Original Article

# Use of Physical Restraints in Nursing Homes: Current Practice in Singapore

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## Abstract

**Introduction: One of the indicators of quality care in nursing homes is the proper use of physical restraints. Restraints have been associated with multiple complications, such as pressure ulcers, incontinence and immobility. The aim of our study was to assess the indication, use and complications related to physical restraints in Singapore nursing homes. Materials and Methods: All residents aged >65 years old from 3 nursing homes were included in the study. A geriatrician reviewed the medical records of all elderly residents on restraints. Nursing staff interviews were also done to assess their knowledge regarding restraint use. A brief medical record review was also done for the elderly residents without restraints. Results: Out of 390 elderly residents, 91 were on physical restraints. The mean age of these residents were 80.1 years; 67% were female, 90.1% were Chinese and 82.4% belonged to functional category IV. Both urinary and faecal incontinence were observed in 97.8% of residents. Forty-six (50.5%) residents had no documented indication for restraints. It was noted that 20 (22%) residents were restrained to prevent dislodgement of the feeding tube, 17 (18.7%) were restrained to prevent falls and 8 (8.8%) were restrained for agitation. There were documented trials of removal of restraints for only 21 (23.1%) residents. Alternative approaches, such as diversion technique, were used for 31 (34.1%) residents to avoid restraint use. Conclusion: Our study revealed a high rate of restraint use in the nursing homes. A restraint protocol should be available in every nursing home, requiring physician approval for the long-term application of physical restraints and intermittent reviews by physicians to assess the continued need for restraints.**


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**Key words: Aged, Long-term care, Quality indicator, Restraint reduction**

## Introduction

Singapore's population is ageing rapidly. It is estimated that the proportion of elderly aged 65 and above will rise from 7.2% of the total population in the year 2000 to 18.2% in 2030.[1] Increase in life expectancy due to the availability of modern healthcare services has resulted in a large number of functionally impaired elderly citizens living in the community. These older persons require significant assistance for their medical conditions and functional impairments.

Various socioeconomic factors, such as smaller family size and dual income status, make it very difficult for family members to care for the dependent elderly. As a result, despite a long-held sense of filial piety and traditional values, increasing numbers of elderly Singaporeans are being placed in nursing homes for custodial care. Since nursing home residents are the most frail segment of the elderly population and their numbers are expected to grow rapidly, it will be a great challenge to provide quality care for them. One of the indicators of quality care in nursing homes is the proper use of physical restraints.[2]

According to the Omnibus Budget Reconciliation Act (OBRA)[3] guidelines of 1991, restraints were defined as "Any method or physical or mechanical device, material or equipment attached or adjacent to the resident's body that the individual cannot remove easily which restricts freedom of movement or normal access to one's body". Bed rails were not initially considered a restraint till 1992, when the

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OBRA guidelines were revised.

The use of physical restraints on older persons is common in geriatric care settings. However, their use has been found to vary between countries.[4] In the extended care setting for the elderly in the United States, 25% to 43% of residents had been physically restrained at least once.[5] A component of the OBRA, which took effect on 1 October 1990, declared that nursing home residents have the right to be free from physical or chemical restraints that are not required to treat specific "medical symptoms".[6] Certain characteristics of residents are often mentioned as factors that may lead to restraint use in nursing homes. Several studies showed that there is a relation between restraint use and cognitive impairment, incontinence, functional impairment, older age, history of falls, impairment of mobility and use of neuroleptics.[7-9] In the nursing home setting, restraints have been associated with pressure ulcers, incontinence and immobility.[10]

The aim of our study was to assess the indication, use and complications related to physical restraints in nursing homes in Singapore.

## Materials and Methods

Three nursing homes run by voluntary welfare organisations agreed to participate in the study. Two nursing homes had regular visits by geriatricians, but no restraint reduction programmes had been initiated at the time of study. The third nursing home had no formal geriatrician input. All nursing homes had residents with dementia. Private medical practitioners were contracted to provide medical care for residents of these nursing homes.

Only residents aged >65 years old were included in the study. Medical record reviews and physical inspections were carried out on different types of physical restraints and their related complications. For the purpose of this study, bed rails were not considered a restraint. Demographic information, medication use, indication for restraint use and attempted trials to remove restraints were obtained from casenotes. Nursing staff were interviewed to assess their knowledge of restraint use. The use of psychoactive medication among residents of the nursing homes was also noted; antipsychotics, sedatives, hypnotics, antidepressants and anticonvulsants (those not used for seizure control) were considered psychoactive medications. Brief medical record reviews were done for elderly residents without restraints to facilitate comparison between the 2 groups – with and without restraints. In Singapore, Resident Assessment Form (RAF) for nursing home residents measures the need of care for the resident on the basis of the measurement of their functional and cognitive ability ranging from functional category I-IV. Those who score <6 are functional category I, score of 7-24 is functional category II, score of 25-48 is functional category III and score >48 is functional category IV. Functional category IV residents are completely dependent for all aspects of care. Use of restraint in various functional categories of residents was compared.

