An Evaluation of Violence Risk Screening at Triage in one Australian 

Emergency Department 

Submitted by 

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Abstract

Background

There is an increasing focus in the published literature on the problem of patient violence in hospital emergency departments (ED). Patient violence negatively impacts staff safety and ultimately the quality of care provided to patients. Research and clinical practice guidelines indicate that the prevention of patient violence in hospital EDs requires a systematic process for identifying patients who are at risk; however the evidence supporting the implementation of risk screening processes in practice is limited.

This research was conducted to evaluate the processes and outcomes of a violence risk screening decision support process at triage in one Australian ED. A decision support process for identifying patients at risk of becoming violent was developed and integrated into usual patient assessment practices at point of entry (triage). An evaluation of the risk screen process was then conducted to measure its influence on staff, patient, and organisational outcomes.

Design

A mixed methods design incorporating both qualitative and quantitative approaches was utilised. Three studies were sequentially conducted to; explore the feasibility and need for a risk screening process, implement a brief risk screening process and evaluate its influence on the use of security and clinical responses to incidents of patient violence (Code Grey events).

Setting

The study site was a level one trauma centre located in Melbourne, Australia. This ED has an annual census of 60,000 presentations with a 40% admission rate.
Methods

Study One was conducted to explore the need for, and feasibility of, violence risk screening in practice. Semi-structured observations of triage nurses conducting routine patient assessments were made at the study site. In addition, a retrospective analysis of Code Grey responses matched with demographic and clinical information was performed to characterise the patients and situations in which Code Grey responses were activated. Patient and carer interviews were performed to explore the public perceptions and acceptability of violence risk screening at triage.

In Study Two, the violence risk screening decision support process was developed and pilot tested. Levels of agreement between independent raters was determined using the risk screening process for a series of triage assessments.

In Study Three, a before and after evaluation was conducted of the risk screening process for its influence on Code Grey responses and access to clinical care. Analysis of the predictive ability of the risk screening process including estimates of its sensitivity and specificity, likelihood ratios and predictive values were performed. Matched pair analysis compared triage nurse self-efficacy before and after the intervention.

Results

In Study One structured observations of routine patient assessment at triage (N=167) found nurses used the existing triage process to identify at-risk individuals. Based on their assessments the nurses identified a small number of patients requiring risk assessment (6%:10/167) This integrated approach to determining risk was observed to be used in all cases and deviated from standard operating procedure that recommended the use of pre-scripted questions.

The 12-month retrospective review of Code Grey responses (N= 1959) identified a high risk group of patients who attended the ED on more than one occasion and required a Code Grey response for violence. Although this group represented 12% (105/857) of patients, they accounted for 32% (577/1796) of all
Code Grey events audited. Of the 950 presentations requiring a Code Grey, 67% (639/950) were male, 66% (623/950) arrived by ambulance and 36% (350/950) were referred for a mental health assessment. Factors such as arriving escorted by police and requiring a mental health assessment significantly increased the risk of an individual having a Code Grey response while in the ED (OR=18.88; 95%CI=12.9,27.97; OR=11.68, 95%CI=9.13,14.94 respectively). Analysis of the Code Grey data showed that 25% (500/1959) of events occur at entry points to ED and 50% of a Code Grey responses occurred within the 77 minutes of arrival to the ED.

Patient and carer interviews found there is a community expectation that patients at risk of violence are identified to allow an opportunity for prevention and improve safety (N=19).

In Study Two, pilot testing of the risk screening process showed that triage nurses correctly identified 52% (122/233) of the patients who required a Code Grey response. Emergency department nurses (n=6) reviewed the triage notes for a sample (n=29) of patients not correctly identified at risk of violence. There was an acceptable level of agreement between triage nurses 69-82%, (kappa .25-.65). Of the 29 presentations of patients who required a Code Grey but were not identified at triage, 45% (13/29) did not have warning signs for violence at triage.

In Study Three following the introduction of the violence risk screening decision support process, the proportion of Code Grey response at triage reduced from 29% before (258/904) to 22% after (200/897) implementation p<.001. The median duration of Code Grey events decreased from 14 to 13 minutes p<.009. The proportion of planned Code Greys increased from 52% (468/904) before to 62% after (556/897) p<.001. The sensitivity of the risk screening process was estimated at 56% and the specificity 97%.

The total number of coercive interventions (physical restraint, medication given during the Code Grey and mechanical restraint) increased from 822 before to 1007 after p<.001. The median time from triage to first Code Grey increased from 71 minutes before (IQR=7-226) to 124 after (IQR=21-304) p<.001. Patients who
required a Code Grey response were seen more quickly by medical staff (Median=47, IQR=19-106) compared to baseline data (Median=51, IQR=14-114) \(p<.002\).

The revised violence risk screen resulted in ED nursing and medical staff being alerted to risk of violence by the electronic alert symbol for 61% (494/817) of Code Grey responses.

**Conclusion**

On arrival to ED, the risk for violence was determined by the triage nurse using clinical judgement. This process was found to be feasible, acceptable to clinical staff, integrated into current triage processes, and reflected the public’s expectations of care. Communication of risk was facilitated using the existing clinical information system and normal work flow within the ED. High risk patient groups and locations were identified. Not all patients who require a Code Grey response were found to have observable warning signs at triage.

Following the intervention there was an overall reduction in time staff engaged in emergency responses for aggression. Access to care was unchanged following the introduction of the risk screening; however the increase in the use of coercive practices following implementation of the risk screening process is of concern and warrants further exploration.
Student Declaration

This is to certify that

☐ the thesis comprises only my original work towards the PhD;

☐ due acknowledgement has been made in the text to all other material used; and

☐ the thesis is less than 100,000 words in length, exclusive of tables, maps, bibliographies and appendices.

Catherine Elizabeth Daniel

Date__/__/__
Declaration of Researcher's Interest in the Study

I have a nursing background spanning 26 years and my experience has mainly focused on clinical work in acute mental health services. I have worked with a Management of Clinical Aggression prevention training team at the study site from 2006 until 2013. I have completed a Masters degree by research that evaluated the implementation of a mechanical restraint policy and developed resources to support staff in approaching care within a restraint minimisation framework.

My current clinical role is in Consultation Liaison Psychiatry where I have worked as a liaison nurse since 2003. In this role I have worked with the Violence in ED Action Group and the Mental Health and ED Liaison Group to improve process and support staff who care for people who require mental health assessment and treatment. My clinical role involves direct patient assessments, developing policies, and providing education to nursing, medical, and allied health staff.

It is from this clinical role and collaboration with ED that the first violence risk screening tools were drafted, discussed and debated. Although this tool originated from mental health liaison group the intention has always been to identify the risk of violence for all patients, not just those require a mental health assessment.

The revision and implementation of the violence risk screening process has provided a consistent approach for staff and has been integrated into triage nurse practice and existing IT infrastructure. This process has been supported and acceptable to ED nursing and medical staff.
Acknowledgements

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I would like to acknowledge the support and contribution of my supervisors, Associate Professor Marie Gerdtz, Associate Professor Stephen Elsom, and Associate Professor Jonathan Knott. My supervisors have been generous with their time, knowledge and support. I would also like to acknowledge Ms Roshani Prematunga who provided advice on statistical analysis. Within the ED, I would like to acknowledge Ms Elizabeth Virtue (Nurse Manager ED) who has a long standing commitment to research and initiatives to improve the management of patients who may present a risk of violence but require emergency care. Dr Matthew Walsh, Emergency Physician, developed the violence risk symbol and altered the triage screen to pilot the revised process.

During my candidature, Professor Nick Santamaria chaired panel meetings, provided support, and encouragement in completing this thesis. In addition Professor Joy Duxbury, Chair of Mental Health Nursing, University of Lancashire, attended Progress meetings and a global view to both my confirmation and completion seminars.

This research was possible due to collaboration between mental health services and ED and the long standing commitment to The Violence in ED Action Group and the ED and Mental Health Liaison Group. The original concept of violence risk screening was generated from clinicians in these groups, particularly Mr Michael Bruce and Dr Jenny Dakis. This foundation work has provided the basis for this thesis.

Guidance from Professor Graham Hepworth, Statistical Consulting Centre at The University of Melbourne provided advice and invaluable suggestions to improve my knowledge of statistics. I am indebted to the staff at the School of Nursing for providing infrastructure, training programs and support that facilitated
my learning and development of research skills. I would also like to express my gratitude to the nurses, patients and carers who participated and shared their ideas and expertise. The participants have contributed to my understanding of the complexity of the violence in ED and the success of violence risk screening is a credit to the nurses and doctors at The Royal Melbourne Hospital ED.

Finally, I would like to thank my extended family and children, Bailey and Blake, who supported me to complete this research. I have a deep appreciation of my family and professional opportunities that I have been fortunate to receive. I am hopeful that this contribution to knowledge will assist and support the excellent nurses and doctors who provide emergency care every day for patients at risk of violence.
Glossary

**Ascribe Symphony™.** Ascribe Symphony™ is the electronic medical record that is used to record triage interaction, and care provided while in ED.

**Clinical Aggression.** At the study site the term Clinical Aggression is used in the aggression prevention program and is defined as an attempt, threat or offer to do harm to people or property with or without forethought. An act or gesture which suggests that violence may occur (Melbourne Health, 2005, p. 10).

**Emergency Department.** The emergency department (ED) is a 24 hour primary care department located in an acute care hospital. Emergency departments provide initial treatment to people who present with a variety of illnesses and injuries some of which are life-threatening and require an immediate response. On presentation to the ED all people are screened according to presenting problem and level of urgency.

**Enhanced Crisis Assessment and Treatment Team (ECATT).** ECATT is a multidisciplinary team of mental health professionals that provide an acute mental health assessment for patients who are in the Emergency Department. These clinicians provide a 24-hour service and are part of the area mental health service.

**Patient Alert.** Patient alerts are recorded on iPM which refers to the hospital electronic registration system. The alert identified can relate to the risk of violence, allergic reactions to medication or limitations of medical treatment. The information recorded is retained for subsequent admissions to forewarn staff of the particular risk.
Management of Clinical Aggression (MOCA). MOCA is a training program for hospital staff in the prevention and management of aggression and violence.

Mechanical Restraint. Mechanical restraint is the application of any device (including, but not limited to category one and category two restraints) attached to or near a person's body which cannot be controlled or easily removed by the person and which deliberately prevents or is deliberately intended to prevent a person's free body movement to a position of choice and/or a person's normal access to their body (Royal Melbourne Hospital, 2013)

Melbourne Health Code Grey Database. Security officers record the time, location, duration, type and interventions conducted at every Code Grey response. This information is recorded in the Code Grey database.

Patient. The term patient will be used describe a person who receives care in ED. The term patient will encompass consumer and ED Service User.

Physical Restraint. Physical restraint is recorded at the study site when security have to touch the person in any way during an emergency response. This can range from holding a person against their will to guiding a person with their hand.
**Planned Code Grey.** At the study site a Planned Code Grey is when “Staff anticipate a risk due to an unarmed threat including aggressive behaviour where any person (patient, visitor, intruder) could potentially threaten injury to others or themselves. In anticipating a situation, staff may afford themselves the opportunity to develop a planned and coordinated response, utilising resources in their area in conjunction with Security Officers, thus minimising the risk of injury to all involved.” (Royal Melbourne Hospital, 2014, p.17).

**Risk.** The effect of uncertainties on objectives whilst previously the standard focused on risk as being the chance of something happening that will have an impact on objectives; (AS/NZS ISO 31000 Risk Management).

**Risk Screening Tool.** A risk screening is used to identify a level of risk and involves a brief review in which the clinician identified the presence or absence of risk. Risk screening often involves a checklist to be completed which is brief and able to be completed with information available in the clinical interaction.

**Self-efficacy.** A “person’s beliefs in ones capabilities to organise and execute the courses of action required to produce given attainments” (Albert. Bandura, 1997, p.3).

**Triage.** A triage system is the basic structure in which all incoming patients are categorised into groups using a standard urgency rating scale (Gerdtz et al., 2007). Triage category refers to the Australasian Triage Scale (ATS) level of acuity priority based on the severity of their presentation and is rated from 1 (immediately life-threatening) to less urgent (category 5).
**Unplanned Code Grey.** At the study site an Unplanned Code Grey is when “Staff perceive an immediate risk due to an unarmed threat including aggressive behaviour where any person (patient, visitor or intruder) threatens injury to others or themselves” (Royal Melbourne Hospital, 2014, p.17).

**Violence.** The term violence has been used to capture all behaviour that may be considered by ED staff to present a potential or immediate risk of violence to the patient or others. This includes any situation that may require a security presence to support staff to manage a clinical situation. The terms violence and aggression are often used interchangeably so the term violence has been used to provide consistency and includes behaviours that may be considered aggressive or violent.
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Chapter One: Introduction

This thesis describes the implementation and evaluation of a violence risk screening process that identifies patients who are at risk of violence on arrival to the emergency department (ED). This approach is based on the premise that early identification of those individuals who are at risk of becoming violent will provide staff with the opportunity to plan for prevention. The theoretical basis for this approach is informed by a conceptual model that identifies environmental, situational and patient related factors for aggression and violence and links these to management strategies to prevent violence (Duxbury, 2002).

In this chapter the background, context and setting for the thesis will be provided. The purpose and process of the initial assessment for all ED patients will be outlined. An overview of definitions and concepts used to describe and measure aggression and violence in healthcare will be presented. The research questions, aims, and design will be introduced and an overview of the thesis structure will then be provided.

Definitions of Violence and Aggression in Health Care Settings

There is now an extensive body of literature reporting on the problem of patient violence in different healthcare settings. A major gap in the published literature which remains largely unresolved, is the lack of a standard definition that differentiates the phenomenon of patient aggression and violence in health care settings from other types of violence that occur within the wider community (Bushman & Anderson, 2001; Rippon, 2000).

The World Health Organisation defines violence as, “the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation” (Butchart, Phinney, Check, & Villaveces, 2004, p. 5). Despite this definition, the language used to define aggression and violence in healthcare settings, remains problematic and the two terms, aggression and violence, are often used
interchangeably (Glassman, 1995). These concepts are strongly influenced by the context in which the behaviour occurs (Whittington, 1997). Aggression in particular can be difficult to classify because subjective factors influence individual interpretations of behaviour that may, or may not, be perceived as aggressive or violent (Lau, Magarey, & McCutcheon, 2004). This lack of definitional clarity severely limits comparisons in the reporting and measurement of incidents (Kennedy, 2005).

Violence has been further classified into sub-types that include specific observable behaviours. Physical violence has been defined as, “the use of physical force against another person or group that results in physical, sexual or psychological harm. It includes amongst others beating, slapping, stabbing, shooting, pushing, biting and pinching” (International Labour Office, International Council of Nurses, World Health Organization, & Public Services International, 2002, p.4). Psychological violence, is defined as, “the intentional use of power, including the threat of physical force, against another person or group that can result in harm to physical, mental, spiritual, moral or social development. It includes verbal abuse, bullying/mobbing, harassment and threats” (International Labour Office, 2002, p.4). Acts of physical violence often include a component of psychological violence, but not all psychological violence includes a physical act of violence (International Labour Office, 2002).

The International Labour Office (2002) recommends using a broad definition of violence that incorporates both physical and psychological sub-types. Accordingly in this thesis the term ‘patient violence’ will be used. This term will be used to encompass all patient behaviour that a healthcare professional may perceive as violent. Here the term ‘patient’ is used to describe those who are the consumers of healthcare. Implicit within this is an unequal relationship between care providers (health professionals) and care recipients (patients). This staff-patient interaction occurs within the context of a social dynamic in which health professionals exercise a duty of care over patients.
Background

In the past decade the problem of patient violence in healthcare has received increasing attention from governments worldwide (Butchart et al., 2004; Drugs and Crime Prevention Committee, 2011). This has resulted in the development and implementation of a range of occupational health and safety policies and practices. In 2002 the International Labour Organisation, International Council of Nurses, World Health Organisation and Public Services International launched an International research program to address the growing problem of occupational violence in the health sector, and declared the prevention of violence a major part of its public health program.

In response to these policy initiatives, best practice guidelines were developed and implemented in a number of countries to inform prevention and management (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002). These guidelines are based on a public health approach, and are predicated on the premise that violence and aggression can indeed be prevented, and that factors that contribute to aggressive behavioural responses can be modified. Notwithstanding these recommendations, no published examples of where this has been successfully achieved in healthcare have been identified. Indeed, some commentators have argued that not all episodes of violence can actually be prevented (Gillespie, Gates, Miller, & Howard, 2010).

In 2011 The Australasian College of Emergency Medicine (ACEM) reported 90% of ED staff to have experienced exposure to some form of patient violence. Based on these data ACEM now support a zero tolerance approach to patient aggression and violence (Australasian College for Emergency Medicine, 2011). Additionally, ACEM recommend that staff be trained in identifying the predictors of violence and that hospitals be provided with security, staff support and environmental strategies to improve staff safety. From a nursing perspective, Pich, Hazelton, Sundin, and Kable (2010) similarly call for a zero tolerance approach to violence. These authors report that ED nurses experience verbal and physical abuse so frequently that it has become an accepted part of the job.
Socio Political Factors Influencing Violence in Health Care

In 2011 in the state of Victoria, Australia a newly elected conservative government responded to growing public concerns about violence in the community generally and in hospitals specifically. They proposed the introduction of armed Public Service Officers to patrol public transport to reduce violence, improve safety and have a visible presence. Additionally they planned for the Public Service Officers to be located in hospital EDs to improve staff safety. In response to concerns raised by health professionals, the government commissioned a Parliamentary Inquiry to explore expert opinion, evidence and the acceptability of this proposal (Drugs and Crime Prevention Committee, 2011).

Ultimately, the outcome of The Parliamentary Inquiry did not support the use of armed guards in hospital EDs. Instead, a series of twenty two recommendations were made for improving staff and patient safety in Victoria’s 40 hospital EDs. In 2013 the government commissioned further work to explore training standards for ED and hospital security staff (Knott, Gerditz, Daniel, Dearie, & Holsheimer, 2013). Furthermore, it recommended a risk management approach in preference to an incident management approach. A risk management approach requires the identification of risk and action to eliminate or manage the risk proactively as part of an overall approach to managing the risk of violence.

Theoretical Basis for this Research. The theoretical basis for this early intervention approach was informed by an explanatory model proposed by (Nijman, Campo, Ravelli, & Merckelbach, 1999) that examined how patient, staff and ward variables interact, and contribute to the development or exacerbation of aggression in acute psychiatric inpatient units. Nijman’s et al., (1999) model of complex interactions was further developed by Duxbury (2002) who explored how staff and patients perceive strategies to manage aggression. Patients consider staff approaches “controlling” and identified communication and environmental factors that contribute to aggression. By contrast, staff identified “internal” or patient factors. When mental health staff attribute the cause of aggression to patient
related factors such as current psychiatric symptoms they valued traditional methods of medication and seclusion to manage aggression (Duxbury, 2002; Duxbury & Whittington, 2005).

Duxbury (2002) has identified that patients and staff have different perceptions of what causes aggression with staff identifying only internal or “patient factors” contributing to aggression. This demonstrates a lack of awareness of the impact of communication and interactions in the context of a therapeutic relationship. This model is based on the premise that prevention is the responsibility of staff. Managing situational factors lies within the clinical interaction and staff have the ability to adapt their communication skills and interaction based on the patients current presentation. To support staff in this process however a clear process for identification of risk on arrival and a communication that supports the staff and provides access to timely medical and nursing care is required.

In practice, when patients attend ED in crisis their internal risk factors for violence will remain relatively fixed. Risk factors in the environment and the interactions between the staff, the patient can be managed by clinical staff to limit aggressive behaviour and prevent escalation to physical violence.

**Violence Risk Screening**

In Australia, addressing violence and aggression in general hospital settings, including EDs, has become a National Occupational Health and Safety priority (Heads of Workplace Safety Authority, 2009). However prevention of patient aggression and violence in healthcare organisations remains within the remit of state governments. In Victoria this is manifest in the Victorian Occupational Health and Safety Act 2004 and the Accident Compensation Act 1985. The Occupational Health and Safety Act 2004 aims to provide a safe workplace, and where possible to eliminate risks that may harm an employee. Importantly, this legislation places responsibility for providing a safe workplace primarily with the employer.
The Accident Compensation Act 1985 guides the delivery of rehabilitation and compensation for people who are injured at work and is provided by Work Safe. In 2008, Work Safe launched a handbook for workplaces titled “Prevention and Management of Aggression”. The handbook includes policy guidance and a toolkit of sample policies, training evaluations, and templates to identify hazards in the workplace. A template called the High Risk Screening Tool for nurses in ED to identify patients at risk is also included. To date this tool has not been evaluated, implemented or integrated into triage nursing practice.

**Emergency department triage.** In Australia, triage is the first point of contact for patients entering the ED. The function of triage is to prioritise access to limited resources based on predetermined clinical criteria (Australasian College of Emergency Medicine, 2006). This is achieved using a 2-5 minute focused assessment conducted by a registered nurse based on the patient’s general appearance, history and physiological status (Australasian College of Emergency Medicine, 2006). Through this process all incoming patients are allocated a triage category according to the Australasian Triage Scale (ATS). The ATS is a valid and reliable five-point ordinal scale that is used to describe clinical urgency (Gerdtz et al., 2007). Patients allocated ATS 1 must receive simultaneous assessment and resuscitation while persons triaged ATS 5 may wait up to 120 minutes. The level of behavioural disturbance is rated from most urgent (ATS 1) for patients with severe behavioural disturbance to least urgent (ATS 5) for patients who are clinically well, have chronic symptoms and are known to the service. The ATS includes both observed and reported clinical signs and symptoms, levels of behavioural disturbance, and risk of harm to self and others to guide the triage process.

The first step in the triage process is to consider safety hazards (Gerdtz et al., 2007) and staff safety at triage requires awareness of factors that increase the risk of violence (ACEM, 2006). Despite awareness of the risk staff face at triage there is no screening process for violence in the current “Triage Education Resource Kit” (Gerdtz et al., 2007).
**Violence risk screening at the study site.** The impetus for this research dates back to 2009, when a four question risk screening process with a binary response (yes/no) was integrated to the electronic patient information system used at the study site. The purpose of this preliminary screening approach was to guide nurses in the identification of patients at risk of aggression. Three questions were asked of the patient:

1. Have you been involved in any violent incidents?
2. Do you have any thoughts of harming yourself?
3. Do you have any weapons or dangerous items in your possession?
4. The final question prompted the triage nurse to identify whether the patient is at risk of becoming violent.

The pilot work which informs this thesis was completed in 2009. Its purpose was to develop a comprehensive description of locally appropriate interventions for preventing and responding to episodes of violence (Daniel, Gerdtz, Dearie, & Virtue, 2009). This work explored what interventions are commenced once a patient is identified at risk of violence. Nursing, medical and security staff participated in focus group interviews (N=24). These focus groups confirmed that once a patient was identified at risk, there were interventions for prevention occurring. The outcome was a streamlined risk screening process and a set of locally relevant recommendations for prevention. The attached flowchart describes interventions for prevention aligned with the model of causative factors (Duxbury, 1999). What was less clear however, was the utility of the four risk screening questions. There was no consensus reached during the focus groups on who should be screened and how this should occur in practice. At the time of its implementation it was not known if, and indeed how, the recommended violence risk screening process was used in practice, nor if the current patient alert system was relevant for ED. Importantly, no evaluation of this approach had been conducted to determine its usability and predictive ability, or to the extent to which violence risk screening had been integrated into triage nurse practice.
Purpose of Research

The purpose of this research is to evaluate the processes and outcomes of a violence risk screening decision support process into triage practice, and determine its influence on clinical care, emergency responses to patient violence (Code Grey), and user’s (triage nurses) self-efficacy.

Research Questions

The thesis aims to address four core questions.

1. Can an integrated decision support system for violence risk screening at triage be successfully developed and implemented?
2. To what extent are clinicians (triage nurses) able to identify who is at risk of violence on arrival to the ED?
3. How does identifying patients at risk of violence influence clinical care and emergency responses for patient violence (Code Grey)?
4. What is the influence of a violence risk screening decision support process on triage nurse self-efficacy in identifying and managing those at risk?

Two subsidiary questions were developed to explore the feasibility and utility of violence risk screening in practice.

1. How does the public perceive the risk of violence being explored at Triage?
2. Is it feasible to identify the risk of violence during the triage nurse interaction?

Outcome Measures

To evaluate the influence of violence risk screening, primary and secondary outcome measures were identified. Primary outcome measures included an analysis of the predictive ability including sensitivity, specificity, likelihood ratios and predictive values and the frequency and location of Code Grey responses.
Secondary outcome measures include the proportion of patients identified at risk on arrival and use of Code Grey responses and coercive interventions. Further secondary outcomes explored included the time to review by medical staff, mental health assessment and length of stay for patients who required a Code Grey. Match paired analysis explored the influence of violence risk screening decision support on triage nurse self-efficacy.

**Research Setting**

This PhD study was conducted at one Australian Level 1 Major Trauma Centre and tertiary referral hospital, with 60,000 presentations per year and a 40% admission rate. Mental health services are delivered via the public health system and integrated with acute health, with many acute admissions to the mental health unit arising from the ED. In terms of clinical services, the ED has a 24-hour mental health service that provides assessment and supports the management of patients with mental health conditions. Initiatives to improve the management of violence in ED are governed by a working group of the ED Safety and Quality Committee called the Violence in ED Action Group. All ED staff can access an aggression prevention and management training program, and are encouraged to attend at least once every two years.

The ED reports approximately 180 security responses (Code Grey events) per month. Local governance for overseeing the prevention and management of patient aggression is guided by a working group. An organisation wide emergency response procedure to patient violence is activated when staff anticipate an actual or potential risk and request a security presence. This emergency response is referred to a Code Grey (Knott et al., 2013). This may include patient attempts to leave, treatment interference, to manage use of mechanical restraint, or to be on standby. There is an existing patient alert process for noting patients who are considered a “safety or security risk”. Patients who have an incident that affects their safety or the safety of others may have an alert placed on their medical record.
so that the next time they present to the ED an alert symbol will appear in the electronic clinical information system.

**Research Methods**

A mixed methods design was used to address the research questions. The study was comprised of a before and after evaluation of violence risk screening including and an assessment of user self-efficacy. This approach was combined with qualitative modes of inquiry that involved interviews with members of the public regarding the process of violence risk screening and structured observations of triage practice.

**Significance of Thesis**

Patient violence in the ED is a significant problem that negatively impacts both staff and patients and leads to poor quality care. Government recommendations and best practice guidelines call for prevention by identifying high risk patients, yet there is no validated approach to identifying patients at risk of violence on arrival to the ED (Australasian College for Emergency Medicine, 2011; Department of Health, 2011; Drugs and Crime Prevention Committee, 2011; Gerdtz et al., 2007; Work Safe, 2008). Emergency Departments are open 24-hours per day and provide an emergency service to the whole population. Nursing staff triage each presentation based on a triage nursing assessment and safety is the first step. In practice however, the accuracy of identifying who is at risk of violence at triage is unknown.

**Impact of violence on staff.** Violence has a significant impact on staff and the organisation. Due to the uncertain nature of ED workload many staff experience stress, this is compounded by exposure to violence (Kowalenko et al., 2012a). Research indicates that there is a significant correlation between staff exposure to violence in the ED and psychological wellbeing. Gates (2011) found 94% of nurses reported at least one post-traumatic stress disorder symptom after a violent event, and their productivity was affected. Furthermore, exposure to
violence is known to negatively impact retention of nursing staff (Chapman, Perry, Styles, & Combs, 2009a; Farrell, Bobrowski, & Bobrowski, 2006).

At triage in ED there is only 2-5 minutes to complete triage nursing assessment and the environment can be busy, with ambulances arriving, families arriving concerned about sick relatives, and acutely unwell patients arriving each shift. Staff have a duty of care to patients in their care, however, this duty does not extend to them being placed at risk of violence due to the aggressive and violent behaviour of some patients. Triage nurses also have the right to a safe work environment and employers have a responsibility to provide an environment that is as safe as possible (Pich et al., 2010).

**Clinical implications of violence for patients.** Violence reported in healthcare incorporates a range of situations and behaviours that are often termed “violent” or “aggressive”. Some of these behaviours require an emergency response by security to assist clinical staff to provide care safely. Patients may also be experiencing an acute mental health crisis, dementia, delirium, head injury, or alcohol or drug intoxication or withdrawal. Emergency responses are called for situations when a patient tries to leave against medical advice, refuses to have required medication or treatment, or engages in intrusive or wandering behaviours that place the person or others at risk.

The patient’s perspective was highlighted in an American study by Allen, Carpenter, Sheets, Miccio, & Ross, (2003) to understand the patient’s experience of emergency mental healthcare. The study included a total of 59 patients from across four emergency care forums, and found 49% of patients restrained report remembering every detail, and 67% reported that staff did not try any alternatives prior to restraint. It is also significant that 54% of patients restrained indicated the experience has caused them to avoid seeking care in the future. This has implications for early intervention and collaboration, particularly between mental health service providers, patients and EDs.
Coercive interventions to manage violence. Nursing and medical staff can use coercive interventions, including medication given in the presence of security staff, and restraint to manage actual and potential violence. Mechanical restraints are used to manage patients who present an immediate threat of violence to themselves or others (Knott, Bennett, Rawet, & Taylor, 2005). Although the intention of the use of restraint is to improve patient safety, there is no evidence to support its use and there are negative consequences for patients and staff. Patients may experience physical injury and psychological harm such as re-traumatisation, and loss of dignity (Huckshorn, 2005). The most serious consequence of being physically restrained is death. A review of deaths in restraint in the UK by Duxbury (2011) identified 38 restraint related deaths, and of these 16 had a history of mental illness. Positional asphyxia was implicated in at least 26 of the 38 deaths. This highlights that the use of security to hold patients (physical restraint) to manage violence can be a life threatening intervention, so opportunities for prevention should be explored, and coercive intervention used only as a last resort. Staff involved in the application of restraint may also suffer physical injuries and experience psychological trauma (Duxbury, 1999).

In summary, violence is a significant and complex problem for staff and patients and although there is an expectation of early identification, there has been no validated process specifically developed for ED triage. There is potential to prioritise clinical interventions to aid prevention once the risk of violence is identified. In practice, patients who have behaviours perceived to be violent still require care, therefore intervention to improve the identification of risk need to be developed and evaluated.
Overview of the Thesis

The thesis is presented in 9 chapters and reports on 3 interrelated studies. These studies were conducted sequentially to explore the feasibility and need, refine and implement, and finally evaluate the influence of violence risk screening decision support on use of security response for immediate or potential risk of violence (Code Grey) and access to clinical care.

In Chapter 1 the study has been introduced with relevant background information, study context and the significance of this research outlined. Chapter 2 will present a review of the literature that examines violence in ED. The prevalence, impact, and strategies for prevention are reviewed. A theoretical perspective and causal models are described to highlight complex interactions as they affect ED triage nurses and patients.

Chapter 3 examines the approaches to the development of violence risk screening and assessment in ED. The predicative ability, ethical and clinical implications are explored.

Chapter 4 will describe the mixed methods approach, research question, and action learning model that was used for the development of a violence risk screen decision support process at ED triage. Each phase of the research will then be presented as separate studies.

Chapter 5 presents the methodology, results, and main findings of Study One. This includes an audit of Code Grey responses, and logistic regression analysis to identify risk factors for a Code Grey response. Observation of triage nurse practice and patient and carer perceptions of the acceptability of violence risk screening are reported.

Chapter 6 presents the development, pilot study and implementation of the revised violence risk screen decision support process. The revised process was developed based on the findings in study one and on existing evidence both supporting and criticising risk screening and assessment for violence.
Chapter 7 presents an evaluation the influence of violence risk screening decision support on access to clinical care, Code Grey responses, and triage nurse self-efficacy. The predicative ability of the revised violence risk screening decision support process is reported.

Chapter 8 discusses the major findings as they relate to the research questions. Chapter 9 is the concluding chapter and reports the translational elements. The strengths, limitations, and recommendations for further research and practice are identified.

**Summary**

Violence in EDs is a significant problem for staff and places patients at physical and psychological risk of experiencing coercive interventions. Although ED staff have the right to a safe workplace, patients who are at risk of violence will present to ED needing life-saving assessment and treatment. Interventions for prevention need to be carefully developed, integrated into ED work practices, and consider causal models. Violence experienced by staff has received increased attention from industrial organisations, government departments and occupational health and safety perspective. Interventions to support staff need to consider a clinical perspective and focus on work practices to prevent, manage, and minimise the impact of patient violence.
Chapter Two: Violence in the Emergency Department

This chapter will present a critical discussion of the international peer reviewed literature and published research that describes the prevalence of patient violence in healthcare settings generally, and in particular, hospital EDs. The causes for patient violence will be discussed and causal theories considered alongside interventions used to minimise the effect of patient violence. The impact of patient violence on individuals (patients and staff) and on organisations (health services) will be reviewed. Recommendations for addressing the problem made by professional groups and arising from the research will then be highlighted. The need for violence risk screening as an intervention for prevention in hospital emergency departments will be introduced.

Search Strategy

This critical review of the literature focused on the problem of violence experienced by staff in the ED, particularly the nursing interaction that occurs at triage. This review prioritised the most relevant literature and contribution to knowledge as described by Grant & Booth (2010). The review was conducted in English using a computerised search of literature in CINHAL, Psych Info, and Web of Science from 1990 to 2015. Key words used in the search included nursing, emergency departments, accident and emergency, emergency care, violence, aggression, theories of aggression, triage, prevention, consumer, patient safety, zero tolerance, risk management, workplace violence and occupational violence.

documents were accessed and reference lists were reviewed to identify additional resources. Six government documents and 13 reports including policy statements, and best practice guides were obtained.

The scope of this thesis is limited to violence that occurs within the context of a nurse-patient relationship in the ED. Extensive literature on other types of violence such as horizontal violence, bullying, intimate partner violence and the legal processes and consequences of violent crimes in the community were excluded. Articles specific to paediatric, adolescence, or aged care were excluded.

In total the search yielded 1,327 papers. Of these, 411 abstracts were reviewed and 104 articles retained. Of these there were 53 research papers, 7 systematic reviews, 9 reports, and 35 papers based on opinion and interpretation of theory. Figure 2.1 shows the scope of literature accessed.
Figure 2.1 Scope of Literature Accessed
Five key questions informed the review including:

1. What is the prevalence of violence in the ED?
2. What causal theories exist to explain patient initiated violence?
3. What factors contribute to violence in the ED and are they amenable to prevention?
4. What is the impact of violence on nursing staff, patient care, and organisational outcomes?
5. What interventions have been used in ED for the prevention and management of violence in the ED?

Significance of the Problem of Patient Violence in the Emergency Department for Triage Practice

Triage is the first point of contact for all patients entering the ED. The primary role of the triage assessment is to determine clinical urgency for each patient or arrival presentation and prioritise care required (Gerdtz et al., 2007). The triage assessment involves identifying safety hazards, which includes recognising the risk of violence for staff and patients. Currently there is no published valid or reliable method for identifying patients who are at risk of violence on arrival to ED. For prevention to commence however patients who are at risk of becoming violent must be identified. Research shows that identifying the risk at violence at the point of entry allows staff an opportunity to plan for prevention (Kling et al., 2006).

Qualitative research suggests that triage nurses are able to identify who is at risk of violence. An Australian study by Pich, Hazelton, Sundin, & Kable (2011) conducted semi-structured interviews with ED triage nurses (N=6) and described their experience of violence in the previous month. Pich et al.,(2011) found ED triage nurses do have the ability to identify and describe warning signs for the risk of violence. Triage nurses described identifying the patients who were at risk by identifying cues in the patient’s mannerisms observed during the triage interaction.

The need for early identification of patients who are at risk of becoming violent at triage is further supported by evidence that demonstrates that most
incidents occur in the first 1-2 hours of arrival (Crilly, Chaboyer, & Creedy, 2004; Knott et al., 2005; Lau, Magarey, & Wiechula, 2011). Australian researcher Crilly (2004) reviewed clinical information for 86 patients who had been violent and found 67% had been in the ED for less than one hour when they became violent. These results were further confirmed by Lau (2011), who conducted an observational study of ED triage and found half of all violence occurred within one hour of arrival. Another Australian study by Knott et al., (2005) reviewed emergency responses for violence and found the mean time from arrival to first code grey response was 59 minutes. This confirms a process at triage is warranted as prevention can commence once patients at risk have been identified.

