Assessing the effectiveness of clinical education to reduce the frequency and recurrence of workplace violence

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KEY WORDS

Workplace violence, high risk for violence, pro-active management, clinical education

ABSTRACT

Objectives
This study assessed the effectiveness of clinical education to identify patients with a high risk for violence and to reduce the frequency of violent incidents.

Design
A before and after design with an education intervention.

Setting
Data were gathered from the direct care staff and from records of violent/aggressive incidents which occurred on two adult medical wards at a teaching hospital in Western Australia.

Subjects
Nurses, Assistants in Nursing and Patient Care Assistants working on the study wards participated in the education intervention (n=65) and completed a questionnaire before and after the education. Details of 48 violent/aggressive incidents perpetrated by 21 patients were examined.

Intervention
An education program addressed four key areas (assessment, planning, implementation [crisis], post incident). Case studies and in-patient scenarios provided context, immediacy and relevance, and 77% of the staff completed the program.

Main outcome measure
Knowledge, confidence and capability of direct care staff to prevent/manage violent/aggressive incidents were measured. Incident data measured the frequency and recurrence of violence/aggression, and if perpetrators met the high risk criteria.

Results
Post education, knowledge increased significantly (p=0.001, CI 0.256-0.542), the use of verbal de-escalation increased significantly (p=0.011, 1df) and the frequency and recurrence of incidents decreased. All perpetrators met criteria indicating a high risk for violence.

Conclusions
Education and coaching provided by clinical experts resulted in increased knowledge, greater use of verbal de-escalation and less incidents. However, more time/coaching is required to improve the perceived capability of clinical staff to manage these incidents.

INTRODUCTION

Workplace violence (WPV) is a worldwide problem (Gates et al 2011; Brennan 2010; Chapman et al 2009a; Peek-Asa et al 2009; Shields and Wilkins 2009, Luck et al 2007; Hegney et al 2006). It includes incidents that cause physical and psychological harm to employees from abuse, threats and assaults in circumstances related to their work. Worldwide, violence in healthcare is estimated to comprise a quarter of all WPV and is a major occupational hazard within health (Commission for Occupational Safety and Health 2010; World Health Organization 2002).

Violence and aggression cannot be completely removed from hospitals as there is potential for violence whenever people congregate (Mental Health Adult Program April 2010). As numerous strategies to reduce WPV had been implemented at an 850 bed adult teaching hospital in Western Australia, there was concern when a 12% increase in incidents occurred in 2011 and when 27 patients were involved in recurring WPV incidents in the first quarter of 2012. At this time generic training comprised an initial training day, followed by a 2.5 hour annual practical refresher with an e-learning module. Training aimed to maintain safety using primary, secondary and tertiary interventions; however, it was not ward/unit specific, was conducted away from clinical areas and consequently omitted feedback during real incidents.

It was thought that ward specific training may address these limitations by facilitating the transfer of knowledge to practice, developing skills identifying problems and implementing prevention strategies. Therefore, a study was designed to assess the effectiveness of a clinically based education program, with three objectives, to:

- assess the effectiveness of clinical education to enable staff to identify patients with high risk for violence;
- assess the influence of clinical education on the frequency of WPV; and
- determine if incidents by repeat perpetrators of violence were influenced by the education strategy.

METHODS

A before and after study was designed with an educational intervention. To assess knowledge, confidence and capability of staff related to managing violence and aggression, assessments of these attributes were taken before and after the education. In addition, six months retrospective incident data and six months prospective data were collected before and after the education intervention.

Sample

A convenience sample of direct care staff on two medical wards participated. They included Registered Nurses (RN) – 41 pre, 45 post; Enrolled Nurses (EN) 15 pre, 17 post; Assistants in Nursing (AIN) – 3 pre, 5 post and Patient Care Assistants (PCA) – 6 pre and post; to give a population of 65 pre and 73 post. All WPV incidents that occurred six months either side of the education intervention were included.

The Intervention

Four key areas (assessment, planning, implementation [crisis], post incident) formed the basis of the education. Hypothetical case studies were augmented by in-patient scenarios to provide context, immediacy and relevance. Education was presented daily during the staff overlap time (2-3pm) and for permanent night duty staff, aiming for 66% to complete the four key education areas and was conducted from 6 February to 13 May 2013.

Data Collection

Data were collected from two sources: 1) staff completed a self-administered questionnaire and 2) data related to violent/aggressive incidents were obtained from hospital records.

