly. Examination by a medical officer within one hour of restraint initiation is required, and every four hours after that the patient is still under restraint (patients restrained for non-mental health related reasons are reviewed as per their care plan). At 12 hours, the case is reviewed with the psychiatry consultant and deemed a 'critical incident' if restraint is continued. Debriefing of staff and the patient occurs after the decision to discontinue restraint is made by medical and nursing staff.

Ethics

The study was approved by University and hospital research ethics committees. All potentially identifying information was removed by the hospital to maintain the anonymity of staff and patients.

Data analysis

Restraint rates were calculated for restraint *incidents* and restrained *patients* (i.e. the numerator is either number of incidents of restraint or number of patients who were restrained at least once). Three methods described by Bowers (2000) were used: rates *per 100 admissions (adjusted)* (number of restraint incidents or patients restrained per month divided by number of patients in the ward per month, multiplied by 100); rates per *100 beds per month* (number of incidents/patients per month divided by number of ward beds, multiplied by 100); and per *100 occupied bed days* (number of incidents or patients per month divided by number of occupied bed days (which is, number of beds multiplied by number of days per month multiplied by percentage occupancy), multiplied by 100). These different methods enable accounting for ward variables such as bed occupancy or number of patients admitted and discharged, which individual methods may not allow (Bowers 2000). Multiple admissions for one person were treated separately. For example, in calculated frequencies of number of patients on a ward, a patient with two separate admissions would be counted twice, as if they were two separate people.

Patient and restraint data was analysed using PASW (SPSS) Statistics Version 18. Descriptive analysis was undertaken to examine characteristics of all patients, restrained patients, and restraint incidents. Comparison of restrained and non-restrained patients or comparisons between groups of restrained patients was undertaken using logistic regression, independent samples *t*-tests, non-parametric alternatives, and Pearson's χ^2-tests.

Results

Sample Demographics

There were 748 individual *admissions* (admissions during the data collection period or an admission prior to the period, but where the patient was still on an

included ward at data collection commencement) across the five wards. Three hundred and sixty-five (48.79%) patients were admitted once during the data collection period. The remaining patients had between 2-7 separate admissions. Of these 748 admissions, 656 (87.70%) involved a stay in only one of the five wards, 86 stayed in two separate wards and the remaining six stayed in three wards.

Ward A had the largest number of patients (495) during the data collection period. In the two other acute care wards, Ward B had 147 patients and Ward C 57 patients; in the extended care wards, there were 64 patients in Ward D and 83 patients in Ward E. In all wards except Ward E, there were more female than male admissions. The mean age in each ward was above 70 years, with the lowest mean age recorded for Ward D (*M*=74.16 years, *SD*=8.86) and the highest recorded for Ward C (*M*=77.11, *SD*=10.32). Across all wards patient age ranged from 43 to 100 years. Patients were predominantly recorded as Caucasian (ranging from 78.95% of patients in Ward C to 92.19% of patients in Ward D) and more than half were born in Australia (57.83% in Ward E to 66.67% in Ward C).

In the acute care wards, mood disorder diagnoses were higher (Ward A 34.95%, B 70.07%, C 54.39%) than in the extended care wards. Organic, including symptomatic, mental disorders were more common in Wards A (27.27% of patients in the ward) and C (24.56%) than in Ward B (4.76%). In the extended care wards, the main principal diagnoses in Ward D were schizophrenia, schizotypal and delusional disorders (62.50% of patients in the ward); while for Ward E the main diagnoses recorded were other degenerative diseases of the nervous system (48.19%), and organic, including symptomatic, mental disorders (32.53%).