**Prevalence of Violence in Emergency Departments**

Internationally, published literature confirms that occupational violence experienced by staff is a significant issue in healthcare settings (Di Martino, 2002; Gerberich et al., 2004; Mayhew & Chappell, 2005). Indeed, the number of reported physical assaults by patients on health care workers is estimated to be higher than in any other workplace (Gates et al., 2011). Of all health care settings the frequency of violence experienced by staff working in ED is consistently reported to be high and problematic for both patients and staff (Fernandes et al., 1999; Gacki-Smith et al., 2009; Gates et al., 2011; Kennedy, 2005; Kowalenko, et al., 2012a; Medley et al., 2012; Rose, 1997).

**Risk of exposure to violence for nurses.** Due to the nature of the work being done, nursing staff are exposed to significant risk of violence. Nursing work involves managing people who are in pain, may have poor impulse control, anger problems, or be in hospital against their wishes (Budd, 1999). Nurses are the largest component of the healthcare workforce, spend most time with patients and enforce limits (Catlette, 2005; Lipscomb & Love, 1992). Furthermore, in an ED setting, Gacki Smith et al., (2013) has attributed the increased risk of violence towards ED staff to several factors, including overcrowding, long waits, and limited access to staff.
Nurses working in the ED are considered to be at greater risk of violence than in other clinical areas of healthcare. A large American study by Gerberich et al., (2004) conducted a postal survey of 6300 registered nurses to explore the frequency, and consequences of violence experienced in the previous 12 months. This sample was randomly selected from 79,128 registered nurses who worked in all areas of health, including ED, medical, surgical, aged care, intensive care, theatre and mental health settings. Gerberich et al., (2004) found that ED nurses were 2.5 times more likely to be physically assaulted and 3 times more likely to be verbally abused, than nurses working in other clinical areas. This study used staff self-reports of exposure to violence in the previous 12 months; however, the reliability of this methodology is unknown. There is potential for recall bias when participants rely on their memory and the time period after which this information becomes inaccurate is not known. It has been suggested that the reliability of recalling the frequency of events might be improved if the time frame for recall was reduced. Bowling (2009) has suggested avoiding reliance on recall over 6 months after the incident unless the event was significant to the participant. Although experiencing a physical assault is likely to be recalled, nurses report verbal abuse is more frequent (Catlette, 2005), therefore the frequency may not be recalled accurately.

Some studies have also questioned the perception of greater risk to nursing staff in ED compared to other clinical areas. A UK postal survey by Winstanley and Whittington (2004b) of assaults, threats and verbal abuse experienced by all clinical staff in the preceding 12 months, found staff experienced more assaults in a medical setting than in the ED. However, nursing staff working in EDs reported higher rates of threatening behaviour and verbal abuse from visitors compared to staff in other clinical areas. This study had a response rate of 33% (375/1141) and included all clinical staff. It is possible that the retrospective survey did not capture all incidents due to recall bias over a 12-month period. Comparisons between general ward areas and ED are limited because the proportion of ED staff sampled was not reported and the study sample only included 3.5% (13/375) ED staff.
In another UK based study by Whittington (1996), 396 general hospital staff completed a postal survey reporting recent assaults, abuse and threats. Whittington (1996) found 21% (72/396) had been assaulted during the previous 12 months, and noted that 90% of staff who were assaulted worked in general ward areas, not the ED. The authors noted there were only nine ED staff in the sample and this was a limitation, however, a comparison of assaults rates between EDs and clinical areas were made. The distinction between EDs and other clinical areas may become less significant over time and is dependent on both the model of care provided and length of stay in ED. As the ED length of stay reduces, patients who are at risk of violence are moved out of ED and cared for in short stay units or rapid assessment areas.

Prevalence of physical and verbal violence in the emergency department based on self reports. There are consistent reports that ED staff experience more verbal abuse compared to physical assaults (Alameddine, Kazzi, El-Jardali, Dimassi, & Maalouf, 2011; Gacki-Smith et al., 2009; Gates et al., 2011). A large American study by Gacki-Smith et al., (2009) of ED nurses was conducted through the Emergency Nurses Association. Gacki-Smith et al., (2009) used an online cross-sectional survey of physical and verbal abuse in the previous three years to explore nurses’ experience and perception of violence from patients. Gacki Smith et al., (2009) found that 23% (811/3465) of nurse participants reported experiencing physical violence more than 20 times in the previous three years. There were more reports of verbal abuse, with 20% of nurses reporting at least 200 occasions of verbal abuse during the same period. The response rate for this study was 10.9% (3465/31,905). In this study there is potential for response bias, as the sample was not randomised, and nurses who have experienced an assault may have been more motivated to respond. The methodology used by Gacki-Smith et al., (2009) relied on the accurate recall of physical violence and verbal abuse over a three year period. Although recall of significant life events may be adequate over longer time periods, the accuracy of recalling regular events over a three-year period was not validated in this study. Furthermore, self-reports should be limited
to a 6-month time period to reduce the impact of recall bias (Bowling, 2009). Recall bias in this study may have contributed to underestimating the actual prevalence of violence.

The increased frequency of verbal abuse from patients to staff reported by Gacki-Smith et al., (2009) was supported by a cross-sectional survey of ED staff from six sites in America conducted by Gates et al., (2011). This study identified the frequency of staff assault in the previous six months. They found 98% (208/213) reported experiencing verbal harassment, 68% (144/213) reported being physically threatened, and 45% (102/213) of participants reported being physically assaulted at least in the past 6 months. Notably, 18% (18/102) of those who reported being physically assaulted said they were injured as a result of exposure to patient violence.

In respect to the aforementioned survey it should also be noted that the response rate was only 29% and the sample was not randomised. These factors again may result in response bias, as those who were assaulted may be more likely to respond to such a survey. This limitation is confounded by a lack of information to describe the proportion of the sample who did not complete the survey. The time period of 6-months used by Gacki–Smith (2009) may reduce the potential for recall bias. However, the study was still based on self-reports of violence, which are by nature subjective to that persons interpretation and difficult to verify.

Although most prevalence studies report both physical and verbal violence, a large American study by Kansagra et al., (2008) focused on the total number of physical attacks in the past 5 years and how safe staff reported feeling at work. Key informants from each of the 65 EDs were asked to identify the total number of physical attacks in the past 5 years. They reported 3461 physical attacks in total, ranging from zero to “over a thousand” and the median was 11 attacks per site. This study also surveyed 3515 medical and nursing staff from 65 EDs and found a quarter of all staff reported feeling safe sometimes, rarely, or never. The potential for non response bias was managed by excluding sites with a response rate of
45% or less. Key informants determined the frequency of physical attacks by providing estimates or reports of physical attacks. Kansagra et al., (2008) acknowledged this is a limitation as key informants may have different interpretations of what constitutes a physical attack and relying on incident reports is likely to underestimate the actual frequency due to underreporting.

There is limited literature on violence experienced by ED staff from developing countries. One exception is a study on frequency of verbal and physical abuse in Lebanon EDs by Alameddine et al., (2011). This study used a cross-sectional survey design to identify the rates of violence in the previous 12 months and burnout in six EDs located in Lebanon (N=256). Alameddine et al., (2011) found 80% of participants reported being verbally abused and 25% reported being physically assaulted. Although the rates of self-reported violence are consistent with developed countries, there are unique issues in Lebanon identified by Alameddine et al., (2011). This study included all staff working in the ED, and found non-clinical staff, such as those in security and administration, were verbally abused more frequently than nursing staff. The authors attributed this to the challenging tasks this group have, including requesting cash deposits for care, denial or delaying care until payment is made, and communicating waiting times and access to inpatient beds. This study was based on self-reports over a 12-month period and it is unknown if there were any cultural influences that may have increased or decreased reporting of violence. Therefore, this study is likely to be representative of current trends in Lebanon because the response rate (70.3%) was high and the sample included six EDs.

**Estimates of prevalence based on organisational reporting systems.**

An alternative approach to relying on self-reports to determine the frequency of violence is to use incident reports, or organisational databases. Incident reports can capture data over a longer time period and they are not subject to recall bias. Incident reports were used in an American study by Medley (2012) to identify rates of violence. A retrospective chart review in ED over a 3.5 year period identified 278
documented violent incidents from over 222,000 presentations. The rate of violent incidents was 1.3 per 1000 patient presentations. Using incident reports alone to establish the prevalence of violence is problematic. Firstly, under reporting of exposure to violence is well documented in the literature. This means that the rates of violence are likely to be much higher than reported (Lyneham, 2000; Lyneham & Jones, 2000; Rippon, 2000). Secondly, it has been established that incidents are more likely to be documented if they are severe and verbal abuse is rarely documented (Jones & Lyneham, 2000; Kennedy, 2005; Rose, 1997).

The problem of under reporting violence on identifying the true prevalence was highlighted in an Irish study by Rose (1997) who surveyed 27 nurses and 9 patient care attendants. They found 60% of staff had been physically assaulted at least once while working in ED, 40% were assaulted in the previous 12 months, and 91% of staff were worried about being physically assaulted at work. The response rate was 73.5% (36/49) and this small study was conducted at one site only. The respondents were provided with definitions of physical assault and verbal abuse. Physical assault included, “any physical contact that resulted in the person feeling threatened regardless of injury” (Rose, 1997, p. 216). Verbal abuse was defined as the use of “any words or threatening gestures that intimidated hospital staff” (Rose, 1997, p. 216). The study did not report the frequency of verbal abuse reports but noted that 63% of nurses did not document the last episode of verbal abuse they experienced. This finding confirms the premise that reporting prevalence based only on documentation, or incident reports significantly underestimates the true prevalence of violence in healthcare settings.

An alternative to relying on self reports and incident reports is to monitor security responses to patient violence. An Australian study by Knott et al., (2005) conducted a 12-month prospective survey of security emergency responses (Code Grey) to manage actual or potential risk of violence. There were 3.2 Code Greys per 1000 presentations and the median time from arrival to first Code Grey response was 59 minutes. This study highlighted that Code Grey responses were call to manage self harm, absconding, refusing treatment or interfering with
medical equipment. Although Code Grey responses are called to manage the risk of actual or potential violence, there is a risk to staff when they intervene and prevent the patient from harming themselves, either intentionally or accidentally. Comparisons using Code Grey data at different sites is problematic as there may be different thresholds for initiating a security response. However, the methodology used by Knott et al., (2005) could monitor the use of Code Grey responses over time to evaluate local violence prevention initiatives. A limitation of this approach is there is likely to be episodes of verbal abuse that don’t require an emergency security response, but would still be considered verbal abuse and violent by most ED staff

**Violence experienced by medical staff.** Although much of the literature reporting on the prevalence of violence in health care focuses on nursing staff, medical staff also experience significant exposure to violence in ED (Kowalenko, Walters, Khare, & Compton, 2005). In one of few studies conducted of medical staff exposure to violence, an American study by Kowalenko et al.,(2005) used a postal survey (N=171). The response rate was 68.4% (171/250), and the sample, which represented several EDs, was randomised from members of the Michigan College of Emergency Physicians by a computer program. They found 75% (128/171) reported verbal threats with at least one threat in the previous 12 months. Furthermore, 28% (48/171) reported a physical assault and 81.9% indicated they were occasionally fearful of the ED. This study confirms that medical staff experience fear while at work as do nurses and patient care attendants (Rose, 1997).

More recently, another study by Kowalenko et al., (2013) in the United States of America, prospectively surveyed the frequency of violent incidents in six EDs. The convenience sample consisted of 213 nurses, doctors and patient care attendants. They used a longitudinal repeated measures design to collect data monthly for nine months and 1795 surveys were returned. Kowalenko et al., (2013) reported 601 physical threats and 226 assaults. The frequency of violent incidents in this study was lower than previously reported and this was attributed to the study
design. This study used a longitudinal design that may be more accurate compared to self-reporting, which is subject to recall bias. Furthermore, given that violent events are traumatic, some staff may overestimate the frequency (Catlette, 2005).

The experience of violence is subjective and there is no consistency in the way physical or verbal violence is measured. A Canadian study conducted by Fernandes et al., (1999) in one ED surveyed 106 ED staff including medical, nursing, administration and security, regarding their perception of violence, and included witnessing of verbal and physical assault. The researchers reported that in the previous 12 months 57% (60/106) of staff had been physically assaulted, 90% had been verbally abused weekly and 73% (77/106) were afraid of patients (Fernandes et al., 1999). This study had a response rate of 65% (106/163) and is based on self-reports, so is therefore dependent on the accurate recall of events over 12 months. There may be a non-response bias given 57 staff did not respond and their experience of violence remains unknown. This study also explored if staff had witnessed any violent events or verbal abuse as the staff considered this an exposure to violence. This approach may affect the accuracy of prevalence estimates if witnessing another staff member be physically assaulted or verbally abused is reported in addition to the original incident (Fernandes et al., 1999). The accuracy of this methodology is influenced by the ability of each staff member to recall events. Including incidents where staff have witnessed violence has implications for determining the prevalence of violence and who it affects. For example, one violent incident may be observed and reported by several staff in further studies of prevalence.

**Prevalence of violence reported in Australian nursing studies.**

Australian studies are consistent with international literature that reports higher rates of verbal abuse than physical violence in ED (Crilly et al., 2004; Lyneham, 2000). In a prospective study by Crilly (2004) the number of violent incidents at two EDs were identified for ED nurses (N=71) over a 5-month period. There were 45,047 presentations and 110 violent incidents, or two violent incidents per 1000
presentations. Of these incidents, 53% (58/110) were episodes of verbal violence, and 26% (29/110) included both verbal and physical violence (Crilly et al., 2004). There was only one incident that included physical violence in the absence of verbal violence. This study did not rely on staff member recall and incidents were recorded on a specific form developed for the study. To improve the accuracy of data, the information collected weekly was monitored by the researcher to ensure it was complete. A benefit of this methodology was the prevalence of violence was determined by a combination of self reports and incident reports. However, this approach is likely to be labor intensive.

A large postal survey of Australian ED nurses was conducted by Lyneham (2000) to identify the type and frequency of violence experienced. The sample was accessed from the NSW Emergency Nurses association and 41% (266/650) responded. The results found 36% (96/266) had experienced verbal abuse weekly and 57% (151/266) had experienced physical intimidation or assault in the past 6 months. Every respondent experienced some form of violence. This study reported higher rates of physical violence than other studies and this could be attributed to grouping both physical assault and intimidation together. The authors noted that this sample represents 11.9% of all ED nurses in NSW, and included rural, metropolitan and remote EDs. This study was dependent upon staff recall, however, recall bias may have been minimised, as the time period ranged from daily, monthly, or in the last 6 months. The sample was not randomised and may be subject to response bias. It is unknown if nurses who had been assaulted were motivated to complete the survey and there was no information available on nurses who did not complete the survey.
Summary of methodological factors that influence estimates of prevalence. Determining the prevalence of violence is difficult as researchers have used different methodologies, data collection periods and definitions. For example Gacki-Smith et al., (2009) reported 25% of nurses experienced violence at least 20 times in the past 3 years and a USA study of medical staff reported more than 25% of physicians were the victims of a physical assault in the previous year (Kowalenko et al., 2005). Data collection over longer time frames may impact the accurate recall of all events and the experience of violence is broader than an actual assault. Witnessing of a violent event has also been recorded as a violent incident in its own right (Fernandes et al., 1999). Including witnessing violent incidents as additional exposure to violence would require data on how many staff witnessed each event and depends on how individual staff perceived the same event.

Limitations of relying on self reports of violence. Self-report surveys have a number of limitations, including recall bias, and it is unknown if nurses over or underestimate the frequency of violence. Recall usually deteriorates with time in cross-sectional studies, and longer periods of recall result in decreased accuracy (Clarke, Fiebig, & Gerdtham, 2008). Clarke acknowledges however that longer recall periods can result in more information being collected. Furthermore, given that violent events are traumatic, some staff may overestimate their frequency (Catlette, 2005). A standardised approach to measuring the prevalence of violence that utilises a consistent methodology has been called for over several years (Crilly et al., 2004; Taylor & Rew, 2011; Wells & Bowers, 2002). There is a perception that violence in acute health is increasing (Cunningham, et al., 2012; Hegney, Eley, Plank, Buikstra, & Parker, 2006; Kennedy, 2005; Kowalenko et al., 2012a; Rose, 1997) however, it is difficult to compare the prevalence of violence across studies and work places. Clinicians may have different beliefs and perceptions of each incident and how violence is defined (Zernike & Sharpe, 1998). A consistent approach to measuring prevalence has the potential to contribute to violence prevention studies and benchmarking.
Measuring the severity of violence. This review identified no standard measure for the severity of violence. Certainly individual reporting of severity is highly subjective, and susceptible to bias. There are also a range of different terms used to describe the severity, such as exposure to violence, experienced violence, or harassment. Moreover, the term “verbal violence” has been used as an alternative to verbal abuse (Crilly et al., 2004). In an attempt to address some of the limitations of measuring the prevalence and impact of violence on healthcare professionals a data collection tool was developed and piloted (Kowalenko, Hauff, Morden, & Smith, 2012b). In this Kowalenko et al., (2012b) the researchers developed 11 filmed vignettes based on past reports of violence. Participants (193 ED staff: medical, nursing, security, clerical and allied health) rated each vignette for severity on a 6 point ordinal rating scale (1=low to 6=high). Although this tool was developed at one site, there may be potential for its use in other settings. This is the first method that has the potential to prospectively capture the frequency and severity of violence, however the inter rater reliability of the tool was not reported in this pilot study.

Overall the prevalence of violence is difficult to compare between studies however there is agreement that the frequency of verbal and physical incidents that lead to physical injury or psychological distress is unacceptably high. The following Table 2.1 provides a summary of research that reports the frequency of violence experienced by ED staff.
Table 2.1 Summary of Research that Reports the Frequency of Violence Experienced by ED Staff

<table>
<thead>
<tr>
<th>Author/Country</th>
<th>Setting/Sample</th>
<th>Method</th>
<th>Prevalence of aggression/violence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kowalanko et al., 2013 USA</td>
<td>ED medical, nursing and patient care staff from 6 sites (N=213)</td>
<td>Longitudinal repeated measures design over 9 months</td>
<td>Monthly surveys identified 827 events, 601 physical threats and 226 physical assaults</td>
</tr>
<tr>
<td>Medley et al., 2012 USA</td>
<td>636-bed trauma center with 44 ED beds</td>
<td>Retrospective review of ED incident reports over the 42 month</td>
<td>Prevalence was 1.3/1000 ED presentations</td>
</tr>
<tr>
<td>Gates et al., 2011 USA</td>
<td>Medical and nursing staff from 6 EDs (N=213).</td>
<td>Cross sectional survey of violence experienced in previous 6 months from patients</td>
<td>98% (n=208) experienced at least one episode of verbal harassment 68% (n=144) experienced at least one physical threat 48% (n=102) experienced at least one physical assault 9% (n=18) had been injured by a patient assault</td>
</tr>
<tr>
<td>Benham et al., 2011 USA</td>
<td>Emergency Medicine residents and attending physicians (N=272)</td>
<td>Cross-sectional online survey of violence in the previous 12 months</td>
<td>78% experienced at least one incident of violence 21% reporting more than one type of violent act Verbal threats were the most common followed by physical assaults</td>
</tr>
<tr>
<td>Gacki Smith et al., 2009, USA</td>
<td>Registered nurse members (N=3,465) of the Emergency Nurses Association.</td>
<td>Cross-sectional survey of physical and verbal abuse in the past 3 years</td>
<td>25% of respondents reported experiencing physical violence more than 20 times 20% reported experiencing verbal abuse more than 200 times</td>
</tr>
<tr>
<td>Kansagra et al., 2008 USA</td>
<td>65 EDs</td>
<td>Survey of key informants to identify the total number of physical attacks over the past 5 years</td>
<td>A total of 3,461 physical attacks were reported, the median number of physical attacks per ED ranged from 0 to “over a thousand” Median per site was 11 attacks in 5 years.</td>
</tr>
<tr>
<td>Kowalenko et al., 2005, USA</td>
<td>Emergency physicians, (N=177).</td>
<td>Cross sectional mail out survey of verbal and physical aggression in the past 12 months</td>
<td>74.9% experienced at least one verbal threat 28.1% experienced a physical assault, 11.7% were confronted outside of the ED</td>
</tr>
<tr>
<td>Author/Country</td>
<td>Setting/Sample</td>
<td>Method</td>
<td>Prevalence of aggression/violence</td>
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<tr>
<td>Esmaeilipour et al., 2010</td>
<td>Nurses from 11 EDs (N=109)</td>
<td>Cross sectional survey with consensus sampling of verbal and physical abuse over the past 12 months</td>
<td>91.6% were verbally abused 19.7% were physically abused Patient relatives were the most common source of violence</td>
</tr>
<tr>
<td>Alameddine et al., 2011</td>
<td>All staff at 6 EDs (N=256)</td>
<td>Cross sectional survey of physical and verbal abuse in the past 12 months</td>
<td>80.8% experienced at least one episode of verbal abuse 25.8% experienced at least one episode of physical violence</td>
</tr>
<tr>
<td>Fernandes et al., 1999, Canada</td>
<td>163 ED staff, (N=106).</td>
<td>Cross sectional survey of the frequency of violence experienced in the past 12 months</td>
<td>92% (94/102) experiencing verbal abuse 97% (99/102) experienced physical threats 92% (93/101) experienced physical assault 68% (70/103) reported an increased frequency of violence over time 60% (64/106) reported an increased severity</td>
</tr>
<tr>
<td>Rose, 1997, Ireland</td>
<td>ED staff (N=27) (nurses and attendants)</td>
<td>Cross sectional survey</td>
<td>60% (n=21) were physically assaulted at least once 40% had been assaulted within the past 12 months</td>
</tr>
<tr>
<td>Knott et al., 2005 Australia</td>
<td>One inner city ED with 47,000 presentations per year and 33% admission rate (N=151).</td>
<td>A 12 month prospective observational survey of Code Grey Responses to manage actual or potential violence</td>
<td>Code Grey rate was 3.2/1000 presentations</td>
</tr>
<tr>
<td>Crilly et al., 2004 Australia</td>
<td>ED Nurses (N=108) from 2 hospitals.</td>
<td>Longitudinal cohort design</td>
<td>45,047 presentations in 5 months found 86 patients were responsible for 110 violent incidents. Violent incident rate was 2/1000 presentations approximately 5 violent incidents per week</td>
</tr>
</tbody>
</table>
Under Reporting of Violent Incidents in the Emergency Department.

There is agreement in the literature that violence is consistently under reported and only the most serious incidents are described (Rippon, 2000; Zernike & Sharpe, 1998). An Australian study by Kennedy (2005) conducted a retrospective survey of Australian EDs and identified up to 70% of violent incidents were not reported via hospital incident data. This supports an earlier Australian study by Lyneham (2000), who surveyed 266 ED nurses and found that 70% of violent incidents were not reported. The actual prevalence of violence in EDs therefore remains unknown.

The reluctance to document and report violent incidents in ED was explored by Ferns (2012) in a UK study of staff documentation of patient violence. A retrospective review of incident reports over a 2-year period and nursing staff interviews (N=9) found 66% (25/38) of incident reports were incomplete or lacking in detail. Furthermore, ED staff were possibly reluctant to complete incident reports due to fear that these reports may be used by management to criticise staff practice. The incident report form was problematic because it was used for all incidents and there were several sections that were not relevant. This study highlighted that even when incident reports are completed the information may still be inadequate, and if they are used to criticise staff there will be some reluctance from staff to complete them. Ferns (2012) concluded that documentation of violent incidents is part of professional practice and poor documentation may be viewed as poor practice.

The problem of under reporting of violence from patients to staff is complex and likely to be influenced by several factors. There are systems issues based on organisational structure, including complex forms, lack of time to complete forms, lack of confidentiality, negative feedback, peer pressure and the stigma of becoming a victim (Kennedy, 2005). The frequency of violence in ED and lack of clarity about what is unacceptable has led staff to consider violence and aggression to be “part of the job” (Forster, Petty, Schleiger, & Walters, 2005; Kennedy, 2005). This concern was also raised by Jones and Lyneham (2001), who
identified that when incidents are not reported injuries are concealed. There are consistent reports that staff may feel embarrassed and a sense of failure and that violence reflects their inability to manage challenging situations appropriately (Linsley, 2006).

An extensive inquiry into violence in emergency departments collated staff feedback on the causes of under reporting (Drugs and Crime Prevention Committee, 2011). The inquiry report noted that staff tend not report episodes of patient violence due to fear of retribution, incident reports being too complex and time consuming, the report not being taken seriously, and the belief nothing will be achieved if the incident is reported.

The implications of under reporting are significant for the management and prevention of violence in ED. Reporting incidents is required to address workplace violence and under reporting is likely to remain until nurses are clear about what constitutes violence (Jones & Lyneham, 2000). Furthermore, reporting of violent incidents is required to guide prevention, and nurses have a responsibility to themselves and others (Kennedy, 2005; Munro, 2002).

**Causal Theories of Violence**

In this section of the review causal theories for patient violence are described in order to develop an understanding of potential strategies for prevention. Behaviour that is perceived to be violent is a complex display of human behaviour likely to be a product of psychological, biological and social factors, acting in combination and separately (Whittington, 1997). Understanding violent behaviour and developing strategies for prevention requires an awareness of theories used to explain these behaviours (Ferns, 2007). Knowledge of causal theories raises awareness of what may contribute to an individual's behaviour, and therefore inform organisational strategies to reduce the risk of violence (Ferns, 2007). The application of this theoretical knowledge to practice in an ED setting is fundamental to the development and implementation of prevention strategies (Ferns, 2007; Lau et al., 2004).
**Psychological theories.** There are more than 140 psychological theories of aggression and violence (Bjorkly, 2001). The three major psychological theories that have implications for clinical practice and research are: psychoanalytical theory, drive theory, and social learning theory (Bjørkly, 2006).

**Psychoanalytical theory.** In psychoanalytical theories the biological and instinctive processes are emphasised. Psychoanalytical theory by Freud considered aggression to be both instinctual and inevitable, and the primary aim was to reduce and eliminate tension or excitation (Brennan, 1998). Biological theories view aggression as having a physiological cause, either from an adverse stimulus, an innate drive, or neurological, genetic or hormonal functioning. The biological approach considers violence a psychological disorder which is caused by disturbance of biological, biochemical or physiological equilibrium (Ferns, 2007). Applying the biological model in practice is relevant to an ED setting as violence is often a result of clinical deterioration (Ferns 2007). Lau (2004) has questioned if the biological approach then implies medical intervention is required for prevention.

**Drive theory.** Drive theories frustration-aggression hypothesis contends aggression occurs because of an interference with an individual’s goal-directed activity (Dollard, Doob, Miller, Mowrer, & Sears, 1939). This theory links the severity of aggression the amount of frustration, the degree of interference, and the number of frustration responses each individual experiences. The severity of each violent response is worsened when the patient’s expectations are not met. Lau (2004) has proposed this theory is relevant at triage where one patient who has waited for treatment, sees another patient called for treatment quickly.
Social learning theory. Social learning theory emphasises the cognitive processes and social interactions that contribute to aggression. Social learning theory involves the learning of behaviour by exposure to that behaviour and reinforcing that learning via role models (Bandura, 1997). The exploration of violence requires determining the origin of aggression, what instigates the occurrence, and conditions that maintain the behaviour. Ferns (2007) has argued Social learning theory is relevant to health care as EDs mirror violence seen in the community.

Causal Models for Explaining Violence in Health Care

The causes of violence in health care are multifactorial, and prevention requires causal models that have been developed to contribute to understanding of these factors. The World Health Organisation report (Krug et al., 2002) uses an ecological model to understand the causes, impact and prevention of violence. This model assumes no single factor can explain why some groups are at greater risk. Interpersonal violence is the outcome of complex interactions of four levels including the individual, the relationship, the community and society. Figure 2.2 shows the ecological model of risk factors for sub types of interpersonal violence.
Figure 2.2 Ecological Model of Risk Factors for Sub types of Interpersonal Violence.

This ecological model has a global perspective and is more comprehensive than other explanatory models such as the biological model. The ecological approach covers causative factors in the internal, external, and situational models, as described in clinical settings (Duxbury, 1999; Nijman et al., 1999).

An explanatory model was proposed by (Nijman et al., 1999) to examine how patient, staff and ward variables interact, and contribute to the development or exacerbation of aggression in acute psychiatric inpatient units. This model identifies patient factors, such as psychopathology and altered cognitive processes, as factors that may be exacerbated by environmental and communication stresses. Nijman (1999) proposes that repeated aggression occurs when communication or environmental stresses occur after an incident, and this increases the risk of a further episode of violence (Nijman et al., 1999). These factors include an organisation’s response to aggressive incidents such as restricting leave. The actual weight of each variable in different patient groups was not determined by Nijman et al., (1999), nor has the model been evaluated.

Nijman’s et al., (1999) model of complex interactions was further developed by Duxbury (2002) who went on to explore how staff and patients perceive strategies to manage aggression in a mental health unit in the United Kingdom. Interviews with patients (N=80), and questionnaires with nurses (N=72) and doctors (N=10), confirmed staff and patients have different views on what contributes to aggression. Patients consider staff approaches “controlling” and identified communication and environmental factors that contribute to aggression. By contrast, staff identified “internal” or patient factors. When mental health staff attributed the cause of aggression to patient related factors such as current psychiatric symptoms they valued traditional methods of medication and seclusion to manage aggression (Duxbury, 2002; Duxbury & Whittington, 2005). Of the three domains, staff identified only internal or “patient factors” contributing to aggression. This demonstrates a lack of awareness of the impact of communication and interactions in the context of a therapeutic relationship. Although this study
occurred in a mental health setting it is relevant because ED staff regularly provide acute mental health treatment.

The three domains reported by Duxbury (2002) in literature are the “internal”, “external” and “situational”. Although they will be outlined separately, there is agreement in the literature that each episode of aggression is likely to have causative factors in each of three models (Duxbury, 2002; Nijman et al., 1999).

**The internal (biomedical) model.** The internal model focuses on specific patient characteristics such as age gender, or previous history of violence (Ministry of Health, 1998; Royal College of Psychiatrists, 1996). These factors also dominate actuarial risk assessment procedures, which are used in clinical settings to predict the risk of violence (Webster & Polvi 1995). From the perspective of those seeking to prevent violence the internal model is not helpful since internal factors are relatively static and are not readily amenable to preventative interventions. Specific patient factors that may limit an individual’s ability to develop a therapeutic alliance would also need to be considered yet capacity to form a therapeutic alliance is not part of actuarial risk assessments.

**The external (environmental) model.** The external model considers how environmental factors such as lighting, noise, and overcrowding contribute to patient aggression (Nijman et al., 1999) Staff factors such as availability and experience have also been included in the external model; however, they are also relevant to the internal and situational model (J. Duxbury, 2002).

**The situational (interactional) model.** The situational model includes interactions between the nurse and the patient, which may be influenced by both internal and environmental factors that influence the staff-patient relationship (Duxbury, 2002). There are also non-patient related factors, which influence the staff-patient relationship, such as skill mix and the ward culture.

Although the internal, external and situational models acknowledge the multi-factorial components that contribute to aggression (Duxbury, 2002; Nijman et al., 1999) no research to date has evaluated the impact of each model on staff or patients. The situational model has been supported and underpins an interactional
model proposed as a training approach by Farrell (2010). This model promotes an awareness of interactions that occur between staff and patients that acknowledge staff member values and emotional responses to challenging behaviour. This approach shifts the responsibility for the management of violent behaviour to staff rather than attributing aggression to patient or internal factors alone (Farrell et al., 2010). The interactional model (Farrell et al., 2010) and the situational model (Duxbury, 2002) both recognise the role of staff in contributing to aggression and call for prevention by exploring and understanding the influences of the environment and staff.

The situational model has the potential to underpin further research in an ED setting. A review of ED research methods to explore violence by Lau (2006) identified that the interaction between staff, patients and the situation could aid prevention by exploring triggers and staff interactions prior to violent incidents.

**Cognitive model of violence.** The cognitive model was developed by UK researcher Winstanley (2005) and is based on incidents of violence in acute health that followed an anxiety provoking incident. This model prioritises the patient’s perspective, but acknowledges the situational variables and the cognitive processes of the patient. According to this model, when a patient is hypervigilant from anxiety, they may perceive staff actions as a threat and respond aggressively. Staff perceive the behaviour as aggressive yet patients might see the behaviour as a defence against perceived attack (Winstanley, 2005). This is consistent with earlier research, which confirmed there is a difference between staff and consumer perspectives on aggression in a mental health setting (Duxbury, 2002). This model is relevant to an ED setting and is the only model that was developed based on data collected in an acute health setting.
Applying a Causative Framework to Staff/Patient Interactions at Triage

There are internal, situational and external factors present in each triage interaction that may contribute to a violent incident. An awareness of these factors has the potential to inform understanding of the causes of violence and identify opportunities for prevention. The environment is often fixed, though may change depending on the number of people waiting and patient factors that are individual and unknown until arrival. The interactions are also dependant on individual characteristics, such as the ability to establish rapport, and effective communication. The patient factors may include current symptoms and also past experiences with ED. Figure 2.3 highlights how each factor can contribute to a violent incident and increase risk to staff and patients. This model hypothesises that an acute hospital admission, for any reason, introduces situational stress for the service-user and that environmental and staff factors then compound to produce an episode of aggression (Duxbury, 2002). Figure 2.3 shows the model of causative factors.

![Figure 2.3 Model of Causative Factors for Violence on Arrival to ED](image-url)
Human Computer Interactions at Triage

The purpose of the interaction between a triage nurse and patient is to collect information to determine clinical urgency at point of entry (Australasian College of Emergency Medicine, 2006). Typically this information is entered into a computer program that guides data collection. Using computer technology to guide decisions at point of care provides an additional opportunity to guide clinician behaviour and reduce errors (Dowding et al., 2009). This influences patient outcomes and can improve the quality and consistency of decisions made and patient safety (Shiffman et al., 1999; Sintchenko, Magrabi, & Tipper, 2007).

A systematic review conducted in Canada by (Shojania et al., 2011) was undertaken to examine the use of on screen reminders at point of care. This review focussed on point of care reminders that were generated when the clinician was actively engaged with the patient. The reminders aimed to prompt clinicians to recall specific information and then perform or avoid specific actions when providing care (Gordon, Grimshaw, Eccles, Rowe, & Wyatt, 1998). Results confirmed that computerised reminders at point of entry showed small to modest improvement in care processes or targeted behaviours. It was not clear, however, which factors contributed to the improvement. The review focussed on studies with a sample of at least 50% of participants working in health care. The review highlighted that “on screen” reminders will be more prevalent as technology is further introduced into health care and further evaluation is required.

A further systematic review was conducted by Randall (2007) in the UK to examine the impact of eight computerised decision support systems, nursing performance and patient care. There were no patient outcomes reported and the impact on nursing performance was found to be inconsistent. Randell (2007) argued more research is needed as nurses move into advanced practice roles and computerised decision support systems continue to be introduced.

Another systematic review conducted in the UK by (Kawamoto, Houlihan, Balas, & Lobach, 2005) explored 70 clinical decision support systems. This review identified independent predictors that did improve clinical practice. These were the
automatic provision of information integrated into clinician workflow, providing recommendations and not just assessments, and computerised decision support at the time and location of the interaction. These factors are more likely to be successful than paper based approaches, as the effectiveness of a decision support system is dependent on minimising the effort required by clinicians to use the system (Kawamoto et al., 2005). These findings support a further systematic review of Electronic Decision Support Systems (EDSS) by Sinchenko et al., (2007), which found there were no detrimental effects of decision support; however, the effectiveness was not consistent. In acute care EDSS were more effective than in chronic care, and the most common improvement was adherence to clinical guidelines. This review focussed on randomised controlled trials, on prescribing guidelines and care pathways for illnesses such as diabetes, and recommended further evaluation of decision support systems.

