The safety of nurses during the restraining of aggressive patients in an acute psychiatric unit

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ABSTRACT

Objective
The aim of the study was to describe patterns of injuries sustained by nurses during the restraining of aggressive patients and to identify factors in the restraining process that can be modified to improve the safety of nurses during restraining.

Design
Within-method triangulation was used in this study and involved two quantitative data collection methods.

Setting
An adult acute psychiatric unit in Victoria, Australia.

Subjects
Seven male and twenty-six female nurses.

Main outcome measures
The outcome measures are patterns of injuries and ways of reducing injuries.

Results
Incident reports showed more than half of all injuries occurred in the afternoon shift and during the holding stage of restraining. Eighty percent of the injured nurses sustained multiple injuries. Questionnaire results showed that restraining was associated with an estimated increased risk of being injured of 25% (RR = 1.25, 95% CI= 0.97 to 1.61, p > 0.05). The proportion of injuries was higher among female nurses (52.38%) compared with male nurses (28.57%), (RR=0.51, 95% CI = 0.15 to 1.74, p > 0.05). Lack of group co-ordination was perceived as the main contributor to injury. Introducing easier restraining techniques and increasing the training period were identified as ways that might improve the safety of nurses.

Conclusion
Most injuries occurred at the holding stage of restraining and in the afternoon shift. Many participants sustained multiple injuries and most of the injuries were caused by physical assaults. There is need for improving group coordination during restraining to increase the safety of nurses.

INTRODUCTION

The injuries sustained by nurses in mental health services is a global problem, and there is a worldwide concern for the safety of nurses (Duxbury and Paterson 2005; Erdos and Hughes 2001). While the core business of nursing is to improve patients' health, occupational health and safety of the people who nurse them also needs to be promoted and protected. Mahoney (1991) states that assaults of nurses by patients result in emotional responses including anger, anxiousness, sense of helplessness, loss of control and increased irritability. Physical injuries sustained from assault may heal quickly, but the emotional trauma lasts longer (Bruser 1998). This study was designed to identify ways of reducing injuries to nurses during restraining thereby promoting physical and mental health of nurses.

LITERATURE REVIEW

The use of restraining in hospitals

'*Control and Restraint*' is the most commonly taught manual technique for the management of aggression and has existed in mainstream psychiatry for approximately 15 years, yet there is little research on its safety and effectiveness (Southcott and Howard 2007). Leadbetter (1995) identified four components used when employing physical restraint, namely: the immobilisation of the subject through the use of body weight and strength; the restriction of limb movement by employing some form of hold; keeping the subject in an off-balance position; and the use of 'reasonable force'. The mental health unit which is the subject of the current study uses the components identified by Leadbetter (1995) for controlling and restraining patients.

The authors in the current study divided the restraining process into three stages in order to facilitate the description of patterns of injuries. The first stage is the restraint initiation, where nurses move towards restraining the patient. The second stage is holding, where nurses maintain the patient in an immobilised state using special holds (called 'locks'). The last stage is exit, where nurses loosen their hold on the patient and move away from the patient.

Patterns of nurses' injuries during restraining

It appears that injury of staff during restraining is not uncommon, although prevalence estimates vary. A study by Graham (2002) showed that in 81 episodes of restraint there were 13 episodes (16%) which resulted in abrasions to either patients or staff, and a study by Carmel and Hunter (1989) revealed that two thirds of staff members were injured during containment procedures and most of them sustained injuries to the body extremities.

Factors associated with nurses' injuries during restraining

Dowson et al (1999) revealed that staff injured whilst restraining patients had not been trained in restraining. Wright (2003) asserts that staff and patient injuries during restraining are caused by poorly executed and ill-defined restraining techniques. Southcott and Howard (2007) demonstrated that gender had no effect on the safety of restraining. This might be explained by the fact that female and male nurses receive the same training in restraint.

Ways of reducing injuries to nurses during restraining

The Australian Nursing Federation (ANF) (Victorian Branch) provides education to nurses on the prevention of injuries and management of violent incidents by conducting seminars on prevention of violence against nurses (ANF Victorian Branch 2009). ANF (Victorian Branch) endorsed a zero tolerance policy for occupational violence and aggression towards its members (ANF Victorian Branch 2006). The policy helps to prevent injuries to nurses because it does not accept occupational violence and aggression (ANF Victorian Branch 2006).

As there is a paucity of research conducted amongst nurses about injuries sustained during restraining of patients there is clearly a need for more study on this subject.