The review of medical records, patients' assessments and nursing staff interviews were conducted by a geriatrician. The study was ethically approved by the authorities of all 3 nursing homes. The data were analysed using SPSS version 10.0 for Windows (SPSS Inc., Chicago, IL, USA).

## Results

Of the 520 residents staying in the 3 nursing homes, 130 were excluded from the study as they were <65 years old. Of these 130, 7 were on physical restraints. Of the 390 residents involved in the study, 91 (23.3%) were on physical restraints. Their demographic information is summarised in Table 1.

Among residents on restraints, urinary and faecal incontinence were seen in 89 (97.8%) residents. No history of falls was noted for 55 (60.4%) residents, 31 (34.1%) had at least 1 fall and 5 (5.5%) had fall-related fractures. Table 2 shows the types of restraints, related complications and various behavioural problems observed in restrained residents.

The majority of the residents (n = 50) had fewer than 5 routine medications; 50 residents were prescribed psychoactive medications and 46 (50.5%) residents were

Table 1. Characteristics of Restrained Residents (n = 91)

| | |
|---|---|
| Age (y) | 80.1 (range, 65 to 97) |
| Length of stay (mo) | 34.8 (range, 1 to 218) |
| Sex | |
| Male | 30 (33%) |
| Female | 61 (67%) |
| Race | |
| Chinese | 82 (90.1%) |
| Malay | 5 (5.5%) |
| Indian | 3 (3.3%) |
| Others | 1 (1.1%) |
| Functional category | |
| III | 16 (17.6%) |
| IV | 75 (82.4%) |
| Dementia | |
| Yes | 59 (64.8%) |
| No | 32 (35.2%) |
| Feeding method | |
| Oral | 64 (70.3%) |
| Nasogastric tube | 26 (28.6%) |
| PEG | 1 (1.1%) |

PEG: percutaneous endoscopic gastrostomy

Table 2. Types of Restraints and Related Complications

| Variable | No. (%) |
|---|---|
| Types of restraints (n = 91) | |
| One upper extremity | 15 (16.5) |
| Both upper extremity | 21 (23.1) |
| Body | 49 (53.8) |
| Mitten | 6 (6.6) |
| Restraint-related complication (n = 32) | |
| Injury | 20 (62.5) |
| Pressure sore | 3 (9.4) |
| Impacted faeces | 5 (15.6) |
| Pressure sore and injury | 3 (9.4) |
| Deep vein thrombosis | 1 (3.1) |
| Behavioural problem (n = 93) | |
| Wandering | 22 (23.7) |
| Shouting | 34 (36.6) |
| Injury to self | 29 (31.2) |
| Injury to others | 8 (8.6) |

Table 3. Cross Tabulation of Restraint Use and Dementia*

| | Dementia | No dementia | Total |
|---|---|---|---|
| Restraint use | 59 | 32 | 91 |
| No restraint use | 128 | 171 | 299 |
| Total | 187 | 203 | 390 |

*$P$ = 0.0004 (Chi-square test, significance level $P$ <0.05)

Table 4. Cross Tabulation of Restraint Use and Category IV Functional Status*

| | Category IV | Other categories | Total |
|---|---|---|---|
| Restraint use | 75 | 16 | 91 |
| No restraint use | 173 | 126 | 299 |
| Total | 248 | 142 | 390 |

*$P$ = 0.00003 (Chi-square test, significance level $P$ <0.05)

prescribed at least 1 psychoactive medication on a regular basis.

Forty-six (50.5%) residents had no documented indication for restraints. In the casenotes, it was noted that 20 (22%) residents were restrained to prevent dislodgement of their feeding tubes, 17 (18.7%) were restrained to prevent falls and 8 (8.8%) were restrained for agitation. According to the nursing staff, 31 (34%) residents were on restraints to prevent falls, 21 (23.1%) were on restraints to prevent falls and to control agitation, 20 (22%) were on restraints to prevent them from pulling out their feeding tubes, 12 (13.2%) were on it to control agitation, and 7 (7.7%) were on restraints for various combinations of the reasons mentioned earlier. Only 21 (23.1%) residents had documented trial of removal of restraints. Alternative approaches, such as diversional technique, were used for 31 (34.1%) residents to avoid the use of restraints.

Dementia was present in 59 (64.8%) residents compared to 128 (42.8%) residents without restraints ($P$ = 0.0004). When functional status was compared, Cat-IV functional status was observed in 75 (82.4%) residents in the restrained group and 173 (57.9%) residents in the non-restrained group ($P$ = 0.00003); 16 (17.6%) residents in the restrained group and 90 (30.1%) residents in non-restraint group. There were no Cat-II residents in restraint group but 36 (12%) were Cat-II in the non-restrained group.