The staff questionnaire assessed knowledge with open questions, and confidence and perceived capability to prevent/manage workplace violence/aggression on a 1-5 Likert Scale. It was administered before and after the education to measure the effect of the education on these attributes. Envelopes containing the questionnaires and a return envelope were sent to staff members, and returned by internal mail to the researcher.

Retrospective and prospective data related to incidents of violence/aggression were obtained from hospital records. These included records of Code Black incidents, Staff Accident and Incident (SAIR) forms, Hazard forms and Clinical Incident Forms (CIF), with additional information obtained from the patient's notes. This information was collated on a data collection tool, which included long established indicators for a high risk of violence/aggression (Kling et al 2011; Drummond et al 1989). The purpose was to measure the frequency and characteristics of incidents before and after education to assess the effectiveness of the program. All incidents perpetrated by patients towards staff in the time frame on the study wards were included.

Analysis

Data from the staff questionnaires and the violent/aggressive incidents were managed in SPSS Statistics 20. Categorical data were presented as frequencies, proportions and percentages, and continuous data as means and median. Comparison of means, correlations, and odds ratios were computed, with the alpha set at $p=0.05$. Scores from specific summed Likert Scale questions (knowledge, confidence, capability) were calculated and logarithmic transformation performed prior to linear regression of these three scores.

Validity and Reliability

The education intervention was considered to be 'best-practice' as it was based on current research, therefore demonstrating content validity. Although not a validated tool, the staff questionnaire had content and face validity as it was designed specifically to evaluate the effectiveness of the education. This was pilot tested with a convenience sample of 23 nurses and three PCA's from non-study areas. Fifty eight percent were returned on the first and 52% on the second occasion, with reminder emails sent. Test re-test reliability was assessed using the combined scores for knowledge to give a Pearson's r = 0.986 and a combined score for the Likert Scale questions to give a Pearson's r = 0.96. Internal consistency was assessed with Cronbach's Alpha, with homogeneity demonstrated for the three questions relating to confidence (0.93) and two questions relating to capability (0.78).

Ethical Consideration

Ethics approval was obtained from the Human Research Ethics Committee. Information sheets explained the studies purpose. Returned staff questionnaires implied consent was given and as no names were obtained, anonymity was ensured. Although identification of staff and patients were necessary to follow-up incidents, these details were excluded from reports. All data were stored securely with access limited to those involved.

RESULTS

Staff Questionnaire: Response, Demographics and Education

The percentage of returned staff questionnaires before and after the education intervention was similar: 65 pre-questionnaires were mailed and 28 returned (43%) and 73 post-questionnaires were mailed with 31 returned (42.5%).

No significant difference was observed in the gender, age group, professional experience, employment group, work status or rostered work between the pre and post staff (table 1). The majority were female, RN, with more than five years professional experience, aged more than 30 years and working full time but not on permanent night duty. Forty-seven staff completed all four key areas of the education intervention (77%).

Table 1: Demographic details: pre and post questionnaire respondents

	Pre (*n=28*)	Post (*n=30*)	Statistic
Gender			
Male	3	3	*p=1.0* (1df)*
Female	25	26	
Age Range (years)			
<30	8	6	
30-39	7	9	*p=0.67* (4df)*
40-49	4	5	
50-59	8	6	
>60	0	2	
Professional Experience (years)			
<5	12	14	
5-10	5	7	*p=0.54* (4df)*
11-20	5	3	
21-30	5	3	
>30	0	2	
Employment Group			
Nurse RN	23	19	
Nurse EN	5	7	
AIN		1	
PCA		1	
Work Status			
Full Time	21	26	*p=0.78** (1df)*
Part Time	7	6	
Permanent Night Duty			
Yes	3	1	*p=0.35* (1df)*
No	25	28	

*Fisher's Exact Test **χ^2

Staff Questionnaire: the Effect of Clinical Education on Confidence, Capability and Knowledge

Data from three Likert scale questions relating to confidence were summed to give a combined confidence score. Likewise, responses to two Likert scale questions relating to capability to deal with aggression were summed to give a combined capability score and an overall score from four questions assessing knowledge were summed to give a knowledge score, with a potential score of 10. No data were missing and data were not normally distributed (table 2).