The usability of electronic decision support for triage decision making must be sensitive to context and quick to use by different staff. An American study by Dowding et al., (2009) interviewed nurses in assessment clinics and outpatient settings, and conducted non-participant observation to explore how computerised decision support systems were used in practice. This research found nurses overrode the program when the algorithm did not take into account specific patient factors that the nurse was aware of. Nurses reported decision support systems useful to confirm decisions they had already made and this occurred when nurses were more experienced and confident. They also found the guidance on decision making more useful when the nurse was less experienced. Of concern though is that nurses could override decisions if clinically indicated and this could reduce the consistency of decision making, even though consistency was the objective of electronic decision support. In this situation the nurses manipulated the software to get the outcome they thought was clinically appropriate (Dowding et al., 2009).

Implementation of electronic decision support systems at triage may not always be feasible. For example Aronsky (2008) highlighted that some process should not occur at triage. Medication reconciliation at triage was time consuming,
and screening for domestic violence was not appropriate and should be conducted at the bedside. This was attributed to staff needing a private environment, and more time to discuss sensitive issues and develop a relationship between the patient and health care provider. It is essential that EDSS are integrated with existing patient information systems. This will prevent duplicating data entry and allow for information to be shared (Aronsky et al., 2008).

**Evidence and Violence Prevention**

An awareness of models of causes of aggression would allow clinical staff to reflect on contributing factors in their own practice and focus on targeted strategies for prevention (Lau et al., 2004). Awareness of these models has the potential to reduce reliance on traditional and coercive methods including physical, mechanical, and chemical restraint. Despite literature on the multifaceted nature of factors that contribute to aggression in mental health settings, traditional approaches such as restraint and medication continue to dominate (Duxbury, 1999). Nurses in mental health settings have knowledge of the nurse-patient therapeutic relationship and a culture of consumer participation and awareness. In contrast, triage focuses on acuity and prioritising urgency of treatment. It could be argued, however, that consumers are entitled to the same level of consumer awareness and participation in ED, given that mental health services are mainstreamed in Australia.

Australian researchers Sands et al., (2009) developed Clinical Practice Guidelines to identify risk factors for patient violence in triage settings (mental health and EDs), however, to date these have not been systematically implemented into practice or evaluated. There is concern that research findings are not translated into practice and this can result in patients not receiving evidence-based care (Grimshaw, Eccles, Hill, & Squires, 2012).
Factors Contributing to Violence in the Emergency Department

The complex nature of violence and the number of factors that may contribute to this has led to a range of opinions on what causes violence. Earlier research has questioned if the increase in violence and aggression is due to an increase in behaviours seen in the community such as substance abuse, availability of weapons, and using violence to solve problems (Lipscomb & Love, 1992). Many patients who present to EDs may experience fear, pain, anxiety, lack of choices, as well as varying ability to tolerate feelings of frustration, and this may contribute to violent events (Winstanley & Whittington, 2004a). The environment of the ED also includes noise, crowding, limited privacy and delays, which can contribute to aggression.

Acute mental health care. In Australia mental health service provision has shifted to a mainstreaming model. This means that acutely unwell patients with mental illness are assessed and managed in EDs (Wand & White, 2007). Community mental health services have limited capacity to respond and police are regularly required to transport patients at risk to themselves and others to ED for assessment. This has led to concerns that there will be an increase in violence in EDs (Benveniste, Hibbert, & Runciman, 2005). Mental health presentations to EDs have increased and ED nurses have expressed concern that they are not able to provide appropriate care (Pich et al., 2011). They attribute this to not being psychiatric nurses and having knowledge and skills to de-escalate situations. This has resulted in ED nurses avoiding contact with mental health patients (Jones & Lyneham, 2000). This perception assumes that only psychiatric nurses have communication skills and yet mental health presentations are a major source of violence in ED. Certainly having a mental illness increases the risk of violence when compared to the level of risk in the community, however, this increase is due to specific, acute psychotic symptoms, and the majority of people with a mental illness are not violent (Davison, 2005). Clinical presentations that are more likely to include some violence behavior in acute settings include dementia, acute confusion, acute mental illnesses or personality disorders (Gerberich et al., 2005).
Interactions between emergency department nurses and patients.

Patient factors are often considered responsible for violence; however, there is awareness amongst ED nurses that there are times when a nurse’s behaviour may escalate a situation. An Australian study by Lyneham (2000) used in-depth interviews to explore precipitating factors for violence with ED Nurses (N=9). The nurses reported that some staff approach “aggression with aggression”, have a negative attitude, and this approach was being copied by less experienced staff. This was attributed to a lack of support for staff, burnout, stress, and potentially some nurses not being suitable for ED work.

Conversely, nurse behaviour has also been identified as having a positive effect on patient behaviour. A qualitative study by Levin (1998) in America conducted four focus groups and included nurses who had been assaulted in the sample (N=22). The participants identified nurses’ manner is important; on approach the nurse should appear confident and respectful, as conveyed by body language and attitude. The nurses also noted when the nurse was confident and assertive the patient would not “try to get away with anything” (p 251). This study confirms that nurses are aware of how their behaviour may be perceived. Furthermore, there was an assumption that patients are able to decide when to become violent, yet this may not be possible when patients are affected by drugs, alcohol, or acute mental health symptoms.

The nurse-patient interaction was explored by Australian researcher Lau et al., (2011) using an ethnographic approach to study the cultural aspects of violence in ED. Emergency department nurses (N=33) were interviewed and practice was observed for 242.5 hours. This data identified three major cultural themes. These were ‘problems and solutions’, ‘requests and demands’, and ‘them and us’. It was identified from observations that there was usually a turning point that provided an opportunity for the nurses to avoid violence. Furthermore, establishing rapport through early communication and effective interpersonal skills of the ED nurse have a major role in reducing violence in ED. This study was conducted at one large urban ED and staff and patients were aware they were being observed, so
there was some potential for behaviour to be modified. There were no patients included in the study due to ethical and methodological challenges and Lau et al., (2010) has identified this limitation and suggested alternatives, such as focus groups to increase patient participation in the future.

**The influence of drugs and alcohol on behaviour.** There is concern among health professionals that drug and alcohol use leads to violence in ED (Kennedy, 2005; Kowalenko, et al., 2012a) and patients who are intoxicated are at greater risk of becoming violent (Crilly et al., 2004; Sands et al., 2009). Furthermore, qualitative research has shown ED nursing staff perceive that there is no warning with this type of violence and it is unpredictable (Lau, 2011) which can limit opportunities for prevention.

The perception that alcohol and drug use are contributing factors to violent incidents was confirmed by an Australian survey of ED nurses by Lyneham (2000). Of the 226 ED nurses surveyed, 88% reported alcohol and 79% reported drugs to be precipitating factors for violence. This study was based on the perception of ED nurses and not a review of actual incidents.

It is possible that ED nurses have overestimated the role of drugs and alcohol as a contributing factor for violence. A later Australian study by Crilly et al., (2004) prospectively recorded violent incidents at two EDs to identify contributing factors. Nurses’ perceived alcohol was a contributing factor in 27% (30/110) of incidents and drugs 25% (27/110). Data was collected prospectively and monitored data weekly to ensure it was complete and accurate. This study confirms that alcohol and drug use is a contributing factor in some violent incidents however the proportion identified was lower than reported by Lyneham (2000) who surveyed ED nurse perceptions that were not linked to incidents. This finding may be due to the methodology used that was less reliant on recall and the accuracy of data collection was checked weekly.
Access to treatment and waiting times. Waiting for treatment is often regarded as a contributing factor for patient violence in the ED, however, there is conflicting evidence to support this position. An ethnographic study by Lau (2011) in Australia explored staff perception of contributing factors to violence. Lau (2011) reported staff perceived long waiting times to be a precipitating factor in 89% of incidents. This finding was not based on actual wait times but retrospective perceptions from ED nursing staff. It is possible that nurses experience verbal abuse from patients who are waiting, however if this behaviour does not generate an emergency response or incident report it will not be recorded.

There may be a relationship between long waits and the staff resources to communicate and care for patients (DHS 2005), however, there is no significant association between violence and patient-to-nurse ratio in an ED setting (Medley et al., 2012). An American retrospective study by Medley et al., (2012) explored the association between occupancy rates in the ED and rates of violence toward staff. They reviewed patient charts and incident reports over 42 months and calculated the occupancy based on average length of stay, and the number of patients seen in ED over a 24-hour period. They found a significant association ($p <0.001$) when comparing the occupancy rate and days when there were violent incidents. Multivariate logistic regression confirmed a significant association between crowding and violence toward staff ($OR \ 4.290$, $95\%\ CI \ 2.137–8.612$). This study, which took place at one ED in a rural setting, was dependent on documentation, and the actual association between occupancy and violence may have been understated due to under reporting of violence. These findings highlight that at times of increased occupancy there are more violent incidents, and focusing on prevention while staff are busy needs to be a priority. This also supports the premise that environmental factors significantly influence the incidence of aggression and violence.
Impact of Violence on Nursing Staff and the Quality of Patient Care

Experiencing violence has both physical and psychological consequences for staff and negatively affects the organisation and the quality of patient care. The effect on the staff member’s health will depend on the support they receive after the incident (Nurse Policy Branch, 2005), how they respond, cope, and how they perceive professional expectations (International Council of Nurses, 2007). Physical injuries range from bites, bruises, fractures, pain, and in the most extreme cases death. Psychological injuries include frustration, anxiety’, irritability’, apathy’, self-blame’, and helplessness (Fry, O’Riordan, Turner, & Mills, 2002). Victims may also experience loss of sleep, nightmares, and flashbacks (Gerberich et al., 2004). Staff also report feeling annoyed they did not anticipate the event, disbelief, and shock (Arnetz & Arnetz, 2001; Fry et al., 2002; Lyneham & Jones, 2000). The amount of psychological distress experienced may be related to the perceived intent of the perpetrator. Violence from patients with limited control, such as those with dementia, is thought to have less impact on the staff due to some compassion for the patient (Mayhew and Chappell, 2003). For example, patients with dementia who are violent are seen as resisting care and the behavior is seen an unintentional (Pich et al., 2010).

The emotional wellbeing of ED nurses may be affected by violence. An American study by Gates (2011) of nurse productivity and Post Traumatic Stress Disorder (PTSD) was conducted with 230 emergency nurses. They reported 94% of nurses experienced at least one post-traumatic stress disorder symptom after a violent event. A more serious consequence is that 17% of nurses had a probable diagnosis of PTSD (Gates et al., 2011). Moreover, they found that exposure to violent events was significantly related to decreased productivity. The authors concluded that although ED nurses report they are not “affected” they have more difficulty remaining cognitively and emotionally focused at work following a violent incident. This supports a call for greater research and intervention after violent incidents to reduce the negative effects on nurses (Gillespie, 2008).
The influence of violence on patient care. Most research on the impact of violence focuses on staff however evidence suggests that violence also influences the quality of patient care. Abused staff may hold negative attitudes towards patients (Arnetz & Arnetz, 2001) and the quality of care and productivity decreases (Gates et al., 2011). Further workforce consequences will impact patients. A large Australian study by Farrell (2006) surveyed nurses from all areas of health (N=2407), and found 11% of respondents had left a position once during their career, and 24% of respondents had considered resigning during their last four working weeks because of violence. Two thirds of nurses who had experienced aggression indicated that it “frequently or occasionally” contributed to their potential to make errors. This is significant because 63.5% (n=1,528) of the respondents had experienced aggression (Farrell et al., 2006).

Impact of violence in the emergency department on organisational outcomes. It is difficult to quantify the impact and cost of violence, and there has been no economic evaluation of the actual cost to health services. In addition to time spent responding to aggressive and violent behavior, hospital staff report increasing sick leave, (Lipscomb & Love, 1992; Lyneham, 2000), low morale, increased turnover, burnout (Lyneham, 2000; O’Connell, Young, Brooks, Hutchings, & Lofthouse, 2000), and decreased job satisfaction (Whittington et al., 1996). Further financial implications include legal action, compensation, and reduced productivity (Di Martino, 2002).
Interventions for Prevention and Management of Violence in the Emergency Department

There is agreement that multiple factors contribute to violence in acute health care, and prevention requires several strategies to form an organisational approach to prevention (Cox & Leather, 1999). Further research is needed to explore the effectiveness of interventions, and ensure organisational processes and structures are evidence-based and integrated with prevention and safe practice (Anderson et al., 2010; Catlette, 2005; Fernandes et al., 2002; Gates et al., 2011; Kynoch, Wu, & Chang, 2011). There is extensive literature on managing patient violence, but the majority of this research is conducted in psychiatric facilities. Interventions for violence prevention range from policy initiatives such as zero tolerance, aggression prevention training, and mechanical restraint reduction.

“Zero Tolerance” as a strategy for prevention. In responding to the burgeoning problem of violence in health care settings, governments have developed policies based on a “zero tolerance” approach. In essence this strategy conveys a key policy directive that violence, regardless of the context in which it is experienced, is never acceptable and will not be tolerated. The zero tolerance approach was adopted both within the National Health Service of the United Kingdom and by some states and territories within Australia, where it received endorsement from the national union of nurses, The Australian Nursing Federation (ANF, 2010).

As a policy intervention, zero tolerance is conventionally applied to crime prevention rather than health care settings. The zero tolerance approach focuses on deterring violence by threatening consequences or punishment for unacceptable behaviour (Di Martino, 2002; Bushman & Anderson, 2001). Zero tolerance aims to provide staff and patients with a therapeutic environment that is free from any violence or aggression (ANF, 2010 #260), however, there is no evidence to support its use. As a policing strategy, zero tolerance has been described as an approach where all crime is reported, all laws are enforced, and there is no discretion or consideration to the context of the criminal offence.
(Marshall, 1999). A zero tolerance approach was reported as successful against crimes such as homicide, robberies, and violent crimes in New York, however, complaints against police increased. It was considered a short-term fix without consideration for longer-term issues, such as working with communities (Hyde, 1998). Zero tolerance is based on an assumption that if people see minor crimes being punished to the full extent possible, this will deter criminals, compared to crime escalating when minor offences are not punished (Marshall, 1999). This assumption is not transferable to a health context and has not been adopted by the Department of Health in Victoria supported by or evidence (Department of Human Services, 2007; Wand & Coulson, 2006)

**Negative impact of zero tolerance for patients.** What is concerning though, are the negative impacts the zero tolerance approach has been shown to have for patients. Studies of the impact of the zero tolerance policy in the United Kingdom (NHS) and in Australia suggest this approach increases the use of high intensity interventions such as physical and mechanical restraint to manage challenging behaviour (Whittington & Higgins, 2002). An Australian study by (Middleby-Clements & Grenyer, 2007) compared a training program with mental health nurses when a zero tolerance approach was advocated. Nurses who received training that promoted zero tolerance had decreased levels of confidence, tolerance, and a more rigid approach. Moreover, the zero tolerance policy was not found to significantly change staff perceptions about the level of support from managers to take action against perpetrators of aggressive and violent behaviour (Hurst, 2007).

Despite a lack of empirical evidence to support its use zero tolerance continues to be supported by some health sector unions (ANF, 2010)) and in some jurisdictions by governments (NSW Health, 2003). An awareness of how zero tolerance is applied in practice may be evolving. Evidence submitted to a Victorian Parliamentary Inquiry (2011, p. 68) has noted initial support for zero tolerance was shifting towards the view that although violence is unacceptable, when it does occur it should be managed. It is also noted that the use of “zero tolerance”
terminology may lead to health care workers being less able to manage and cope with violent situations effectively.

Violence prevention programs that are specific to ED have advocated for a zero tolerance approach (Kowalenko et al., 2012a). This has raised concerns from clinicians that zero tolerance policies are contrary to evidence-based aggression prevention strategies, and may lead clinicians to avoid using non-coercive strategies, such as de-escalation as a first line of defence (Wand & Coulson, 2006). This may result in greater risk for staff if interactions are confrontational (Hodge & Marshall, 2007). However, other commentators assert the potential for a zero tolerance approach to be highly effective, but acknowledge transferring the principles of the zero tolerance approach from a crime reduction strategy into a health setting requires some adaptation (Pich, 2011 #122).

**The use of zero tolerance in practice.** The application of zero tolerance to violence in ED is problematic. In a health setting not all patients are cognitively intact and understand the consequences of their behaviour. The relationship between a health professional and patient has a component of duty of care, and this duty of care is not altered by the patient’s behaviour. Behaviours such as treatment interference and wandering place staff at risk of violence, yet there is no option to apply “zero tolerance” to these behaviours. In an acute health setting, patients may attempt to leave while experiencing a delirium, or resist intrusive interventions such as pulling on a urinary catheter, naso-gastric tube or airway tube. When patients attempt to remove these devices, nurses will attempt to maintain the patient’s safety and medical treatment. At times this will result in security staff assistance to apply mechanical restraint or return a confused person to their bed. These behaviours are common in acute health, yet applying a zero tolerance approach to these behaviours would contradict duty of care and not be effective.
**Aggression prevention training.** Violence prevention and management training for staff is a commonly used organisational prevention strategy. There is inconsistent evidence on the effectiveness and impact of aggression prevention training and few studies that could be replicated. Despite this, there is agreement and support for aggression prevention training to be provided and it is a required component of a comprehensive violence prevention program (Martindell, 2012).

An Australian study by Hills (2008) surveyed staff to determine their experience of aggression, prevention training, and perceived self-efficacy in managing patient aggression. A random sample of 650 nurses yielded a response rate of 48.3% (N=300) from all areas of acute health, including emergency, medical, surgical, and aged care. This study was based on self reports of any physical or verbal aggression in the past three months. Hills (2008) found 76% (n=224) had experienced aggression and verbal abuse was more common than physical assaults. Staff reported their self-efficacy to be low to moderate (M=20.1, SD=6.4). There was a very low association between attending aggression prevention training in the past five years, the frequency or type of aggression experienced, and self-efficacy (Hills, 2008).

This study confirmed that aggression prevention training requires further evaluation and the sustainable reduction of aggressive incidents could be an outcome measure. Evaluating training by reporting the frequency of incidents may be problematic due to under reporting because an increase in events may indicate improved reporting rather than inadequate training. The need for further evaluation identified by Hills (2006) was supported an earlier UK study by Lee (2001) of self-efficacy and aggression prevention training. Nurses from ED (N=76) were surveyed and reported a similar level of self-efficacy (M=20.38, SD=5.5). ED staff reported high rates of violence, including 79% (n=60) who experienced violence once previously, and 71% (n=54) who had experienced verbal violence at least three times in the previous three months (Lee, 2001). This study found the training provided, which was described as sporadic and possessing limited content on de-escalation, did not equip staff to manage aggression.
An Australian study by Deans (2004) evaluated an ED specific training program. The program included awareness of the environment, responsibilities, colleague’s strengths and weaknesses, cause and types of aggression, responses, and options to manage, and led to a 50% reduction in aggression and violence (Deans, 2004). The program also included physical techniques of deflection, avoidance, and secure escort techniques. This study is limited by the small sample size. A total of 40 staff attended training and 55% (n=22) completed before and after questionnaires. This sample represented only 36% of all the ED nurses (N=60) who were invited to participate. After training there was a statistically significant improvement noted. Nurses in ED had greater confidence reporting aggression to management and dealing with aggressive situations. Staff had improved knowledge and understanding of managing aggression and working as part of a team. The reduction in incidents was attributed to ED nurses intervening earlier and de-escalation of potentially violent situations (Deans, 2004).

There is no evidence that education results in sustainable reduction in the number of violent events. A Canadian study by Fernandes (2002) explored the impact of a 4-hour specific ED aggression prevention training program recorded the number of violent incidents at three and six months following training. Staff responses (N=667) indicated the number of incidents reduced initially, but there was no sustainable change in the frequency of violence.

Some health services provide staff training due to legislative requirements. A study of workplace violence programs in EDs included 116 hospitals in California and 50 hospitals in New Jersey (Peek-Asa et al., 2007). Hospitals in California have to comply with the Hospitals Security Act, which was introduced in 1993, and requires all EDs to provide training, and all staff who work in EDs to attend training. They found that 91% of hospitals in California had a training program compared to 72% in New Jersey. Despite having training programs, only 7.5% of staff in California and 5.6% of staff in New Jersey had attended training, with medical staff most likely to be excluded. A review of the training programs (N=166) found they did not cover all topics required, and nearly half of the programs lasted for one
hour or less (Peek-Asa et al., 2007). The programs were often led by a few individuals, and tended to focus on components they were familiar with. For example, nurses focused on training and human resources staff focused on policy. This comprehensive research identified that legislating training did not translate into adequate training frequency or content. Legislation may be more effective if it is enforced, and prevention programs should be targeted to each hospital’s environment. This study did not assess the quality of the training programs. It only noted the absence of components and no patient outcomes were reported (Peek-Asa et al., 2007),

**Mechanical restraint reduction.** Although using mechanical restraint is seen as an intervention to improve staff safety when a patient is aggressive, restraint reduction should be considered. Mechanical restraint is used to manage patients who present a threat of violence to themselves or others (Knott et al., 2005), however, there are negative effects for patients. In a survey of American Psychiatric Emergency Centers the majority agreed that patients recall mechanical restraint and there is potential for adverse effects (Allen & Currier, 2004). There is a risk of serious injury and death, 69% of patients were able to recall the experience, and 54% reported they would not seek treatment again (Allen et al., 2003). Although mechanical restraint use is always considered an emergency last resort, violence rarely occurs suddenly and without warning (Wand & Coulson, 2006). There may be an opportunity to intervene and de-escalate the situation to minimise restraint use. Minimising mechanical restraint in an emergency setting would, therefore, require parallel initiatives to manage violence.

Restraint reduction is possible in EDs without an increase in staff assaults. McMahon (2003) reported decreasing the number and duration of patients restrained by 50%, with no increase in assaults in an ED with 95,000 presentations annually. Previous attempts at restraint reduction by increasing policy compliance had not been successful, and there was no sustainable improvement. This three year project aimed to improve the overall management of aggression by increasing reporting, ensuring all staff were trained, discussing safety issues openly, and
supporting staff who chose to pursue legal action after being assaulted. An American study by Emde and Merkle (2002) reported on changing practices to reduce the use of restraint. This ED had 51,000 presentations annually and restrained on average 22 people per month. An education program of 11 hours was provided and sitters were arranged when needed. Sitters are trained support staff to provide patient care and observation. There was no increase in assaults towards staff and episodes of restraint reduced to an average of seven per month.

**Environmental design as a strategy for prevention.** The principles of “Crime Prevention Through Environmental Design” are designed to reduce the opportunities for crime by altering the environment (Mayhew & Chappell, 2005). This approach requires consideration of workspace design, such as the location of doors, lighting, and improved surveillance. There is increasing consideration being given to security measures such as metal detectors, in response to growing concern from nurses that patients are bringing guns to hospital (Catlette, 2005; Gates, Ross, & McQueen, 2006) and reports that staff identify weapons from X-Rays (Gillespie, 2008).

An American study by Rankins (1999) conducted a retrospective review of security records from 1992 to 1996 to determine the number of weapons and assaults before and after a security system was implemented. The security system included metal detectors, cameras, limited access, and a manned security booth at the ED entrance. Rankins (1999) found 24 weapons were removed before and 40 after the implementation. Although the number of weapons identified increased there was a reduction in the number of weapons found in patient care areas. The number of assaults over this period did not change. This study confirms that one strategy in isolation will not reduce the number of violent incidents, and that environmental strategies need to be part of an organisational response to violence.

International research from the UK has explored patient and staff experience of violence and aggression in ED by reviewing the design and pathways for patient care (Design Council (2014). This work involved 3 stages. Firstly a “Guidance” project explored signage and informing patients what to
expect in their journey through ED. The second stage was a “People” project for front line staff to reflect on interactions with people in ED and finally an on line toolkit was developed with design principles. The online toolkit contains information on triggers for violence, perpetrator characteristics, and ways to improve the patient’s experience. The toolkit provides tips on considering the design process and developing local solutions that work to benefit both staff and patients. This comprehensive work suggests initiatives should contribute to existing programs of work rather than conducted in isolation to improve integration into practice and sustainability.

**Use of organisational alerts to identify risk of violence.** Organisational procedures to identify and record patients who are at risk is often referred to as “flagging files” and this may include an alert on the patient registration system or medical record. Mayhew and Chappell (2005) have suggested flagging files to warn staff given that past violence is the best predictor of future violence. However, flagging files is intended to prompt staff to develop prevention strategies to improve the safety of staff and patients (Drummond, Sparr, & Gordon, 1989; Kling, Yassi, Smailes, Lovato, & Koehoorn, 2009). Sanctioning of patients has been used increasingly in the UK, but this type of deterrent is not effective with patients who can’t control their behaviour, so it has limited relevance to patients with an acute mental illness or cognitive impairment (Mayhew & Chappell, 2005).

The use of flagging files has been considered by Heads of Workplace Safety Authorities who monitor compliance with Occupational Health and Safety legislation (2009). They conducted an audit of 163 hospitals in 2009 to determine to what extent organisations had specific components of a violence prevention strategy. Components audited included policy, training, incident reporting, risk assessment, design, and management commitment. Each organisation was rated based on the presence or absence of pre-determined criteria. However, the extent to which strategies were actually integrated into health care provision at a local level were not evaluated. For example, they audited if there was a procedure for flagging files of patients at risk of aggression. The auditors concluded that having a
procedure for flagging files had no significant effect upon the reported levels verbal or physical aggression. They questioned if this was due to staff not having access to the information, or the flagging system not actually being used. Despite the audit not identifying if flagging files had been used in practice, they questioned if past aggressive behaviours were a valid predictor of future behaviours (Heads of Workplace Safety Authority, 2009). This is a clear contradiction to long-standing evidence that past aggressive behaviour is an indicator for increased risk of further aggression (Drummond et al., 1989; Mullen, 2000.; Sands et al., 2009).

**Best Practice Recommendations for Violence Prevention in the Emergency Department**

Although there are multiple descriptions of the problem of violence in an ED setting the principles for prevention and management are consistent. There is agreement that multiple interventions are required and violence prevention training alone is inadequate. Prevention requires a coordinated approach including policy, raising the awareness, enhancing the interface between police and hospitals, appropriate training, reporting, and monitoring systems (Department of Human Services, 2007). This organisational approach is supported by Gillespie et al. (2012) who encourages a range of measures, including security cameras, policy, staff support, prevention programs, and a focus on coping after a violent incident. This approach reflects the many contributing factors to violence in ED.

A clinical approach and best practice guideline to manage the risk of violence has been developed by a collaborative of emergency physicians and psychiatrists (Holloman & Zeller, 2012). This group acknowledged that traditional methods of using medication and restraint can be minimised with a coordinated approach to managing agitation (Richmond et al., 2012). Agitation is defined as “an extreme form of arousal that is associated with increased verbal and motor activity” (Nordstrom et al., 2012, p.3). The word “agitation” is a shift away from terminology such as violence and aggression, and there is also no reference to a zero tolerance approach. Holloman et al., (2012) reported working groups were formed
and goals developed included accurate diagnosis, rapid stabilisation of the acute crisis, avoiding coercive practices, least restrictive setting, developing a therapeutic alliance, and care planning. These priorities have a patient focus and aimed to provide clinicians with best practice guidelines. Although the guidelines have a mental health focus, the principles apply to managing agitation for patients with a medical presentation, or both (Stowell, Florence, Harman, & Glick, 2012). There is recognition that patients, carers, and family, should have an opportunity for consultation during the assessment of agitation in an emergency setting (Stowell et al., 2012).

There is an emphasis on reducing restraint to manage agitation and prioritise less coercive approaches, such as using verbal de-escalation, yet there is no evidence on its effectiveness. A non-coercive approach using verbal de-escalation has been outlined for use with agitated patients in the ED (Richmond et al., 2012). Verbal de-escalation has three stages and involves verbally engaging the patient, developing a collaborative relationship and de-escalation of agitation. The objectives include safety, helping the patient manage current agitation, and avoiding restraint and coercive interventions that may escalate the situation. The success of this approach depends on genuine commitment from the clinician involved, and although there is no reported rate of success, with experience clinicians can de-escalate situations more often than previously thought (Richmond et al., 2012).
A risk management approach to violence prevention. Risk management is guided by an international standard that requires organisations to have process for continual improvement, accountability, monitoring risk, and integration with a governance structure (ISO, 2009). Risk management has three phases, they are identifying hazards, assessment of risk and factors that contribute to risk, and developing processes to eliminate or minimise the risk (Work Safe, 2008). In a health context, risk management requires staff to be proactive if there is a potential for violence (Forster et al., 2005). This process for risk identification at triage requires development and evaluation, because it is unknown if these principles applied at triage will reduce the incidence, impact, or severity of violence in ED.

Implications of this Review for this Thesis

This chapter highlighted the prevalence and impact of violence in EDs. The current approaches used to measure the prevalence are dependent on the definition of violence, recall of incidents or rely on documentation and reporting which is problematic. The strategies for preventing violence and causal theories were outlined. This demonstrated the complex nature of interactions that occur at triage. A coordinated approach developed with ED staff is required to develop policy, training, and risk identification processes. There is a need for balance to be reached between the need for staff safety and also maintaining duty of care (Forster et al., 2005).

The models of care provided to patients, and in which staff work, can impact the acuity of each clinical area. Although ED is considered a separate area, the length of stay is reducing, and short stay and medical/surgical assessment models of care are being developed and implemented. Patients are often transferred to these units within a few hours of arriving at ED. This effectively increases the acuity of patients cared for out of ED and increases the turnover for ED staff. Strategies developed for ED settings and ward areas may need to be more closely aligned.
There are opposing views on the ability of healthcare organisations to prevent violence; however, these views are of little value to nurses trying to prevent violence. There is no evidence for a “zero tolerance” approach, but it is still suggested as a strategy for prevention. Despite the range of interventions to manage violence and some awareness of factors that contribute, there was little reference to appropriate clinical care i.e. managing withdrawal, hypoxia, delirium, and dementia. It may be that focusing on patient care may be more useful than increasing security cameras, for example.

There is a lack of evidence about the effectiveness of interventions on reducing the incidence, severity or impact of violence on health professionals and patients. There is limited research on the use of flagging files or alert systems, and interventions need to be thoroughly evaluated, as violence impacts both patients and staff.

There is also a distinct lack of consumer awareness in the current literature. There is no literature that explores using decision support systems for the subjective assessment of the risk of violence at triage, or examination of the consumer perspective on electronic decision support systems at triage. Prioritising a therapeutic relationship (Duxbury, 2002) as a valid and reliable intervention for prevention of violence presents a challenge for the brief triage nurse-patient interaction.

Research to explore violence has been hampered by the lack of a standardised definition and the absence of a measure of severity that could be applied in an ED setting. This has implications for replicating research findings, generalisability, and measuring the impact of violence prevention initiatives. Given the extent of violence and the impact on staff, a risk identification approach has the potential to enable staff to prepare, not only physically, but emotionally to commence prevention for patients at risk of violence.
Chapter Three: Violence Risk Screening at Triage

A critical discussion of the international peer-reviewed literature and published research that describes the rationale for, and evidence supporting, violence risk screening in the ED will be presented. The concept of risk screening will be differentiated from risk assessment. Traditional approaches to violence risk assessment used in mental health will be described, including unaided clinical judgement, actuarial assessment, and structured clinical judgement. A comprehensive approach based on the limitations of existing approaches called the Risk Analysis Model (Lamont & Brunero, 2009) will be outlined. This review will also explore the limitations of violence risk screening for patients and staff from a clinical perspective. Ethical considerations of violence risk screening will be discussed. The implications for this thesis and areas for further research will also be identified.

Search Strategy

A comprehensive search of peer-reviewed literature was conducted to explore approaches to violence risk screening in the ED. The review was conducted using Medline, CINHAL, and Psych Info from 1990 to 2015. Search terms were: aggression risk screening, aggression risk assessment, violence risk, aggression risk screening and ED risk assessment, and violence prediction. A total of 917 articles were accessed and 61 were included in the review. Of these, 30 were research papers, 8 were reviews of the evidence, 7 reports and the remaining literature was based on opinion and theory. Government reports and policy documents were accessed where relevant. Reference lists were reviewed to identify additional resources. Clinical practice guideline databases were searched including The Cochrane Library, Consensus Guidelines, National Clinical Guidelines Database and the US National Guideline Clearing house. Figure 3.1 shows the scope of the literature accessed.
Key Terms
Date range 1990-2015
aggression risk screening, aggression risk assessment, violence risk, aggression risk screening and ED risk assessment, and violence prediction

Articles identified
N=939

Articles excluded
n=4431
Violence risk assessment in forensic and/or mental health,

Abstracts reviewed
n=510

Articles included in this Chapter n=61

Research papers
n=30

Reports
n=7

Opinion and interpretation of theory
n=16

Evidence review
n=8

Figure 3.1 Scope of Literature Accessed
Three key questions informed the review:
1. What approaches are used to identify patients who are at risk of violence?
2. What are the existing tools to identify the short term risk of violence?
3. What are the clinical and ethical implications of identifying patients at risk of violence on arrival to ED?

This search strategy identified several articles reporting on intimate partner violence and these were excluded. Literature that focused on violence risk assessment in forensic mental health settings and required knowledge of the patients past history and an interview to complete was excluded. Violence risk assessment literature that focused on short term prediction of violence and identifying risk for violence in ED was included. Violence risk assessment tools that could be used in a triage interaction, administered on admission, and used in a mental health setting were also considered as they do have some relevance to an ED setting.

**Differentiating Violence Risk Screening and Assessment**

The terms 'risk screening' and 'risk assessment' are often used interchangeably, however, these are different processes. The purpose of risk screening is to identify a disease or condition, provide treatment, and prevent its occurrence (Langan, 2010). Risk assessment has been defined as, “a process of gathering and evaluating information to assist in decision-making regarding the likelihood of an adverse event (Sands et al., 2009, p.157). In practice, conducting a risk assessment is a comprehensive process. All available information, including collateral history from multiple sources and an in-depth interview are used in combination to determine the level of risk and subsequent management plan. A violence risk assessment conducted in a mental health setting aims to “identify individuals who are at greater risk of harm and provide these patients with a higher level of treatment and supervision, thereby reducing the incidence of harm” (Large & Nielssen, 2011, p. 413).
Identifying the risk of violence at triage is not a complete violence risk assessment; rather it is a framework to commence prevention by identifying risk factors (Sands, 2007). The triage violence risk assessment process described by Sands (Sands, 2007) includes a primary survey to identify physiological indicators, observation of behaviour, and an analysis of the patient’s conversation. The triage process can include the risk of violence when determining the clinical urgency (Gerdtz et al., 2007). In an ED triage setting, identifying the risk of violence is a rapid decision (Sands, Elsom, Gerdtz, & Khaw, 2012).

**Approaches to Identifying the Risk of Violence**

The purpose of predicting the risk for violence at triage is to plan care and commence preventative strategies (Swanson, 2008). Research indicates that there is agreement that the risk for violence cannot always be accurately predicted (Maden, 2003). Despite this limitation risk factors for violence can be easily identified by health professionals (National Institute for Clinical Excellence, 2005).

**Unaided clinical judgement.** The most common approach to identifying patients at risk is clinician’s unaided clinical risk assessment (Dolan & Doyle, 2000) (National Institute for Clinical Excellence, 2005). Using this approach, health professionals determine the level of risk based on their clinical judgement alone rather than the outcomes of validated tools or rating scales. This approach has a number of limitations, including poor levels of inter-rater reliability and content validity. In addition to these limitations there is currently no clear evidence available to guide preventative interventions once a risk is identified (Monahan et al., 2001; Webster, Douglas, & Eaves, 1997).

Using unaided clinical judgement has been criticised because the perception of risk is subjective, lacks transparency, and is effectively a guess based on the clinicians experience and judgement (Large & Nielssen, 2011). Research suggests that the effectiveness of unaided clinical judgement can be improved when used in conjunction with multidisciplinary team input (Fuller & Cowan, 1999). Mulvey and Lidz (1995) reported that the accuracy of unaided
clinical judgement could be improved when staff considered the clinical context of when violence occurred. In contrast, clinical psychologists have cautioned against relying on clinical judgement alone when working with familiar groups in familiar contexts (Ægisdóttir et al., 2006). Clinicians may become overconfident, selectively remember clinical factors that support their decision, and avoid using or recalling contradictory information. It is unknown how a nurse’s individual beliefs and value systems may influence their perception of risk. If a nurse determines a patient is at risk of violence there is potential for minimum care to be provided. It is unknown if ED nurses may avoid patients due to being fearful of the risk of violence and this may result not engaging or with the patient. In mental health settings clinicians are also affected by “high loss but low probability” events that attract significant attention from the community, such as stranger homicide, which may influence future decisions about risk (Large & Nielssen, 2011).