## Discussion

The use of physical restraints is highly debated among health professionals caring for the elderly. Long-term use of physical restraints can lead to multiple medical, psychological and functional problems. It can cause falls and injuries, death from strangulation, abrasion at restraint site, incontinence of urine and stool, faecal impaction, dehydration due to lack of access to fluid, decreased functional status, deconditioning and osteopaenia. Psychological effects include increased agitation, anxiety and depression.[11] Hence, avoidance or removal of physical restraints can improve quality of life for nursing home residents.

Our study showed that a significant number of elderly nursing home residents were on physical restraints. The rate of restraint use was similar to that of American nursing homes before the introduction of OBRA regulations.[5] A statistically significant association between dementia and restraint use ($P$ = 0.0004) was observed in this study (Table 3). It appears that diagnosis of dementia is a risk factor that may predict the use of restraints in nursing home residents.

A large number of residents were on restraints due to agitation and other behavioural problems. Although demented residents are prone to agitation and behavioural problems, there was no statistically significant association between the diagnosis of dementia and behavioural problems ($P$ = 0.96). Prolonged restraint use in nursing home residents may actually increase the incidence of agitation and behavioural problems.[11]

Residents on restraints appeared to be more functionally dependent than non-restrained ones. Similar findings have been noted in previous studies.[9,12] There was a statistically significant association between restraint use and functional status of residents in category IV ($P$ = 0.00003) (Table 4). Once functionally dependent residents are restrained, they lose the chance of functional recovery through rehabilitation programmes.

Urinary incontinence frequently coexists with faecal

incontinence. Physical restraint is an important risk factor for both urinary incontinence and faecal incontinence.[13] One study revealed that urinary incontinence was independently associated with impairment in activities of daily living, body restraints, chair restraints, bedrails and use of anti-anxiety/hypnotic medications.[14]

We found that the residents on restraints were on a large number of psychoactive medications. Compared to the current practice in Singapore nursing homes,[15] restrained residents had higher use of psychoactive medications. Psychoactive medications are usually associated with an increased risk of falls in long-term care settings.[16,17] As shown in a previous study,[18] the most common reason cited for restraint use was to prevent falls. Ironically, the reduction of psychoactive medication use may actually lead to a decrease in restraint use by reducing the risk of falls.

The nursing staff initiated all restraints and the physicians supported 45 of them. For the rest of the residents on restraints (n = 46), there was no documented approval for the use of physical restraints from the physicians. It would be a good practice to seek assessment and documented approval from physicians for the initiation and continuation of long-term physical restraint use. A formal restraint protocol requiring physicians to document indication for use, trial of alternate approach, regular reviews to justify continued use and the consent of residents or their families would improve the quality of care in nursing homes.

The attitude of the caregivers may play a role in the use of restraints. Nursing staff have reported feelings of frustration, guilt and ambivalence associated with the use of physical restraints.[19-22] It has been reported that nurses regard restraints as helpful in preventing falls,[21,23] and that nurses' perception of patients' likelihood of falling is what distinguishes restrained from unrestrained patients.[24] In our study, we noted that the nursing staff caring for the residents were aware of why each resident was restrained. According to them, the indications for restraint use were to prevent falls and dislodgement of feeding tubes. They were also aware of some restraint-related complications and the most commonly cited complications were restraint site injury and agitation. However, they were not aware of other restraint-related complications, such as deconditioning, incontinence and faecal impaction. As observed by Werner et al,[25] in-service training programmes educating nurses about physical restraints aid restraint reduction by increasing the use of care alternatives.

Facility type and size, as well as the organisation of care, may influence restraint use.[26,27] Our study was done in 3 nursing homes with similar organisations of care. Therefore, we were unable to make comparisons among them. A larger study involving both private and non-profit nursing homes may address this issue.

A large number of residents were also on long-term tube feeding using nasogastric tube (NGT) and restraints were used to prevent dislodgement of the NGT. The use of percutaneous endoscopic gastrostomy, as an alternative to NGT, may reduce the need for use of restraints in nursing home residents.

Removal of restraints improves quality of life. There are contradictory reports regarding the association between removal of restraints and falls, with or without injuries. Several studies have indicated a decrease in fall rate,[28-30] while others have shown an increase.[31-33] Five studies reported no change in serious injuries following restraint reduction efforts,[31,32,34-36] 2 reported a decrease[28,33] and 1 reported an increase.[32]

## Conclusion

Our study revealed a high rate of restraint use in nursing homes. The elimination of restraints may not be possible, but significant reduction is possible and will require educating staff about alternative ways of controlling agitation and managing falls.[34] Nursing educational programmes on restraints, including the various types of restraints, proper indications for their use, related complications and alternative ways to avoid restraints would improve the quality of care in nursing homes. A restraint protocol should be available in every nursing home, requiring the physician's approval for the long-term use of physical restraints and intermittent review by physicians to assess the continued need for restraints, as well as the use of alternative approaches in managing behavioural problems in agitated residents.

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