The majority of patients had been admitted from 2006 onward (668, 89.30%), with 80 (10.70%) admitted prior to 2006. Median length of stay in the *hospital* (taking account of all movements between wards) was 42.50 days (*Range*=1.00-11, 572.00

days). A Kruskal-Wallis test revealed that length of stay significantly differed between acute care wards for admissions in 2006, $H(2, N = 358) = 8.28$, $p < .05$. Post hoc analysis using Mann-Whitney tests (with Bonferroni adjustment $p < .017$) found that Ward A (*Mdn*=29.38 days, *Range*=0.29-264.58) had a significantly greater length of stay than Ward C (*Mdn*=18.52 days, *Range*=0.08-184.83), $U = 3809.50$, $z = -2.51$, $p = .01$; differences between Ward A and Ward B (*Mdn*=24.88 days, *Range*=0.00-206.33) approached significance, $U = 9249.50$, $z = -2.21$, $p = .03$. Wards B and C did not differ significantly on length of stay. A second Kruskal-Wallis test examining differences between Wards A, D, and E for admissions 2006-2009 revealed that length of stay significantly differed for these wards, $H(2, N = 597) = 94.47$, $p < .001$. Both extended care wards, Wards D (*Mdn*=198.94 days, *Range*=4.79-1463.91) and E (*Mdn*=218.92, *Range*=2.00-1095.88), had longer lengths of stay than Ward A (*Mdn*=32 days, *Range*=0.13-703.75): Ward D, $U = 3450.50$, $z = -7.19$, $p < .001$; Ward E, $U = 6579$, $z = -7.18$, $p < .001$. Wards D and E did not differ significantly on length of stay.

Restraint rates

Of the acute care wards, Ward A recorded the highest restraint use in 2006. Over the entire data collection period, Ward A had a mean of 19.66 incidents per 100 admissions per month. Expressed as patient-based rates, this is a mean of 12.74 patients per 100 admissions per month, or more simply 12.74% of patients were restrained at least once during this period. In occupied bed days, this equates to an average over this period of 0.47 incidents or 0.30 patients per 100 occupied bed days. Restraint incidents and patients restrained decreased over this time period. One patient restrained seven times during the final six-month period of data collection led to an elevated incident-based rate. Of the other two acute care wards, Ward B recorded only

one incident of restraint in the year data was collected, and Ward C recorded five restraint incidents in nine months (8.77% of admissions).

In the two extended care wards, Ward D had no recorded incidents of restraint, while Ward E recorded two incidents of restraint in the first year of data collection (4.88 incidents/patients per 100 admissions per month).

Table 1 presents calculated rates of restraint by admissions, bed numbers, and occupied bed days.

[Table 1]

Patients who were restrained

The characteristics of restrained patients were examined for each ward. For Ward A, binary logistic regression was undertaken to assess predictors of restraint, comparing patients restrained during their hospital stay with patients who were not restrained over the three-and-a-half year period of data collection. Descriptive analysis was undertaken to examine the characteristics of the eight patients who were restrained in the other wards. The regression analysis for Ward A is presented first, followed by examination for the three other wards that recorded restraint incidents.

Patients who were restrained in Ward A

Comparing restrained and non-restrained patients

Regression analysis was conducted using *being restrained at least once during hospitalisation* (no=0, yes=1) as the dependent variable. Independent variables were gender, age, principal condition, and length of stay in hospital. Principal condition was coded into five categories (organic, including symptomatic mental disorders; mood [affective] disorders; schizophrenia, schizotypal and delusional disorders; other degenerative diseases of the nervous system; other). Organic, including symptomatic mental disorders was selected as the reference variable (i.e. other principal condition

categories were compared with this category in the regression). Length of stay was categorised by median split (≤38 days; ≥39 days), and 39 or more days was the reference variable. For gender, female was the reference variable. Table 2 presents descriptive statistics of patients who were and were not restrained for the regression variables. Ethnicity and country of birth were not included in the regression analysis due to small numbers in individual groups other than Caucasian and Australia, respectively (see Table 2).