AIM OF THE STUDY

The aim of the study was to describe patterns of injuries sustained by nurses during restraining of aggressive patients and to identify factors in the restraining process that can be modified to improve the safety of nurses during restraining, in a mental health acute ward in Victoria, Australia. The specific objectives were:

1. To identify patterns of injuries to nurses sustained during the restraining procedure.

2. To explore nurses' perceptions of factors associated with their injuries during the restraining procedure.

3. To explore the nurses' perceptions on ways of improving their safety during the restraining procedure.

METHODS

Design

Within-method triangulation was used in this study and involved two quantitative data collection methods. Within-method triangulation "is used when the phenomenon being studied is multidimensional. For example two or three different quantitative instruments might be used to measure the same phenomenon. Conversely, two or more qualitative methods can be used" (Burns and Grove 2005, pp.226). Within-method triangulation was appropriate for this study because the phenomenon being studied was multidimensional and one method of data collection could not completely answer the research question.

Ethical issues

Approval from The Faculty Human Ethics Committee at La Trobe University, Faculty of Health Sciences (reference: FHEC09 / 244) and from the hospital ethics committee (Project number: 09280B) was obtained prior to conducting of this study. Participants were informed that they were not obliged to participate in the study and that non-participation in the study would not affect their relationship with the researchers in any way.

Setting and sample

The study was conducted in an acute inpatient adult psychiatric unit in Victoria, Australia. The 25-bed unit is in one of the hospitals of Victoria's largest public healthcare provider. The two eligibility criteria for participation in the study were: being a nurse in a psychiatric unit and being eligible to restrain aggressive patients. All 33 nurses who work in the unit were provided with details of the study because they were all eligible to participate. As the eligible study population was small any other method of sampling would have resulted in sampling error and selection bias. Potential participants included seven male and twenty-six female nurses with an age range of 19 to 62 years. Two consecutive weekly meetings were used to recruit participants. Participant information sheets were distributed during the meetings and also placed in the mail pigeon-holes of those who did not attend the meeting. A recruitment advertisement was also displayed on the nurses' notice board.

Data collection

There were two data collection phases. The first was through the analysis of incident reports; the second was through a questionnaire.

Incident reports

Data on patterns of injuries to nurses sustained between January 2008 and December 2009 were retrieved from Incident Reports stored in the hospital "RISKMAN" database. Data items collected included: time of injury; type of injury; causes of injuries; gender; and the stage of restraining procedure when injury took place. The incident reports were de-identified to ensure the anonymity of nurses and patients.

Questionnaire

The questionnaire was designed to collect data about the nurses' perceptions of factors associated with their injuries, patterns of nurses' injuries, and on ways of improving staff safety during the restraining procedure, and also included questions generated through the RISKMAN review of incident reports. The researcher distributed the consent form, withdrawal of consent form, and questionnaires to the participants to complete on their own time. Anonymity of all participants was maintained throughout the study.

Reliability and validity

Incident reports are accepted as valid and reliable instruments in Australia and worldwide as they have been used to generate injury surveillance data for many years, including data about injuries to patients and nurses in hospitals. A pilot study was carried out on a group of nine Master of Public Health students during a thesis workshop in order to determine face validity and reliability of the questionnaire. Validity was also established by use of triangulation of incident reports and questionnaire.

Data analysis

Data were analysed using the statistical package Stata/IC 10.0. Descriptive statistics were used to analyse data. Fisher's exact test was used to test the association between variables. A statistical significance level of $p < 0.05$ was used. A content analysis was undertaken to analysis qualitative responses from open ended questions.

FINDINGS

Findings from incident reports

Patterns of injuries

Twenty-two incidents of injuries to nurses while restraining aggressive patients were identified in RISKMAN. Twenty-one incidents of injuries were caused by physical assaults and only one had an unspecified cause. The review also revealed that six nurses sustained upper limb injuries; five sustained head injuries, see Table 1. Most injuries occurred during the afternoon shift (twelve), followed by morning (seven) and night shift (three). The analysis of injuries by restraining stages demonstrated that holding stage had the highest frequency of injuries (54.55%), followed by initiation stage (27.27%) and exit stage (18.18%).

Table 1: Types of injuries by causes of injuries (n=22)

Causes of injuries	Types of injuries							Total
	Head	*Chest*	*Upper limbs*	*Lower limbs*	*Abdomen*	*Unclassified*	*Multiple*	
Physical assault by patient	5	1	6	3	1	2	3	21
Unspecified cause	0	0	0	0	0	1	0	1
Total	5	1	6	3	1	3	3	22

Findings from the questionnaire

Of the 33 questionnaires distributed thirty were returned, giving a response rate of 90.9%. Three participants did not participate in restraining. Of the twenty-seven participants who were involved in restraining, twenty-four were trained in restraining. Table 2 summarises the characteristics of the participants.