Table 2: Descriptive summary of confidence, capability and knowledge scores

	Knowledge Score (/10)		Confidence Score (/15)		Capability Score (/10)	
	Pre	Post	Pre	Post	Pre	Post
N	28	31	28	31	28	31
Median (IQR)	6.0 (4-7)	8.0 (7-9)	10.0 (9-12)	11.0 (10-12)	6.5 (5-8)	7.0 (6-8)

Logarithmic transformation was performed prior to linear regression of the three scores (table 3), which showed a statistically significant difference between the pre/post education scores for knowledge (p=0.001).

Table 3: Summary of linear regression

Variable	Log*prepost questionnaire	F Statistic	P (CI)	r2
Knowledge Score	1.725 – 0.399	$_{1,49}$ 31.504	0.001 (0.256-0.542)	0.391
Confidence Score	2.37 – 0.023	$_{1,55}$ 0.239	0.627 (-0.073-0.119)	0.004
Capability Score	1.848 – 0.045	$_{1,55}$ 0.372	0.545 (-0.104-0.195)	0.007

Violent/Aggressive Incidents: Data Sources and Staff Involved

Most of the incident data was obtained from security reports and patient notes, with the least obtained from CIF and SAIR forms (table 4). The perpetrators' URMN enabled their notes to be sourced to obtain further information.

Table 4: Incident data sources

Data Sources	Pre / Post Frequency		Combined Frequency	Percentage %
Security Data & Patient Notes	18	13	31	64.6
Patient Notes	7	3	10	20.8
SAIR	2	0	2	4.2
Security Data	1	1	2	4.2
SAIR, CIF & Patient Notes	1	0	1	2.1
SAIR, Security Data & Patient Notes	1	0	1	2.1
CIF, Security Data	1	0	1	2.1
Totals	31	17	48	100.0

Although details are incomplete (table 5), the majority of staff involved in the WPV incidents were female (78.8%), RN (68%) worked full time (58.6%), with the majority of incidents involving a single nurse (58.7%). They had been employed for a median of 54 months (IQR 11-103 months) with almost half (48%) employed for less than four years.

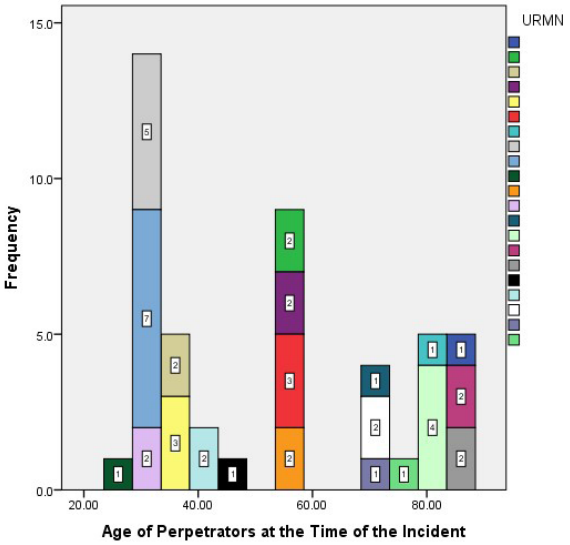
Table 5: Characteristics of staff involved in violent/aggressive incidents

Variables		Number	Valid %
Gender	Male	6	18.2
	Female	26	78.8
	Unknown	1	3.0
	Missing	15	
Employee Status	Full Time	17	58.6
	Part Time	9	31
	Casual / Agency	3	10.3
	Missing	48	
Employment Position	EN	3	8.6
	RN	24	68.6
	AIN	1	2.9
	PCA	1	2.9
	Cleaner	1	2.9
	Security Officer	2	5.7
	Medical Staff	3	8.6
	Missing	13	

Violent and Aggressive Incidents: Perpetrators and Incidents

There were 48 violent/aggressive incidents, with the majority (n=35, 73%) perpetrated by 14 males, who initiated between one and seven incidents each. Twelve incidents (25%) were perpetrated by seven females, with between one to three incidents each, plus an incident where the gender and age was unknown. The known ages of the perpetrators was 26 to 88 years, with a median of 55 (IQR 33-73 years). These data were not normally distributed, with figure 1 demonstrating the spread of the age and the frequency of the repeat perpetrators (URNM omitted to maintain anonymity).

Figure 1: Age of perpetrators at the time of the incident



All known perpetrators (47 of 48), met the criteria indicating a high risk for violence/aggression. The most frequent high risks categories were a history of violence, a history of substance abuse and confusion related to delirium/dementia (table 6). More than one high risk category could apply.

