

Impact of hospital security programmes and workplace aggression on nurse perceptions of safety

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Aim To assess how nurses' perception of their safety and risk of violence was affected by their work environment and whether this perception correlated with their actual risk.

Background The work environment has an impact on nurses' perception of their risk of violence and this perception affects worker productivity, quality, employee retention, worker satisfaction and their actual safety.

Methods A cross-sectional survey was conducted in person of 314 emergency department nurses and 143 psychiatric nurses, and assault data was collected from injury logs.

Results This study found that nurses in the emergency and psychiatric units differed in their perception of violence and safety. The workplace elements that led to a perception of lower risk of violence were not correlated with a lower rate of injury from violent acts. The nurses' beliefs about the adequacy of security equipment, security guards and the frequency of verbal abuse were strongly correlated with perceived safety.

Conclusion Several factors that influence nurses' perception of their risk of violence are not well correlated with their actual risk.

Implications for nursing management Managers must address workplace elements that affect nurse perceptions because this has an impact on quality and employee retention. They must also address factors that have an impact on the actual risk of violence because this study showed, for the first time, that these may differ from perceptions.

Keywords: nurse perception, safety, security, workplace violence

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Introduction

Violence against health-care workers is a significant occupational health problem. Potential for violence

affects nurse performance, job satisfaction, employee turnover and retention, and patient satisfaction (Jackson *et al.* 2002, Hegney *et al.* 2010, Roche *et al.* 2010, Gates *et al.* 2011). Nurses who experience aggression

tend to become more apathetic toward patients and less caring, and this can lead to poor care and less patient satisfaction (Astrom *et al.* 2004, Josefsson *et al.* 2007, Gates *et al.* 2011). Nurses have reported much higher personal stress levels as a result of perceived risk of violence (Gates *et al.* 2011). McNamara *et al.* (1997) showed that 11% of people visiting an urban emergency room would choose not to return because they did not feel safe while seeking medical care. The true costs of violence in health care thus go far beyond the direct costs resulting from violent behaviour to include indirect costs associated with the effects of a violence-prone environment. These indirect costs will be larger for hospitals in which the staff and the public perceive a high risk for violence.

There is very little literature published with regard to hospital characteristics as they affect the perception of safety. Several researchers have shown that metal detectors within emergency departments (EDs) improve the perception of safety among both the public and employees (McNamara *et al.* 1997, Mattox *et al.* 2000). These investigators also found that the public did not object to the use of metal detectors upon entry into the ED and only a small percentage of the public visiting an ED felt that searching bags upon entry was an invasion of privacy; the majority of workers did not object to the use of metal detectors (McNamara *et al.* 1997, Mattox *et al.* 2000). They also found that the use of metal detectors resulted in a significant number of weapon confiscations upon entry into the ED (Irvin & Habas 1999, Mattox *et al.* 2000). However, the same number of assaults continued to occur with the use of metal detectors, although these did not involve weapons (Rankins & Hendey 1999).

Available literature regarding occupational risks has classified assault risk factors for nurses into three broad categories: work tasks, work environment and personal characteristics. For example, work tasks such as intimate personal care activities and activities that significantly invade the private personal space of the patient are more risky (Hahn *et al.* 2010). The work environment can also have an impact on the risk of violence. For example, Gacki-Smith *et al.* (2009) showed that in the hospital ED the night shift tends to be more problematic. In contrast, the night shift in nursing homes tends to be quiet because the residents are often asleep (Astrom *et al.* 2004). Although individual characteristics of nurses are an independent risk category, studies that have explored the role of job experience and age have had mixed results (Astrom *et al.* 2004, Lawoko *et al.* 2004, Hahn *et al.* 2010). Patient characteristics, such as geriatric populations

serviced in nursing homes, may have a high rate of aggressive behaviour because many of the residents have conditions, such as dementia, that predispose them to violent behaviour.