[Table 2]

Principal condition significantly predicted whether a patient was restrained (Table 3). Odds ratios revealed that the odds of a patient being restrained were .18 and .29 times lower if they were diagnosed with a mood disorder or schizophrenic disorder, respectively, in comparison to an organic, including symptomatic mental disorder. Inverting the ratios (1 divided by the ratio), the odds of a patient being restrained were 5.56 (mood disorder) and 3.45 (schizophrenic disorder) times higher if they had a principal diagnosis of an organic mental disorder. Time also was a significant predictor, with the odds of a patient being restrained 1.85 times higher if they had a longer hospital stay (39 or more days).

[Table 3]

Further descriptive data of patients who were restrained in Ward A

There was variation in time in the hospital prior to a patient's first (or only) restraint event (*Mdn*=24 hours, *Range*=on admission-598 days into admission). However, 75% of patients who were restrained were restrained within 7.86 days of their hospitalisation, and 50% of these patients were restrained within 17.50 hours of their admission. Only seven restrained patients (9.46%) had been admitted to or came from another ward.

Sixteen out of 74 patients were restrained multiple times in the same admission, and one patient was restrained twice in two separate admissions. There were no significant differences in gender, age, or length of stay between those restrained once and those restrained multiple times during the same admission (Table 4). Cross tabulation comparing patients on diagnosis also revealed few differences in observed versus expected frequencies. Due to small numbers, these have not been reported.

Forty (54.05%) of the 74 patients restrained were on a detention order when they were restrained or, if restrained multiple times, restrained for the first time. Of these patients, 20 (50%) were on a first 21-day detention order, 18 (45%) on a 3-day detention order, one (2.5%) on a continued detention order, and one (2.5%) on another order (see Table 4 for detention status/changes for repeat patients). While there was variation between patients restrained more than once in the time between each consecutive restraint, with the exception of two patients who had 2.5-3 months between consecutive restraint episodes, the range of time between restraint incidents was from a few minutes to no more than three weeks.

[Table 4]

Patients who were restrained in other wards

In acute care wards B and C, all six patients who were restrained were female and under a voluntary admission. One patient with two separate admissions was restrained during both hospital stays. Patients were aged between 71-88 years, born outside of Australia in four cases, and all but one patient was listed as Caucasian. Range of time between admission and restraint was 1.5 hours to 7 days, and length of stay was between 17 hours and 43 days for five patients, with the sixth patient having an admission of 1625 days.

In extended care ward E, both patients were Caucasian, Australian-born, had a diagnosis of an organic, including symptomatic, mental disorder, and were under a voluntary admission. One patient was an 84 year old male with restraint occurring 100 days into a 408 day admission. The second patient was a 65 year old female restrained 3291 days into a 3396 day admission.

Restraint incidents

Examination of restraint incidents for Ward A is presented first, followed by examination of incidents for the other wards.

Restraint incidents in Ward A

There were 84 incidents of mechanical and 25 incidents of physical restraint, and two instances which involved both types of restraint. Table 5 presents why restraint was undertaken (what risk existed) and specific documented reasons, and Table 6 presents specific restraint method used and site of the restraint. Mechanical restraint was primarily undertaken to prevent the risk of harm to others (41, 48.81%) and harm to self (40, 47.62%). The most common specific reasons documented were aggression towards others (41 incidents, 48.81%) and falls (23, 27.38%), and to a lesser extent self harming (7, 8.33%) and intrusive (7, 8.33%) behaviours. The most common methods of enacting mechanical restraint were through the use of lap belts (35, 41.67%) or jacket restraints (28, 33.33%).

Physical restraint was used predominantly to prevent harm to others as a result of aggression (13 incidents, 52%) and to enable provision of medical treatment (10 incidents, 40%). The body site of physical restraint most often involved the whole body (9, 36%) or the arms (6, 24%).

Overall, while number of males and females restrained (40 male, 34 female), and number of restraint incidents (59 male, 52 female) were similar in regard to

gender, males tended to be restrained in greater numbers for aggression toward others (22 males, 34 restraint events; 10 females, 22 events). Falls exhibited little difference as a function of gender (10 males, 11 incidents; 12 females and 12 incidents).