**Actuarial risk assessment.** The actuarial approach to violence risk assessment uses validated tools to, “assess the probability of an adverse event by scoring patient characteristics according the presence or absence of a predetermined set of risk factors” (Large & Nielssen, 2011, p.414). This approach avoids relying on clinical judgement and requires a clinician to complete a standardised tool that determines the risk based on static factors such as gender and past history of violence. The ratings are completed in a consistent way in the absence of clinical judgement and take into account previous violent behaviour (Grove, Zald, Lebow, Snitz, & Nelson, 2000). The actuarial approach ignores fluctuations in an individual’s circumstance that may influence risk and places less importance on clinical judgement (Doctor, 2004; McSherry, 2004). In clinical practice an actuarial risk assessment does not identify the purpose of violence and this limits identifying the most appropriate interventions for prevention. The lack of clinical judgement, however, limits bias from individual clinicians, is transparent, and has a higher level of inter rater reliability (Daffern & Howells, 2002). Completing an actuarial risk assessment requires less expertise than using clinical judgement (Large & Nielssen, 2011). In clinical practice the probabilities of risk are
based on population estimates and reliance on these factors alone is not recommended when determining the risk of violence for an individual (Ministry of Health, 1998). Actuarial tools require extensive information, which is often not available on admission when patients are at highest risk of violence (McNiel & Binder, 1994).

An American study by McNiel et al., (2003) reviewed the predictive ability of three actuarial tools to determine which patients would have a violent episode. These were the Historical, Clinical, Risk Management–20 (HCR-20), the Hare Psychopathy Checklist–Screening Version (PCL-SV), and the McNiel–Binder Violence Screening Checklist (VSC). Ratings were completed based on clinical documentation for 100 acute mental health patients who had a behavioural emergency that resulted in their admission to a locked mental health unit. The authors concluded that the strongest predictive factors for violence were clinical risk factors rather than historical variables. Furthermore, clinical variables such as current behavioural disturbance or acute phase of schizophrenia (McNiel et al., 2003) are more useful when predicting the risk of violence in the short-term, whereas long-term predictions remain reliant on historical variables. This study used a randomised sample and relied on documentation to complete the tools rather than direct clinical interaction. In practice, these tools would usually be completed during a clinical interaction and this may have limited the available information.

The time frame used by McNiel (2003) was considered ‘short-term’ and ranged from the next few days to weeks following evaluation, and the sample was limited to patients requiring admission to a mental health unit. These actuarial tools are not suitable for use at ED triage, however, this research confirms clinical factors are relevant in determining the risk of violence, and there is a role for decision making tools for the short term prediction of violence (McNiel et al., 2003).
**Structured clinical judgement.** The third approach to violence risk assessment is using structured clinical judgement (Doyle & Dolan, 2007). This approach is regarded as holistic and considers the patient on an individual level (National Institute for Clinical Excellence, 2005). Risk is conceptualised as dynamic, and fluctuations in a person’s environment, illness, and situation are incorporated into the decision making processes. This approach determines the risk of violence using a combination of clinical judgement and actuarial information, which allows for clinical expertise to be combined with evidence based risk factors (Maden, 2003; McSherry, 2004). There is nursing support for this comprehensive approach, which is considered superior to using clinical judgement or actuarial methods in isolation (Delaney, Cleary, Jordon, & Horsfall, 2001). A benefit of this approach is being able to determine risk factors across settings and populations (Muir-Cochrane & Wand, 2005; National Institute for Clinical Excellence, 2005; Lewis & Webster, 2004).

An example of using structured clinical judgement in practice is using a list of risk factors developed to identify the risk of violence and management required. An Australian study by Forster et al., (2005) developed a violence risk assessment tool for use in all areas of an 800 bed general hospital. The tool contains nine items, some of which include agitation, a history of threatening behaviour, and acute mental health symptoms. Each item is rated low, medium or high, and prompts staff to commence management strategies. A benefit of using a list of objective items is that this process limits staff decisions being based on subjective information alone. The use of the tool coincided with a reduction in violent incidents on medical and surgical wards, but there was no evaluation of the sensitivity and specificity. Of concern is one item that identifies if a patient has assaulted a healthcare worker in the previous 12-months. This item is dependent on the clinician knowing historical information, the patient being capable of recalling the information, and the timeframe is not evidence based. It is not clear, for example, whether a patient who assaulted a healthcare worker 13 months ago would not be at risk of further violence.
The benefits and limitations of the clinical judgement versus actuarial methods have also been referred to as the clinician versus researcher (Douglas, Ogloff, Nicholls, & Grant, 1999). The research focus has been on the predictive ability of the tool and the clinicians’ focus on the prevention of violence and providing care (Abderhalden et al., 2004; Doyle & Dolan, 2004). Clinicians have a responsibility to prevent adverse outcomes and successful management and prevention of violence will affect the predictive ability of the assessment tool (Lamont & Brunero, 2009). In clinical practice, prevention strategies targeting patients identified at risk this may lead to less incidents of violence. This could be interpreted as a risk identification process with a high rate of false positives and a lower sensitivity from a research perspective. From a clinical perspective however this would be appropriate.

**Risk analysis model.** The “Risk Analysis Model” has been proposed by Lamont & Brunero (2009) as an alternative to using actuarial tools, unaided, or structured clinical judgement to determine risk. The Risk Analysis Model (2009) incorporates a comprehensive approach to provide clinicians with a framework that acknowledges the dynamic nature of risk assessment. Figure 3.2 shows the Risk Analysis Model.
Figure 3.2 Risk Analysis Model (Lamont & Brunero, 2009 p 31)

The four stages of the model are risk assessment, formulation, management and review. Risk analysis involves information gathering, identifying risk factors, exploring proactive interventions to prevent and manage the risk of violence, and continuous review (Morgan, 2001; National Institute for Clinical Excellence, 2005; Thomas, 2010). This approach requires workplace systems for communication, collaboration and an organisation that supports clinicians to practice within a risk analysis approach. The risk analysis model is consistent with government recommendations that propose a risk management approach to identify hazards, assess risk, and implement control measures as part of a continuous process (Department of Health, 2011; Work Safe, 2008).
**Statistical analysis of tools to predict violence.** Violence screening tools are evaluated by determining the ability of a tool to accurately predict an outcome. Statistical measures include sensitivity, specificity, predictive values, likelihood ratios and receiver operator characteristics (ROC) (Mossman & Somoza, 1991). Sensitivity is the proportion of correctly identified cases and the specificity is the correctly identified non-cases. The higher the specificity and sensitivity scores indicate greater accuracy of the tool. The positive predictive value is the probability of being violent when screened positive, and the negative predictive value is the probability of not being violent when screened as not at risk of violence. The total predictive value is the likelihood of any test result being correct. The positive likelihood ratio indicates how likely it is that a positive test result will be accurate for a person screened positive compared to a person who is screened negative. The negative likelihood ratio indicates how likely a negative screen result will be accurate compared to a person who is screened as positive. The area under the curve is determined by ROC analysis and is used to determine the most appropriate cut off point based on an acceptable sensitivity and specificity. The higher the cut of point, the fewer false positives however there will be more false negatives. The opposite also applies with a lowered cut of score resulting in fewer false negatives and more false positives. The area under the curve is a measure of accuracy with values between 0 and 1. A value closer to 1 indicates a higher sensitivity and specificity and values closer to 0 indicate lower sensitivity and specificity (Lalkhen & McCluskey, 2008).

Attia (2003) highlights the benefits of using likelihood ratios in clinical practice because they are useful to determine the probability of disease for an individual patient. This is required in clinical practice because there is awareness that prediction tests are not 100% accurate. There is no literature that explores how prevention may have influenced care and resulted in a higher number of false positives and factors that are implicated when there are false negatives, i.e. the screening tool did not identify a person who subsequently becomes violent.
Summary of approaches to predict the risk of violence. There are different approaches to identifying the risk of violence but the aim remains constant. These tools are used in a variety of settings and there is agreement that any tool or decision support process to identify the risk of violence must be usable and specific to the context and patient group. The identification of violence risk in clinical practice (as opposed to research) has to take into account what actions can commence for prevention, and staff support for organisational processes to manage the risk of violence.

Rationale for Identifying the Risk of Violence at Triage

There is an expectation that nurses can manage violence by anticipating the patients who are at risk and effectively use de-escalation techniques (Department of Human Services, 2007). Although there are strategies to manage violence, the best management is prevention (Hodge & Marshall, 2007). However, prevention of violence requires early recognition of those at risk, and doing this on arrival provides an opportunity for care planning to reduce the risk (Drummond et al., 1989; Kling et al., 2006; Sands et al., 2009).

Nurses in the ED manage patients in the acute phase of their illness and yet often have the shortest time frame to develop a therapeutic relationship (Luck, Jackson, & Usher, 2007). At triage, the time for communication with each patient is between 2 to 5 minutes and the triage nurse has multiple competing demands (Australasian College of Emergency Medicine, 2006). This increases the risk to nursing staff because they impose limits, enforce decisions, spend the most time with patients and have limited time for communication, particularly at triage (Daffern & Howells, 2002). There is minimal information available at triage and limited time to determine the level of risk specific to the current situation. Research shows that clinicians in other settings tend to overestimate the risk of violence when relying on clinical judgement alone (Monahan et al., 2001), however, the extent to which triage nurses under or over estimate violence risk is unclear.
The purpose of violence risk screening at point of entry to health services is to identify patients at risk of violence, provide the care required, and minimise the risk to staff and others. A screening process has the potential to guide clinical decision-making and reduce variations in care provision (Moore, 2008). A clinical practice guideline on violence risk screening at triage was developed by Sands et al., (2009), but there has been no evaluation of its use in practice. Sands et al., (2007) has called for clinicians at triage to have competency based training in risk assessment, yet there is no valid or reliable approach to identify the risk of violence at triage. Procedures for identifying the risk of violence in ED require an understanding of the context and precipitating factors (Luck et al., 2007).

Procedures for predicting who is at increased risk of violence in ED should not be limited only to sub populations such as those with mental health problems. This view is supported by Crilly et al., (2004), who reviewed violent incidents in two Australian EDs. In this study staff attributed only 40% (44/110) of violent incidents to patients who had a mental illness. This confirms the premise that identifying patients at risk of violence is relevant for all patients and not only those with a primary mental health complaint.

Identification of Patients at Risk of Violence by Triage Nurses

Conducting risk assessments is often seen as a role for psychiatrists and psychologists, however, it is nurses who spend the most time with patients and have to manage potential and actual violence (Lewis & Webster, 2004). Identifying the risk of violence is an accepted part of psychiatric nursing practice (Crowe & Carlyle, 2003). Qualitative research confirms nurses in ED can identify warning signs for violence. An Australian study by Luck et al., (2007) conducted 290 hours of participant observation, as well as semi-structured and field interviews with ED nurses to identify observable warning signs for potential violence. Nurses identified observable behaviours that indicate a risk for violence. These included Staring, Tone and Volume of voice, Anxiety, Mumbling, and Pacing, and they were formatted into an acronym STAMP. In addition to identifying observable signs of
the potential for violence, Luck et al., (2007) argued that ED nurses were capable of using structured clinical judgement to identify patients at risk of violence. The ED nurses reported components of actuarial methods of predicting risk such as intoxication, cognitive impairment, and mental state. Furthermore, they were able to combine this knowledge with dynamic and observed factors that were specific to nursing assessment in ED. This comprehensive study explored decision making processes ED nurses use to determine the risk of violence and aligned this with approaches to predicting risk not previously used in ED. Luck et al., (2007) has called for a violence risk assessment tool to predict violence against nurses that can be used by staff who are not specialists in mental health.

A further Australian study by Wilkes et al., (2010) developed a Violence Assessment Tool (VAT) informed by the cues and warning signs identified by Luck et al., (2007). The tool was specifically developed for ED to identify the potential for violence against nurses. This tool was refined from 37 items to 17, using three rounds of Delphi technique and all items were observable e.g., threats, yelling, and demanding attention. The tool did not require any previous knowledge of the person’s history and was designed for use inside the ED. There was no evaluation of how the tool would be used by ED nurses and the usability was not explored, however, the authors asserted it was “quick and efficient” to use (Wilkes et al., 2010, p.79).

The final VAT developed by Wilkes et al., (2010) contained 18 items and an observational study explored if these items can predict violence against nurses (Jackson, Wilkes, & Luck, 2014). Jackson et al., (2014) conducted observations over 1150 hours in ED, delivery and general wards found there were 5 behavioural cues that indicated a patient would become violent. These items were resisting healthcare, making aggressive statements, yelling, abusive language or prolonged and intense glaring. Of these, resisting healthcare and making aggressive statements were the most significant with an odds ratio of 11 and 7.6 respectively.

This study confirms that there is a window of opportunity for prevention and found the average time from behavioural cue to violent act was 16.54 minutes. The
methodology and sample has provided a thorough examination of behavioural cues to predict violence, all of which were observable. There has been no evaluation of the Violence Assessment Tool (VAT) in clinical practice and it is intended for use within the ED. In the observational study the VAT was completed once a patient displayed any one of the 18 items (Jackson et al., 2014). For example, once a patient has displayed one behavioural cue, then the VAT is completed. In practice, however, once a person has displayed a known warning sign for violence, the value of completing the checklist has not been explored.

The ED environment is time critical and there are competing demands on nurses’ time. Once a patient is in ED some time may have lapsed and interventions for violence prevention could have commenced. Moreover, if a patient requires searching it is preferable that this occurs prior to entering treatment areas. Given that previous research has confirmed most violent incidents occur within the first 1-2 hours (Crilly et al., 2004; Knott et al., 2005; Lau et al., 2011) identifying the risk of violence needs to commence on arrival.

Jackson et al., (2014) has called for a specific process to identify the risk of violence from patients towards nurses in ED. This is based on concern that processes used in a mental health setting may not be relevant for an ED context and able to be used by staff without specific mental health nursing skills. Although ED and mental settings are differentiated by reason for admission and length of stay, the nursing skills for the identification of the risk of violence have more similarities than differences. The observable warning signs for violence noted in the VAT (Jackson et al., 2014) were reported as specific to ED, however they are consistent with Clinical Practice Guidelines for Violence Risk Assessment at triage developed for both mental health and emergency department triage (Sands et al., 2009). Table 3.1 lists the warning signs of violence identified in clinical practice guidelines.
Table 3.1 *Warning Signs of Violence identified in Clinical Practice Guidelines* (*Sands et al., 2009*).

<table>
<thead>
<tr>
<th>Cognitive &amp; behavioural (p 68)</th>
<th>Observable behaviours (p 79)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hostility</td>
<td>Verbal abuse or threats</td>
</tr>
<tr>
<td>Suspiciousness</td>
<td>Physical aggression towards objects/property damage</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>Threats of aggression</td>
</tr>
<tr>
<td>Poor impulse control/impulsivity</td>
<td>Lack of cooperation</td>
</tr>
<tr>
<td>Homicidal ideation</td>
<td>Intrusion into personal space boisterous</td>
</tr>
<tr>
<td></td>
<td>Self harm</td>
</tr>
</tbody>
</table>

**Short term prediction of violence in the emergency department.** There are several violence risk assessment tools that are used in mental health settings, but few tools that assess the short-term risk of violence in ED. Two studies that evaluate a violence alert process specific to acute health will be outlined here separately. The first study was conducted in America by Drummond et al., (1989) who reviewed incident reports and identified patients who had been violent (*N*=48). An alert process was implemented by adding “flags” to the patient registration system to advise on management strategies at subsequent presentations.

The evaluation compared data for 12 months before and after the alert process was implemented and found a 91.6% reduction in violent incidents and a 42.2% reduction in attendances. This study occurred at one site and focused on patients who had been previously violent. The reduction in incidents was attributed to planning for prevention and the alert giving the patient a form of “recognition”. Drummond (1989) asserts the “recognition” may have met the patients need to feel
special and they did not need to become violent. This reasoning attributes the cause of violence to patient or internal factors rather than an awareness of how the environment and staff or situational factors can contribute to violence. This study was reported in 1989 and the awareness of causal models was not published at this time. However, as this study is the only review of how an alert system can be implemented and evaluated, there is no other literature to compare this with. This is a significant gap in research, as file flagging systems are used in several hospitals and have been listed as a prevention strategy (Heads of Workplace Safety Authority, 2009).

The second study was conducted in Canada. Kling et al., (2006) evaluated the predictive ability and utility of an alert system used to screen all admissions for the risk of violence. The alert system identified patients with a history of violence, or who were currently physically aggressive, threatening, or verbally hostile. Patients with three or more additional risk factors such as wanting to leave, confusion, or agitation were also considered at risk. A “flag” was then added to the medical record and further assessment of the risk and care planning commenced. This screening process was found to have 71% sensitivity and 94% specificity. Not all patients were screened on arrival however, and 30% were screened later. Although 71% of patients at risk of violence were accurately identified, the authors questioned why more incidents could not be prevented. They also queried the value of an alert process if it was not more useful for violence prevention. A limitation of this evaluation was the screening of patients after an incident rather than on arrival. This limits the opportunities for prevention, and may indicate the risk identification process is not being used in practice as it was intended.

Kling et al., (2006) used focus groups to explore the utility of using an alert for violence. They found the process was difficult to follow and procedures were used inconsistently in practice. Staff reported completing an alert based on their clinical judgement rather than the alert criteria. There was support for using the alert system, and although some staff lacked confidence, they considered the risk screening system preferable to relying on word of mouth.
A further evaluation of the same process by Kling et al., (2011) explored the impact of identifying patients at risk of violence on prevention. The number of violent incidents per 1000 hours worked was measured at three time points: before, during and after the alert system was introduced. There was a reduction in the number of violent incidents from 1.6 to 1.1 incidents per 100,000 worked hours during the implementation phase; however, this change was not sustained in the 3 month post intervention phase. Modified Poisson analysis showed a greater reduction in the risk rate during the implementation phase in high-risk areas such as the ED, compared to the remainder of the hospital. A retrospective case–control phase of this study explored the effect of the Alert System for 109 cases and 634 controls. The case control analyses found the Alert flag was associated with an increased risk for a violent incident ($OR = 7.74$, 95% CI $4.81–12.47$).

This comprehensive study by Kling et al., (2011) has highlighted two major challenges with research into violence in healthcare settings. Firstly, this study could not assess what interventions for prevention commenced if a patient was identified at risk. The care provided to a patient at risk may have been modified, or staff may have altered their approach to this patient. Secondly, the lack of sustainability was attributed to the need for ongoing training, and the authors assert identifying patients at risk of violence needs to be part of a multi-factorial violence prevention strategy. It is also possible the apparent increased injury rate was due to increased reporting. The results confirm that the staff were identifying the correct population, however, the impact of identifying patients at risk and how this translates into prevention remains complex and unclear. The authors noted there was organisational support to continue to use the alert process, which was one component of an overall approach to violence prevention.

**Short term prediction of violence on arrival to a mental health unit.**

A brief checklist for violence used at admission was developed and evaluated in an American acute mental health unit by McNiel and Binder (1994). The checklist was designed to determine the short-term risk of violence in the days following
admission, and reported sensitivity of 57.2%, specificity of 70%, and a total predictive value of 65.4%. The checklist contained 5 items, with a score of two or less deemed low risk (negative), and a score above three deemed high risk (positive). The five checklist items are: a history of physical attacks and/or fear-inducing behaviour within two weeks before admission, absence of suicidal behaviour (attempts, gestures, or threats) within two weeks prior to admission, schizophrenic or manic diagnosis, male gender, and currently married or living together? McNiel and Binder (1994) argue that a tool with the smallest number of items that are the best predictors of violence can have equal predictive ability compared to larger tools. The information required to complete this checklist would not be known by the triage nurse and although it is for “short-term” predictions the time frame in ED is measured in hours not days. McNiel and Binder (1994) concluded these results were promising; however, the specificity was 70%, which represents the number of patients who were correctly identified not at risk of violence. There is no accepted level of specificity reported in the literature therefore it is difficult to determine if a specificity of 70% is reasonable.

**Occupational health and safety recommendations to identify patients at risk of violence.** In 2008, to guide prevention of aggression in Victorian health services, Work Safe launched a handbook for workplaces “Prevention and Management of Aggression” (Work Safe, 2008). The handbook includes policy guidance, and templates for training evaluation and hazard identification in the workplace. A screening tool for triage nurses in the ED to identify high-risk patients was also proposed. The screening process takes 1-2 minutes to complete at triage and is used for all patients. If a patient is identified at risk then a further assessment is required. The assessment requires an ED staff member to complete a 31-item checklist including history of violence, current behaviour, and health service issues such as delays to treatment.

This tool has not been evaluated, implemented, or integrated into triage nurse practice. Any process developed for an ED triage setting needs to consider the time, skill level, and information required to complete the screening tool. This
tool requires the staff member to complete a risk assessment formulation, including what could happen, how it could happen, and who is at risk. Furthermore, the staff member is required to rate the consequence of the “risk”, which ranges from ‘insignificant’ to ‘catastrophic’, and the likelihood of the event occurring, which ranges from ‘rare’ to ‘almost certain’. There is no reference to staff training, expertise in risk formulation, or use in clinical practice. Although this process is comprehensive determining the risk of violence in an ED setting needs to be rapid and consider that dynamic factors change rapidly.

**Summary of violence risk assessment and screening tools.** A comprehensive search of the published peer reviewed literature found there are few tools that are relevant to identifying the risk of violence at ED triage. The literature confirms that tools must be brief, able to be completed during the triage interaction, and specific to an ED setting. The evaluation of risk screening processes consistently suggested that once a patient is identified as at risk, prevention must commence. This has been problematic, however, and there has been no evaluation of interventions commenced for high-risk patients. There is support for a process to identify the risk of violence in the short-term based on observable warning signs. See table 3.2 which provides a summary of violence risk assessment and screening tools.
**Table 3.2 Summary of Violence Risk Assessment and Screening Tools**

<table>
<thead>
<tr>
<th>Author/Country</th>
<th>Setting/Sample</th>
<th>Risk Assessment Process</th>
<th>Evaluation</th>
</tr>
</thead>
</table>
| Drummond et al., (1989) | 700 bed Veterans Hospital | Patients at risk of violence identified from incident reports and "flags" added to the patient registration system. To guide prevention at subsequent presentations                                                   | Compared 12 months of data before and after an alert system for high risk patients (N=48)  
  - 96.1% reduction in violent incidents  
  - 42.2% reduction in presentations  
  Flagging files more relevant for high risk group that re present |
| McNiel & Binder (1994)  | In patient mental health unit | Checklist on admission for short term risk  
  5 items (≤2=low risk (negative) ≥3=high risk (positive)).  
  1. history of physical attacks and/or fear-inducing behaviour within two weeks before admission,  
  2. absence of suicidal behaviour (attempts, gestures, or threats within two weeks before admission,  
  3. schizophrenic or manic diagnosis,  
  4. male gender  
  5. married or living together?                                                                 | Sensitivity of 57.2%, specificity 70%                                                                |
| Kling et al., (2006)    | Large acute hospital      | On admission flag is initiated with if :  
  • History of violence or physical aggression  
  • Physically aggressive or threatening  
  • Verbally hostile or threatening  
  Or if 3 or more of these indicators are present  
  • Shouting or demanding  
  • Drug or alcohol intoxication  
  • Suffering auditory or visual hallucinations  
  • Threatening to leave  
  • Confused or cognitively impaired  
  • Suspicious or Withdrawn  
  • Agitated                                                      | 117 violent patient charts were reviewed and compared with 161 non-violent patient charts.  
  Sensitivity 71% and specificity 94%. Only completed for 30% (81/268) patients before a violent event incident occurred. |
<table>
<thead>
<tr>
<th>Author/Country</th>
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<th>Evaluation</th>
</tr>
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</table>
| Work Safe 2008      | Victoria All Emergency Departments | Stage 1. Triage nurse screens all patients using observation and direct questioning for history of violence, presenting with injuries from self or others, substance affected, behavioural disturbance, stating intent to harm self or others, hypervigilance in 1-2 minutes  
Stage 2. If a patient is identified at risk then a further 30 minutes Violence Hazard Identification and Risk Assessment occurs and 31 items are rated by a senior staff member. | None                              |
| Luck et al., (2007) | Emergency Department   | 290 hours of participant observation, 16 semi-structured interviews and 13 informal field interviews                                                                                                                                                                                                                                                       | Five elements of observable behaviour indicating potential for violence were identified and described through the acronym STAMP: Staring and eye contact, Tone and volume of voice, Anxiety, Mumbling and Pacing. |
| Wilkes et al., (2010)| Emergency Department   | Delphi technique used to develop a 17 items checklist called the Violence Assessment Tool. All items can be observed and none require knowledge of patients history                                                                                                                                                                                                 | Not evaluated                     |
The Implications of Identifying Patients at Risk of Violence

There are ethical and clinical implications of identifying patients who are at risk of violence. The triage process allocates treatment based on expert clinical judgement and established objective criterion. It is not clear that these are applied consistently and ethically to patients who are at risk of violence. Furthermore, once staff identify the risk of violence there is a clinical expectation and responsibility to communicate this knowledge, and incorporate violence prevention into care planning.

Ethical implications of identifying patients at risk of violence at triage.

Triage systems are informed by the utility principle, where decisions are evaluated on the basis of the outcomes that are produced and the overall benefits for the community (FitzGerald, Jelinek, Scott, & Gerdtz, 2010). For example, a patient who is at risk of violence in the waiting area could have his care expedited to avoid delays and escalation, but this may be seen as unfair to patients who are waiting “quietly”. Responding to this group of patients may be seen as rewarding behaviour and letting them ‘get their own way’.

Although the community (i.e. waiting room) may benefit from allowing the person at risk of violence to be seen first, this may not be acceptable to all triage nurses. The challenge for triage nurses is compounded because warning signs of violence are subjective, there is no exact measure of severity, and behaviour can be unpredictable. Applying the principles of distributive justice in this situation is difficult, because identifying the risk of violence has an individual focus rather than a “fair system for all”.

Stigma and labeling patients at risk of violence. There is an ethical consideration that patients will be ‘labeled’ violent (Kling et al., 2006) and stigmatised because they are considered at risk. However, it has been argued by Maden (2003) that the risk of violence is what leads to stigma, not the risk screening tool or process. Labels are assigned to people who are violent and they range from “assailant” (Royal College of Nursing, 2008), to “perpetrator” (Lim et al.,
2009). People who presented to a hospital frequently and were difficult to manage were referred to as “repeatedly disruptive” (Drummond et al., 1989, p.2531). These terms are derogatory and do not take into account patients who have limited ability to access health care appropriately or may be experiencing symptoms that staff may perceive as potentially violent. Furthermore, these terms broaden the gap between carers, patients and staff and don’t reflect the complex nature of violence in a clinical context. Although patients may be violent, collaboration in care is required to meet the patient’s needs and prioritise staff safety. The use of negative labels may lead staff to avoid clinical intervention and communication with the patient, which could increase the risk of violence.

Although labeling a patient as potentially violent is considered negative, there may be benefits to the patient (Kling et al., 2006). These included having an established process with known risk factors to determine the risk of violence rather than relying on potential misinformation. Enhancing safety by having a clear process for communicating risk information at handover aims to make staff feel safe. Forster et al., (2005) inferred that if staff feel safe they will provide optimal care and the patient will feel safe also.

The purpose of risk assessment may be seen as an institutionalised approach to manage an individual’s behaviour (Beck, 1999), and this will focus on the organisation’s interest rather than the interest of the patient (Crowe & Carlyle, 2003). Patients who provide information to clinicians on the risk to themselves or others may be unaware of the consequences of providing this information, and the disclosure of this information has been described as a “confession” (Crowe & Carlyle, 2003, p.22). This however is not consistent with the expectation of collaboration between patients and carers and identifying the risk of violence should be seen as beneficial to the patient as well as the staff who provide clinical care.
Langan (2010) has highlighted some ethical challenges for mental health patients who are screened for their risk of violence. Firstly, the patient may not be aware they are being screened, or understand the screening tool and the implications for their care, including possible restrictions on leave or discharge. Secondly, it is not likely to be an optional service, and risk screening is conducted for the benefit of others rather than the patient in isolation. If the patient was aware they were being screened for the risk of violence, they may not be able to access this information, as it may be stored electronically, or identified only as a code or symbol only known to staff.

**Clinical implications of identifying patients at risk of violence at triage.**

There are clinical implications if patients are identified to be at risk of violence, because an integrated approach to prevention and management is then required. There is support for management plans that guide care for high-risk patients and an alert system (Drummond et al., 1989; Kling et al., 2011). In mental health settings there is concern that patients identified as low-risk may receive less intensive care, and patients at high-risk have increased stigma, and can be alienated from participating in their own care (Large & Mullin, 2011).

A patient at risk of violence may not get the same attention as other patients, and the rationale for determining who is at risk may be vague, or based on limited or incorrect information. There has been no evaluation on the impact of violence risk screening or changes in the use of Code Grey response and coercive practices. The intention of identifying patients at risk is to commence prevention. However, there is potential for staff to avoid providing care to patients at risk of violence and subsequently limited opportunities to commence prevention.

**Patient perspective on violence risk screening.** Although there is literature on the significant impact of violence from a staff perspective, there is minimal reference to carers or patients. One exception is an Australian study by Lim, Weiland, Gerdtz, and Dent (2011), which compared the effect of exposure to a Code Grey (N=33) with a control group (N=37) on patients’ and visitors’ level of
anxiety. They found observing behavioural disturbance did not provoke anxiety in ED service users and visitors. Participants suggested that patients requiring a Code Grey response should be managed in a separate area where they can’t be seen or heard. There was an awareness of the patient who required the Code Grey response and their need for respect and dignity. Participants suggested that patients should be screened prior to entering ED, however, they acknowledged that screening would not guarantee violence could be prevented (Lim et al., 2011).

There is minimal literature on how patients who use ED services perceive violence risk screening. One exception is a Clinical Practice Guideline for Violence Risk Assessment at Triage developed by Sands et al., (2009) for use in ED and mental health settings. Mental health consumers provided feedback, and reported that determining a person’s risk for violence requires an appropriate environment, such as interview room and an experienced clinician. The clinicians must be aware that alcohol and drug use increases the risk of violence when used in combination, and communication should be calm to diffuse the situation rather than directive, which can escalate a situation. Concerns were also raised that an “alert” on a file may lead to discrimination. This is consistent with staff concerns where an alert system was used. Kling et al., (2006) found staff were concerned that if an alert for violence was initiated, it may be there for a subsequent admission and not warranted.

There is a considerable risk that patients will receive unnecessary care and interventions given the large number of false positives after a violence risk assessment (Large & Mullin, 2011). There is a lack of evidence that violence risk assessments are effective, yet there is an expectation that care is evidence based (Wand, 2012). There has been a longstanding concern amongst clinicians that the focus on risk assessment has implications for clinical care, which can lead to a culture of blame and defensive practice (Royal College of Psychiatrists, 1996).
**Criticism of risk assessment processes.** Risk assessment tools are developed to assist staff, however, they tend to be criticised if they are too long, generic, complex, inaccessible, or difficult to individualise (Zarola, Leather, & Barklamb, 2008). From a staff perspective, risk assessment processes can be time consuming, irritate the assessor, prevent direct patient contact, and can potentially stigmatise the consumer and are rarely evaluated (Maden, 2003). In contrast, Lamont and Brunero (2009) questioned why some staff criticise risk assessment tools which are designed to assist risk identification and care planning. The criticism of risk assessment tools has led to staff using no process to determine the level of risk, which only becomes apparent during incident reviews when there has been an adverse outcome. Large & Nielsen (2011) argue that risk assessment tools should not be used if they categorise a patient as high or low risk, and that clinical decisions should be based on an informed discussion with the consumer in a mental health setting. They also called for clinicians to accept that we have limited ability to predict future harm.

**Limitations of Violence Risk Screening**

There are several limitations of violence risk screening. Triggers might precipitate violence but may not be apparent at the time screening occurs (Lim et al., 2011), and the ability to predict whether a person is going to be violent can be difficult (Lidz, Mulvey, & Gardner, 1993). Maden (2003) asserts that determining the risk of violence requires the clinician to incorporate dynamic factors even though static factors are easier to measure. In the ED, however, static factors are not always evident during the triage interaction. This is consistent with ED staff feedback that collateral information on history is not always available at triage, and time constraints limit the depth of risk information able to be obtained (Sands et al., 2009).

The accuracy of identifying the risk of violence is affected by organisational systems, the staff that complete the assessment, and the availability of information (Harris & Rice, 2003). Staff have less confidence in predicting the level of risk
when they use poor quality data and predictions are subsequently less accurate (Douglas, Ogloff, & Hart, 2003). Although risk may be determined with actuarial tools clinicians are encouraged to review the information and decision making process when there is concern about the level of risk (Douglas et al., 2003). Risk assessments conducted in mental health treatment settings have greater access to clinical and historical information and more time to determine the level of risk. In contrast, an ED triage nurse has minimal information and time and depends on observed and reported information, or alerts based on previous presentations.

There is little reference in the literature to the severity of violence or outcomes of violent incidents, regardless of whether they were predicted or not. One of the few examples is a study conducted by McNiel and Binder (1994), who used the Overt Aggression Scale (OAS) (Yudofsky, Silver, Jackson, Endicott, & Williams, 1986) to measure the acuity of an inpatient mental health unit in an American hospital. The OAS (1986) is completed at the end of each 8 hour shift by nursing staff and records the number and type of incidents for each patient. This would not be possible in an ED setting due to the brief length of stay. Measurement of violent incidents is required to determine the severity, and whether or not aggression prevention interventions are successful (Bowers, Nijman, Palmstierna, & Crowhurst, 2002). The severity of aggression is often determined on the actual outcome, however, Wells and Bowers (2002) has suggested the injury potential, regardless of intent, may be a more accurate measure.

Implications of the Review for this Thesis

There is an expectation that violence in healthcare can and should be prevented. There is limited research on the effectiveness of violence risk screening in an ED setting and how this leads to prevention. An evidence based approach that considers the ethical implications for staff and patients should be explored to determine the effectiveness of risk identification at triage in clinical practice. An effective screening tool for violence that provides an opportunity for prevention and guides consistent triage decision-making should be developed specifically for EDs.
The impact of violence risk screening on the use of coercive measures to manage the risk of violence, such as physical, chemical and mechanical restraint is unknown. There were no violence screening processes that demonstrated a sustainable reduction in harm and no changes in practice reported. A sustainable approach to violence risk screening requires risk identification to be integrated into triage nurse practice and supported by policy and training.

Electronic decision support for the subjective assessment of the potential for violence at triage requires consideration of usability, and ensuring the processes are locally appropriate and used as intended. The challenge is to consider how these models can be used for prevention, integrated into triage practice, and evaluated.

**Gaps identified in the literature.** The majority of research for identifying the risk of violence has been developed and evaluated in the mental health and forensic setting. There are no tools that have been specifically developed to screen for the risk of violence on arrival to the ED. There is limited reference to the usability and patients’ perceptions of these processes in the ED. No observational studies have occurred to explore how violence risk screening could be incorporated into triage practice. Although sensitivity and specificity are often reported, there has been no explanation of patients who are identified at risk but do not become violent. The literature reports favorably on risk assessment tools with a high sensitivity; however, if prevention strategies were successful the sensitivity would be reduced. Prevention strategies are not reported and there is no literature on how these prevention strategies could be measured. Furthermore, predicting low base rate events are difficult and challenging (Hashman, 2005). Patients who were not identified at risk of violence but required a Code Grey response could be investigated to review how this occurred in clinical practice. Without this information, it is not known if there were particular clinical scenarios not identified and if an improved process is required.
Existing research focuses on using validated tools for forensic and mental health settings to predict violent incidents rather than exploring how violence risk screening could be integrated into practice. There is no previous research using Action research methodology to develop violence risk screening and evaluate outcomes in a clinical environment.