Studies have shown that a nurse's definition of violence (Isaksson *et al.* 2008) and a medical receptionist's definition of violence (Bayman & Hussain 2007) are quite dynamic and highly variable. Context matters greatly in terms of whether a health-care professional will consider an aggressive act as 'violence'. Magin *et al.* (2011) have also shown that the context and a person's own experiences will greatly affect their perception, in some cases resulting in greater sensitivity and in other cases less sensitivity to actions that could be considered violent. Many nurses do not report aggression in the workplace because they consider it as just 'part of the job' and do not believe it will yield a beneficial result (Erickson & Williams-Evans 2000). Isaksson *et al.* (2008) found in their surveys that many behavioural health nurses felt that aggression resulting from mental health issues was not violence but rather a symptom of the patient's disease. In contrast, occupational health professionals and advocates for workplace safety consider violence in a broadly defined context. As summarized by Hahn *et al.* (2010) and the Centers for Disease Control (CDC) National Institute for Occupational Safety and Health (NIOSH) (2002) violence is any aggressive act that includes verbal as well as hostile physical actions including, but not limited to threats, spitting and derogatory comments.

The analysis presented here is part of a larger study evaluating security initiatives in hospitals located in New Jersey and California (Peek-Asa *et al.* 2007, 2009). This analysis examines job-specific and hospital security programme characteristics that may influence staff perceptions of safety and whether these characteristics are associated with reported employee assault rates.

Aim

The aim of this study was to assess how nurses' perception of their safety and violence was affected by their work environment and whether this perception correlated with their actual risk.

Methods

Study population and setting

The study population included ED and psychiatric unit staff nurses in California and New Jersey counties of at

least 250, 000 residents. Hospital locations selected for the assessment were sampled to represent all hospitals in each respective state, by type and location. Hospital types were grouped into categories of trauma hospitals and general acute care facilities with 300 beds or more and general acute care facilities with fewer than 300 beds. Hospitals were randomly selected from these strata to maintain a representative distribution of hospital types in both New Jersey and California. A total of 168 EDs and 73 psychiatric units participated in the study.

Design

This was a mixed methods study design where hospitals were selected for participation using stratified random sampling. Information from each hospital was collected through multiple sources, but this analysis used data primarily from in-person interviews. Details are provided by Peek-Asa *et al.* (2007, 2009). In summary, a cross-sectional survey of hospital security programmes was administered to staff nurses working at the selected New Jersey and California hospitals from 2003 to 2005. There were a total of 457 nurse interviews; of these, 314 were emergency department nurses and 143 were psychiatric nurses. Interviews were conducted in person using a structured interview form that was evaluated for content and face validity using standard methodology and pilot-tested before use. Some questions on the structured interview used Likert scales and others were open ended. Demographic data and personal identifiers were not collected during interviews with the exception of questions pertaining to job title and work experience.

Two ED and two psychiatric nurses at each participating hospital were interviewed on-site during their shift; this took approximately 15 min each to complete. In 22 instances with ED nurses and three instances with psychiatric nurses, the nurses initially scheduled were unable to participate because of emergencies that required attention in their medical unit at the time of the interviews and therefore only one nurse from that unit was interviewed. These in-person interviews included questions regarding the nurse's attitude and beliefs about their safety and their hospital's security programme. In particular, the survey included questions about how safe the nurse felt while working, their perception of the effectiveness of the security programme, their perceptions about the effectiveness of security guards and environmental controls, their perceptions of the workplace violence training programme, violence prevention policies, reporting systems for

violent events and their perception of hospital management's commitment to safety.