[Table 5]

[Table 6]

There were on average 3.41 staff (*Range*=2-9) and 0.33 security staff (*Range*=0-3; 72 events involved no security staff) present. For 25 incidents, data on number of staff (attendees) and security staff present was missing. There was a tendency for more attendees for physical (*M*=3.87, *S.E.*=.33) than mechanical (*M*=3.21, *SE*=.17) restraint (not including the two mixed restraints), $t(82) = -1.93$, $p = .057$ (95% CI -1.33 to .02). For the 14 incidents using security staff, there was even distribution in number of staff between physical and mechanical restraint.

There was a large amount of missing data for restraint duration (73; 67 of these were for mechanical restraint). For mechanical restraint (17 recorded), the median event was 120 minutes (*Range*=5-495 mins), and for physical restraint (19 recorded) the median was 10 minutes (*Range*=3-225 mins). For one event using both methods, the duration was 90 minutes.

Restraint incidents in other wards

All incidents in acute care wards B and C involved mechanical restraint. Restraint was used to prevent falls, with lap belts applied to the lower body of patients. Length of time and number of staff involved were recorded for only two separate incidents, with one restraint lasting 150 minutes and another involving two staff.

Of the two mechanical restraint incidents in extended care ward E, one patient (male) was restraind to prevent harm to others through aggression (30 minutes duration, 4 staff), with the patient restrained using a lap belt applied to the lower body

and legs. The other patient (female) was restrained to prevent falls (3 staff), and this involved a lap belt used to restrain the whole body. No security staff were present for either event.

Time of restraint: all wards

Twenty-six (21.85%) restraint incidents occurred between 12a.m. and before 9a.m., 48 (40.34%) between 9a.m.-5p.m., and 45 (37.82%) after 5p.m. to before midnight.

Discussion

This study investigated restraint use in acute and extended care inpatient psychiatric services for older persons. The study adds to knowledge in the area of restraint practices in older persons' psychiatric services in Australia over time. Many previous studies have not used comparison groups, or limited data collection to a shorter period of time and/or only a part of patients' hospital stays (Lofgren *et al.* 1989, Karlsson *et al.* 1996, DeSantis *et al.* 1997, Keski-Valkama *et al.* 2010).

Differences in rates of restraint were large, with acute wards responsible for all but two out of 119 incidents of restraint. Approximately 13% of patients admitted to Ward A were restrained. Comparisons with previously published results remains difficult, due to lack of uniformity in reporting (Bowers, 2000) and heterogeneity of settings. However, from the work that is available, the rates of restraint for all wards in this study are lower than previous studies (DeSantis *et al.* 1997, O'Connor *et al.* 2004).

Patients with organic, including symptomatic mental disorders, of which dementia was the main diagnosis, were restrained at higher rates than those patients with mood or schizophrenic disorders, similar to previous research in older persons'

psychiatric settings (DeSantis *et al.*, 1997). This might also explain some of the differences between acute care wards in restraint: over 70% of patients in acute Ward B were diagnosed with mood disorders (versus approximately 35% in Ward A), and less than 5% were diagnosed with dementia (versus over 40% of patients diagnosed with dementia or Alzheimer's disease in Ward A).

The Progressively Lowered Stress Threshold Model (Hall & Buckwalter 1987, Smith *et al.* 2004) suggests that dementia results in a lessened threshold for stressors and demands which the individual is no longer able to meet, resulting in increased anxiety and, if no intervention is enacted, eventually dysfunctional behaviour. Large wards with higher numbers of patients with these disorders, such as Ward A, may therefore face particular challenges in behaviours. Differences between extended care wards, in particular Ward E where over 80% of diagnoses were Alzheimer's or dementia, and Ward A may reflect the lesser acuity of an extended care patient. Admission to extended care services may also reflect more severe dementia, with accompanying lost ambulatory and mobility function, as well as decreased behavioural or psychological symptoms (Reisberg *et al.* 2006) indicating the lesser need for restraint.