**Summary**

There are various approaches to identify patients at risk of violence but their purpose is consistent: to improve the safety of the patients and staff providing care by providing an opportunity for prevention. Developing processes for violence risk screening has clinical and ethical implications that need to be carefully considered. Although the risk of violence can be identified, it is not clear what level of specificity is acceptable and how prevention can be targeted to patients at risk. There are opposing views in the literature with both criticism and support for processes to identify patients at risk of violence. Further research is required to establish an evidence based approach to identify patients at risk of violence on arrival to ED.

Violence in the ED is a significant problem and the true prevalence remains unknown due to under reporting. Models for understanding causative factors for aggression have identified three domains (internal, external and situational) that alone or in combination can contribute to a violent incident. The negative impact of violence on staff and patients has been established. Coercive interventions used to manage the risk of violence expose staff and patients to both physical and psychological injuries. Literature suggests that prevention requires a process to identify who is at risk of violence yet there is no established process for identifying the risk of violence at ED triage.
Chapter Four: Methodology

Introduction

This chapter will describe the approach used to develop and implement a violence risk screening decision support process at triage and present the methods used to evaluate its effectiveness. A mixed methods design was used incorporating three separate but related studies. This design incorporated both qualitative and quantitative approaches to first of all determine the need for and feasibility of a risk screening process in practice, and then to test the predictive value of violence risk screening. Figure 4.1 provides a summary of the key aspects of the research design.
Study 1 Feasibility and need for violence risk screening

Retrospective audit of all Code Grey responses (N=1959) for a 12 month period was combined with Code Grey data and clinical data from the electronic medical record and patient registration system to:

- Identify risk factors for a code grey response
- Provide baseline data prior to implementing violence risk screening decision support
- Characterise Code Grey responses

Structured Participant Observation of Triage Nurse Interactions (N=167)
Semi-Structured Interviews with ED Patients (N=19)

Study 2- Intervention Development and Implementation The Revised Violence Risk Screen

- Alter existing triage screen
- Introduce a symbol to communicate the risk of violence
- Confirm pathway for communicating the risk of violence
- Implement and pilot risk screening (8th October 2012 – 31st January 2013)
- Feedback on predictive ability during the implementation phase
- Use reminders at triage

Study 3- Evaluation of the influence of Violence Risk Screening and Predictive Ability

- Determine the sensitivity, specificity, positive likelihood ratio, negative likelihood ratio and positive and negative predictive values.1st February, 2013 to 31st July, 2013 (N=521)
- Review inconsistent cases 1st November to 30th November to explore usability issues (November 2012 (N=29)
- Determine the influence of Violence Risk screening on use of Code Greys responses (Pre N=905, Post N= 897 post)
- Determine the influence of Violence Risk Screening on access to clinical care (Pre 27,559 presentations and 465 of these required a code grey, Post 30,135 presentations and 454 required a code grey.)

Figure 4.1 Diagrammatic Representation of Research Design
The first study established the need for violence risk screening at triage by analysing a 12-month retrospective audit of Code Grey responses in ED. This data was matched with clinical information to characterise the at risk population and identify patient and environmental factors that influenced the activation of a Code Grey response. The feasibility of violence risk screening was then explored by observing how triage nurses identify who is at risk of violence in practice. Semi-structured observations were conducted to describe how nurses performed risk screening at triage. Semi-structured patient interviews were conducted with members of the public in the ED waiting room to explore perceptions and expectations of violence risk screening.

The second study refined the existing process for violence risk screening and a decision support process was developed. The intervention was based on the retrospective audit of Code Grey data, observation of practice, and interviews with members of the public. The revised risk screen was implemented using reminders, feedback, and advising staff of the changes to the triage screen. A pilot evaluation for three months during implementation explored the predictive ability of violence risk screening for three months during implementation.

Finally, study three evaluated the predictive ability of violence risk screening for three months during implementation and then for a further six-month period. The influence of the decision support system on Code Grey responses and access to clinical care was explored by comparing pre and post intervention samples. The influence of violence risk screening on triage nurse self-efficacy was measured before and after risk screening was implemented.

Each study was conducted separately and is therefore reported sequentially. The design, research question, setting and ethical considerations are also discussed. The approach to data management and justification for the research design are presented.
Purpose

The purpose of this research was to evaluate the processes and outcomes of a violence risk screening decision support system in practice, and to evaluate its effect on the clinical care, Code Grey responses and triage nurse self-efficacy.

Design

A mixed methods design incorporating qualitative and quantitative approaches was used to develop, implement, and then evaluate the risk screening process. In the development and implementation phases, Action Learning was employed as the strategy to translate evidence into action. Multiple sources of data and research methods were employed to investigate three linked research questions. Information sources included a large organisational database (Code Grey data), observational notes and surveys from staff as well as interview data from members of the public.

Rationale for mixed methods research. Mixed methods research designs are typically employed to explore complex social phenomena. The assumption that underpins their use is that the use of multiple data sources and methods reduces the likelihood of measurement error. For this reason mixed methods research had been extensively used in health program evaluation (Doyle, Brady, & Byrne, 2009). Mixed methods research involves the sequential or concurrent combination of both qualitative and quantitative methods to inform the same research (Venkatesh, Brown, & Bala, 2013). Using a mixed methods approach can overcome the limitations of relying only on one method and complex research questions often require a mixed methods approach (Doyle et al., 2009).

Methodological triangulation is one type of mixed methods and is used to examine complex concepts (Burns & Grove, 2001). This approach also allows greater understanding of the concept being studied (Creswell & Clark, 2007). Methodological triangulation involves using two or more research methods in the one study and this allows triangulation of data. In this study, data triangulation informed the development of the risk screening intervention. The intervention was
informed by the review of code grey data, observation of triage nurse practice and patient interviews.

**Action learning**

Action learning has been used in research to develop and implement practice changes (Board & Symons, 2007). Action learning was developed by Revans (1998) and is based on the assumption that solutions to complex problems can be developed by learning from each other. This process involves reflection and action and individuals are in control rather than passive participants. This approach underpinned key aspects of this study.

The action learning cycle (Kolb, 1984) was applied to determine the most appropriate violence risk screening intervention. In the first phase of “thinking” the audit of Code Grey responses, observation of triage practice and interviews with the public provided three data sources to inform how the risk of violence was currently identified, frequency, and the public perceptions. The “planning” stage involved consultation with key stakeholders and learning from the group. The “do” phase involved piloting violence risk screening and reflection on how risk screening was accepted by staff. The “reflect” phase included providing feedback to the ED triage nurses, learning from them how risk screening was used in practice and further refinement and action as required. See figure 4.2 that outlines the relationship between each phase of research and the action learning cycle.
**Action research.** The PhD Candidate was known to some staff in ED, has had an active role in nursing education, and is a member of the Violence in ED Action Group. Because of this, the research design also incorporated principles of Action research. Action research is an ongoing process, which involves planning, intervention, evaluation and subsequent further planning (Coghlan & Casey, 2001). This design allowed for the information gained to further direct interventions. Action research methodology is relevant because many of the interventions are opportunistic, and depend on staffing, current clinical issues, and pre-existing initiatives in the hospital. Action research is conducted in the researchers’ own

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**Figure 4.2** The Relationship Between each Phase of Research and the Action Learning Cycle.
environment, and is commonly used by nurses to improve practice and contribute to the profession (Karim, 2001).

**Insider action research.** Research conducted by a person who is part of the organisation and culture is considered insider action research (Coghlan & Casey, 2001). Insider action research allows the researcher to be part of the process rather than joining an organisation for a specified project time. This allows for changes in practice to become routine rather than linked to projects and it is hoped that this will encourage sustainable changes in nursing practice. Action research is well suited to nursing because it aims to introduce theory into practice and reflects what happens in real clinical situations (Karim, 2001). Insider action research presents ethical issues of consent and potential impact on participants. Participants may feel obliged to participate and although they provide informed consent they may experience some anxiety during the study (Moore, 2012).

**Justification for Approach**

This thesis utilised a mixed methods design including both quantitative and qualitative methods. Principles of insider action research and the development and evaluation of complex nursing interventions were key considerations. The combination of qualitative and quantitative data provided a comprehensive exploration and informed the revision and development of the violence risk screen decision support process.

This design was chosen because identifying the risk of violence at ED Triage is new practice. The usability, influence, and public perceptions of this practice had not been explored. Although the PhD candidate was familiar with assessing the risk of violence in other settings, how this could be integrated into triage nurse practice was unknown. What had been established, however, was that the current violence risk screening process in ED was not being used and had minimal support from triage nurses. Based on this, the development and implementation of risk screening required consultation with the Violence in ED
Action Group to ensure the revised process was acceptable, useable, and was integrated into existing ED work practices.

This research approach had advantages over a single method approach. The mixed methods approach provided comprehensive evidence from qualitative (observation of triage nurse practice and ED semi structured interviews) with quantitative data (Code Grey and clinical data). This design allowed usability to be explored and the intervention was developed based on local data and work practices. This is essential, as introducing a change to the triage screening process affects every presentation to ED, required approval from the ED Executive, and had to be integrated with triage nurse practice and existing information technology infrastructure.

Utilising an existing data set limited some variables to binary responses. A benefit of this data set was the large sample size, which would not have been possible with manual data collection methods. This data set allowed for the data to be closely monitored during implementation and the evaluation phase. This was considered important to ensure the risk screening process was useable, accepted by staff, and able to identify the correct patient group.

A benefit of insider action research was incorporating staff feedback and learning about issues faced by staff identifying the risk of violence at triage. This level of understanding was vital to developing a violence risk screen that would be used by staff and ensure that an evaluation of the impact was possible. In this study, the integration of violence risk screening with the existing ED infrastructure and ED work flow required regular consultation with the Violence in ED Action Group.

This study was based on the principles of Action research. Action research aims to improve practice by involving participants, using an educational approach and cyclic process of evaluation and action (Hart & Bond, 1995). In health care Action research has been used to generate positive outcomes for patients and staff (Meyer, 1999). This was a consideration when identifying intervention strategies
that were sustainable, could be introduced to existing systems, and engaged staff in the process.

Research Questions

The research aimed to address four core questions:

- Can an integrated decision support process for violence risk screening at triage be successfully developed and implemented?
- Can triage nurses accurately identify who is at risk of violence on arrival?
- How does identifying patients at risk of violence influence clinical care and Code Grey responses?
- Does Violence Risk Screening increase Triage nurse self efficacy in identifying and managing patients at risk of violence?

Subsidiary questions to explore the feasibility and utility of violence risk screening were:

- How does the public perceive the risk of violence being explored at Triage?
- Is it feasible to identify the risk of violence during the triage nurse interaction?

Setting

The study site was a level one trauma centre located in Melbourne, Australia. This ED has an annual census of 60,000 presentations with a 40% admission rate. There is a 24/7 Enhanced Crisis Assessment Treatment Team (ECATT) available to provide acute mental health assessments and a 29 bed adult mental health acute admission unit on site. Mental health data confirms that 3.5% of ED presentations require a mental health assessment.
**Process for managing aggression and violence.** In 2009, a set of four risk screening questions with binary responses (yes/no) were proposed for use at triage to identify those patients at risk of violence. The questions identified whether the patient had thoughts of self-harm, recent involvement in violent incidents, weapons or dangerous items in their possession, and whether staff considered the patient at risk. These questions were added to the computerised triage screen, were optional, and had not been evaluated. Informal feedback from staff indicated that the triage nurses were not completing the screening questions. The ability of triage nurses to identify patients at risk and the influence on clinical care and Code Grey responses was unknown.

**Governance of clinical processes.** The development and implementation of violence risk screening was supported and guided by the Violence in ED Action Group. This working group consisted of ED senior nursing and medical staff, aggression prevention trainers, security staff, community and occupation health and safety representatives. This group was updated bi-monthly on the progress of the research and they provided feedback on the acceptability of risk screening, integration with existing information technology infrastructure, and implementation strategies.

**Patient alerts.** There was an existing hospital alert process referred to as patient alert. This alert is placed on the electronic patient registration system to notify staff at subsequent presentations that a risk has been identified previously. This alert process to “flag” files can be used to record past violence, allergies, management plans, or specific medical treatment orders. Using patient alerts or for a history of violence is an accepted practice to improve patient safety (Heads of Workplace Safety Authority, 2009). However, its relevance for use in ED for violence was unknown.
**Clinical and security staff responses for violence.** Security emergency responses to ED are considered a “planned” Code Grey when staff anticipate a potential risk and request a security staff presence or an “unplanned” Code Grey in which security staff are requested because there is an immediate risk of violence. The clinically led response team consists of security officers, nurse in charge, medical staff, and ED nurses. A Code Grey response is activated when there is an actual or anticipated risk of violence, and this includes situations such as absconding, treatment interference, to manage the use of mechanical restraint, or to be on standby while clinical care is provided. This emergency response complies with standards (Knott et al., 2013) determined by the Victorian Department of Health.

**Ethical Considerations**

The study commenced following initial approval as a quality assurance project (QA2011.002) on 16th March 2011. See Appendix A for a copy of the approval documentation. Melbourne Health Research and Ethics Committee (MHREC) approved the study on the 19th October 2011, approval number 2011.151. See Appendix B for a copy of the MHREC approval. A further Human Research and Ethics Committee approval was granted by The University of Melbourne on 17th November 2011, approval number 1137073. See Appendix C for a copy of the University of Melbourne Research and Ethics approval.

Identifying patients at risk of violence, and conducting research in the ED where the PhD Candidate is known to participants raises ethical issues. The National Statement on Ethical Conduct in Human Research (2013) provides guidance on respect, beneficence, and conducting research for special populations including patients with a mental illness or patients in the ED.

**Emergency care.** The ethical issues to be considered when conducting semi structured interviews with patients in the ED included the participants’ current medical state and the brief time they spend in ED. Patients who were distressed or had a medical condition that would make participating uncomfortable were
excluded. This was determined by the triage nurses as they were in the best position to determine who should not be approached. Patients have a time limited period in ED and were advised that if they were called for treatment, their care would be the priority.

Respect. The PhD Candidate was known to the Violence in ED Action Group and ED staff in her current employment capacity of Consultation Liaison Psychiatry Nurse and Aggression Prevention Trainer. An assistant was used to distribute consent forms and collect pre and post triage nurses questionnaires to avoid staff feeling obliged to participate. The observation template was shown to triage nurses prior to observation commencing so they were aware of the information being collected and the data was confirmed with each nurse at the conclusion of the observation period.

Data confidentiality was maintained by using password protection on the PhD candidate’s computer. Only the PhD candidate, supervisors and the statistician had access to the raw data. Data reported in publications did not identify any individual. Data was stored in a locked filing cabinet in a secure area.

Justice. Patients presenting for emergency mental health care were excluded from participating in a semi-structured interview. This group were excluded because it was not appropriate to conduct an interview with patients who were experiencing acute mental health symptoms and there was no benefit to the patient. Furthermore, to include patients presenting for a mental health assessment an additional assessment of capacity would have been required (National Statement on Ethical Conduct in Human Research, 2013). An alternative approach to conducting interviews with patients presenting with acute mental health symptoms was available. Mental health consumers are represented by a group of Consumer Consultants from the Area Mental Health Service and they were invited to provide feedback.
Non-malificence. There is potential for patients to be “labelled” as violent and this may be seen as a judgement that can have negative consequences for patients. The same “label” applies to all patients identified at risk of violence however the severity and potential risk to staff can vary greatly. It is unknown if nurses will avoid patients and provide the same level of care to patients who are identified at risk of violence, For this reason, labelling a person who is at risk of violence presents an ethical issue for consideration. Patients who were identified at risk of violence at triage were not notified and all data was de-identified. The identification of risk refers to that particular episode of care in ED only, and is recorded in the electronic medical record. Although this “labels” a person as at risk of violence, it also prompts staff to focus on patient care needs and prevention. This is preferable to decisions on risk being made in isolation, potentially based on misinformation and not formally recorded (Forster et al., 2005). There is potential for staff to have concerns about which patients are identified at risk. A review of a similar alert process found staff were concerned that patients may be labelled as potentially violent when it was not warranted (Kling et al., 2006). There is also potential for nurses to have strong views about victims of domestic violence being “labelled” as potentially violent. The impact of identifying patients at risk of violence is unknown. There is potential for staff to avoid patients at risk, which may result in increased time in ED and situations escalating.

Beneficence. Patients who are considered violent in ED can challenge staff who work within organisational values that promote respect for everyone, however there is potential for this group to receive less than optimal care. This research has promoted respect of patients at all times, regardless of their behaviour. Violence risk screening was promoted as an opportunity for prevention that has benefits for staff and patients.
**Data Management**

Data was accessed from organisational databases, questionnaires, observation, and semi-structured interviews. All data was de-identified. The information obtained was checked with Senior ED staff to ensure it was accurate. Data that was re-coded manually was checked by a second person who provided statistical guidance for this research. The analysis was checked and confirmed by a second person. Any cases that were not able to be verified were excluded and not recorded in the analysis. Data from hospital databases was extracted and checked for errors. The organisational databases accessed included code grey data, clinical data from the electronic medical record and alert information from the patient registration system.

**Code Grey data.** The code grey data is collected by security staff/personnel at each emergency response. The date, location, duration and interventions including mechanical and physical restraint and medication administered in the presence of security staff is recorded.

**Clinical data.** Clinical data obtained from the electronic medical record and included the date and time of arrival, presenting complaint, triage category, gender, referral to mental health service, length of stay and time from triage to review by medical staff.

**Patient alerts.** This data is recorded on the patient registration system and records if there is an alert for violence and other important medical information such as allergies.

**Summary**

This chapter has described the research design, methodological approach, and action learning model that guided the intervention development and evaluation. The approach to data management and justification for the research design were outlined. The following three chapters will present each phase of this research including the aims, sample, method, analysis and discuss the findings.
Chapter Five: Study One - Exploration of the Feasibility and Need for Violence Risk Screening

The feasibility, usability and need for violence risk screening was explored to inform the development and implementation of a decision support process to identify patients at risk of violence on arrival to the ED. A retrospective audit of Code Grey responses and logistic regression analysis of risk factors for a Code Grey response identified the need for violence risk screening. Qualitative analysis of structured participant observations of triage nurses practice explored how the risk of violence was identified in practice and semi-structured interviews with ED patients explored the public’s perception and acceptability of violence risk screening. This chapter will present the methodology, results and discuss the main findings of the research conducted to inform the development of a violence risk screening process, which will then be described in Chapter six.

Phase A: Retrospective Audit of Code Grey responses in ED

A retrospective audit of matched data for all Code Grey responses over a 12 month period was conducted (1\textsuperscript{st} January, 2010 to 31\textsuperscript{st} December, 2010). Matching was conducted with information from electronic medical record. These data were used to explore the use of Code Grey responses in ED, characterise patients, and identify risk factors for a Code Grey response. There are two types of Code Grey responses used. A planned Code Grey is when staff anticipate there is a risk due to an unarmed threat including aggressive behavior where any (patient, visitor, intruder) could potentially threaten injury to others or themselves. The purpose of anticipating a situation is that staff may afford themselves the opportunity to develop a planned and coordinated response, utilising resources in their area in conjunction with Security Officers, thus minimising the risk of injury to all involved. (Royal Melbourne Hospital, 2014). An unplanned Code Grey is activated when staff perceive an immediate risk due to an unarmed threat including aggressive behavior where any person (patient, visitor or intruder) threatens injury to others or themselves (Royal Melbourne Hospital, 2014). This provided a baseline sample
from which to explore the influence of violence risk screening on clinical care and Code Grey responses

**Aim.**

- Describe the use of Code Grey responses in ED.
- Identify factors that increase the risk for a Code Grey response

**Sample.** Data from three administrative and clinical data bases (ED electronic medical record, patient registration system and the Melbourne Health Code Grey Database) from 1st January 2010 to 31st December 2010 were included. A total of 1959 Code Grey responses were identified. Of the 57,112 presentations to ED, Code Grey data was matched to 950 patient presentations. This sample captured any seasonal variation and was large enough to conduct logistic regression using an anticipated maximum 15 variables.

**Method.** A retrospective audit of all Code Grey responses was matched by medical record number and date to clinical data from electronic medical record and patient alerts for past violence from the patient registration system. Data from the Code Grey database included: time, date, duration, type of emergency, chemical, physical, and mechanical restraint, location and frequency. The proportion of Code Greys that were planned and unplanned and location were recorded to ascertain the type of emergency responses utilised by staff. Information contained within electronic medical record included: age, gender, triage category, time and date, length of stay, primary complaint, mode of arrival, time to medical treatment, and referral to the mental health service in ED. Information from patient registration system identified any past alerts for violence. The date was used for matching clinical and Code Grey responses to account for patients who had Code Grey on the day following admission but within the same episode of ED care.
Data analysis. All data was exported into Microsoft Excel® for cleaning and linking using the patient’s medical record number and date of triage interaction. Analysis was performed in SPSS, Version 19 (SPSS Inc., Chicago, IL, USA) by ED visit comparing patients, who did and did not have a Code Grey. Tests for normality were performed for the duration of planned and unplanned Code Greys.

Descriptive analysis. Descriptive analysis was conducted to explore the frequency of coercive interventions at each Code Grey response. Coercive Interventions to manage behaviour included physical restraint, mechanical restraint, and medication given in the presence of security staff. Each patient has a unique medical record number and this was used to determine if patients had more than one presentation requiring a Code Grey response within the 12-month period. Patients who had one or more Code Grey response at one or more presentations were coded into subgroups. The patient registration system was checked to identify past violence alerts for all patients who had a Code Grey.

Descriptive statistics were calculated including frequencies and measures of central tendency. The time from triage to first Code Grey response was calculated from the time of triage to commencing a Code Grey response. The mean, standard deviation, median and range were calculated for length of stay, and time to medical treatment, age and time to mental health assessment. Factors associated with having a Code Grey were explored using Chi-square and Pearson’s correlations.

Exploratory analysis. Logistic regression was conducted to explore factors that increase the risk of requiring a Code Grey response. Logistic regression analysis has been used to predict a binary outcome from a set of variables (Tabachnick & Fidell, 2001). In this study, the outcome is to predict who will require a Code Grey response and the variables are clinical factors including triage category, gender, mode of arrival, referral for mental health assessment and presenting complaint. The Chi-square test for independence was used to identify categorical variables that have a significant association with having a Code Grey. Each variable was explored independently in the first instance and then in combination to identify the relationship between the need for a Code Grey and
triaign category, gender, mode of arrival, presenting complaint and referral for mental health assessment.

Colinearity was explored using the correlation of matrix estimates to identify variables in the model that have a relationship (Tabachnick & Fidell, 2001). No variables were highly correlated and excluded from the logistic regression analysis. All variables that were significant were added to the model. In a backward stepwise process, the least significant variables were removed to determine whether the predictive ability of the model could be improved. Previous history of violence was not able to be incorporated into the model as the use of the hospital alert was minimal in the baseline data set.

Phase B: Structured Participant Observation of Triage Nurses

Structured participant observations were used to explore how triage nurses identify patients at risk of violence and to observe how the current risk screening questions were used in practice. Structured participant observation has been used to gain an understanding of complex interactions rather than just collecting information (Bowling, 2009). Observation has been defined as a, “research method in which the investigator systematically watches, listens to and records the phenomena of interest” (Bowling, 2009, p.386). Structured observations require a clear process for recording phenomena to be observed. Participant observation involves the researcher in the activities of the group and the participants know they are being observed (Timseena, 2009). Observations were recorded as they occurred and the researcher together with the participant explored the interpretation and explanation of the events.

Structured observations were used to ensure there was a consistent approach to recording observations and to capture the same information for each triage interaction that was identified as being at risk of violence. This approach was used because it was unclear how triage nurses used the existing violence risk screening questions in practice.
Each presentation could be screened for the risk of violence on arrival at the discretion of the triage nurse. This screening process was captured in the triage assessment and required the triage nurse to identify whether the patient was at risk of violence. If the triage nurse considered the patient to be at risk of violence, a further three questions were asked. Patients who were identified at risk were noted by the presence of a symbol. The symbol was a dagger, which was automatically generated, and was visible on the electronic patient record. The final question was completed by the triage nurse to confirm the risk of violence regardless of positive responses to the previous three risk identification questions. See Figure 5.1 that shows the existing violence risk screening decision support process.

<table>
<thead>
<tr>
<th>Aggression Risk Screening? (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the triage nurse identifies the patient at risk then a further 3 questions were asked:</td>
</tr>
<tr>
<td>1. Have you been involved in a recent violent event to self or to others?</td>
</tr>
<tr>
<td>2. Do you have any ideas of harming yourself or others?</td>
</tr>
<tr>
<td>3. Do you have any weapons or dangerous items in your possession?</td>
</tr>
<tr>
<td>4. Staff identified high risk of violence aggression?</td>
</tr>
</tbody>
</table>

*Figure 5.1 Existing Violence Risk Screening Decision Support Process*

It was unknown how these questions were used in practice and their usability had not been examined. Successful implementation of a risk screening process requires face validity. Although there was agreement between nurses working in triage that identifying patients at risk is useful, there had been no evaluation of how this occurred in a triage setting. In an ED triage context, the information to complete the violence risk screen must be available and not impact on the triage nurses workload or delay patient care. Decision making processes developed need to take into account how they will be used in practice and they must be feasible (Toll, Janssen, Vergouwe, & Moons, 2008). Brehaut (2005) has...
identified the useability of a decision making process will determine if it is actually used by staff regardless of its effectiveness.

**Aim.** The aim of observing triage nurses while engaged in triaging patients was to:

a. Describe how the process of violence risk screening was integrated into clinical practice at triage

b. Determine the usability of the current violence risk screening tool

**Sample.** A convenience sample of nine triage nurses were observed which represents 12.5% of all triage nurses ($N=72$) Staff were advised of the study at in-service education sessions and self-nominated to participate. Observations occurred for a maximum of two hours at a time with each nurse being observed on one or two occasions only. The duration of observation was restricted to a maximum of four hours per nurse to ensure several nurses were observed and to limit the intrusiveness of observation on individual nurses. Triage nurses were observed for 30 hours in total. Observations were scheduled during business and after hours including weekends.

**Method.** Prior to commencing observation, the template was trialled with an experienced triage nurse for a total of four hours over two occasions to ensure it captured the required information and it could be completed while observing the triage nurse-patient interaction. See Appendix D for a copy of the Triage Nurse Observation Template. Trialling this template allowed the PhD Candidate to become aware of the triage nurses’ environment prior to commencing formal observations. The data collection template was shown to the triage nurse prior to commencing observations. The triage nurses were advised that the purpose of observation was to review how Violence Risk Screening questions were applied to real clinical situations.

Staff were asked to provide written consent after reading the Participant Information and Consent Form. See Appendix E for a copy of the Triage Nurse Participant Information and Consent Form. At the commencement of the observation period, the triage nurse was advised that the PhD Candidate would
observe discretely, and once it was clear a person was at risk note taking would commence. The field notes recorded what occurred at each period of observation, and were documented at the time of observations for accurate recall. They were shown to the triage nurse for confirmation at the end of the observation period and clarification if required. Data was recorded using a template that identified the use of direct questioning, a brief description of each presentation and whether the triage nurse and PhD Candidate agreed the clinical presentation indicated a risk of violence.

**Data analysis of observation of triage nurse practice.** The proportion of patients identified who were at risk and how risk screening was integrated into practice was described. The shift when observations occurred, gender and triage category of patients at risk were tabulated. Observation data included field notes, completed observation templates, and feedback from triage nurses collected with structured observations. The use of violence risk screening or rationale for not using this process was recorded for each presentation. A review of data by the primary supervisor experienced in triage confirmed data saturation and results. These findings were discussed with ED nurse educators to explore the use of risk screening and the existing triage guidelines. Data was collected using a template that recorded use of direct questioning, agreement between the researcher and the triage nurse and brief description of each presentation. Agreement between the researcher and triage nurse was important to collect to ensure the researcher had a clear understanding of how risk was established in triage nurse practice.
**Rigour.** The rigour of data during collection and analysis was maintained by applying the criteria outlined Guba and Lincoln (1989).

**Auditability.** Field notes and completed observation templates were stored securely and available to verify results. The field notes consisted of a summary of each presentation that the triage nurse identified at risk of violence. These notes were discussed with primary supervisor and this information was used to inform the development of the violence risk screening decision support process. This data was reviewed by the PhD Candidates’ primary supervisor who has experience in triage to confirm interpretation of observations. To reduce the risk of observer bias the observations were discussed with the primary supervisor and an ED nurse educator who was responsible for triage nurse education. Observer bias is when there is a difference between the observed phenomena and the observer’s interpretation of the events (Bowling, 2009). The PhD Candidate was not familiar with the triage nurse interactions to be observed and this limited the chance that activities would be taken for granted or ignored (Bowling, 2009).

**Credibility.** All responses were documented and confirmed with each participant at the conclusion of the observation period. The observation of triage interactions ceased once data saturation was achieved. Data saturation is considered as the point in data collection when no new information is being obtained (Strauss & Corbi, 1990). Data saturation was confirmed by reviewing data obtained and consultation with ED Nursing education staff to confirm the interpretation of data. The sample was considered representative as it was equivalent to the number of presentations in a 24-hour period and included observing nine triage nurses. The data and interpretation was presented to the Violence in ED Action Group to ensure there were no other clinical scenarios that were relevant and not yet explored through observation.
Fittingness and confirmability. Observations were recorded in real time and the rationale was recorded concurrently during the observation period. This allowed discussion and clarification with the triage nurses following each triage interaction. This was essential to explore how violence risk screening was used in practice.

Phase C: Semi-structured Interviews with Patients and Carers

The public’s awareness of violence experienced by ED staff and how violence risk screening was perceived was unknown. Introducing direct questioning to determine the risk of violence is a change in practice and the acceptability of this for patients and carers was unknown. Previously, mental health consumers have given feedback on the development of Clinical Practice Guidelines for Violence Risk Assessment at Triage (Sands et al., 2009). However, there has been no feedback from ED patients or carers.

Aim. The aim of this phase was to determine the public’s perception of the acceptability of violence risk screening at triage and searching for weapons and dangerous items in ED.

Sample. A convenience sample of patients at triage (N=19) was invited to participate in a semi-structured interview to determine how violence risk screening was perceived. Participants were invited to participate regardless of whether or not they were asked the Violence Risk Screening questions at triage. Of the 19 patients approached, 5 nominated the accompanying person to participate. This was due to the patient being taken for a procedure or a family member preferring to participate on behalf of a family member they were caring for. The triage nurse was asked to identify which patients in the waiting room or cubicles met the inclusion criteria. Patients who were sedated, acutely agitated, requiring a Code Grey response, presenting with acute mental health symptoms, in pain, or any medical condition that may make participating in an interview uncomfortable, were not approached to participate.
Method. Participants were approached by the PhD Candidate and were provided with a Participant Information and Consent Form. See Appendix F for a copy of the Participant Information and Consent Form. All participants remained anonymous. To minimise the impact on patients attending ED, the interviewer documented the interview responses for each patient and confirmed accuracy at the time of the interview. Data was reviewed after 15 interviews to explore data saturation. Achieving data saturation is required to ensure that no new information is able to be collected (Bowling, 2009). A further four interviews were conducted and no new information was obtained.

The interview enabled exploration of any previous experience the patient may have had of risk screening at triage. The relevance, clarity and language used were discussed to determine whether it was perceived as acceptable and appropriate. Participants were asked whether they considered searching of belongings prior to entering treatment areas acceptable and how this should be conducted when required. See Appendix G for a copy of the ED Patient Interview Schedule.

Analysis of interview data. All responses were tabulated to identify themes and reviewed by the PhD Candidate and primary supervisor separately to improve rigour (Barbour, 2001). Thematic framework analysis (Spencer & Ritchie, 1994) was used to explore participant responses. This analysis required five stages. The first stage is familiarisation in which each response is read separately. The second stage involves identifying themes and developing categories. The third stage is indexing in which the text is systematically analysed against the thematic framework to ensure the themes created were grounded in the original data. The fourth step is charting of the themes developed to clarify categories and language. The final stage is mapping and interpretation, in which associations between the established themes are considered to derive meaning from the data. Direct quotes were identified by the interview number and tabulated to demonstrate support for both the main and sub-themes.
Interview Rigour. The rigour of interview data was addressed during data collection and analysis. During data collection the interviewer used paraphrasing to confirm that the meaning of participant responses had been understood. Responses were documented in view of the participant on the interview schedule. The PhD candidate has 20 years of experience as a nurse and has the necessary interpersonal skills to support the interviewee and obtain accurate and thorough information. The data was analysed by the PhD Candidate and Primary Supervisor separately in the first instance. The main themes and sub-themes were tabulated and supported by direct quotes. Firstly, agreement was reached by reviewing data, discussion and preparing the results into tables. Secondly, peer analysis confirmed the interpretations through consultation with the Violence in ED Action Group and the PhD Candidate’s supervisors. Using peer analysis has been used to improve the trustworthiness of qualitative data and in this study accessing experts from ED enabled checking of the interpretations and their application in practice (Schneider, Whitehead, & Elliott, 2007). Quotes from participants to support sub-themes were displayed in the results and coded with participant number to enable checking of raw data.

Results

Phase A: Retrospective Audit of Code Grey responses in the Emergency Department

A retrospective audit from 1st January, 2010 to 31st December, 2010 explored the use of Code Grey responses in the ED. There were 3,739 Code Greys in all areas of the hospital and 52.5% ($n=1,959$) of these were called in the ED. There were more planned Code Greys (55%, 1,078/1,959) than unplanned Code Greys (45%, 881/1,959).
**Incidence of Code Grey.** There were 56,263 presentations, of which 1.7% (950) patients required a Code Grey response during ED treatment. Figure 5.2 shows the incidence of planned\(^1\) and unplanned\(^2\) Code Greys in 2010.

![Graph showing incidence of planned and unplanned Code Greys in 2010.](image)

**Figure 5.2 Incidence of Planned and Unplanned Code Grey in 2010 (N=1,959)**

1. Planned Code Grey: “Staff anticipate a risk due to an *unarmed threat including aggressive behavior* where any (patient, visitor, intruder) could potentially threaten injury to others or themselves. In anticipating a situation, staff may afford themselves the opportunity to develop a planned and coordinated response, utilising resources in their area in conjunction with Security Officers, thus minimising the risk of injury to all involved.” (Royal Melbourne Hospital, 2014, p.17).

2. Unplanned Code Grey: “Staff perceive an immediate risk due to an *unarmed threat including aggressive behavior* where any person (patient, visitor or intruder) threatens injury to others or themselves.” (Royal Melbourne Hospital, 2014, p.17).
**Onset of Code Grey.** Most Code Greys occurred on a Saturday (15.8%, 309/1,959) and the least Code Greys occurred on a Friday (13% 255/1,959). There were more unplanned Code Greys on Sundays. Figure 5.3 shows the number of planned and unplanned Code Grey responses by day of the week.

![Figure 5.3 Number of Planned and Unplanned Code Greys by Day of the Week (N=1,959)](chart)

**Shift Code Greys commenced.** There are more Code Greys, both planned and unplanned, on afternoon and night duty shifts. This has implications for providing clinical care due the time required to respond and manage Code Grey responses when fewer staff are available. Figure 5.4 shows the number of planned and unplanned Code Greys by shift.
Figure 5.4 Planned and Unplanned Code Greys by Shift

Note.
AM=0700 to 1500
PM =1500 to 2200
Night Duty=2200 to 0700

Duration of Code Grey responses. The total time engaged in Code Grey responses was 613 hours. This was measured from the time the code was called, until security staff were informed by the clinical leader the emergency had resolved. Planned Code Greys on average have a longer duration (Median=15, IQR=10-25 minutes) compared to unplanned Code Greys (Median=12, IQR=7-20). The duration of Code Grey responses was not normally distributed (Kolmogorov-Smirnov statistic $p<.001$). The medians were compared using the Mann-Whitney U Test and found a significant difference $p<.001$, $Z=5.041$. 
**Duration of Code Greys at point of entry.** Code Greys at point of entry (ambulance bay, triage, waiting area and entrance) have a longer median duration, \((\text{Median}=18, \text{IQR}=10-30\text{ minutes})\) than Code Greys inside the department \((\text{Median}=13.59, \text{IQR}=9-10\text{ }).\) Figure 5.5 shows a comparison of the duration of Code Grey responses at the point of entry and inside the ED.