Table 6: High risk characteristics observed in the perpetrators of violence

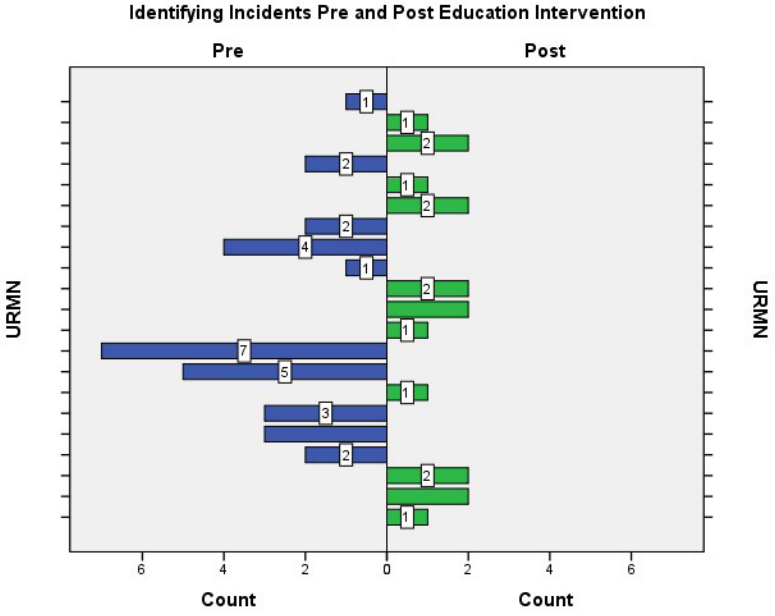
	High Risk		
	Yes	**No**	**Total**
History of Violence	32	15	47
History of Substance Abuse	22	25	47
Confusion related to Delirium/Dementia	21	26	47
Non Traumatic Cerebral Problem	16	31	47
Chronic Pain	15	32	47
Current Substance Abuse	14	33	47
History of Substance Intoxication	9	38	47
Head Injury	5	42	47
Current Substance Intoxication	3	44	47
Serious Mental Illness & Acute Psychosis	3	44	47
Serious Mental Illness & Antisocial Personality Trait	3	44	47
Postictal	2	45	47
Hypoglycaemia	1	46	47
Serious Mental Illness & Personality Disorder	1	46	47

In addition to a history of violence, 83% (n=40) of the perpetrators demonstrated adverse behaviours during their current admission. Most incidents occurred in the ward areas (n=44, 92%); one in a bathroom and three outside the ward. There was a six day median between admission and the incident (IQR 3-30 days), with a non-normal data spread. Physical and actual incidents were the most common (n=35 each) followed by verbal incidents (n=23), with potential and near misses (n=6 each) less common and significantly more potential incidents post education (p=0.02, 1df).

Violent and Aggressive Incidents: the Effect of Clinical Education

Violent/aggressive incidents decreased by 45% following education, with the proportion of recurring incident also decreasing. Pre-education seven of 30 incidents were the first incident (this admission); post-education eight of 17 incidents were the first incident. Although not significant ($\chi 2$ p=0.08, 1df), less incidents were generated by the same patient. Figure 2 displays the incidents pre/post education. Before the education 10 patients were responsible for 30 incidents, with the most frequent reoffender perpetrating seven incidents. Following education there were 17 incidents from 11 patients, with a maximum of two incidents each.

Figure 2: Frequency of incidents per patient pre and post education



Verbal de-escalation in the immediate crisis increased significantly post education (p=0.001, 1df), although there was no increase in other crisis management activities: medications administered (p=0.1, 1df), withdrawing (p=0.61, 1df), activating code black (p=0.32, 1df), physical (p=0.2, 1df) or mechanical restraint (p=0.79, 1df). Furthermore, no significant changes were observed in the ongoing management post education: patient review (0.37, 1df), management plan (p=0.14, 1df) or medication review (p=0.2, 1df).