Length of stay was also related to restraint use, although the study cannot address whether this is caused by the restraint, or whether patients requiring restraint are more physically or psychologically unwell (Strumpf & Evans 1988, Lofgren *et al.* 1989, Engberg *et al.* 2008). Ward A had a longer length of stay than acute care Wards C or B (although the latter difference only approached statistical significance), which may suggest that these patients exhibited greater disturbances in behaviour and functioning and, thus, potential need for restraint. It is likely that Ward C, as a specialist medical service, focused on stabilising patients for discharge or admission to another ward.

Patients were often restrained early in their admission, a finding comparable to studies of patients of similar age range and cognitive impairment in non-psychiatric settings (e.g. Lofgren *et al.* 1989). This suggests that early on in hospitalisation when the patient is most likely to be acutely unwell, and find themselves in an unfamiliar environment which may result in confusion or fear (Muir-Cochrane *et al.* 2011b), that this may result in behaviours which staff manage using restraint. Indeed, few differences between patients restrained once or multiple times, even on length of hospital stay, suggests that restraint was used for behaviours exhibited when the patient was new to the ward.

Age and gender were not significant predictors of restraint in Ward A. This may be due to the restricted age range in the sample and the relationship between age and disorders such as Alzheimer's disease. The importance of age differences is more likely to emerge when comparing this group to other acute care inpatients, such as the findings of Keski-Valkama *et al.* (2010), that patients 18-64 years with schizophrenic and substance use disorders were more likely to be restrained than those with mood disorders or those in an 'other' group (including organic mental disorders).

The relationship between gender and restraint use has been inconsistent in previous research in psychiatric settings (Bower *et al.* 2003). In the present study, proportionally more males were restrained, and restrained for aggression towards others. This might reflect research that gender, alone, is not a stable predictor of restraint and, in the case of behaviours such as aggression, factors including gender role identification, function of the aggression, gender of the intended recipient, and what individual nurse and health practitioners believe constitutes aggressive behaviour (likely gendered as well) need to be considered (Cutcliffe 1999, Patel & Hope 1993, Milovchevich *et al.* 2001, Muir-Cochrane *et al.* 2011a).

The two main reasons for restraint were aggression and falls prevention. This focus on aggression might reflect the potential for aggression or violence in psychiatric settings (Daffern & Howells 2002), or the use of restraint rather than other interventions to handle an aggressive situation (Shepherd & Lavender 1999). Indeed, Patel and Hope (1993) highlighted that aggressive behaviour "is the most common cause of referral to a psychogeriatric service and one of the most frequent causes for admission to a nursing home or hospital" (p. 457).

The prevalence of falls in hospitalised elderly, and risk factors associated with use of particular medications or psychoactive drugs and diagnoses of dementia or cognitive impairment (Capezuti *et al.* 1998, de Carle & Kohn 2001) likely account for the higher use in these settings. However, in a systematic review and meta-analysis, Oliver *et al.* (2007) concluded that physical restraint removal "showed no evidence of significant effect on falls or fractures in either direction" (p. 84). This would suggest the need to look to fall-prevention alternatives, and that nurses need to be particularly aware of how patients with dementia or other disorders may communicate desires such as wanting to walk to accomplish a task (Capezuti *et al.* 1998).

The need-driven, dementia-compromised behavior (NDB) model (Algase *et al.* 1996) is particularly useful, with a focus on the purpose of disruptive behaviours. The model stresses that background factors, such as personality type, cognitive status, and language skills interact with more immediate proximal factors (e.g. emotions, physiological need states, physical and social environment) in the expression of these behaviours which reflect needs or goals. For example, wandering may reflect a preference for physical activity or compromised wayfinding ability, or aggressive behaviour during showering or another routine may reflect sleep disturbances (Algase *et al.* 1996). The examination of behaviours at both levels can lead to more targeted and individualised interventions (Kolanowski *et al.* 2002).