Employee injuries that are required by the United States Federal Occupational Safety and Health Administration (OSHA) to be recorded and reported on OSHA 200 logs that resulted from assaults were determined through an analysis of on-site records at each location. Incidents of violence against staff within each ED or psychiatric ward were obtained from OSHA 200 logs for a 10-year period covering 1992 to 2001. The average rate of assaults was calculated based on this data abstraction for the period from 1996 to 2001, which is the 5-year period after the California Hospital Security Act came into effect. Denominator data were abstracted from the New Jersey Department of Health and Senior Services (NJDHSS) Division of Health Care Quality and Assessment and the California Office of Statewide Health Planning and Development to calculate the rate of OSHA recordable injuries resulting from assaults. Employee-hour data of ED staff and psychiatric staff from 1996 to 2001 were abstracted for each enrolled hospital. The total number of employee person-hours worked served as a proxy for the risk of injury from exposure to violence and was used as the denominator to calculate annual average assault rates for each hospital ward from 1996 through 2001. Using an average gave a better representation of the assault risk in each hospital, which was particularly important because data on OSHA recordable injuries for later years was not available for this analysis.

Analysis

This data was used to: (1) determine which elements of the security programme make nurses feel safe; (2) calculate the odds ratio of explanatory factors for the outcome of nurses feeling safe; and (3) to determine if the factors found to make nurses feel safe are associated with lower OSHA recordable injury rates resulting from assaults. All analyses were conducted using SAS v9.2 (SAS Inc., Cary, NC, USA).

Analyses were conducted separately for ED and psychiatric nurses. Initially, cross-tabs forming 2 × 2 tables were created to evaluate the frequency distribution of survey responses by nurses that felt safe and those that did not feel safe while at work. Fisher's exact tests were run on these frequency distributions. Emergency department nurse responses were then further analysed using logistic and linear regression whereas analysis of psychiatric nurses was limited to the observations in the cross tabs. Logistic and multiple linear regression analysis of survey responses was not warranted with the

psychiatric nurses because the statistical power was not high enough to draw inferences as only five psychiatric nurses felt unsafe some of the time (~4%) out of 143 psychiatric nurses interviewed. The level for significance in the Fisher's exact tests, logistic regression and linear regression was set at a *P*-value of 0.05.

Odds ratios for emergency department nurses were calculated using univariate logistic regression where the outcome variable was whether the staff member indicated they felt safe (1) or felt unsafe (0) and the explanatory variable was one of the factors thought to be potentially related to the nurses' perception of safety. The explanatory variables considered included how long the nurse had been in their current position, how long the nurse had been in the health-care field, whether they had received training about workplace violence, whether they felt their security equipment was adequate, whether they felt that the security guards were adequately trained and experienced, whether they felt the response time for security to respond to a violent event is adequate, if they felt that security and staff work together effectively, whether they felt security was important to senior management, whether they worked the night shift, whether they worked more than 10% of their time on the night shift, whether they had experienced frequent verbal abuse while at work or had been assaulted, whether they received updates on patterns of violence and whether they received information about individual violent events and methods for prevention. Frequent verbal abuse was defined as one verbally abusive incident per three shifts or more. Explanatory factors for emergency department nurses were then selected for multivariate logistic regression if they were significant in the univariate analyses.

Multiple linear regression was used to determine if factors identified as having an influence on nurse perception of safety were predictive of the assault rate in the hospital. Emergency department data was evaluated using a forward selection procedure in SAS v9.2.

Results

Emergency department and psychiatric nurses surveyed in this study were similar in the level of their job experience, similar in their self-reports of being assaulted on the job, and similar in their feelings about the adequacy of the response time for security guards to respond to a violent event (Table 1). The data in Table 1 was taken from 2 × 2 tables of nurse type (ED or psychiatric) by interview response and only includes respondents who answered yes to the question posed in Table 1. In some cases, nurse interview data was missing so the total for

Table 1
Comparisons of nurses perceptions of safety and violence in the emergency department and psychiatric unit