DISCUSSION

All perpetrators in this study were admitted to general medical wards with medical disorders. However, they also had characteristics that posed a high risk of violence: a history of violence, substance abuse and cognitive dysfunction (Stewart and Bowers 2013; Pich et al 2010; Luck et al 2007). Therefore, as these perpetrators met the criteria for high risk of violence, their behaviour was predictable. Healthcare workers must remember that a past history of violence is the greatest predictor of future violence (Ferns 2005), that an estimated 40% of admitted patients have substance abuse issues (alcohol and drugs) (Phillips 2007) and of the violence

potential within cognitive dysfunction (Luck et al 2007). Furthermore, they need to monitor behaviours used by Emergency Department (ED) nurses (Luck et al 2007) and non-ED nurses (Chapman et al 2009b), that serve as warnings of potential violence. These behaviours are summarise within the acronym STAMP: **S**taring and eye contact, **T**one and volume of voice, **A**nxiety, **M**umbling and **P**acing (Luck et al 2007).

Patient assessment is one of many preventative interventions required to address violence in healthcare, in combination with security systems, zero tolerance policies, organisational support, flagging/alert systems and education/training (Kling et al 2011; Kling et al 2006). Although training demonstrates short term success reducing violence (Kling et al 2011; Zarola and Leather 2006) there is evidence that recognising predictors of violence and implementing de-escalation influences the outcome of potentially violent situations (Jackson et al 2014; Chapman et al 2009a, 2009b). As a consequence of this study, and to align with the literature, training was amended to pro-actively promote early recognition of the predictors of violence and development of de-escalation strategies to avert exacerbation of violence (Jackson et al 2014; Chapman et al 2009b). Pro-active training promotes prevention rather than management of incidents and aligns with the WorkSafe Code of Practice (Commission for Occupational Safety and Health 2010).

Due to their social, medical and violence history, difficulties were experienced securing discharge accommodation for some perpetrators. Consequently, they exceeded the average length of stay (2.6 days) and perpetrated multiple incidents during their admission (eight, 12, 45 and 114 days). Frustration at this perceived lack of care may have contributed to recurring episodes of violence (Roche et al 2010). It is recommended that patients with known mental health illnesses are 'fast-tracked' to appropriate wards/units to reduce the risk of violence (Pich et al 2010), with a relationship identified between waiting for placement and violent/aggressive incidents (Roche et al 2010). Difficulties placing patients who meet the high risk criteria for violence can be anticipated at the time of admission and priority should be given to finding suitable places to ensure a safer workplace.

An advantage of the education intervention was that it placed experts within the study wards. This significantly increased knowledge and the use of verbal de-escalation, resulting in fewer incidents and recurring incidents. However, confidence and capability of the staff did not increase. These qualities may require more time to develop and may benefit from ongoing input from experts. Capability, (perceived ability, confidence and self-assurance to deal with conflict) was described as essential to prevent WPV (Zarola and Leather 2006), and raises concerns related to this study. Therefore, it is recommended that early contact is made with clinical experts when high risk patients are first identified, rather than following an incident, and that key ward staff are trained and mentored to develop confidence in managing patients with a risk for violence/aggression.

As the majority of staff were female nurses it is not surprising they were involved in the majority of incidents or that full-time staff were involved in more incidents. However two vulnerable groups stand out and align with literature: incidents involving a single nurse and staff with ≤48 month experience (Roche et al 2010). As a mechanism to protect staff from patients who pose a risk of violence, staff should not enter the patient room alone (Kling et al 2011). A prerequisite is that patients are assessed to identify those with a high risk for violence, that the risk is documented (notes and handover sheets) and verbally reported at shift changes and to everyone involved. When a history of violence/aggression is known, vigilance is required, as it is the greatest indicator of future behaviours (Pich et al. 2010; Chapman et al 2009b; Luck et al 2007). By contrast to the less experienced vulnerable group, nurses with more experience appear to be able to recognise signs that predict violence and then to take steps to de-escalate the situation (Roche et al 2010). Although all staff are at risk, this highlights the increased vulnerability of those with less experience and the need to reinforce these details within training sessions.

Limitations of this study include the sample size with incidents from just two wards. Furthermore, under-reporting is anticipated with these incidents inevitably omitted.

CONCLUSIONS

The purpose of this study was to assess the effectiveness of a clinically based education intervention. An outcome was that knowledge related to violence/aggression improved significantly as did the use of verbal de-escalation, and consequently both the frequency of incidents and the number of recurring incidents decreased. The education intervention provided information and coaching by clinical experts, with the results suggesting that access to clinical expertise enhanced the development of skill managing violence/aggression. The prevalence of violence within general hospitals is unlikely to spontaneously decrease. Therefore, it is essential to embrace pro-active strategies and have a planned response rather than reacting to incidents. This will ensure staff are better prepared to manage patients with a high risk for violence.

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