*Figure 5.5 Duration of Code Grey at Entry or Inside the Emergency Department*
Duration of Code Greys on weekday or weekend. Code Grey responses on weekend days had a shorter median duration \((\text{Median}=13.59, \text{IQR}=9-20\) minutes) compared to weekdays \((\text{Median}=14.59, \text{IQR}=10-25)\). The duration of Code Grey responses on weekend or weekdays was not normally distributed (Kolmogorov-Smirnov statistic \(p<.001\)). The medians were compared using the Mann-Whitney U Test which found a significant difference \(p<.013, Z=2.489\). Figure 5.6 shows the duration of Code Grey responses by weekend or weekday.

![Box Plot](image)

Figure 5.6 Duration of Code Greys on Weekend or Weekdays

**Location of Code Grey responses.** Entry points to the ED account for 26% \((281/1,078)\) of planned Code Greys and 24% \((215/881)\) of unplanned Code Greys. “Entry points” include the ambulance bay, triage, waiting area and entrance. The remaining planned \((74\%, 797/1,078)\) and unplanned \((76\%, 666/881)\) Code Greys occurred inside the ED.
**Frequency of presentation and Code Grey response.** The medical record number was unknown for 4% (48/1,078) of planned Code Grey responses and 10% (92/881) unplanned Code Grey responses. Of the 1,959 emergency responses, 857 individual patients could be identified. There were 86 Code Greys in the ambulance bay where the medical record number was missing and it is likely that the arrival circumstances contributed to this rather than staff not collecting the information. It is possible that these Code Greys were activated for a visitor, family member, the patient left before assessment, or their identity was yet to be established.

Patients who had two or more presentations in 12 months with a Code Grey at each presentation accounted for 32% (341/1,078) of planned Code Greys and 27% (232/881) of unplanned Code Greys. Some patients were only identified as having one presentation to the ED but having more than one Code Grey while in the ED. This group accounted for 39% (420/1,078) of planned and 35% (306/881) of unplanned Code Greys. A high-risk group of 359 patients were identified who accounted for 1,278 Code Grey responses. Table 5.1 shows the frequency of presentation, use of the patient alert and number of Code Grey Responses.
Table 5.1 *Frequency of Presentation, Code Grey Response, and use of Patient Alert*

<table>
<thead>
<tr>
<th>Presentation frequency in 12 months</th>
<th>Patients (N=857)</th>
<th>Code Grey (N=1,796)</th>
<th>Use of patient alert(^1) (N=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One presentation and one Code Grey</td>
<td>498</td>
<td>498</td>
<td>9</td>
</tr>
<tr>
<td>Two or more presentations requiring at least one Code Grey</td>
<td>105</td>
<td>573</td>
<td>11</td>
</tr>
<tr>
<td>One presentation with 2 or more Code Greys</td>
<td>254</td>
<td>726</td>
<td>5</td>
</tr>
</tbody>
</table>

1. A patient alert is added to the electronic patient registration system when a risk is identified on previous admission.
2. There were an additional 163 Code Greys that were not matched to a clinical presentation because the medical record number was not obtained.
**Interventions at Code Grey responses.** A total of 2,002 coercive interventions occurred during Code Grey responses, including the use of mechanical and physical restraint, and/or administration of medication.

**Mechanical restraint.** Mechanical restraint was used for 32% (285/881) of unplanned Code Greys and 35% (379/1,078) of planned Code Greys. Figure 5.7 shows the number of planned and unplanned Code Greys that required the use of mechanical restraint.

*Figure 5.7 Use of Mechanical Restraint at Planned and Unplanned Code Greys*

Note. “Mechanical restraint is the application of any device attached to or near a person’s body which cannot be controlled or easily removed by the person and which deliberately prevents or is deliberately intended to prevent a person’s free body movement to a position of choice and/or a person’s normal access to their body” (Royal Melbourne Hospital, 2013) p. 11)
Physical restraint. Physical restraint was used for 46% (405/881) of unplanned Code Greys and 43% (463/1,078) of planned Code Greys. Figure 5.8 shows the number of planned and unplanned Code Greys that used physical restraint.

Figure 5.8 Number of Planned and Unplanned Code Greys that used Physical Restraint.

Note. At the study site physical restraint was recorded when security staff had to touch the person in any way. This can range from holding a person against their will to guiding a person with their hand.
**Medication.**

Medication was administered in the presence of security personnel for 23% (244/1,078) of planned Code Grey and 26% (226/881) of unplanned Code Grey responses. Figure 5.9 shows the use of medication at planned and unplanned Code Greys.

![Bar chart showing the use of medication at planned and unplanned Code Greys.](chart)

**Figure 5.9 Use of Medication at Planned and Unplanned Code Greys**

Note. Medication given during a Code Grey response is recorded on the Code Grey database as “chemical restraint”. This database does not specify what type of medication is used, although ED staff have reported that medications given during a Code Grey are typically to manage behaviour, rather than treatment for an acute medical presentation.

**Time from triage to first Code Grey response.** Of 950 presentations in a 12-month period, time from triage to first Code Grey was collated for 944 presentations. Of these, 25% of Code Greys occurred in the first 11 minutes and 50% commenced within 77 minutes of triage. The time from triage to first Code Grey for each presentation is shown in a Kaplan-Meier survival curve (N=944). The time from triage to first Code Grey ranged from 0 to 1417 minutes (Median= 77.5, IQR=11-213, 95%CI 66.96, 87.03). Figure 5.10 shows the time from triage to first Code Grey response.
Clinical Characteristics of Patients who required a Code Grey Response in the Emergency Department

The aim of this phase was to identify the clinical characteristics of patients and risk factors for each presentation that required a Code Grey response. This analysis used 12 months of clinical data that was matched to Code Grey data. There were 56,105 presentations and of these 950 required a Code Grey response. Table 5.2 shows the comparison of clinical and demographic information for all presentations who required a Code Grey response.
### Table 5.2 Comparison of Clinical and Demographic Information for all Presentations (N=56,105)

<table>
<thead>
<tr>
<th>X²/df/p</th>
<th>Code Grey absent (n=55,155)</th>
<th>Code Grey present (n=950)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X²(1)=28158.5, p&lt;0.001</td>
<td>Female</td>
<td>25444 (46)</td>
<td>311 (33)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>29684 (53)</td>
<td>639 (67)</td>
</tr>
<tr>
<td></td>
<td>Missing</td>
<td>27 (0)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>55155 (100)</td>
<td>950 (100)</td>
</tr>
<tr>
<td>Mode of Arrival</td>
<td>Other</td>
<td>34836 (63)</td>
<td>170 (18)</td>
</tr>
<tr>
<td></td>
<td>Ambulance</td>
<td>19974 (36)</td>
<td>623 (66)</td>
</tr>
<tr>
<td></td>
<td>Police</td>
<td>317 (1)</td>
<td>157 (17)</td>
</tr>
<tr>
<td></td>
<td>Missing</td>
<td>28 -</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>55155 (100)</td>
<td>950 (100)</td>
</tr>
<tr>
<td>Triage Category</td>
<td>1</td>
<td>16563(3)</td>
<td>66 (7)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>8066(15)</td>
<td>218 (23)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>22800 (41)</td>
<td>536 (56)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>19912 (36)</td>
<td>121 (13)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>2676 (5)</td>
<td>9 (1)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>55155 (100)</td>
<td>950 (100)</td>
</tr>
<tr>
<td>Presenting Complaint</td>
<td>Other</td>
<td>49319 (89)</td>
<td>582 (61)</td>
</tr>
<tr>
<td></td>
<td>Mental Health</td>
<td>653 (1)</td>
<td>186 (20)</td>
</tr>
<tr>
<td></td>
<td>Drug/Alcohol</td>
<td>623 (1)</td>
<td>83 (9)</td>
</tr>
<tr>
<td></td>
<td>CNS</td>
<td>4560 (8)</td>
<td>99 (10)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>55155 (100)</td>
<td>950 (100)</td>
</tr>
<tr>
<td>Stream</td>
<td>1</td>
<td>18288 (33)</td>
<td>354 (37)</td>
</tr>
<tr>
<td></td>
<td>Fast track</td>
<td>4744 (9)</td>
<td>4 (0)</td>
</tr>
<tr>
<td></td>
<td>Trauma</td>
<td>8083 (15)</td>
<td>191 (20)</td>
</tr>
<tr>
<td></td>
<td>Discharge</td>
<td>15663 (28)</td>
<td>151 (16)</td>
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<tr>
<td></td>
<td>Admission</td>
<td>8307 (15)</td>
<td>248 (26)</td>
</tr>
<tr>
<td></td>
<td>Missing</td>
<td>70 -</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>55155 (100)</td>
<td>950 (100)</td>
</tr>
<tr>
<td>Mental health assessment</td>
<td>No</td>
<td>53979 (98)</td>
<td>600 (63)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>1176 (2)</td>
<td>350 (36)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>55155 (100)</td>
<td>950 (100)</td>
</tr>
</tbody>
</table>

1. Triage category refers to the Australasian Triage Scale (ATS) level of acuity priority based on the severity of their presentation and is rated from 1 (immediately life-threatening) to less urgent (category 5).
Gender. Males had more Code Greys than females. Males accounted for 67% (639/950) of Code Grey compared to females 33% (331/950).

Access to care. The time from triage to review by medical staff, acute mental health assessment and length of stay, and age was compared for patients who did and did not require a code grey response. The duration in minutes from triage to review by a doctor and or mental health clinician, length of stay and age were not normally distributed (Kolmogorov-Smirnov statistic $p<.001$). The medians were compared using the Mann-Whitney U Test.

Patients who required a Code Grey response were seen more quickly by medical staff ($n=908$, Median= 64, $IQR=16$-125 minutes) compared to patients who did not require a Code Grey response ($n=51379$, Median=86, $IQR=28$-169) $p<.001$ Figure 5.11 shows the time from arrival to review by medical staff and use of Code Grey response.

![Figure 5.11](image-url) Comparison of the Time from Arrival to Medical Review for Patients who required a Code Grey Response.
Patients who required a Code Grey response were seen more quickly by a mental health clinician ($n=350$, median=125, $IQR=36-305$ minutes) compared to patients who did not require a Code Grey response ($n=1,176$, median=130, $IQR=54-278$) but the difference was not statistically significant $p<.462$. Figure 5.12 shows a comparison of the time from triage to review by mental health clinician for patients who required a Code Grey response.

![Figure 5.12 Comparison of the Time from Triage to Mental Health Assessment for Patients who required a Code Grey Response](image)

*Figure 5.12 Comparison of the Time from Triage to Mental Health Assessment for Patients who required a Code Grey Response*
Patients who required a Code Grey response had a greater length of stay ($n=950$, median $= 341$, IQR $= 191-581$ minutes) compared to patients who did not require a Code Grey response ($n=55,113$, median $= 266$, IQR $= 159-412$), $p<0.001$. Figure 5.13 shows a comparison of the median length of stay for patients who required a Code Grey response.

![Box plot comparing length of stay between Code Grey absent and present]

**Figure 5.13 Comparison of the Length of Stay for Patients who Required a Code Grey Response**

Patients who required a Code Grey response had a lower median age ($n=950$, median $= 35$, IQR $= 26-47$ years) compared to patients who did not require a Code Grey response ($n=55,129$, median $= 45$, IQR $= 28-66$), $p<0.001$. Figure 5.14 shows a comparison of the median age for patients who required a code grey response.
Figure 5.14 Comparison of the Median Age for Patients who Required a Code Grey Response.

Seasonal variability.

The seasonal variability was explored by reviewing the number of presentations that required a Code Grey, arrived by police, or were referred for a mental health assessment per month. There was no significant difference in the number of Code Greys each month ($p < .344$). The number of police presentations was greatest in October ($n=55$) and lowest in March ($n=28$) $p < .041$. The most number of presentations that required referral for a mental health assessment occurred in August ($n=173$), and the least number in January ($n=78$) $p < .001$. Although there were differences in the number of police presentations and patients referred for a mental health assessment, this did not occur in the same month. Figure 5.15 show the proportion of presentations that required a Code Grey response, arrived by police, or were referred for a mental health assessment ($N=56,104$).
Logistic regression analysis.

Logistic regression analysis used a backwards stepwise process and explored clinical and demographic risk factors for a Code Grey response. Review of the correlation matrix of estimates did not identify collinearity. To account for patients who presented more than once, the second presentation for every person was removed and the first presentation for every person in the 12-month period was retained for analysis. This was possible due to the large sample size. The frequency of presentations that required a Code Grey response was less than 2%, and this limits the ability of logistic regression analysis to predict who will require a Code Grey. A subset of 41,755 presentations was retained for analysis and 14,369 re-presentations were removed. Of all primary presentations, 574 required a Code Grey response. The variables stream and triage category were removed as the odds ratio was less than one.

Table 5.3 shows the clinical and demographic information for primary presentations who required a Code Grey response.
Table 5.3 Clinical and Demographic information for Primary Presentations who did and did not require a Code Grey Response (N = 41,735)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Code Grey absent (n=41,143)</th>
<th>Code Grey present (n=574)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>Total</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X^2(1) = 70.748, p &lt; .001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1951 (47)</td>
<td>166 (29)</td>
<td>19317</td>
</tr>
<tr>
<td>Male</td>
<td>21992 (53)</td>
<td>408 (71)</td>
<td>22400</td>
</tr>
<tr>
<td>Missing</td>
<td>18 (0)</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41161</td>
<td>574</td>
<td>41735</td>
</tr>
<tr>
<td>Mode of Arrival</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X^2(2) = 1886.438, p &lt; .001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>26445 (64)</td>
<td>94 (16)</td>
<td>26539</td>
</tr>
<tr>
<td>Ambulance</td>
<td>14470 (35)</td>
<td>396 (69)</td>
<td>14866</td>
</tr>
<tr>
<td>Police</td>
<td>228 (1)</td>
<td>84 (15)</td>
<td>312</td>
</tr>
<tr>
<td>Missing</td>
<td>18</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41161</td>
<td>574</td>
<td>41735</td>
</tr>
<tr>
<td>Triage Category^1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X^2(4) = 282.940, p &lt; .001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1484 (4)</td>
<td>56 (10)</td>
<td>1540</td>
</tr>
<tr>
<td>2</td>
<td>6136 (15)</td>
<td>158 (28)</td>
<td>6294</td>
</tr>
<tr>
<td>3</td>
<td>16708 (41)</td>
<td>308 (54)</td>
<td>17016</td>
</tr>
<tr>
<td>4</td>
<td>15007 (36)</td>
<td>49 (9)</td>
<td>15056</td>
</tr>
<tr>
<td>5</td>
<td>1791 (4)</td>
<td>3 (1)</td>
<td>1794</td>
</tr>
<tr>
<td>Missing</td>
<td>17</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41161</td>
<td>574</td>
<td>41735</td>
</tr>
<tr>
<td>Presenting Complaint</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X^2(4) = 184.646, p &lt; .001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>36938 (90)</td>
<td>379 (66)</td>
<td>37317</td>
</tr>
<tr>
<td>Mental Health</td>
<td>378 (1)</td>
<td>88 (15)</td>
<td>466</td>
</tr>
<tr>
<td>Drug/Alcohol</td>
<td>507 (1)</td>
<td>49 (9)</td>
<td>556</td>
</tr>
<tr>
<td>CNS</td>
<td>3338 (8)</td>
<td>58 (10)</td>
<td>3396</td>
</tr>
<tr>
<td>Missing</td>
<td>18</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41161</td>
<td>574</td>
<td>41735</td>
</tr>
<tr>
<td>Stream</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X^2(4) = 184.646, p &lt; .001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency</td>
<td>12131 (29)</td>
<td>185 (32)</td>
<td>12316</td>
</tr>
<tr>
<td>Fast track</td>
<td>3617 (9)</td>
<td>3 (1)</td>
<td>3620</td>
</tr>
<tr>
<td>Trauma</td>
<td>6288 (15)</td>
<td>154 (27)</td>
<td>6442</td>
</tr>
<tr>
<td>Discharge</td>
<td>12785 (31)</td>
<td>84 (15)</td>
<td>12869</td>
</tr>
<tr>
<td>Admission</td>
<td>6297 (15)</td>
<td>148 (26)</td>
<td>6445</td>
</tr>
<tr>
<td>Missing</td>
<td>8 (0)</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41161</td>
<td>574</td>
<td>41735</td>
</tr>
<tr>
<td>Mental health assessment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X^2(1) = 3006.383, p &lt; .001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>40408 (98)</td>
<td>365 (64)</td>
<td>40773</td>
</tr>
<tr>
<td>Yes</td>
<td>753 (2)</td>
<td>209 (36)</td>
<td>962</td>
</tr>
<tr>
<td>Total</td>
<td>41161</td>
<td>574</td>
<td>41735</td>
</tr>
</tbody>
</table>

1. Triage category refers to the Australasian Triage Scale (ATS) level of acuity priority based on the severity of their presentation and is rated from 1 (immediately life-threatening) to less urgent (category 5).
A comparison of the proportion of presentations that required a Code Grey who had single or multiple presentations to the Emergency Department.

This comparison explored the proportion of presentations that required a Code Grey who had single or multiple presentations to the ED, to justify including the first presentations only for every person in the logistic regression analysis. Of the 948 presentations that required a Code Grey response, 69% (658/948) attended on one occasion in a 12-month period. The remaining 31% (290/948) attended two or more times in a 12-month period. A two proportions test using Minitab (Version 16) estimated a difference between the two groups was 0.39 95% CI: (0.35, 0.43), Z-score: 18.34, p<.001. Table 5.4 shows the proportion of presentations that were referred for a mental health assessment, gender and arrival mode.

Table 5.4 Comparison of the Proportion of Single and Multiple Presentations that required a Code Grey by Gender, Arrival mode and need for Mental Health Assessment

<table>
<thead>
<tr>
<th>Mental health assessment n (%)</th>
<th>Gender n (%)</th>
<th>Mode of arrival n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Single presentation (n=658)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>234 (67)</td>
<td>463 (72)</td>
</tr>
<tr>
<td>Multiple presentations (n=290)</td>
<td>116 (33)</td>
<td>176 (28)</td>
</tr>
</tbody>
</table>
**Results of logistic regression analysis.** Logistic regression analysis found these variables do not predict a Code Grey response indicating that there are other contributing factors. The variables of triage category and stream were removed because the odds ratio was less than one and not all triage categories were significant. The Hosmer and Lemeshow Test was significant (Chi Square 18.284, df 8, \( p < .019 \)) and therefore the model was not supported. The model summary showed 3.7 to 27.4 of the variability was explained by the variables in the model. This model predicted 7.1% (41/574) of presentations who required a Code Grey. There were 55 patients who were predicted to have a Code Grey response but did not require one.

The model identified the odds of having a Code Grey was 2.016 times higher for males than females and police transport increases the odds by 18.997 compared to arriving independently. Referral for a mental health assessment increased the odds of having a Code Grey by 11.683. Analysis of presenting complaint found that a primary mental health condition was less likely to require a Code Grey than attending with a drug and/or alcohol condition. The odds ratio is higher for patients with a presenting complaint for drug/alcohol (OR=2.776, 95%CI 1.951,3948) compared to a patient with a mental health presentation (OR=1.3, 95%CI 917, 1.83).

For each additional minute in the ED there was a 1% increase in the odds of having a Code Grey. There was an inverse relationship between age and risk of requiring a Code Grey response. For each year older a person was the odds of having a Code Grey were reduced by 2.4%. Table 5.5 shows the significant variables and the odds ratio for a Code Grey.
Table 5.5 Significant Factors and Odds Ratio for a Code Grey Response

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>p value</th>
<th>OR</th>
<th>95% CI. OR</th>
<th>Lower, Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of Arrival</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (Reference)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambulance</td>
<td>1.929</td>
<td>0.122</td>
<td>251.495</td>
<td>1</td>
<td>.001</td>
<td>6.88</td>
<td>5.421, 8.732</td>
<td></td>
</tr>
<tr>
<td>Police</td>
<td>2.944</td>
<td>0.197</td>
<td>222.36</td>
<td>1</td>
<td>.001</td>
<td>18.997</td>
<td>12.901, 27.973</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0.701</td>
<td>0.1</td>
<td>49.16</td>
<td>1</td>
<td>.001</td>
<td>2.016</td>
<td>1.657, 2.452</td>
<td></td>
</tr>
<tr>
<td>Mental health assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.458</td>
<td>0.126</td>
<td>382.71</td>
<td>1</td>
<td>.001</td>
<td>11.683</td>
<td>9.133, 14.946</td>
<td></td>
</tr>
<tr>
<td>Presenting Complaint</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (Reference)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Health Related</td>
<td>0.263</td>
<td>0.178</td>
<td>2.174</td>
<td>1</td>
<td>.140</td>
<td>1.3</td>
<td>0.917, 1.843</td>
<td></td>
</tr>
<tr>
<td>Drug/Alcohol</td>
<td>1.021</td>
<td>0.18</td>
<td>32.258</td>
<td>1</td>
<td>.001</td>
<td>2.776</td>
<td>1.951, 3.948</td>
<td></td>
</tr>
<tr>
<td>CNS disturbance</td>
<td>0.413</td>
<td>0.148</td>
<td>7.738</td>
<td>1</td>
<td>.005</td>
<td>1.511</td>
<td>1.13, 2.02</td>
<td></td>
</tr>
<tr>
<td>ED Length of Stay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minutes</td>
<td>0.001</td>
<td>0</td>
<td>59.83</td>
<td>1</td>
<td>.001</td>
<td>1.001</td>
<td>1.001, 1.002</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years</td>
<td>-0.025</td>
<td>0.003</td>
<td>93.907</td>
<td>1</td>
<td>.001</td>
<td>0.976</td>
<td>0.971, 0.981</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-5.727</td>
<td>0.162</td>
<td>1257.244</td>
<td>1</td>
<td>.001</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. OR=Odds Ratio; CI=95% Confidence interval
Phase B: Structured Participant Observation of Triage Nurses

The aim of this phase was to observe how triage nurses identify patients at risk of violence in practice. Triage nurses (N=9) were observed conducting triage assessments (N=167) over 30 hours (23rd May, 2011 to 22nd July, 2011). Observations occurred during business and after hours including weekends. Of the 167 triage assessments observed, 6% (10/167) of patients were considered at risk.

Risk identification during triage interaction. Triage nurses used observed and reported information to determine risk. Observable information included the patient’s language, manner, degree of cooperation, behaviour, or intoxication. For example, an intoxicated patient (5) was pleasant toward the triage nurse, approached the triage desk several times, and was sexually disinhibited in that he wanted to go out with the triage nurse and start a relationship. This patient was considered at risk because his behaviour may escalate; he had poor judgement and was intoxicated.

Information was reported to the triage nurse and this contributed to risk identification and formulation. For example, the police reported that a patient (2) required handcuffs, but they were difficult to apply and the patient subsequently had minor abrasion and remained handcuffed on arrival to the ED. Reported information from ambulance staff also indicated the risk of violence by identifying the patient’s response to treatment from ambulance staff, as well as interactions at the scene and during transit to hospital. In the case of patient (2), risk identification included the fact that the patient had previously attended the ED that day, left against medical advice, been non-compliant with anticonvulsant medication, and experience subsequent seizures and a post-ictal state. Ambulance staff provided background information including that the patient was living in a homeless shelter and had a previous diagnosis of acquired brain injury.

Direct questioning was not used due to the clinical presentation and environmental constraints, such as lack of space, time and privacy. Of the 10 patients who were identified at risk, three were waiting for an acute mental health assessment, four were intoxicated, two were victims of assault, and one was in police custody. Emergency services personal provided information on risk of
violence by describing the level of cooperation, reason for presentation, and use of restrictive measures such as handcuffs and transport by police. The triage nurse used an established triage assessment process (Gerdtz et al., 2007) to enquire about risk without asking scripted risk screening questions. For example, a nurse asked an intoxicated person, “What happened to your hand?” The patient replied that he had been in a fight. This is an example of how information obtained during the interactions identified past history of violence.

The decision not to ask the violence risk screening questions was made by the triage nurse during the triage interaction. The PhD candidate did not interact with the triage nurse or the patient during the observation. Following observation of the triage presentations identified at risk of violence, the triage nurse discussed how the violence risk screening questions could be applied in practice. It was at this point the PhD Candidate noted that based on each presentation, the violence risk screening questions were not appropriate. For example, in those situations I would not have asked the questions either. Table 5.6 provides a summary of the observations of triage nurses identifying the risk of violence on arrival to the ED.
<table>
<thead>
<tr>
<th>Number and Time</th>
<th>Episodes observed</th>
<th>Risk identified</th>
<th>Risk not identified</th>
<th>Gender</th>
<th>Presenting complaint</th>
<th>ATS category</th>
<th>Risk identified during triage interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, am</td>
<td>13</td>
<td>0</td>
<td>13</td>
<td>-</td>
<td>-</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2, pm</td>
<td>8</td>
<td>1</td>
<td>7</td>
<td>M</td>
<td>BIBP² psychotic, agitated</td>
<td>2</td>
<td>Triage nurse unable to engage with patient due to high level of agitation</td>
</tr>
<tr>
<td>3, pm</td>
<td>9</td>
<td>1</td>
<td>8</td>
<td>M</td>
<td>BIBA⁴ seizures reported earlier today</td>
<td>3</td>
<td>Intoxicated patient high level of agitation</td>
</tr>
<tr>
<td>4, pm</td>
<td>8</td>
<td>0</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>5, am</td>
<td>11</td>
<td>1</td>
<td>10</td>
<td>M</td>
<td>Peri anal abscess</td>
<td>4</td>
<td>Intoxicated, patient sexually dis-inhibited</td>
</tr>
<tr>
<td>6, pm</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td>-</td>
<td>-</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>7, pm</td>
<td>8</td>
<td>0</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>8, pm</td>
<td>11</td>
<td>1</td>
<td>10</td>
<td>M</td>
<td>Assaulted with a bar to head</td>
<td>3</td>
<td>Assault victim, with no observable signs of aggression³³</td>
</tr>
<tr>
<td>9, pm</td>
<td>18</td>
<td>1</td>
<td>17</td>
<td>M</td>
<td>Pain in hand, smashed window</td>
<td>4</td>
<td>Intoxicated, physical fight with family, left without being seen</td>
</tr>
<tr>
<td>10, am</td>
<td>14</td>
<td>0</td>
<td>14</td>
<td>-</td>
<td>-</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>11, am</td>
<td>18</td>
<td>1</td>
<td>17</td>
<td>M</td>
<td>BIBP, Wants psychiatrist, 4 attempts to self harm in 24 hours</td>
<td>2</td>
<td>Police required for transport, recent illicit substance use, several attempts to self harm</td>
</tr>
<tr>
<td>12, am</td>
<td>20</td>
<td>3</td>
<td>17</td>
<td>M</td>
<td>Requesting benzotropine IMI</td>
<td>3</td>
<td>Reluctant to engage, demanding medication</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td></td>
<td>Unable to recall reported assault, unable to recall suicidal idea</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td>Mental health assessment</td>
</tr>
<tr>
<td>13, a</td>
<td>23</td>
<td>1</td>
<td>22</td>
<td>F</td>
<td>Victim of assault, intoxicated</td>
<td>3</td>
<td>Intoxicated and high level of distress presenting following alleged assault</td>
</tr>
<tr>
<td>Total</td>
<td>167</td>
<td>10</td>
<td>157</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Shift when observation commenced, am=0700-1500, pm=1501-2100. A total of 30 hours of observation is reported, some nurses were observed on more than one occasion, but no nurse was observed for more than 4 hours in total.
2. Triage category refers to the Australasian Triage Scale (ATS) level of acuity priority based on the severity of their presentation and is rated from 1 (immediately life-threatening) to less urgent (category 5).
3. BIBP = Bought in by police
4. BIBA = Bought in by ambulance
Phase C: Semi Structured Interviews with ED Service Users

Semi-structured interviews were conducted with ED service users to explore the acceptability of violence risk screening. Of the 19 individuals approached, 5 preferred to have an accompanying person (carer or family member) respond. All respondents reported the risk screening questions were clear, and all but one person thought they were appropriate. None of the participants had been asked risk screening questions previously. There were three main themes identified. These were the relevance of violence risk screening, limitations of violence risk screening, and the interpersonal skills staff required to engage with ED patients at risk of violence. Each subtheme identified has been illustrated by direct quotes from participants.

Relevance to current clinical presentation. The first theme was relevance to their current clinical presentation to the ED. Only 2/19 participants thought violence risk screening might be relevant to them. The rationale provided by one participant was that “you never know” who may become aggressive or violent. Another participant reported that the questions were relevant because he had been involved in an incident and pushed by security staff when being escorted from a hotel. The remaining participants (16/19) considered risk screening irrelevant to their situation. Only 3/19 participants had been asked some of these questions before at an airport, by the police and by a doctor. The remaining participants were aware of the purpose of the questions.

The participants reported an expectation that high risk patients are identified on arrival and this could be achieved through observing the persons behaviour or having an awareness of what makes a person at risk. For example, in the case of a patient presenting with a football injury, direct questioning about the risk of violence would not be seen as consistent with the reason for presentation. Table 5.7 shows the thematic summary of the relevance of violence risk screening.
Table 5.7 *Thematic Summary of the Relevance of Violence Risk Screening*

<table>
<thead>
<tr>
<th>Sub Theme</th>
<th>Patient</th>
<th>Carer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited relevance to current presentation</td>
<td><em>Not offended by questions but not consistent or usual with a football injury. (P: 6)</em></td>
<td><em>Would be surprised if asked about ideas to harm self or others. (P:1)</em></td>
</tr>
<tr>
<td>Targeting high risk presentations</td>
<td><em>Staff should be able to determine by how someone looks, i.e. by their language or if it’s a Friday or Saturday night. Hospitals are more dangerous than airports. (P:3)</em></td>
<td><em>If a person presents after using drugs, then the safety questions should be asked but if a person has a standard presentation then they should not be asked. (P:11)</em></td>
</tr>
<tr>
<td></td>
<td><em>Nurses should decide who is at risk e.g. lots of black eye make-up and black clothes, who knows what they might have.(P:8)</em></td>
<td></td>
</tr>
</tbody>
</table>

Note: P=Participant number

**Limitations of violence risk screening.** The second theme identified was the perceived limitations of risk screening and this included the impact on the patient, effectiveness, and perceived bias. There was a view amongst respondents that direct questioning may not be appropriate for victims of domestic violence. There is no privacy and limited time at triage to develop rapport. The participants questioned the effectiveness of violence risk screening. They acknowledged that information obtained via direct questioning would be dependent on the patient
responses. For example, the patient would have to be physically able to answer direct questions, and not all patients would admit to ideas of harming themself or others. Furthermore the accuracy of searching belongings would be dependent on the person conducting the search. Participants expressed the view that there could be potential for bias if staff only conducted violence risk screening with specific patient groups. Participants expected staff to “judge” who is at risk. The expectation that patients who use drugs have belongings searched can lead other patients to feel safe. In contrast, another participant acknowledged that having her belongings searched would cause her to wonder what the staff thought of her. Table 5.8 shows the thematic summary of perceived limitations of violence risk screening.
### Table 5.8 Thematic Summary of Perceived Limitations of Risk Screening

<table>
<thead>
<tr>
<th>Sub Theme</th>
<th>Patient</th>
<th>Carer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential impact on the patient</td>
<td>Asking if a person has been involved in violent incidents recently is not appropriate if the person is a victim of domestic violence, no privacy, very public, not going to get an answer and rapport has not been established. (P:5)</td>
<td>Although it is appropriate it depends on the person but this also prejudices some people, nurse should be able to tell who should be asked, e.g. Patient on drugs. (P:17)</td>
</tr>
<tr>
<td>Effectiveness of risk screen</td>
<td>Even if bags are searched there is potential for dangerous items to be hidden. (P:4)</td>
<td>If you saw someone come in and get checked by security you would feel safer especially when someone wild came in, you feel someone was looking after the place. (P:18)</td>
</tr>
<tr>
<td></td>
<td>Asking about harm to self and others—people may not tell the truth anyway if they have ideas to harm self or others. (P:2)</td>
<td></td>
</tr>
<tr>
<td>Perceived bias in screening</td>
<td>These questions should be asked when patients have been in fights, have problems or injuries. (P 3)</td>
<td>The media leads to false ideas about people, for example not everyone with a beard is a terrorist If a person presents with using drugs, then the safety questions should be asked but if a person has a standard presentation then they should not be asked. (P:11)</td>
</tr>
<tr>
<td></td>
<td>Would expect to have bags searched, would want to know that hospital searched “drugo trash bags” so you would be safe. (P:16)</td>
<td>Would wonder what the staff thought of her if her bags were checked. (P:1)</td>
</tr>
</tbody>
</table>

Note: P=Participant number
Attitude and skill required for violence risk screening. The final theme identified by participants was the attitudes and skills required for effective violence risk screening, including empathy, respect, communication, and interpersonal skills. Participants consistently reported the process of searching belongings is important, particularly the skills of the person conducting the search. There was a clear expectation that the patients should be treated with respect and dignity and not made to feel like criminals. There was a need for signs and clear communication for patients who may have their belongings searched. Using a metal detector was proposed as an alternative and was considered a less intrusive measure than being searched by a security officer. There was an awareness of other instances where bags are searched, such as at airports or when leaving the supermarket. Table 5.9 shows the thematic summary of the skills and attitudes required to conduct violence risk screening.
## Table 5.9 Thematic Summary of Skills and Attitudes Required to Conduct Violence Risk Screening

<table>
<thead>
<tr>
<th>Sub Theme</th>
<th>Patient</th>
<th>Carer</th>
</tr>
</thead>
</table>
| **Communication and interpersonal skills** | *Do it in a way that doesn’t make the patient look like a criminal. (P:14)*  
Manner should be pleasant. (P:15)  
Needs to be signs, depends on how it is said, information available in different languages, respectful and private process. (P:5) | *Need to ask in a diplomatic way and explain why, work out who to ask, maybe the ones who get asked will be offended. (P:17)* |
| **Respect and dignity**          | *Private, done in a dignified way and there should be signs. (P:14)*     | *If a person went through my handbag contents that would be offensive, but okay to ask what is in there and open to show contents same as what you would do at a supermarket. (P:13)* |
| **Acceptability**               | *Unreasonable to be searched by hospital, use of a scanner would be more acceptable than being searched by a person. (P:7)*  
She saw a person yesterday who came in, blood on head, possible on drugs/drink, had been injured in a fight with others, need more security for those patients. (P:3) | *If it’s a routine procedure you would not be offended. (P:18)*  
A metal detector would be fine; they use them when you go to court to check you and your bags. (P:1)  
Expect the hospital to consider safety for patients who are drunk - we would hope that the hospital is searching those at risk properly and that would be expected for everyone’s safety. (P:11)* |

Note: P=Participant number
Discussion

The need and feasibility for a violence risk screening decision support process was informed by exploring how triage nurses identify the risk of violence at ED, and their use of Code Grey responses. This data was considered in conjunction with qualitative analysis of ED service user interviews and consultation with key stakeholders in the ED. This provided the evidence for the development, implementation, and pilot testing of a violence risk screening decision support process at ED triage that will be reported in study two. The principal findings of study one established a small proportion of patients account for several Code Grey responses, the existing violence risk screening process was not used and public expectations call for a process to identify who is at risk of violence on arrival to ED.

Retrospective Audit of Code Grey Response

The retrospective audit of Code Grey and clinical data found that a relatively small proportion of ED presentations required a Code Grey response. A sub-group of patients who required a Code Grey response were involved in almost one third of all Code Grey responses. In addition, 25% of all Code Grey responses occurred at triage. The practice of applying an alert for violence to the patient record was identified as problematic, and we found poor compliance with this process. This may be partially attributed to a recent change in organisational procedure that was aligned to the implementation of new information systems, and so staff lacked awareness of the new procedure. This is significant as the best indicator of future violence is a history of past violence (Sands et al., 2009). Although several hospitals have a file “flagging” system with alerts, this highlights that they may not always be used as intended.