Other lesser documented risks were wandering and disinhibited behaviour. This may relate to coding (e.g. wandering as risk of falls), or that increased supervision in a ward (as opposed to at home) ameliorates some risks. Self-harming behaviour and intrusive behaviours did emerge, though in lesser degree. It may be that behaviours which are harmful but not necessarily suicidal, such as refusal to eat, are of particular concern in settings such as the one studied here (see Haw *et al.* 2009). These may require different interventions than restraint, in comparison to a more direct risk such as cutting or self hitting (e.g. head banging).

Mechanical restraint (mainly lap belts and jackets) was documented more often than physical restraint. The findings are difficult to compare to previous work, as particular types of restraint are often not differentiated in reporting of results, and what is considered a restraining device can differ. Bed rails, for example, are often not included in studies of restraint (e.g. Karlsson *et al.* 1996, DeSantis *et al.* 1997), and differences in particular restraint types differ between units (O'Connor *et al.* 2004).

No restraint exceeded 12 hours, although there were incidents that continued past eight hours. Clinical staff rarely exceeded five professionals, and often there were no security staff present. There was substantial missing data here, reflecting the importance of more complete documentation. These results, however, highlight the need for adequately-trained staff, but that consideration should be given to how a patient – particularly one who is confused – may feel with the presence of many clinical and security staff (see Bowers *et al.* 2012 regarding assembling of staff as a 'show of force'). Similarly, once a patient is restrained, monitoring by nurses to assess patient needs and possible discontinuation is extremely important, given the potential for negative health outcomes with prolonged use (Lofgren *et al.*, 1989).

Ward A demonstrated restraint reduction over time. Based on the continual use during the time period studied, however, the need for reduction goals that take

account of current use (Fisher 2003), and work toward a minimal or no restraint use policy over time would be advised. The central role of the nurse in decision-making and the actual carrying out of restraint and other containment procedures (Bigwood & Crowe 2008, Happell & Harrow 2010) highlights that "the support of nurses for reduction strategies is a crucial component for the success of any initiatives" (Happell & Harrow, 2010, p. 166). The need for staff education regarding restraint has been particularly advocated (De Bellis *et al.* 2011), and this includes attention to alternative interventions such as de-escalation, specific communication strategies, and other factors which might act as barriers to restraint reduction, such as ward culture (Cohen-Mansfield 2001, Smith & Buckwalter 2005). The importance of assessing needs of patients who engage in such behaviours is again underscored.

Limitations

Examination of incidents was based on documentation which did not provide details of specific antecedents and consequences of restraint. Data validity in this study is dependent on accurate reporting and, given the large differences between Wards A, B, C and E in restraint incidents, consideration of the potential for underreporting is needed. However, all wards operated under the same policies and procedures regarding restraint, and so underreporting is not likely to be the only factor.

The data did not provide information on other methods of containment. While there were no seclusion rooms in any of the wards, the use of chemical restraint may influence restraint rates. Future research should attempt to collect this information, perhaps through the use of a prospective design, and incorporate examination of other ward and policy variables (Fisher 2003). There is also a need to compare findings in other settings and countries, and with patients of different ethnicities. The patient

demographic profile does, however, fit with Australian national data on patients receiving specialised psychiatric care in a psychiatric hospital or unit (Australian Institute of Health and Welfare 2009a, 2009b).

Conclusion

This study has provided data on restraint use in psychiatric units for older persons. Data analysis is identified as one of the essential steps in restraint reduction initiatives (Fisher 2003), and this study has provided data over an extended period of time for a number of wards. The use of rigorous and multiple methods of rate calculation will allow future investigators to compare their results to the present findings (Bowers 2000).

Diagnosis emerged as a significant predictor of restraint. Restraint was often used to prevent aggression, a well-documented risk to nursing professionals and patients in mental health settings. The findings reinforce the imperative of focused, advanced and individualised care at early stages of admission, attention to theoretical models of dementia behaviour, and the use of data to inform reduction efforts.