Participant responded 'yes' to	Emergency department, nurses % (n)	Psychiatric unit nurses, % (n)	Fisher's <i>P</i> -value
Job experience			
Nurses <1 year experience health-care field	11 (34)	10 (15)	1.0
Nurses <1 year experience in current job	11 (34)	16 (24)	0.09
Perceptions of safety and violence experience			
Felt unsafe	14 (43)	4 (5)	<0.001
Frequent verbal abuse	18 (57)	27 (39)	0.03
Frequent verbal abuse and felt unsafe	6 (18)	1 (2)	0.002
Assaulted and felt unsafe	5 (17)	1 (2)	0.04
Perceptions of the unit's workplace violence programme			
Security equipment deficient	49 (149)	23 (31)	<0.001
Guards deficient	43 (119)	33 (36)	0.066
Security response time inadequate	11 (31)	8 (9)	0.37
Violence training	86 (268)	100 (143)	<0.001
Regular updates of violence trends	27 (81)	59 (85)	<0.001

each category may not equal the total sum of nurses that were interviewed. For example, only 298 out of the 314 ED nurses who participated answered the question about whether they felt safe at work. The per cent is the percentage of nurses who responded to a given question, which roughly approximated the total number of nurses who participated overall.

Nurses in the ED were significantly more likely to report feeling unsafe (14%) than nurses in the psychiatric unit (4%, *P* < 0.001). However, a significantly higher proportion of psychiatric nurses (27%) reported frequent verbal abuse than did ED nurses (18%, *P* = 0.03). The experience of violence in relation to feeling unsafe was very different by type of nursing unit. In the ED, 6% of respondents reported frequent verbal abuse and feeling unsafe, and 5% reported that they had been assaulted and felt unsafe. In contrast, only approximately 1% of the nurses in psychiatric wards who reported frequent verbal abuse felt unsafe and 1% of psychiatric nurses who were assaulted reported feeling unsafe.

Nurses in the ED were significantly less positive about their safety environment. Nearly half of the ED nurses surveyed reported deficiencies in the security equipment and 43% reported deficiencies in security guards. In contrast, only 23% of nurses in psychiatric wards reported deficiencies in security equipment and 33% reported that security guards were deficient. Inadequate

Table 2

Results of univariate logistic regression on emergency department staff interview data where outcome variable modelled is nurses feeling secure

<i>Model explanatory variables</i>	<i>Odds ratio point estimate</i>	<i>Odds ratio confidence interval</i>	<i>P-value</i>
>1 year in current job	0.34	0.08–1.47	0.15
>5 years in health-care field	1.067	0.388–2.934	0.9004
Received violence-based safety training	1.757	0.773–3.992	0.1785
Felt security equipment is adequate	4.852	2.23–10.545	<0.0001
Felt security guards are adequately trained and experienced	4.332	1.998–9.392	0.0002
Felt security response time was adequate	8.731	3.885–19.623	<0.0001
Felt security and staff work together well during violent incidents	4.423	0.953–20.529	0.0576
Felt security was of high importance to management	2.358	1.148–4.841	0.0194
Worked the night shift	1.200	0.145–9.905	0.8656
Worked more than 10% of their time on the night shift	0.525	0.238–1.159	0.1109
Infrequent verbal abuse (less than one incident every three shifts)	4.112	2.048–8.256	<0.0001
Never been assaulted	1.263	0.650–2.452	0.4912
Regularly received reports about violence	3.176	1.202–8.393	0.0197
Received information about individual violent events	2.265	1.039–4.938	0.0397

response time was reported infrequently by both ED (11%) and psychiatric (8%) nurses, and this did not differ significantly. Psychiatric nurses were significantly more likely than ED nurses to report that they received violence training (100 vs. 86%) and received regular updates about violence trends (59 vs. 27%; Table 1).

The univariate logistic regression demonstrated that seven of the explanatory variables analysed were significantly associated with the nurses' perceptions of safety in the workplace (Table 2). These factors included whether they felt their security equipment was adequate, whether they felt that the security guards were adequately trained and experienced, whether they believed the response time for security to respond to a violent incident was adequate, whether they had been frequently verbally abused while at work, whether they received updates on patterns of violence, whether they received information about individual violent events and methods for prevention, and whether they felt security was important to senior management.