Table 2: Characteristics of nurse participants

Characteristics	N=30 Group n	Injuries reported	No injuries reported	Relative risk, 95% confidence limits, 2-sided Fisher's exact test
Sex				RR = 0.51, (95% CI = 0.15 to 1.74)
Male	7	2	5	p >.05
Female	23	13	10	
Age group				
< 25 years	4	1	3	
26 to 35	10	6	4	
36 to 45	4	3	1	
46 to 55 years	10	4	6	
> 55 years	2	1	1	
Involved in restraining	27	15	12	RR = 1.25 (95% CI= 0.97 to 1.61) p >
Not involved in restraining	3	0	3	0.05
Refresher course				RR = 6, (95% CI = 0.91 to 39.31) p <
Attended refresher course (21)	21	14	7	.05
Had not attended refresher course (9)	9	1	8	
Use of recommended technique				
Did use technique	11	4	7	RR = 0.56, 95% CI = 0.74 to 4.15
Did not use technique	17	11	6	
Non-response)	2			

Patterns of injuries

Participants injured while restraining patients

Fifteen (55.56%) participants reported that they had been injured whilst restraining. Restraining was significantly associated with an estimated 25% increased risk of being injured. Eleven participants sustained injuries through physical assaults; seven through falls and two participants did not know how they sustained injuries. Some participants sustained injuries from both physical assaults and falls. Twelve participants sustained multiple injuries; two had back injuries and only one sustained abrasions.

Participants' injuries by gender and age

The proportion of injuries was higher amongst female compared with male participants. Being male was associated with an estimated reduced risk of being injured of 49%, although this was not statistically significant. Participants aged 36 to 45 years had the highest proportion (75%) of participants who were injured compared with other age groups. Participants aged 25 years and below had the lowest proportion (25%) of participants who were injured.

Participants' injuries by restraining stages

The holding stage of restraining had the highest frequency of injuries (62%), followed by initiation stage (33%) and exit stage (5%).

Participants' injuries by refresher course

Fourteen out of twenty-one participants who attended the refresher course in restraint training were injured and only one out of nine of those who did not attend a refresher course were injured. Attending refresher course was associated with an estimated increased risk of being injured of six fold.

Participants' injuries by use of recommended restraining technique

Recommended techniques were commonly not used when restraining, and injuries were much less common in those who did use the correct technique with an estimated reduced risk of being injured of 44%. Out of nine participants who gave their reasons for not using recommended restraining technique, five recorded that the technique was not applicable; two forgot the technique and the other two recorded that they forgot the technique and that the technique was not applicable.

Perception of nurses on factors associated with their injuries

Some participants provided more than one response to this question. Twenty-one participants believed that injuries were caused by lack of group coordination. Seventeen participants recorded that training was not implemented correctly and ten participants perceived that some patients knew the restraining procedure and used it against staff. Only six participants recorded unconducive/ dangerous environment (for example wet floor) as a factor that contributed to their injuries.

Ways of improving nurses' safety

Table 3 shows the broad themes identified in the analysis of responses to open ended questions on ways of improving the safety of nurses during the restraining procedure.

Table 3: Improving nurses' safety

Themes	Response rate (%)
Increasing training period	39.13%
Improving team work	21.74%
All staff need to be trained	17.39%
Introducing easier restraining techniques	13.40%
Using de-escalation methods	8.70%

DISCUSSION

The aim of the study was to describe patterns of injuries sustained by nurses during restraining of aggressive patients and to identify factors in the restraining process that can be modified to improve the safety of nurses during restraining. The research objectives were used to guide the discussion of the findings.

The results revealed that many participants (55.56%) were injured despite training. This is contrary to the study by Dowson et al (1999), which revealed that staff injured while restraining patients were not trained in restraining. The 95% confidence interval for the population relative risk and the two-sided Fisher's exact test showed that the risk of being injured was the same for those involved in restraining and those not involved in restraining. The researchers have not identified any peer-reviewed literature with which to compare these results. There are nurses who avoid participating in restraining because of fear of being injured during restraining; these results might encourage them to participate in restraining.

Injuries were most common in the age group 36 to 45 years. It can be speculated that the participants in that age group might have worked more shifts and restrained more than the other age groups or they worked less shifts; participated less in restraining and hence forgot how to use the recommended restraining techniques.