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Table 1. Rates of restraint (admissions, bed numbers, occupied bed days) by incidents and persons, per year for the five wards

		Restraint		Rates of restraint					
	Patients	Incidents	Persons	(1) Admissions		(2) Bed Numbers		(3) Bed Days	
Ward				Incidents	Patients	Incidents	Patients	Incidents	Patients
A (Acute)									
2006	154	44	30	28.57	19.48	18.33	12.50	0.68	0.47
2007	148	34	24	22.97	16.22	12.32	8.70	0.51	0.36
2008	158	21	15	13.29	9.49	7.61	5.43	0.31	0.22
2009	87	12	5	13.79	5.75	8.70	3.62	0.36	0.15
B (Acute)									
2006	147	1	1	0.68	0.68	0.46	0.46	0.02	0.02
C (Ac. Med.)									
2006	57	5	5	8.77	8.77	3.70	3.70	0.27	0.27
D (Extended)									
2006	33	0	0	0	0	0	0	0	0
2007	33	0	0	0	0	0	0	0	0
2008	36	0	0	0	0	0	0	0	0
2009	31	0	0	0	0	0	0	0	0
E (Extended)									
2006	41	2	2	4.88	4.88	0.69	0.69	0.03	0.03
2007	41	0	0	0	0	0	0	0	0
2008	40	0	0	0	0	0	0	0	0
2009	18	0	0	0	0	0	0	0	0

Table 2. Comparison of restrained and non-restrained patients in Ward A

	Restrained (n=74)	Not restrained (n=421)	Total
Gender (n)			
Male	40	153	193
Female	34	268	302
Age (M (SD))	77.05 (9.04)	77.10 (7.08)	
Diagnosis (n)			
Organic, including symptomatic mental disorders	33	102	135
Mood [affective disorders]	9	164	173
Schizophrenia, schizotypal and delusional disorders	8	85	93
Other degenerative diseases of the nervous system	17	43	60
Other	7	27	34
Time in hospital (n)			
Up to 38 days	27	221	248
39 days +	47	200	247
Ethnicity (n)			
Caucasian	61	384	445
Unknown	11	35	46
Other	2	2	4
Country of birth (n)			
Australia	43	250	293
Outside Australia	21	126	147
Unknown	10	45	55

Table 3. Logistic regression for the prediction of restraint in Ward A

	B (SE)	Wald's χ^2	Odds ratio	95% CI for Odds ratio	
				Lower	Upper
Constant	-.11 (1.47)				
Gender†	.39 (.27)	1.98	1.47	.86	2.52
Age	-.01 (.02)	.42	.99	.96	1.02
Mood [affective disorders] ‡	-1.72 (.41)	18.05***	.18	.08	.40
Schizophrenia, schizotypal and delusional disorders‡	-1.25 (.44)	8.10**	.29	.12	.68
Other degenerative diseases of the nervous system‡	.12 (.36)	.11	1.13	.56	2.27
Other‡	-.35 (.49)	.49	.71	.27	1.86
Time in hospital§	-.62 (.27)	5.16*	.54	.32	.92

* $p < .05$, ** $p < .005$, *** $p < .001$

Hosmer & Lemeshow $\chi^2(8) = 5.37$, $p > .05$. $R^2 = .09$ (Cox & Snell), .15 (Nagelkerke). Model $\chi^2(7) = 44.35$, $p < .001$

† Reference category = female; ‡ Reference category = organic, including symptomatic mental disorders; § Reference category = ≥ 39 days. CI, confidence interval; SE, standard error.

Table 4. Comparison between patients restrained once and patients restrained multiple times in Ward A.