The multivariate model included variables that were significant in the univariate analysis but that did not have strong correlations with other predictor variables.

Table 3

Multivariate logistic regression results where outcome variable was whether the emergency department nurse felt safe (1) or unsafe (0) and the explanatory variables were security response time, frequent verbal abuse, adequacy of security equipment, receiving regular updates on violence, and security being important to management

<i>Model explanatory variables</i>	<i>Emergency department nurses felt safe</i>		
	<i>Odds ratio point estimate</i>	<i>Lower Wald confidence limit</i>	<i>Upper Wald confidence limit</i>
Security response time adequate	5.4	2.0	15.1
Infrequent verbal abuse (less than one incident every three shifts)	3.8	1.6	9.0
Security equipment adequate	3.8	1.5	9.4
Received regular updates on violence	1.8	0.6	5.3
Security is important to management	1.8	0.8	4.1

The response time of security guards was highly correlated with security guard adequacy, and response time was more significant in the univariate model. Similarly, patterns of violence represented the same construct as individual violence and therefore only patterns of violence was included in the multivariate model. The multivariate logistic regression model demonstrated that adequacy of security equipment, response time and frequent verbal abuse defined as one verbally abusive incident per three shifts or more had a statistically significant impact on the nurses' perception of safety. Specifically, the multivariate model showed that ED nurses who were not frequent victims of verbal abuse were almost four times as likely to feel safe compared with those who were frequent victims of verbal abuse. ED nurses who felt that their security guard response times were adequate were more than five times as likely to feel safe at work compared with nurses who did not feel the response time was adequate. ED nurses who felt their security equipment was adequate were almost four times as likely to feel safe compared with nurses who did not feel their security equipment was adequate (Table 3).

The comparison of variables collected during the ED nurse interviews with the actual assault rates within the hospital demonstrated that the workplace features described in Table 3 were not predictive of the assault rate within the hospital. The adequacy of the security equipment and adequacy of the security guards had P -values >0.5 and verbal abuse had a P -value of 0.15 and an R^2 of 0.009, so none of the variables modelled predicted the assault rates in the hospitals.

Discussion

Specific factors affected the nursing staff perceptions about their safety, including similarities and differences between ED nurses and psychiatric nurses, and the fact that workplace features that improve nurses' perception of their safety may not actually lower assault rates within their unit.

The ED and psychiatric nurses surveyed in this study were similar in their level of job experience, similar in their self-reports of being assaulted on the job and similar in their feelings about the adequacy of the time for security guards to respond to a violent event. However, significant differences were also found between the two groups of nurses surveyed. Major differences between the groups included ED nurses generally feeling less secure, less confident in the security equipment and guards, and having less training and updates compared with psychiatric nurses.

The study demonstrated the impact of a person's work environment, the culture of that environment and the specific training of the nursing specialty. In general, comparison of the ED and psychiatric nurses showed that ED nurses generally felt less secure than psychiatric nurses despite the fact that both groups have significant assault risk. One reason could be that inpatient psychiatric nurses tend to deal with a population they know to some degree: often patients in psychiatric units have a diagnosis and are receiving treatment that has, or will soon stabilize their illness, and psychiatric nurses may better understand deviant human behaviour and therefore be less frightened by it. Interestingly, psychiatric nurses who were verbally abused were significantly less likely to feel threatened than ED nurses who were verbally abused. This may be the result of psychiatric nurses having more training and better skills in de-escalating patients and that inpatient psychiatric nurses may know their patients better and hence be better able to judge the threat potential of abusive comments. This may also result from the higher potential of family members to be abusive to nurses in the ED, whereas interaction with a wide range of family members may be less frequent for inpatient psychiatric units. A family member who becomes verbally abusive cannot have their abusive behaviour attached to a medical condition and hence the behaviour is likely to be considered inexcusable and more frightening to nurses. The ED nurses also are more likely to encounter patients who are seeking drugs, which may have an impact on their attitude towards patients. Psychiatric nurses also seemed to be more tolerant of abusive behaviour