There were a higher proportion of injuries among female participants compared with male participants and, although in this study the relationship between gender and injuries is not statistically significant, this is consistent with a study by Southcott and Howard (2007), which demonstrated that gender is not related to the safety of use of a restraining procedure. The high proportion of injuries among female participants is a concern and requires further attention.

Both incident reports and questionnaire results have demonstrated that the majority of the nurses were injured during the holding stage of restraint compared with other stages. Explanations for this might be that the restrainers became less cautious because at that stage the patient was fully restrained or the restrainers got tired during the holds. These findings suggest that nurses need to be more cautious during the holding stage. There is no published literature to compare these results with; however the results are valid because two methods of data collection gave similar findings.

Another concern is that participants who attended the refresher course were more likely to be injured than those who did not attend the refresher course. The relationship between attending the refresher course and sustaining injuries while restraining aggressive patients was statistically significant, and we have not identified any published studies with which to compare our results. The refresher course was probably more focused on the prevention of injuries to patients and overlooked the safety of nurses, and nurses who attended the refresher course were more likely to engage in restraining more often than those who did not attend the refresher course.

Injuries were more common among participants who were not using recommended restraining techniques compared with those who used recommended techniques. These findings are consistent with Wright's (2003) study which revealed that, staff and patient injuries are caused by poorly executed and ill-defined restraining techniques. The restraining techniques were inapplicable to the situation and / or forgot the techniques at the time of restraining were the most common reasons given by the participants for not using the appropriate restraining techniques. There is a need to modify the restraining techniques so that they become applicable to all restraining situations.

Both incident reports and questionnaire showed that physical assaults were the leading cause of injuries to nurses and falls were the least cause of injuries. There is no published literature for comparison.

The incident reports we analysed showed that upper limb injuries were the most common injuries sustained by nurses followed by head injuries. The questionnaire revealed that the majority of those injured sustained multiple injuries. Graham's (2002) study showed that there were 13 episodes of abrasions to either patients or staff out of 81 episodes of restraint, and is consistent with the study which showed that only one out of twenty-seven participants sustained abrasions.

The incident reports also showed most injuries occurred during the afternoon shift and there is no published literature for comparison. This study was not designed to identify temporal patterns of injuries and associated reasons, and further research is required to find out why injuries are more common at this time.

Many participants attributed their injuries to training not being implemented correctly and lack of group coordination. It can be speculated that lack of group coordination was caused by lack of effective communication among restrainers.

More than half of the participants perceived that restraint training needs improvements and this supports the study results by Southcott (2002), which revealed that although staff were generally satisfied with the restraint training, they did identify some gaps. Some participants perceived that introducing easier restraining techniques; improving team work; increasing restraint training period; and using de-escalation methods may improve the safety of nurses. Increasing training periods may provide nurses with more time to master restraining techniques.

LIMITATIONS OF THE STUDY

1. The sample size was too small to generalise the results to all acute psychiatric units in Victoria.
    However, it is possible that despite the requirement to report work-related injuries not all are reported.

2. There were more female participants than male participants.

3. The questionnaire was only tested for face validity.

The authors feel that these limitations were minimised and did not significantly affect the quality of study results.

CONCLUSIONS

This study is of paramount importance to the safety and well-being of nurses and patients. The study has shown that nurses working in the acute psychiatric units remain at risk of being injured during the restraining of aggressive patients. If easier restraining techniques are introduced; restraint training period is increased and group coordination during restraining is reinforced, it could evoke a greater sense of safety and confidence when dealing with aggressive patients.

RECOMMENDATIONS

Recommendations for nursing practice

The study has confirmed that nurses are injured while restraining patients and suggests the need for the use of safer alternative methods and the need to reduce the use of restraint in psychiatric units.

Nurses are recommended to improve group coordination during restraining and to use recommended restraining techniques in order to reduce injuries during restraining. Psychiatric units are encouraged to introduce easier restraining techniques and increase restraint training period to help restrainers to master the techniques.

Nurses should advocate for their safety during restraining aggressive patients because if they do not advocate for themselves then that equates to apathy in the work place, and very little will change to improve their working conditions.

Recommendations for further research

1. The study showed that most injuries occurred at the restraining stage, therefore further research is needed to explore why this is so.

2. There is an urgent need for more research on a state level on the safety of nurses during the restraining procedure using a large sample size in order to generalise the results.

3. There is need for further study to evaluate the effectiveness of restraint refresher course.

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