Of the 857 patients identified from 1,959 Code Grey responses, 12.3% (105/857) had a presentation in the previous 12 months, but only 10.5% (11/105) had an alert applied to the electronic record. This finding indicates that the existing process for identifying violence risk requires improvement. Research shows that decision support for violence risk screening should not only take into account
dynamic factors (clinical) such as observed behaviour (Sands, 2007; Pich et al., 2011), but also static factors (actuarial) such as a history of violence (Dolan & Doyle, 2000). In this study only a small number of patients had multiple Code Greys at two or more presentations, so the process of applying alerts to this small but high-risk group should be easily implemented and made a priority. This study confirms earlier research on aggression in EDs that a small group of high-risk patients were responsible for multiple incidents (James, Madeley, & Dove, 2006). In our study we found that only 1.7% of presentations required a Code Grey response, however previous research confirms the impact of aggression on the functioning of the ED is significant and disruptive (Knowles, Mason, & Moriarty, 2012).

Over half of the presentations that required a Code Grey response had not attended the ED once in the 12-month audit period. For this group of patients an alert for past violence less relevant, however, a process to identify these patients on arrival and identify the dynamic risk of violence is achievable.

**Time from arrival to Code Grey response.** The time from triage to first Code Grey response demonstrated that the first 1-2 hours was a period of high risk. Staff needed to utilise this time to plan care that would reduce the risk of violence. This includes allocating the patient to a high visibility area, notifying staff of the risk of aggression and being aware of the patient’s location in the ED. Early identification of high risk patients provides an opportunity for senior staff to make rapid treatment decisions, prompt referrals, and prioritise and allocate required resources.

We found that one third of patients who had a Code Grey event were referred for an acute mental health assessment in the ED. Although this clearly indicates that patients with an acute mental health presentation do have an increased risk of aggression and violence, mental health patients alone do not account for reported increases in violence reported in the ED.
**Impact of violence on workload.** The data confirmed the management of violence has a significant impact on resources, and in 12 months there were 613 hours when staff members were actively engaged in Code Grey responses. Although this figure is high it does not capture the time involved for prevention, management, and follow up by nursing and medical staff. Furthermore, this data only captures when a Code Grey response is activated. Anecdotal evidence confirms there are several incidents that would be considered an episode of violence. For example a patient may be verbally abusive when they are leaving the ED, yet a Code Grey response would not be activated as the patient has left. For this reason, the data is likely to underestimate the actual time required for prevention and management of violence.

**Use of coercive interventions.** The audit found that a third of Code Grey responses involved the use of mechanical restraint. Using mechanical restraint is known to be a high risk intervention (Duxbury et al., 2011) and although the mental health legislation (Mental Health Act, 1986) requires monitoring and reporting, these criteria only apply to patients who receive mental health treatment involuntarily. Although the proportion of emergency response for violence that used three forms of coercive practice may be considered small (6.7%, 131/1959), there is potential for negative impacts on patients. Mechanical restraint and physical restraint are known to be high risk interventions for both staff and patients. The risk to staff and patients are physical and psychological, so even though restraint is labelled as an intervention for safety, there are inherent risks with this practice (Duxbury et al., 2011). Although there is no measure of severity currently used, there is potential for the use of coercive practices to be monitored to inform the severity of Code Grey responses for violence. There are some Code Grey responses that may be more difficult to contain, use physical, mechanical and medication with security present. Alternatively there are Code Grey responses that can be resolved without coercion.
The Code Grey audit found 38.4% (752/1959) of Code Greys did not require any coercive interventions. It is possible in these emergency responses staff were able to use other interventions such as de-escalation (Richmond et al., 2012). The use of de-escalation has been promoted to manage the risk of violence, but this is dependant of the interpersonal skills of the clinician. It is also unknown if staff are confident to use de-escalation as a first line intervention or have some degree of reliance on using coercive interventions such as mechanical restraint. The role of mechanical and physical restraint remains complex in the ED. An evaluation of a training intervention for prevention of violence found that ED nurses were unsure about restraint use and its role in safety, but there was agreement that restraint was sometimes necessary (Gerdtz et al., 2013). Medication administered during a Code Grey response is included as a coercive intervention as four security officers are present and consent to medication administration may be not be explicit. However, medication may have been chosen or accepted by the patient and consumers have reported it is preferable to use medication rather than physical or mechanical restraint (Allen & Currier, 2004).

**Risk factors for a Code Grey response.** Logistic regression analysis explored patient factors that increase the odds of having a Code Grey in a 12-month period. This analysis, which explored variables including gender, stream, triage category, mode of arrival, referral to a mental health service, and presenting complaint, did not support a model for predicting who would require a Code Grey. Despite this, the data was able to confirm the clinical factors that increase the risk of having a Code Grey response. These were arriving with emergency services and being referred for a mental health assessment. Patients who arrive with police are 18 times more likely than someone who presents independently to have a Code Grey. Patients arriving by ambulance are also at increased risk and are six times more likely to require a Code Grey response. Patients who are referred for a mental health assessment also are 11 times more likely to experience an emergency response for violence.
Triage nurses report that although they are aware of these risk factors, not every person who arrives with police or is referred for a mental health assessment is at risk of violence. This is consistent with triage nurses using clinical judgement which takes into account known risk factors and situational/dynamic risk factors. A limitation of using the predictive model is that situational and interactional factors cannot be included in the assessment of risk, as they are not consistently collected during the triage interaction.

The importance of situational factors has been highlighted in a model of causative factors developed by Duxbury (2005). This model suggests that prevention needs to address staff behaviour and interactional factors rather than focus solely on the patient’s behaviour. A limitation of regression analysis to inform the perception of risk is the absence of contextual and interpersonal information such as level of cooperation and engagement with the triage process. This results in the responsibility for prevention resting with staff and organisations, rather than with the patient. This view, however, contradicts support for the zero tolerance approach, which places the responsibility with the patient and advocates sanctions for violent behaviour. Notwithstanding this view, criminal acts committed in the ED may warrant both a therapeutic intervention, such as management plan, patient alert for past violence, and further counselling, as well as a concurrent report to police and compensation for any victims.

**Predictive ability of regression analysis.** The model predicted only a small proportion of patients who required a Code Grey. Over 90% were not predicted. This level of “false negatives” is high and would not be acceptable in clinical practice. The model did not include past history of violence as the use of the patient alert was poor, however, this could be included in future analysis. This would only have been relevant to 102 patients in this data set as they had presented in the previous 12 months. The model summary confirmed a small proportion of variability was explained by the variables in the model. The poor fit of the model suggests that other factors are contributing to the risk of requiring a
Code Grey response. The sample size was large ($N=41,735$) and prevalence of presentations that required a Code Grey response was small ($n=574$).

The model confirmed existing knowledge that patients who require police transport and/or mental health assessment have an increased risk of requiring a Code Grey response. Logistic regression analysis showed that for every minute a patient’s length of stay increases the odds of having a Code Grey increase by 1%. This has implications for length of stay in the ED, and is an important factor for prevention, as length of stay can be controlled, whereas gender or arrival by police transport are not able to be altered by the ED processes. Furthermore, the risk of violence identified on arrival may be useful in short stay models of care that provide 12 to 48 hours of medical care.

**Observation of Triage Practice**

Observation of triage nurse interactions confirmed that the nurses did not use the existing violence risk screening questions. There was agreement between the researcher and the triage nurses not to ask the existing risk screening questions. The PhD candidate had considered that there was potential for alterations to the scripted questions to improve the interaction between the patient and the triage nurse and subsequently identify patients at risk of violence. Analysis confirmed the existing process required extensive revision and consultation with key stakeholders to develop a usable and integrated process at triage.

*How triage nurses identify the risk of violence.* Observations of triage nurses showed they incorporate elements of unstructured risk screening into their assessment of urgency using both observed and reported information. Although direct questioning is used in other settings, such as mental health, ED triage requires a process that focuses on risk identification, as a complete risk assessment is not possible or appropriate in a triage setting. This confirms previous research by Sands (2007) that promotes an initial assessment of the risk of violence at triage, rather than a complete violence risk assessment. These
findings highlight the need to develop a useable method for identifying individuals who are at risk for violence and aggression at point of entry in the ED.

**Use of clinical judgement to determine the risk of violence.** The triage nurses used clinical judgement when deciding not to use the structured and direct questions to ascertain the risk of violence. Furthermore, to persist with direct questioning against the clinical judgement of the triage nurses could increase the risk of violence and limit access to medical information required to complete a triage assessment. One example of this was how a triage nurse approached a patient who presented with a seizure, recent alcohol use and a history of an acquired brain injury. The patient was mildly irritable on direct questioning so the triage nurse prioritised clinical information required and engaging the patient rather than direct questions about the risk of violence. The information contained in the ambulance handover and initial triage interaction confirmed observable warning signs for potential violence and further direct questioning would not have elicited further information.

The usability of a process to identify patients at risk of violence was explored by Kling et al., (2006), who found that staff preferred to use their own clinical judgement rather than rely of the risk assessment hospital forms. This highlights that it is essential to have an awareness of how risk assessment occurs in practice, rather than develop a stand-alone process that staff will not use.

**Limitations of direct questioning to determine the risk of violence.** The risk of violence is established in other settings by completing a checklist, or asking a set of scripted questions, however, the open environment and time constraints at triage limit this approach. Furthermore, the assessment of risk is limited to the information available during the triage nurse-patient interaction. The observations, consistent with previous research, confirmed triage nurses were able to identify observable risk factors for violence. Observable warning signs specific to ED have been described by Luck et al., (2007) and Pich et al., (2011). This approach is consistent with ED nurse training and the context of the interaction. Additionally, the types of clinical presentations observed were not suitable for direct questioning.
or a tick box approach to identifying the risk of violence. For example, if a person with a mental health presentation was considered a risk factor, ticking a box would not capture the broad range of situational or personal factors. These include level of cooperation, distress, or engagement with the triage nurse, yet situational factors and engagement are considered more relevant causative factors (Duxbury & Whittington, 2005).

Previous guidelines produced by Work Safe (Work Safe, 2008) promote a two stage violence risk assessment, specifically developed for ED, but these have not been integrated into practice. The observations of triage nurse practice have shown these guidelines could not be implemented, and should be revised based on this research. Furthermore, there is support for identifying patients at risk on arrival to services, but serious consideration needs to be given as to how this will actually occur in practice. A tick box approach to identify the risk of violence is not achievable. For example, intoxication with alcohol may be considered a risk factor yet the risk of violence can vary considerably between two individuals who present and are intoxicated.

**Triage work environment.** The triage environment is challenging for the triage nurse to manage. The nurse has to make rapid clinical decisions and manage the immediate needs of patients as they arrive with police, ambulance or family. In addition to this they have to monitor patients in the waiting area as they may deteriorate, need pain relief, and their medical needs may change. During the observation period there was an occasion when the triage nurse was interrupted 12 times in 20 minutes with several requests. The interruptions included requests for a cigarette lighter, advice on parking, and attempts to locate patients in other areas of the hospital.

**Implications for the development of violence risk assessment tools.** The usual process for developing risk assessment tools is to identify the increased risk of a condition by using logistic regression to identify risk factors, which are then combined into a model to predict an outcome. In this case, the variables indicated which factors increased the risk of having a Code Grey, but the model did not
predict who would require a Code Grey. This model is limited by the amount of information available at triage, as on arrival at the ED there are several factors relating to the patient, staff member, interactions and environment that are not recorded or known.

Developing violence risk assessment tools based on regression analysis is problematic when the prevalence is low and the model does not predict who will require a Code Grey. What is useful, however, is raising awareness of which clinical or demographic factors increase the risk of having a Code Grey response in a particular setting. It is then possible to focus on prevention strategies specific to the context. For example, a study on risk factors in the ward areas of a general hospital reviewed medical records of 78 patients and used logistic regression analysis to identify risk factors. Although Williamson et al., (2014) has called for risk assessment tools relevant to this setting, there should also be a focus on delirium prevention and management, as increasing age was identified as a risk factor. Therefore, addressing delirium prevention and management would likely result in a decrease in the frequency and severity of violent incidents. This may be preferable to developing tools which lead staff to complete forms rather than prioritise and provide nursing care.

**Comparison with existing research.** For each additional year of age, the odds of having a Code Grey were reduced by 2.4%. This indicates the risk of a Code Grey response has an inverse relationship with age such that the risk of a Code Grey is higher for younger patients. This is in direct contrast with a study of Code Grey events in an acute hospital by Williamson et al., (2014). Williamson conducted logistic regression analyses of 121 Code Grey events in a general hospital over a 6-month period and found the risk of having a Code Grey increased with age. Patients were twice as likely to have a Code Grey if they were over 65 years old. Williamson et al.,(2014) found other risk factors for a Code Grey included a diagnosis of delirium, dementia, male gender, emergency admission, and being a veteran affairs patient. The study by Williamson et al., (2014) was conducted with a sample of inpatients who were admitted to an acute hospital and
this group have a high prevalence of age related illness such as dementia and delirium. In contrast the current study was conducted in an ED setting with a younger population and median age of 35 years.

Williamson et al., (2014) confirmed past history of violence should be included in determining future risk and prevention strategies, and found 50% (39/78) had a previously aggressive event in the previous six months. This confirms that past history of violence should be included in any process of identifying patients at increased risk of violence. Williamson et al., (2014) called for improved documentation and further development of a risk assessment procedure, but acknowledged that predicting Code Grey events is difficult. Williamson et al., (2014) also identified a group of high-risk patients who represent and require Code Grey responses, and suggested they should be the focus of preventative interventions. This is consistent with the current study that identified a small proportion of patients require a high proportion of Code Grey events. In practice this means that this patient group could benefit from management plans being developed to inform staff of the risks, enhance community management of medical conditions, and engage the patient while not receiving emergency care.

Semi-structured Interviews with Patients and Carers

Interviews with patients and carers confirmed the public were aware of violence in the ED, and highlighted an expectation that triage nurses identify individuals at risk, and actively manage that risk. This is consistent with previous research that found visitors and patients in the ED were aware of Code Grey responses, and suggested this patient group should be identified on arrival (Lim et al., 2011). Although there was support for triage nurses to identify the risk of violence, only 2/19 respondents thought risk screening was personally relevant to them. This raises an ethical issue of triage nurses deciding who is at risk of violence, yet it is unknown if triage nurses can accurately identify who is at risk of violence. This raised the complex question of determining whether all presentations should be screened for the risk of violence, or only sub-groups staff
identify at risk, such as those with a mental illness, past history of violence or were intoxicated or required police transport to hospital.

The acceptability of searching belongings elicited a mixed response. Although it is generally accepted belongings will be searched on arrival to large sporting venues, there is an expectation that hospitals are safe places. Alternatives such as metal detectors used in airports were preferred to manually searching belongings as this was considered less intrusive. The interpersonal skills of staff who may search belongings for weapons was considered important, and there was agreement the dignity of the person at risk of violence should be maintained. Although respondents reported they felt reassured when they observed security intervene with individual patients, there is a competing demand for privacy and dignity for the patient.

From an ethical perspective, the public expect ED triage nurses to identify who is at risk of violence, but patients are not likely to be informed of this. This information is recorded in the electronic medical record, but this will probably not be discussed with the patient. The acceptability of being identified at risk of violence on arrival to ED by the triage nurse is unclear. Although respondents agreed it was useful to identify who was at risk of violence on arrival, most felt that it was not relevant to their current presentation at the ED.

Summary

In this study, the use of Code Grey responses, observation of triage nurse practice and consumer interviews explored the feasibility and need for an integrated violence risk screening process for ED triage. The data confirmed that the existing process was not appropriate for the context or able to be used in practice. Violence risk screening should be integrated with the existing triage process, rather than a standalone process. An integrated violence risk screening decision support process should be developed in conjunction with key stakeholders to ensure it is usable and integrated with ED work practices.
Chapter Six: Study Two - Development and Implementation of a Violence Risk Screening Decision Support Process at Triage

The development of the violence risk screening decision support process was informed by the analysis of Code Grey data, observation of triage practices, patient interviews and consultation with key stakeholders. This information was carefully considered in combination with the existing ED information technology infrastructure and evidence both supporting and criticising violence risk assessment and screening in ED and mental health settings. This chapter will present how risk screening was revised and a summary of the implementation process. Firstly, consultation with key stakeholders at the Violence in ED Action Group confirmed that there was support for the violence risk screen at triage to be refined and evaluated. Secondly, consultation occurred with a mental health consumer representative and a carer representative. A three month pilot evaluation explored the predictive ability of the revised violence risk screen decision support process. Triage documentation for one month was reviewed to determine the presence of warning signs for violence and explore the consistency between triage nurses for patients not identified at triage who required a Code Grey response.

Developing and Implementing Complex Interventions

The development and evaluation of complex interventions has been addressed in a framework proposed by the Medical Research Council (Craig et al., 2008). Complex interventions can be defined as, “interventions that contain several interacting components but they have other characteristics that evaluators should take into account” (Craig et al., 2008, p.979). There are four stages to this framework and they are not always conducted in a linear process. The first stage involves developing the intervention by identifying what is already known about the topic and existing evaluations. An awareness of theory and modelling can be used to inform the design and evaluation. The second stage explores the feasibility, pilot testing, and an awareness of the context of the intervention. The third stage of evaluation requires a research design that identifies the effectiveness and an
understanding of how the intervention was implemented. The final stage involves dissemination of findings and long-term follow up to monitor the sustainability of interventions.

The earlier stages of intervention development are essential to ground the intervention into theory (Corry, Clarke, While, & Lalor, 2013). Interventions and their implementation should be piloted and are more likely to be effective if adapted to local contexts rather than standardised (Craig et al., 2008). Literature on violence prevention in healthcare has recommended intervention studies rather than descriptions of the problem (Kynoch et al., 2011). From a nursing research perspective, however there are few nursing interventions studies (Forbes, 2009).

Although there are simple nursing interventions, many are complex and this can limit attributing the intervention to specific patient outcomes (Conn, Rantz, Wipke-Tevis, & Maas, 2001). Nursing intervention studies are required to consider the impact of the intervention developed on patient care and their effectiveness in the setting they are delivered (Aranda, 2008). Nursing intervention studies require a clear understanding of the problem, and conceptual framework along with defined measures to develop evidence based nursing interventions (Aranda, 2008).

**Key Stakeholder Consultation**

Developing and implementing a new process at ED triage was a significant change to practice and required agreement from a group of key stakeholders. The Violence in ED Action Group was consulted to ensure that violence risk screening is consistent with triage processes, ED work practices, and existing ED infrastructure. The PhD Candidate is not an ED nurse, and has no experience in use of the electronic triage screen, so this reference group provided guidance.

**Consumer consultation.** Consultation with a Mental Health Consumer Consultant was conducted because patients with an acute mental health presentation were excluded from participating in an interview in ED. Consumer participation has been described as having consumers participate in planning and
evaluation of service delivery (Tobin, Chen, & Leathley, 2002). There is a risk that consumer participation in research could be “tokenistic” and to minimise this, a model of consumer participation has been proposed to describe different levels of consumer participation (Happell & Roper, 2007). The term “consumer consultation” has been defined as, “a process through which consumers are consulted for specific advice or expertise which the research team has recognised that consumers can provide” (Happell & Roper, 2007, p.240). There are limitations of using this approach, rather than consumer collaboration where consumers are involved in all stages of research design, analysis and dissemination. There is a risk that the overall research may miss significant issues or make incorrect interpretations or assumptions (Happell & Roper, 2007).

Obtaining consumer input into changes in service delivery, development, and evaluation is expected (Department of Human Services, 2009; Elsom, Sands, Roper, Hoppner, & Gerdtz, 2013). Consumers are employed in all public mental health services in Victoria to contribute to service development and they have expertise, understanding and are impacted by service developments. In Victoria, Emergency Departments provide acute care to mental health patients so the local Mental Health Consumer Consultant was approached to participate.

**Carer consultation.** There is an expectation that Carer Consultation occurs in planning service delivery and evaluation, as carers have a unique perspective (Victorian Government Department of Health, 2010). A carer is defined as someone, “who provides unpaid care and support to family members and friends who have a disability, mental illness, chronic condition, terminal illness, drug or alcohol issues or who are frail aged” (Carers Victoria, 2012, p.4). This Charter has been developed to guide service delivery to ensure the care relationship is recognised and supported. Carers have an awareness of how services are delivered and how they can be developed and improved (Victorian Government Department of Health, 2010)
Aims.

1. Incorporate the expertise of the Violence in ED Action Group in the
development of violence risk screening decision support.
2. Provide an opportunity for consultation with a mental health consumer
consultant and carer representative to incorporate their views in the
development of violence risk screen decision support process at triage.
3. Refine the existing ED Triage violence risk screening decision support
process

Method. Consultation occurred with a Carer Representative and a Mental
Health Consumer Consultant employed at the study site. During these
consultations the proposal to commence violence risk screening was discussed
including who should be screened and what questions should be asked.
Responses were recorded at the time of consultation and confirmed to ensure the
summary was a correct reflection of the feedback provided. See Appendix H for the
Violence Risk Screening Mental Health Consumer Consultation Template and
Appendix I for the Violence Risk Screening Carer Representative Consultation
Template.

Regular consultation occurred with the Violence in ED Action Group. This
multidisciplinary group was formed to monitor violence prevention initiatives
including training, significant incidents, and the frequency of emergency responses.
Violence risk screening was a standing agenda item and the PhD candidate
attended bi-monthly meetings. The key findings from observing triage nurse
practice, patient interviews in ED and Code Grey analysis were discussed with this
group.

Results of mental health consumer consultation. Consultation with a
mental health consumer consultant found that consumers expect to be asked these
questions when they are unwell and it is reasonable to discuss the risk of violence.
Consumers would be concerned if risk to others or themselves was not
established. However, these questions should only be asked if the current
presentation is for an acute mental health assessment. Consumers have reported
feeling annoyed if they are asked risk questions when they are presenting with an ankle injury for example. In this situation, being asked risk questions is annoying, unnecessary and offensive.

If questions to determine the risk of violence were to be asked at triage, the topic should be introduced. Some examples suggested were

“Can I ask about your safety?”
“Given how upset you have been.........”
“It’s been difficult for you today ..........”

To assist ED nurses, it was suggested that a mental health consumer could provide education to provide exposure to consumers who are well and engaged in employment. This would allow triage staff to be aware that the person they see at triage is usually well and capable, and will become well and capable again.

The potential to identify patients who have been victims of domestic violence was identified. This raised some concerns that asking direct questions about recent violence may add to the person’s distress. For this reason, it was suggested that the rationale be explained to the patient during violence risk screening if direct questions were to be asked.

Results of carer consultation. Consultation with a Carer representative highlighted the need to consider patients who arrive with the police at risk of violence. Although police presentations are likely to be included in the current at risk groups of patients who are intoxicated, have an acute mental illness or involved in assault there may be others that have police involvement that are not in the above groups. The questions were considered acceptable and clear and should be asked as part of the triage assessment and not in isolation. Direct questioning about weapons/dangerous items is routine practice in courts and airports and is acceptable. Direct questions to identify thoughts to harm self or others may be confronting. It was suggested to inquire about involvement in violent incidents recently as this may be considered less confronting.
**Intervention Development - The Revised Violence Risk Screen**

**Review of the existing violence risk screen.** The analysis of data from Phase 1, particularly the observation of triage nurse practice, highlighted that direct questioning to identify the risk of violence during the triage interaction was not used in practice. This confirmed the need to revise the existing risk screening decision support process. The existing triage screen had one optional question “Risk screening?” Figure 6.1 shows the triage screen with existing risk screen process.

![Figure 6.1 Triage Screen with Existing Risk Screen](image)

NB: Patient names have been concealed.

Assuming the triage nurse identified the patient at risk, a further four questions followed. The questions were:

- Any thoughts of harming self or others?
Any weapons or dangerous items in possession?
Involved in any violent incidents recently?
Staff identified high risk of Violence/Aggression.

The value of these questions that followed once a patient was identified at risk were carefully explored. Each question was considered separately and as part of a risk screening process. This set of questions had been put forward previously, but how they were used in clinical practice has not been explored or evaluated. Identifying the risk of self-harm has already been addressed in triage guidelines (Gerdtz et al., 2008) and there was no intention to change this process. Identifying the risk of harm to self or others is identified by the referrer or emergency services staff who provided transport as this may be the primary reason for transfer to ED. Identifying the presence of dangerous items could be addressed prior to entering treatment areas rather than during the triage interaction. The final question asked the nurse to identify the presence of risk based on their perception and this is effectively the same as the first question. Involvement in a violent incident would be the reason for identifying the person at risk in the first instance and can be the reason for needing ED treatment.

Evaluating the screening questions that followed would only be possible once it was established that the Triage nurse was identifying the correct patient group. Otherwise, the evaluation may focus on a patient group that were not correctly identified initially at triage. The proportion of patients that could be identified at triage who were at risk of violence was unknown.

**Changes to the triage screen.** A revised risk screen decision support process was developed. The first question was revised to “At risk of violence/or aggression?” This question prompted the triage nurse to determine the presence or absence of risk of violence based on the triage interaction. The remaining questions were removed from the triage screen. The revised risk screening question was completed at triage based on observed or reported information and was made mandatory for all presentations.
The triage nurses were advised to identify patients based on their perception of risk and it was acknowledged that risk may not be viewed consistently by all triage nurses. Examples of presentation that are known to be at risk of violence were included in the implementation information. These included patients whose presentation included any of the following factors:

- Involved in an assault
- Intoxication
- Acute mental health symptoms
- Police transport
- History of violence alert
- Behavioural warning signs of violence such as being uncooperative, hostile, intrusive or making verbal or physical threats.

The decision to identify a patient at risk of violence was based on the triage nurse assessment and interaction. A presentation with any of the above factors did not have to be considered at risk. For example, a person who presented with depression did not automatically receive a positive screen for the risk of aggression or violence. Figure 6.2 shows the revised triage screen with the violence risk screen.
NB: Staff names have been covered.

Figure 6.2 Triage Screen with Revised Violence Risk Screen

The risk screening question was set up with the default as “No”. Only a small proportion of patients are identified at risk of violence at triage and this minimised the triage nurses workload as the triage nurse can “tab” through this question. This prevented the triage nurse having to change the default response from “Yes” to “No” for the majority of presentations. The wording was changed from “Risk Screening” to “At risk of violence or aggression. The words “violence or aggression” were chosen because they are often used interchangeably (Rippon, 2000). Moreover, these words cover a broad range of behaviours that could be identified early to aid prevention, rather than focussing on just physical violence.

Introducing a symbol to communicate the risk of violence. The symbol indicating there is a risk of violence was previously a “dagger” and this was replaced with a new symbol. The dagger symbol was initially implemented in isolation, was not consistent with other alert symbols used, and indicates risk of
stabbing or weapons. The new symbol was developed by Dr Walsh (ED Physician) and is red with a white exclamation mark to draw attention to the patient. For each presentation identified at risk, the violence risk symbol is visible next to the patient’s name. The staff who use the bedside computer screen, triage nurses and Senior ED staff inside the department were able to see this symbol. Symbols in ED are used to communicate information such as bed waiting times, or pending results. Figure 6.3 shows the symbol used to indicate that there is a risk of aggression or violence.

![Risk of Aggression or Violence Symbol](image)

*Figure 6.3 Risk of Aggression or Violence Symbol*

Although the symbol forms part of a communication pathway, consultation via the Violence in ED Action Group confirmed that verbal communication should also occur. The communication pathway was aligned with existing team leader roles to ensure that violence risk screening communication was consistent with existing ED work practices. The triage nurses were advised to clarify if the patient had been searched and communicate the presence of a patient at risk with the relevant team leader. Communication with senior staff allows for advanced clinical decision making to commence planning for prevention.

**Integration with evidence.** The intervention developed was consistent with evidence for identifying the risk of violence using observable warning signs at triage. A review of evidence-based violence risk factors at triage by Sands et al., (2009) identified observable warning signs such as hostility, lack of cooperation, intrusion into personal space, and physical or verbal abuse or threats. This confirmed ED specific research by Luck et al., (2007) that found ED nurses identified staring, tone and volume of voice, mumbling, and pacing as observable warning signs that increase the risk of violence (Luck et al., 2007). Furthermore,
Luck et al., (2007) described how ED nurses use observable warning signs of violence in combination with actuarial risk factors, such as a history of violence, or an acute mental health presentation, to determine if there is an increased risk of violence. This process effectively combines dynamic risk factors (warning signs at triage) with actuarial factors (history of violence, acute mental health symptoms, intoxication) to identify who is at risk of violence based on information that is known at triage. Figure 6.4 shows the revised violence risk screening decision support process.

**Figure 6.4 Revised Violence Risk Screening Decision Support Process**

**Implementation of Violence Risk Screen Decision Support**

The implementation plan consisted of providing education, feedback sessions to staff, and reminders. To improve the effectiveness of the implementation strategy, this approach was designed to suit triage nurse work practices. The effectiveness of implementation strategies are improved when they take into account barriers, who is the target group, and how the feedback or reminders are delivered (Richard, Michel, & Martin, 2005).
Risk screening was implemented using short education sessions during the shift handover period. The ED had a 3-5 minute meeting each day at shift handover during which time the afternoon shift staff were provided information by the PhD Candidate. A separate education session was delivered to Nursing Floor Coordinators who are in charge of ED each shift, whereas medical staff were informed by email. Nursing education staff were advised that the PhD Candidate was available for triage nurses who had concerns or did not feel confident using the risk screening process. There were no requests for additional education or support.

**Use of reminders.** Reminders were left at the triage nurse computer and the main staff desk in ED. Reminders have been defined as, “information (whether verbal, on paper, or computer screen) that has been designed to remind a professional of a certain recommendation for good care, and to let him or her take action at that given moment” (Richard et al., 2005, p.159). The reminders were a small wrapped chocolate with a note attached reminding staff that the revised risk screening decision support process has been implemented.

**Feedback.** Feedback was provided to triage nurses during the 3-month implementation phase. The feedback consisted of presenting the previous months data indicating the proportion of patients that were correctly identified at triage, and a general discussion of who was not identified on arrival, but required a Code Grey response in ED. Feedback has been frequently used to implement practice changes (Richard et al., 2005). Feedback has been defined as, “returning information about their actions to professionals, practices or institutions to increase their insight into these actions” (Richard et al., 2005, p.159). Table 6.1 summarises the interventions to implement violence risk screening.
<table>
<thead>
<tr>
<th>Date</th>
<th>Intervention</th>
<th>Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>8(^{th}) October, 2012</td>
<td>Triage screen altered to reflect revised risk screen</td>
<td>ED nursing and triage staff</td>
</tr>
<tr>
<td></td>
<td>Change risk symbol from a dagger to the violence risk symbol</td>
<td></td>
</tr>
<tr>
<td>5(^{th}), 7(^{th}), 8(^{th}) October, 2012</td>
<td>Attend ED handover and advise all nursing staff of changes to screen</td>
<td>ED nursing and triage staff</td>
</tr>
<tr>
<td>7(^{th}) October, 2013</td>
<td>Notice left at triage advising of screen changes</td>
<td>All triage nurses</td>
</tr>
<tr>
<td>8(^{th}), 9(^{th}), 10(^{th}), 12(^{th}) October 2012</td>
<td>Visit triage once on each morning and afternoon shift and confirm staff are aware of changes to triage screen</td>
<td>All triage nurses</td>
</tr>
<tr>
<td>9(^{th}), 11(^{th}) and 20(^{th}) November Update, 2012</td>
<td>Attended handover and clarified that staff can re triage based on risk of violence as they would for any other clinical information that changes</td>
<td>All nurses</td>
</tr>
<tr>
<td></td>
<td>Clarify need to do an patient alert remains as the risk identified at triage is only relevant for this episode of care and not future episodes of care</td>
<td></td>
</tr>
<tr>
<td>16(^{th}), 18(^{th}), 20(^{th}) January Update, 2013</td>
<td>Attended ED handover to remind staff to provide security the patient medical record number. Provided feedback on proportion of patients identified correctly.</td>
<td>All nurses</td>
</tr>
<tr>
<td>6(^{th}) February, 2013</td>
<td>Email to all medical staff to ensure all were aware of new risk identification process.</td>
<td>All medical staff</td>
</tr>
<tr>
<td>February 8(^{th}) 2013</td>
<td>In-service session to provide feedback to nursing staff. Discussed some presentations that were clearly at risk yet not identified at triage. Two issues were raised by staff;</td>
<td>12 nursing staff</td>
</tr>
<tr>
<td></td>
<td>• Some triage nurses admitted to not identifying the patient at risk because they were busy.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Others reported that they accidentally tab through the screen so quickly they don’t click on the risk question to indicate the patient is at risk.</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Intervention</td>
<td>Audience</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>12th February, 2013</td>
<td>Update ED and Mental Health Liaison Group</td>
<td>ED Mental Health Psychiast, Manager and ED Manager and ED Medical Staff</td>
</tr>
<tr>
<td>12, 13th 19th February Update, 2013</td>
<td>Attended handover to show example of triage comments identifying 2 or more risk factors in some patients not identified as at risk on arrival.</td>
<td>All nursing staff</td>
</tr>
<tr>
<td>February 19th, 2013</td>
<td>Attended Floor Coordinator Meeting</td>
<td>9 staff</td>
</tr>
<tr>
<td>March 2013</td>
<td>Bag of small wrapped chocolates left at triage on 3 occasion and main desk in department on one occasion with small note reminding staff that risk screening has commenced.</td>
<td>All staff</td>
</tr>
<tr>
<td>April 2013</td>
<td>Bag of small wrapped chocolates left at triage on 1 occasion with small note reminding staff that risk screening has commenced.</td>
<td>All triage staff</td>
</tr>
<tr>
<td>9th and 15th April Update 2013</td>
<td>Attended handover to advise that an error with &quot;patient expects&quot; had been “fixed.</td>
<td>All nursing staff</td>
</tr>
</tbody>
</table>

Note. *At handover each day 3-5 minutes was available to update staff on changes or provide feedback on current ED projects. There were 15-20 nurses present on each occasion.
Pilot Study of Predictive Ability

The revised violence risk screen decision support process was monitored for a 3-month pilot phase. The risk of violence identified at ED triage and the need for a Code Grey response was determined for each presentation to explore the predictive ability of the revised violence risk screen. All incidents that required a Code Grey response were recorded in an organisational database including the patient’s medical record number. This information was matched with clinical information captured at each triage interaction that identified whether the triage nurse considered the patient to be at risk of violence. The predictive ability of the violence risk screen was monitored monthly during the implementation phase for three months prior to the 6-month evaluation period. A review of triage nurse documentation informed the inter rater reliability between nurses for patients not identified at risk of violence at triage but went on to require a Code Grey response.

Aims.

- Pilot the violence risk screening decision support process.
- Determine the sensitivity and specificity of the refined electronic risk screening tool to accurately predict patients at risk for violence.

Sample. During the 3-month implementation phase, the triage nurse identified the risk of violence for all patients triaged and all Code Grey responses to ED were monitored. In the implementation phase, 1st November 2012 to 31st January 2013, there were 15601 presentations and of these, 233 required a Code Grey response.

Method. All Code Grey responses in ED were matched by medical record number and date to the clinical data to determine the proportion of patients who were identified at risk and required a Code Grey. Each month, data was matched retrospectively to monitor the sensitivity and specificity. This data was collected and matched each month and then combined to form one data set.
Data analysis of predictive ability. The proportion of patients determined to be at risk that did and did not require a Code Grey response was determined to explore the predictive ability of violence risk screening. The sensitivity, specificity, negative and positive predictive values, and positive and negative likelihood ratios were calculated in (EXCEL, 2007). Outcomes were classified according to the total number of true positives, false positives, true negative and false negatives.

Results. There were 15,601 presentations, 233 required a Code Grey response. Of these, 122 presentations were identified at triage. During the 3 month pilot phase (1st November 2011 to 31st January 2012) the sensitivity ranged from 48-62%, the positive likelihood ratio ranged from 18.85 to 24.42, and the negative likelihood ratio ranged from 0.39 to 0.53. The overall sensitivity was 52% and specificity was 98%. The positive likelihood ration was 21.34 and negative likelihood ratio was .49. The positive predictive value was 24% and negative predictive value was 99%. The total number of positive risk screens was 499 and this represents 3.2% of all presentations. Each shift, an average of 1.8 patients were identified at risk of violence.