because they tended to strongly link this behaviour with the patient's condition and ascribe it as an expression of mental illness. Therefore, violent or hostile behaviour may not be viewed as 'violent' and therefore perceived as less threatening. Psychiatric nurses may also be more likely to consider their reaction to patient behaviour as an integral part of the treatment the patients receive and therefore be more focused on de-escalation.

We found that factors associated with nurse's perceptions of safety were not strongly associated with actual rates of violence in hospitals. A lack of frequent verbal abuse, perceived adequacy of security equipment and a perceived adequate response time for security to respond to a violent incident were very strongly associated with the ED staff feeling secure at work. However, these same factors were not predictive of the actual assault rate within the hospital. Therefore, there may be a disconnect between the staff perceptions of their safety and their actual safety. This is particularly problematic when trying to train and assist staff in recognizing their risk and may reduce the effectiveness of interventions that require nursing staff to adequately perceive their risk. It also demonstrates the influence of security programme features that are visible to staff and have a positive perception among nurses. For example, hospitals spend large sums of money on security equipment and the comfort it gives to nursing staff may be more significant than the actual realized benefits in terms of risk reduction. It is likely that nurse perception of their safety is most heavily influenced by security features that they can easily perceive, such as a security camera or adequate security guards. This is important because the climate of safety and its perception is an important factor in job satisfaction, job performance and retention of nurses in the workforce.

Limitations

This study had several limitations, including potential recall bias among survey respondents. In addition, the time-frame evaluated for the assessment of assault rates and staff perceptions is limited because the two time-frames differ in that interviews were conducted from 2003 to 2005 and the assault data was from the period 1996 to 2001. Although we recognize this limits the analysis, assault data were not available for later periods and we believe that taking an average over the 5-year period in close proximity to when the staff interviews were conducted helped to reduce any bias that may have resulted.

Conclusion

The findings from this study demonstrated that ED nurses and psychiatric nurses perceive their safety differently, which is likely a result of the particular characteristics of the environments where they work, their background and how each group defines 'violence'. The ED nurses work in an environment where they do not know the patients, the unit is open and anyone can walk in at any time, family members are frequently involved and the acute nature of treatment does not allow patients to feel they have control; therefore it is highly stressful and emotional situations are commonplace. The ED nurses also have less training in human behaviour, less time to cope with deviant behaviours and are less likely to excuse hostile behaviour by attributing it to a patient's medical condition. This study found that elements of the workplace that make nurses feel safe might not actually result in a lower risk of assault. This is not to say that improved perceptions of safety are not valuable from a job satisfaction standpoint, but this perception may be misleading to nurses when assessing their own risk of violence. Nurses' perceptions regarding the risk of violence are based on many factors and in some cases this perception may deviate from the reality of the risk.

Implications for nursing management

Managers must address workplace elements that affect nurse perceptions because this has an impact on quality and employee retention. They must also address factors that have an impact the actual risk of violence because this study showed, for the first time, that these may differ from perceptions. Nurses' perceptions that they are safe, or not safe from violence are affected by many factors that may not be related to their risk of assault. This results in discordance between nurses' perceptions of their safety and their actual risk of violence. Nurses that perceive themselves as safe may be at greater risk of injury from violence because their perception obscures their true risk of violence.

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Conflict of interest

The authors have no conflicts of interest.

Ethical approval

This study was approved by the University of Iowa, University of North Carolina, and New Jersey Department of Health and Senior Services Institutional Review Boards (IRB) for the protection of human subjects initially in 2004 and reviewed annually thereafter. All interviews obtained verbal informed consent and all activities followed the IRB-approved protocols.

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