	Restrained once (n=58)	Restrained multiple times (n=16)	Differences
No. of times restrained	Once (58)	2 times (8) 3 times (2) 4 times (1) 5 times (4) 7 times (1)	58 patients restrained once, 16 patients restrained multiple times
Gender	Male (31) Female (27)	Male (9) Female (7)	$\chi^2(1, N = 74) = .04, p > .05$
Age (years)	$M = 76.74$, $SE = 1.18$	M=78.19, SE=2.33	$t(72) = .56, p > .05$ (95% CI -3.67 to 6.56)
Time in hospital (days)	*Mdn* = 53.01 *Range* = 3.01-491.63	*Mdn*= 61.38 *Range*= 10.80-1357.83	$U = 444.50, z = -.26, p > .05$
Detention order	3-day (11) 1st 21-day (13) Continued (1) Other (1) Voluntary (32)	3-day (2) 1st 21-day (4) Voluntary (1) 3-day to 1st 21-day (4) 1st to 2nd 21-day (2) 3-day to voluntary (1) 1st 21-day to voluntary (1) Voluntary to other (1) †	Few patients restrained multiple times are voluntary patients. Patients in both groups restrained early in hospitalisation

† For detention status for those restrained multiple times, 'Vol', '3-day', and '1st 21-day' refer to the patient being on this same detention order during their multiple episodes of restraint; 'Vol to other' '3-day to 1st 21-day' and so on refer to movement between detention statuses from their first to subsequent restraint event(s).

Table 5. Documented risk and associated specific reasons for restraint for Ward A.

Type of restraint	Risk	N (%)	Specific restraint reason	N (%)
1. Mechanical	Imminent harm to others	41 (48.81)	Aggression towards others	41 (48.81)
	Imminent harm to self	40 (47.62)	Falls	23 (27.38)
			Self harming behaviour	7 (8.33)
			Intrusive behaviour	7 (8.33)
			Aggression towards others	1 (1.19)
			Disinhibited behaviour	1 (1.19)
			Wandering risk	1 (1.19)
	Non provision of medical treatment	2 (2.38)	Non-compliant with treatment	2 (2.38)
	Other	1 (1.19)	Intrusive behaviour	1 (1.19)
	Total	84 (100)		84 (100)
2. Physical	Imminent harm to others	13 (52)	Aggression towards others	13 (52)
	Non provision of medical treatment	10 (40)	Non-compliant with treatment	10 (40)
	Imminent harm to self	2 (8)	Self harming behaviour	2 (8)
	Total	25 (100)		25 (100)
3. Physical and mechanical	Imminent harm to others	1 (50)	Aggression towards others	1 (50)
	Imminent harm to self	1 (50)	Self harming behaviour	1 (50)
	Total	2 (100)		2 (100)

Table 6. Body site where restraint was applied, by restraint method for Ward A

Restraint method	N (%)	Body site	N (%)
1. Mechanical			
Table Top	9 (10.71)	Lower body	6 (7.14)
		Upper body	3 (3.57)
Lap belt	35 (41.67)	Lower body	31 (36.90)
		Upper body	3 (3.57)
		Whole body	1 (1.19)
Jacket	28 (33.33)	Upper body	20 (23.81)
		Whole body	3 (3.57)
		Lower body	3 (3.57)
		Upper body and arms	1 (1.19)
		Missing	1 (1.19)
Other	10 (11.90)	Lower body	4 (4.76)
		Lower body and legs	3 (3.57)
		Upper body	2 (2.38)
		Missing	1 (1.19)
Missing	2 (2.38)	Upper body	1 (1.19)
		Lower body	1 (1.19)
Total	84 (100)		84 (100)
2. Physical	25 (100)	Whole body	9 (36%)
		Arms	6 (24%)
		Upper body	2 (8%)
		Lower body	2 (8%)
		Upper body and arms	1 (4%)
		Missing	5 (20%)
Total	25 (100)		25 (100)
3. Physical and mechanical			
Other	1 (50)	Lower body	1 (50)
Lap belt	1 (50)	Lower body	1 (50)
Total	2 (100)		2 (100)