Review of Documentation for Patients at risk of Violence not Identified at Triage.

A criticism of risk assessment and screening processes is that there is no exploration of the patient group who were at risk but not identified (Large & Nielssen, 2011). It is essential to report any patient groups that were not captured or usability issues that may affect the sensitivity of any risk screening process (Toll et al., 2008). The proportion of patients who were not identified at risk of violence at triage but who required a Code Grey response in ED were explored for one month during the implementation phase. This group were examined to identify the presence or absence of warning signs of violence documented during the triage nurse interaction and determine inter rater reliability between ED nurses.

The level of agreement when determining the presence or absence of the risk of violence between triage nurses is unknown. Triage nurses make rapid decisions and there is known variability in the level of urgency given to
mental health presentations (Creaton, Liew, Knott, & Wright, 2008). Creaton et al., (2008) found the concordance for assigning a triage category for mental health presentations ranged from 53.3% to 65.6%. The level of agreement for the risk of violence is complex as the perception of risk is subjective. However, some consistency is required to develop some agreed standard of practice at triage.

**Aim.**

1. Determine the proportion of patients that should have been considered at risk based on information documented by the triage nurse.
2. Determine the level of agreement between ED nurses when identifying the risk of violence.

**Sample.** During the first month of the implementation phase there were 5025 triage assessments and 73 patients that required a Code Grey response. Of these, 29 patients were not identified at triage.

**Method.** The “triage comments” for patients who were not identified at risk but subsequently required a Code Grey response were reviewed to explore the presence of warning signs for violence documented in the triage interaction. For each presentation, the triage nurse records free text comments on the electronic triage screen as “Triage Comments”. Information is obtained from the patient, emergency services, family carers, and observations made by the triage nurse.

Nurse educators \((n=4)\) and senior ED nurses \((n=2)\) were asked to review this documentation to determining the presence or absence of warnings signs for violence. The triage comments were presented without identifying information. The purposive sample of ED nurses \((n=6)\) were requested to participate because they had experience working in triage or were nurse educators. Triage comments were then rated as at risk or not to explore what proportion could have been considered at risk at triage.

The triage comments were also reviewed by the PhD Candidate to identify if there were known risk factors for violence at triage documented (Sands et al., 2009). Table 6.2 shows a Triage Quick Reference Guide for
Violence (Sands et al., 2009, p. 204). The triage nurse comments were reviewed and the number of warning signs totalled for each presentation. If the patient had two or more warning signs they were considered to be at risk and if they had one or less they were considered not to be at risk. This rating of at risk or not at risk was considered the "standard " to allow for Fleiss Kappa analysis (Peat & Barton, 2005). At triage there is only limited information available, therefore not all of the risk factors listed in the reference guide could have been known during the triage interaction and incorporated into the decision making process.
Table 6.2 Triage Quick Reference Guide to Risk Factors for Violence (Sands et al., 2009)

<table>
<thead>
<tr>
<th>Risk Factors for Violence</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>Uncooperative</td>
<td></td>
</tr>
<tr>
<td>Angry</td>
<td></td>
</tr>
<tr>
<td>Restless /agitated</td>
<td></td>
</tr>
<tr>
<td>Currently intoxicated</td>
<td></td>
</tr>
<tr>
<td><strong>B. Behaviour</strong></td>
<td></td>
</tr>
<tr>
<td>Irritability</td>
<td></td>
</tr>
<tr>
<td>Property damage</td>
<td></td>
</tr>
<tr>
<td>Suspiciousness</td>
<td></td>
</tr>
<tr>
<td><strong>C. Conversation</strong></td>
<td></td>
</tr>
<tr>
<td>Thinking disturbances (thought disorder)</td>
<td></td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td></td>
</tr>
<tr>
<td>(confusion, memory impairment)</td>
<td></td>
</tr>
<tr>
<td>Delusions and hallucinations</td>
<td></td>
</tr>
<tr>
<td>Homicidal thoughts</td>
<td></td>
</tr>
<tr>
<td><strong>D. Historical factors</strong></td>
<td></td>
</tr>
<tr>
<td>History of poly-substance use (illicit drugs)</td>
<td></td>
</tr>
<tr>
<td>History of mental illness</td>
<td></td>
</tr>
<tr>
<td>Previous diagnosis of anti-social personality disorder</td>
<td></td>
</tr>
<tr>
<td>History of previous violence</td>
<td></td>
</tr>
<tr>
<td>History of non-compliance with psychiatric medications</td>
<td></td>
</tr>
<tr>
<td>History of alcohol abuse</td>
<td></td>
</tr>
<tr>
<td><strong>E. Environmental factors</strong></td>
<td></td>
</tr>
<tr>
<td>Population density (overcrowding)</td>
<td></td>
</tr>
<tr>
<td>Staffing levels (low)</td>
<td></td>
</tr>
<tr>
<td>Agitation levels on ward</td>
<td></td>
</tr>
<tr>
<td>Waiting times (long)</td>
<td></td>
</tr>
</tbody>
</table>

**Data analysis of inter rater reliability.** The analysis was conducted in two stages. Firstly, the number of patients that were considered at risk were totalled for each rater to identify the percentage considered at risk of violence. Secondly, the agreement between the raters was measured against the “standard”. The standard is whether each presentation had two or more warning signs for violence using the triage quick reference guide in Table 6.2. The face validity of the risk screening process was determined by consulting with ED nursing education staff who are considered experts in triage.
Inter rater reliability for each patient presentation was determined by calculating Fleiss’ Kappa (Fleiss, 1971) and percentage agreement because more than two staff rated each scenario. The Kappa statistic allows for agreement between raters that could have occurred by chance (Fleiss, 1971). A Kappa score of 0.0 indicates chance agreement, -1.0 negative agreement, and 1.0 positive agreement (Peat & Barton, 2005).

**Results.** The proportion of patients who were not identified at risk of violence at triage, but who required a Code Grey response in the ED, were explored for one month (1st November, 2012 to 30th November, 2012) during the implementation phase. Of 5025 presentations, there were 29 patients not identified at risk at triage but who required a Code Grey response. Of the 29 cases, 55% (16/29) were found to have two or more warning signs at triage. This provided the “standard” for Kappa analysis of inter-rater reliability using more than one rater.

This group were examined to identify the presence or absence of warning signs of violence documented during the triage nurse interaction, and to explore the level of agreement between ED nurses. The percentage agreement ranged from 68.97 to 82.76. The level of agreement between the raters and the standard was varied between raters, and ranged from low to moderate with Kappa scores between 0.251076 and 0.648485. Table 6.3 shows the level of agreement between appraisers and the standard.
### Table 6.3 The Level of Agreement Between Appraisers and the Standard

<table>
<thead>
<tr>
<th>Appraiser</th>
<th>Inspected Number</th>
<th>95% CI</th>
<th>Kappa</th>
<th>P(vs &gt; 0)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>matched N (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>29</td>
<td>23 (79.31)</td>
<td>60.28, 92.01</td>
<td>0.581731</td>
</tr>
<tr>
<td>B</td>
<td>29</td>
<td>21 (72.41)</td>
<td>52.76, 87.27</td>
<td>0.447619</td>
</tr>
<tr>
<td>C</td>
<td>29</td>
<td>24 (82.76)</td>
<td>64.23, 94.15</td>
<td>0.648485</td>
</tr>
<tr>
<td>D</td>
<td>29</td>
<td>23 (79.31)</td>
<td>60.28, 92.01</td>
<td>0.542105</td>
</tr>
<tr>
<td>E</td>
<td>29</td>
<td>20 (68.97)</td>
<td>49.17, 84.72</td>
<td>0.251076</td>
</tr>
<tr>
<td>F</td>
<td>29</td>
<td>23 (79.31)</td>
<td>60.28, 92.01</td>
<td>0.542105</td>
</tr>
</tbody>
</table>

CI=Confidence interval

**Discussion**

The main findings from consultation with key stakeholders, implementation and the predictive ability established during the pilot phase will be presented. The variability between triage nurses and review of presentations not identified at risk who required a code grey will be discussed.

**Key stakeholders.** Consultation with a mental health consumer consultant confirmed that there is potential for victims of domestic violence to be identified at risk based on the risk screening questions. This concern was consistent with the ED carer and patient interviews discussed in study one. There is support for a process to identify who is at risk but this needs to be specific to the reason for presentation and not just based on a diagnosis of having a mental illness. This view is consistent with an appreciation for situational factors that may increase the risk of violence (Duxbury, 2002). There was an expectation that the risk of violence would be addressed, and mental health consumers expect risk for violence to be addressed on arrival.

Carer consultation highlighted that the identification of the risk of violence should be part of all triage interactions and not in isolation from other
information. There was an awareness of how the direct questioning would be received by the patient and this needs to be considered during the triage interaction.

The violence in ED Action Group consultation confirmed that violence risk screening should be integrated into triage practice and not a standalone process. Although communication in ED occurs directly, patient information is also conveyed by the electronic medical record and the use of symbols. The communication of risk was aligned to teams to ensure that the violence risk screening process was integrated into team leader roles rather than a separate process in isolation. There was agreement that the current violence risk symbol (dagger) should be replaced to an easily recognised alert symbol. The dagger symbol has negative connotations and was not consistent with other alert symbols used in the hospital.

**Predictive ability of violence risk screen.** The pilot phase confirmed more than half of the patients could be identified at triage and this was considered acceptable by the ED Violence Action Group. There was an awareness that not all people would be identified at risk of violence and agreement that the group not identified at triage should be investigated. During the pilot phase the feedback from medical and nursing staff was positive and the revised process was accepted by staff. The use of the violence risk screen identified the patients thought to be at risk on arrival and staff were also reminded to the patient alert to identify patients who may be at risk at subsequent presentations. This process to identify dynamic (risk screen) and static (patient alert) risk of violence was understood and able to be integrated into existing triage nurse practice.

**Patients not identified at triage.** A criticism of violence risk assessment processes is the limited review of patients who became violent but were not identified during the screening process. The proportion of patients who were not identified at risk of violence at triage but subsequently required a Code Grey response in the ED were explored for one month during the implementation phase. This phase of the study investigated the proportion of presentations that,
based on information available to the triage nurse, could have been identified at risk on arrival, and this was used to determine an acceptable level of sensitivity.

One third of patients who required a Code Grey response had not been identified at triage. Of these, 55% of patients had two or more warning signs for violence evident during the triage interaction, however 45% did not. This confirms that establishing 100% sensitivity for identifying the risk of violence at triage is not achievable. Based on this data, a further 16 presentations could have been identified at risk. This number needs to be considered against the total number of presentations for that month ($n=5025$) and the total number of patients who required a Code Grey response ($n=73$).

At triage there is only limited information available, therefore not all of the risk factors listed in the reference guide could have been known during the triage interaction and incorporated into the decision making process. A limitation of this process was that there may have been contextual information, such as degree of rapport and engagement with the triage nurse that indicated the person was at risk or not at risk of violence. During the implementation phase there were some staff who thought they had clicked “yes” and some staff may have been unaware of the revised process as they had just returned from leave.

Because not all patients will be identified at triage it is essential that a positive risk screen for violence is not seen as an absolute indication of risk. It is the perception of risk based on a brief triage interaction with the intention of highlighting this risk for the clinicians who will provide emergency care. For this reason, violence risk screening should be seen as one intervention that forms part of an overall organisational response to patients identified at risk of violence. Furthermore, if patients are not identified at risk and they subsequently require a Code Grey response, it needs to be reinforced that not all patients will be identified at triage, and this is to be expected rather than a criticism of triage nurse practice.

**Implications for predicting who is at risk of violence.** Establishing the sensitivity and specificity for violence risk screening at ED triage has implications for policy makers who promote identifying high-risk patients and intervention for all health services. Approaches to identify the risk of violence
include patient alerts for past violence attached to the medical record, or an alert generated on arrival, as is the case with this research. This study, highlighted that not all patients will have observable warning signs on arrival, and therefore an expectation of identifying all high-risk patients is not achievable.

There is variability in how triage nurses perceive the risk of violence and they may be influenced by their past experiences or the culture of the organisation. For this reason, during the implementation phase, staff members were informed that identifying patients at risk of violence during triage interaction is based on their perception. Known high-risk groups, including patients who were intoxicated, arrived by police, referred to mental health, had an alert for past violence or were visibly agitated, were easily identified by the triage nurses. This level of variability was consistent with Creaton et al., (2008), who reviewed the inter-rater reliability of triage nurses following review of mental health vignettes. Creaton et al., (2008) found inter-rater reliability was influenced by how busy the department was and called for improved consistency through the development of decision support processes.

During implementation there were varying opinions expressed about who should be considered at risk of violence. For example, one nurse questioned if a victim of domestic violence should be considered at risk. Some staff thought there might be potential for the perpetrator to attend the ED and the context and accuracy of the victim’s account had not been verified. An alternative view expressed by nursing staff is that the victim should not be considered at risk because they are the victim. Of concern, however, is that if the victim was considered at risk, then they should still receive the best care possible regardless of the risk of violence being identified at triage. This indicates that there may be some staff members who view a positive risk screen for violence as a negative label.

These varying opinions further highlight the variability in how different nurses may perceive the risk of violence, but also the need to include context-specific factors into the perception of risk. For this reason, further education, feedback to nurses on correctly identified cases, and building their capacity to
identify and manage the risk of violence should be prioritised and an ongoing process.

Discussion with staff found sometimes they thought they had clicked on “Yes” but they actually had not. In the interest of usability the triage screen was designed so the default was “No” given that only a small percentage of presentations are at risk of violence. However, because the default is ‘no’, the triage nurse can “tab” through the violence risk screen for the approximately 96.5% of presentations.

Summary

Study Two addressed the development, implementation and pilot testing of the revised violence risk screening decision support process at ED triage. The revised violence risk screen was supported by staff and integrated into triage nurse practice. The predictive ability was acceptable and no alterations were made to the process. Following this phase, an evaluation commenced to explore the influence of violence risk screening decision support on the use of Code Grey responses, access to clinical care and triage nurse self efficacy.
Chapter Seven: Study Three - Evaluation of the Influence of Violence Risk Screening

This chapter will report the evaluation of a violence risk screening decision support process. The evaluation of violence risk screening process explored the predictive ability for six months following pilot testing. To examine the influence of violence risk screening on clinical care and use of Code Grey responses, data were compared for six months before and after the implementation. The influence of introducing violence risk screening on triage nurses’ self-efficacy was explored. This chapter describes the methodology, analysis, and discusses the findings of research conducted to evaluate the influence of introducing a violence risk screening decision support process. The chapter is presented in three separate studies and reports the predictive ability and influence of violence risk screening on use of Code Grey responses, clinical care and triage nurses’ self efficacy.

Methodology

Predictive Ability of Revised Violence Risk Screen Decision Support

Proactive management of the risk of violence in ED requires an approach that identifies who is at risk (Kling et al., 2006) and allows staff an opportunity to consider prevention and care planning to minimise the impact of violent behaviour. Risk assessment processes have been used in other settings however a risk identification process for use in at ED triage should be integrated into practice and include decision support (Creaton et al., 2008). In a triage setting the best predictor of future risk of violence is past behaviour (Sands et al., 2009). Past risk of violence is captured by the hospital alert system. However, this is only useful if the patient has previously been admitted and the alert was actually completed.

The prospective identification of the potential risk of violence at triage was based on the triage nurses using clinical judgement. The risk of violence and the need for a Code Grey response was determined for each presentation to explore the predictive ability of the revised violence risk screen. All incidents that required a Code Grey response were recorded in an organisational
database including the patient’s medical record number. This information was matched with clinical information captured at each triage interaction that identified whether the triage nurse considered the patient to be at risk of violence. The predictive ability of the violence risk screen was monitored for six months post implementation.

Analysis of predictive ability of the violence risk screening explored whether triage nurses can identify who is at risk of requiring a Code Grey using information available during the triage interaction. The sensitivity and specificity of the violence risk screen tool was monitored and reported to the Violence in ED Action Group. The predictive ability of the violence risk screening decision support process is vital to the prevention and management of violence in ED. It is essential to identify who is at risk on arrival to commence prevention, prioritise safety, and provide required medical treatment and care.

**Aims.**

1. Determine whether Triage Nurses can correctly identify who is at risk of violence at triage.
2. Determine the sensitivity and specificity of the refined violence risk screening decision support process to accurately predict patients at risk for violence.

**Sample.** The sample size required to evaluate the predictive ability of violence risk screening was calculated using the sensitivity, specificity, and prevalence. Determining the sample size had to consider the prevalence to ensure the dichotomous test is evaluated in a sample with the same prevalence as the target population that will use the test. An appropriate sample size also ensures the estimates of sensitivity and specificity are meaningful (Buderer, 1996).

The sample size was calculated based on the first month of data post implementation. In February 2013, there were 76 patients who required a Code Grey and 4,774 presentations. The prevalence of patients requiring a Code Grey was 0.01592, sensitivity 55%, specificity 98% and the sample size required was 5,972. Post implementation data was collected for 6 months, from
1st February, 2013 to July 31st, 2013. During this time there were 30,122 presentations and 456 presentations required a Code Grey response.

**Method.** All Code Grey responses in ED were matched by medical record number and date to the clinical data to determine the proportion of patients who were identified at risk and required a Code Grey. Each month, data was matched retrospectively to monitor the sensitivity and specificity. This data was collected and matched each month and then combined to form one data set.

**Data analysis of predictive ability.** The proportion of patients determined to be at risk that did and did not require a Code Grey response was determined to explore the predictive ability of violence risk screening. The sensitivity, specificity, negative and positive predictive values, and positive and negative likelihood ratios were calculated in EXCEL (2007). Outcomes were classified according to the total number of true positives, false positives, true negative and false negatives.

Sensitivity is the proportion of those with disease (Code Grey) who test positive (violence risk identified at triage) and a very sensitive test would have few false negatives (Altman & Bland, 1994; Peat & Barton, 2005). Sensitivity is calculated by:

\[
\text{Sensitivity} = \frac{\text{True positives}}{\text{True Positive and False Negatives}}
\]

In contrast, specificity is the proportion of those without disease who test negative and a very specific test has few false positives (Altman & Bland, 1994; Peat, 2005).
Specificity is calculated by:

\[
\text{Specificity} = \frac{\text{True negatives}}{\text{True negatives} + \text{False positives}}
\]

A limitation of using sensitivity and specificity to evaluate prediction alone is that they are population measures and not specific for individual patients (Attia, 2003). An alternative is to use likelihood ratios. Likelihood ratios are independent of disease prevalence and measure how much more likely a person with a positive test result is to have the disease compared to a person with a negative test result (Attia, 2003). A larger positive likelihood ratio indicates a greater likelihood the disease is present and a smaller negative likelihood ratio indicates a lesser chance the disease is present (Attia, 2003; Deeks & Altman, 2004). A positive likelihood ratio above 10 or a negative likelihood ratio less than 0.1 is considered strong evidence to rule in or out a diagnosis (Jaeschke, Guyatt, & Lijmer, 2002).

Positive likelihood ratio is calculated by:

\[
\text{Positive likelihood ratio} = \frac{\text{Probability of positive test in those with the disease}}{\text{Probability of positive test in those without the disease}}
\]

The positive and negative predictive values are dependent on the prevalence of the disease being measured and are useful for clinicians (Lalkhen & McCluskey, 2008). The positive predictive value (PPV) is the proportion of those with a positive test that actually have the disease (Attia, 2003). The negative predictive value (NPV) is the proportion of patients with a negative test that don’t have the disease.

The positive predictive value is calculated by:

\[
\text{Positive Predictive Value} = \frac{\text{True Positive}}{\text{True Positive} + \text{False Positive}}
\]
The negative predictive value is calculated by:

$$\text{Negative Predictive Value} = \frac{\text{True negatives}}{\text{True negatives} + \text{False Negatives}}$$

In this study the outcome measures were monitored to explore the proportion of patients correctly identified at risk. All patients were classified based on the identification of violence risk and need for a Code Grey. Patients who were identified “at risk” and subsequently had a Code Grey response at the same ED visit are considered a “True Positive”. Patients who were identified “at risk” and did not have a Code Grey response are considered a “False Positive”. Patients who were identified “not at risk” and subsequently had a Code Grey response are considered a “False Negative”. Patients who were not identified at risk and do not require a Code Grey are considered a “True Negative”. See Figure 7.1 shows a matrix for sensitivity and specificity for the violence risk screen.

<table>
<thead>
<tr>
<th>Risk Decision (Identified at risk at Triage)</th>
<th>Outcome (Required Code Grey response)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td>False positives</td>
</tr>
<tr>
<td>Positive</td>
<td>True positive (sensitivity)</td>
</tr>
<tr>
<td>Negative</td>
<td>False negatives</td>
</tr>
<tr>
<td></td>
<td>True negative (specificity)</td>
</tr>
</tbody>
</table>

*Figure 7.1 Matrix for Estimating Sensitivity and Specificity for Violence Risk Screen.*
Influence of Violence Risk Screening on Code Grey Responses and Clinical Care

The influence of introducing a violence risk screening decision support process at triage on clinical care such as time from triage to review by medical staff or mental health assessment and use Code Grey responses was evaluated. There has been an increase in studies that use “rules/processes” to predict clinical outcomes (Toll et al., 2008). However, the actual impact of these practices are rarely evaluated (Riley, 2003). Triage is a time critical interaction and violence risk screening is an additional item that was completed for every triage interaction. The influence was explored to establish both positive and negative outcomes of violence risk screening.

There are ethical issues when identifying patients at risk of violence. This patient group are “labelled” as potentially violent and there is concern that this can lead to stigmatisation and these patients may be subject to unnecessary interventions (Large & Nielssen, 2011). The evaluation monitored the use of coercive practices and whether if the time to treatment was delayed or enhanced for this group. Although the intention was to improve the care provided to this group there is potential for avoidance by staff once a patient is identified as at risk of violence. For this reason, the influence of violence risk screening on clinical care and use of Code Grey responses was explored.

Aims.

2. Determine the influence of violence risk screening on clinical care.

Sample. Data from three administrative and clinical data bases (electronic medical record, patient registration system and the Melbourne Health Code Grey Database) for 6 months from 1st February, 2013 to 31st July, 2013 were included. A total of 897 Code Grey responses were identified. Of the 30,122 presentations to ED, Code Grey data was matched to 456 clinical presentations. This data was compared to the retrospective baseline data for the same months in 2010 prior to the implementation of violence risk screening. From 1st February, 2010 to 31st July, 2010 there were 905 Code Grey
responses. Of the 27,557 presentations, Code Grey data was matched to 465 clinical presentations.

**Method.** The Code Grey responses were matched by medical record number, and date of presentation to clinical data from the electronic medical record and patient registration system. Data from the Code Grey database included the duration, frequency, type of emergency, and interventions at the emergency response. Information contained within the electronic medical record included: age, gender, triage category, date and time, length of stay, primary complaint, arrival mode, time to medical treatment, and referral for a mental health assessment. Information from patient registration system identified alerts for past instance of violence that were recorded.

**Data analysis of Code Grey responses and clinical care.** Descriptive statistics were used to compare the sample before and after violence risk screening was introduced. The data was compared to explore differences using Chi Square test for independence between data collected before and after violence risk screening was introduced. Evaluation of the influence of violence risk screening on clinical care explored the time to treatment, triage category, length of stay and use of patient alerts for past violence. The influence of violence risk screening on the use of Code Grey responses included the time engaged in emergency responses, frequency of coercive practices used, and time from arrival to first Code Grey response. The proportion of planned and unplanned Code Grey response for patients identified at risk was compared to baseline Code Grey data.

**Triage Nurse Self-Efficacy**

Self-efficacy is a concept developed from social learning theory (Rotter, 1966). Bandura (1977) explored how self-efficacy affects an individual’s actions. Perceived self-efficacy is defined as a, “person’s beliefs in ones capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p.3). Perceived self-efficacy is considered important, because unless people think they can be successful at what they want to achieve, they are unlikely to act and have little incentive to act. Self-
efficacy is not dependant on having adequate skills, rather on a judgement of what the individual believes they can accomplish. Although to be considered competent, both adequate skills and self-efficacy are required. (Bandura, 1977).

Self-efficacy also affects nurses’ well-being. The level of distress, resilience and coping is affected by their belief in their ability to succeed at tasks (Bandura, 1997). If staff don’t believe they can achieve good outcomes when they intervene they are not likely to do anything (Bandura, 1997). In the case of a patient who is at risk of violence, there is potential for staff to avoid providing clinical care, and ignore the patient (Kennedy, 2013). Avoiding this patient group delays staff intervention and may lead to intervention occurring once the situation has progressed past the point where de-escalation is more likely to be effective. Some nurses with low perceived self-efficacy may see this as confirmation that there is no option to prevent violence.

Self-efficacy has been measured with ED nurses (Lee, 2001) and general nursing staff (Hills, 2008) to explore the impact of aggression prevention training on nurses’ perceived self-efficacy. Self-efficacy is important because once a person is identified at risk, there is a need for staff to intervene and commence prevention and management. Identifying the risk of violence is only useful if staff then intervene (Kling et al., 2006) and this requires nurses to have adequate self-efficacy, although it is not known what level of self-efficacy is required.

**Aim.** To evaluate the impact of implementing a violence risk decision support process on ED Triage nurses self efficacy.

**Sample.** Nurses who work in triage (N=72) were invited to participate. Based on a 5% error margin and 90%CI a sample of 58 nurses was required to be representative of all triage nurses at the study site. A total of 66 nurses completed the questionnaire at baseline. From this sample, 53 nurses completed the questionnaire before and after risk screening was implemented and this data was used in the matched pair analysis. The response rate was 74% (53/72).
Method. All triage nurses were asked to complete a questionnaire before and after violence risk screening was implemented. The questionnaire included demographic information and the adapted Difficult Behaviour Self Efficacy Scale (DBSES), (Hastings & Brown, 2002). Consent to use the questionnaire was obtained from the authors. The questionnaires initially had the nurses names attached to allow for matching baseline and post intervention data. The nurses’ names were removed at the point of data entry.

Questionnaire development. The DBSES (Hastings & Brown, 2002) was developed to measure self-efficacy in carers of children with autism. This tool measures five self-reported efficacy items rated on a seven point Likert scale. The scale has five questions that identify self-reported confidence, difficulty, positive effect, satisfaction, and control experienced when caring for a patient who may be aggressive or violent. A higher total score indicates greater perceived self-efficacy than a lower score.

Demographic information was added to the questionnaire including age, gender, grade, years of experience nursing, in ED and working in triage, roster and qualifications. See Appendix J for the Difficult Behaviour Self Efficacy Scale. The questionnaire was piloted with two ED nurses to establish face validity and to ensure the questions were clear and understood. Previous studies utilising the DBSES have reported a high level of internal consistency (Cronbachs α= 0.99) (Lee, 2001). The DBSES was adapted to change the words from “challenging behaviour” to “violence and aggression”. In this study the internal consistency of scale items remained high with a Cronbach’s alpha coefficient of .861. This is above the lowest acceptable level of .80 (Burns & Grove, 2001).
Procedure. A list of all nurses who work in triage was obtained. Because the PhD Candidate was known to triage nurses, an ED nurse was used to distribute and collect questionnaires. This reduced the possibility that individual nurses would feel obliged to participate and allowed questionnaires to be distributed at suitable times as the PhD Candidate would be unaware of current clinical demands.

Data analysis of triage nurse self efficacy. The DBSES consists of five items and is rated using a 7-point Likert scale. Pre and post scores were compared for each matched pair and as a group. Data was entered into EXCEL (2007) and exported to SPSS V19 for analysis. Reliability analysis of the Adapted - DBSES was determined. The relationship between self-efficacy and demographic variables including gender, age, experience and qualifications was explored. Scatter plots were used to identify a linear relationship between years of experience and self efficacy. The scores for each of the five items were totalled for each respondent and compared using matched pair T-Test.

Results

Predictive ability of the Violence Risk Screen

The predictive ability was determined by identifying how many patients were identified at risk of violence at triage and the proportion who required a Code Grey response during treatment in the ED. There were 30,122 presentations from 1 February to 31st July, 2013. During this time there were 456 presentations that required a Code Grey response. Of these, 257 were correctly identified by the triage nurse at risk of violence. The sensitivity was 56% (95%CI 51.66,60.95) and the specificity was 97% (95%CI 97.08,97.46). The positive predictive value (PPV) was 24.13% (CI 21.16,26.84). The negative predictive value (NPV) was 99.32% (95%CI 99.21,99.41).

The positive likelihood ratio was 20.69, and this indicates that a patient identified at risk of violence at triage was 20 times more likely to require a Code Grey response than a patient who was not identified at risk of violence at triage. The negative likelihood ratio was 0.45, and this indicates nearly half the patients
who required a Code Grey were not identified at triage. Table 7.1 shows a summary of sensitivity, specificity, predictive values and likelihood ratios.

Table 7.1 Summary of Sensitivity, Specificity, Predictive Values and Likelihood Ratios (N=30122)

<table>
<thead>
<tr>
<th>Value</th>
<th>Lower Limit</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence</td>
<td>1.51%</td>
<td>1.38 1.66</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>56.36%</td>
<td>51.66 60.95</td>
</tr>
<tr>
<td>Specificity</td>
<td>97.28%</td>
<td>97.08 97.46</td>
</tr>
<tr>
<td><strong>Total Predictive Value</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>3.54%</td>
<td>3.33 3.75</td>
</tr>
<tr>
<td>Negative</td>
<td>96.46%</td>
<td>96.25 96.67</td>
</tr>
<tr>
<td><strong>Positive Predictive Value</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True Positive</td>
<td>24.13%</td>
<td>21.61 26.84</td>
</tr>
<tr>
<td>False Positive</td>
<td>75.87%</td>
<td>73.16 78.39</td>
</tr>
<tr>
<td><strong>Negative Predictive Value</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True Negative</td>
<td>99.32%</td>
<td>99.21 99.41</td>
</tr>
<tr>
<td>False Negative</td>
<td>0.68%</td>
<td>0.59 0.79</td>
</tr>
<tr>
<td><strong>Likelihood Ratios</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>20.69%</td>
<td>18.62 23.00</td>
</tr>
<tr>
<td>Negative</td>
<td>0.45%</td>
<td>0.40 0.50</td>
</tr>
</tbody>
</table>

The predictive ability of the violence risk screen was monitored monthly and shows the specificity and negative predictive values remains consistently close to 100%. The positive predictive value is affected by the number of positive risk screens completed and there was a reduction in March. This confirms that although there was an increase in the number of patients identified at risk, the total number of patients correctly identified (sensitivity) remained constant. The reduction in sensitivity and positive predictive value in July was affected by the availability of Code Grey data. During this month there were 24 Code Grey responses that did not have a patient medical record number recorded. Consequently, these Code Grey responses could not be
matched to clinical presentations. Figure 7.2 shows the sensitivity, specificity and predictive values for identifying the risk of violence at triage during the 6 month evaluation phase.

Figure 7.2 Sensitivity, Specificity and Predictive Values for Identifying the Risk of Violence at Triage
**Number of patients identified at risk.** The number of patients identified each month ranged from 152 to 227. This is equivalent to 1.8 to 2.4 patients per shift. Figure 7.3 shows the number of patients identified at risk of violence each month.

![Figure 7.3 Number of Patients Identified at Risk of Violence per Month (N=1,064)](image)

**Use of Code Grey responses and risk identification.** There was an increased use of planned Code Greys for patients identified at risk of violence until the final month of evaluation. There were 897 Code Grey responses and 817 were matched to clinical data. Of all Code Grey responses, 42.8% were planned interventions for patients identified at risk of violence at triage. Figure 7.4 shows the type of Code Grey response and risk identification.
Of all patients who required a Code Grey response, most required only one Code Grey. Of the patients identified at risk on arrival, 58% (148/257) presentations required one Code Grey response, and a further 19% (50/257) required two Code Grey responses. The remaining presentations accounted for 23% (59/257) and required more than 2 Code Grey responses. Of the patients not identified at risk at triage, but who required a Code Grey response, 130 (65%) required one Code Grey and a further 23% (45/199) required two Code Greys. The remaining presentations accounted for 12% (24/199) and required more than 2 Code Grey responses.

There were more planned Code Greys for patients identified at risk than unplanned Code Greys for patients correctly identified. In contrast, there were more unplanned Code Greys for patients not identified at risk. Staff were notified of the risk of violence prior to 61% (494/817) of Code Grey responses.

Table 7.2 shows the average number of planned and unplanned Code Grey response for patients and risk of violence identified at triage.
Table 7.2 The Average Number of Code Grey Responses and Violence Risk Identification at Triage (N=817)

<table>
<thead>
<tr>
<th>Risk Identification</th>
<th>Mean</th>
<th>95% CI</th>
<th>Total n, (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of violence and use of planned Code Greys</td>
<td>2.45</td>
<td>1.86, 3.04</td>
<td>350 (43)</td>
</tr>
<tr>
<td>Risk of violence and use of unplanned Code Greys</td>
<td>1.29</td>
<td>1.16, 1.42</td>
<td>144 (18)</td>
</tr>
<tr>
<td>Risk not identified and use of planned Code Greys</td>
<td>1.58</td>
<td>1.26, 1.91</td>
<td>174 (21)</td>
</tr>
<tr>
<td>Risk not identified and use of unplanned Code Greys</td>
<td>1.86</td>
<td>1.40, 2.33</td>
<td>149 (18)</td>
</tr>
</tbody>
</table>

Influence of Violence Risk Screening on Access to Clinical Care

The influence of violence risk screening on clinical care was compared before and after the implementation of violence risk screening decision support at triage. A subset of 6 months of baseline clinical and Code Grey data from 1st February to 31st July 2010 was compared with the corresponding months in 2013 post-implementation. There were 27,557 presentations pre and 30,135 post-implementation. Of these, there were 465 pre and 454 post presentations that required a Code Grey response. The prevalence of presentations that required a Code Grey response reduced from 1.69% pre and 1.51% post-implementation however the proportion was not significant $p < .084$. The proportion of patients in both samples remained constant for gender, triage category, mode of arrival, and need for a mental health assessment. Table 7.4 shows the comparison of clinical and demographic information for all presentations pre and post-implementation of violence risk screening.
Table 7.3 Comparison of Clinical and Demographic Information for all Presentations

<table>
<thead>
<tr>
<th></th>
<th>Pre (N=27,557)</th>
<th>Post (N=30,135)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>12740 (46)</td>
<td>14270 (47)</td>
</tr>
<tr>
<td>Male</td>
<td>14805 (54)</td>
<td>15864 (53)</td>
</tr>
<tr>
<td>Missing</td>
<td>12 (1)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>27557 (100)</td>
<td>310135 (100)</td>
</tr>
<tr>
<td><strong>Mode of Arrival</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>17129 (62)</td>
<td>18858 (63)</td>
</tr>
<tr>
<td>Ambulance</td>
<td>10132 (37)</td>
<td>11028 (37)</td>
</tr>
<tr>
<td>Police</td>
<td>210 (1)</td>
<td>249 (1)</td>
</tr>
<tr>
<td>Missing</td>
<td>72 (4)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>27557 (100)</td>
<td>30135 (100)</td>
</tr>
<tr>
<td><strong>Triage Category</strong>¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1108 (4)</td>
<td>401 (1)</td>
</tr>
<tr>
<td>2</td>
<td>4270 (16)</td>
<td>3539 (12)</td>
</tr>
<tr>
<td>3</td>
<td>11946 (43)</td>
<td>12807 (42)</td>
</tr>
<tr>
<td>4</td>
<td>9159 (33)</td>
<td>11816 (39)</td>
</tr>
<tr>
<td>5</td>
<td>1061 (4)</td>
<td>1570 (5)</td>
</tr>
<tr>
<td>Missing</td>
<td>13 (2)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>27557 (100)</td>
<td>30135 (100)</td>
</tr>
<tr>
<td><strong>Presenting Complaint</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>24552 (89)</td>
<td>26823 (89)</td>
</tr>
<tr>
<td>Mental Health</td>
<td>388 (1)</td>
<td>790 (3)</td>
</tr>
<tr>
<td>Drug/Alcohol</td>
<td>340 (1)</td>
<td>392 (1)</td>
</tr>
<tr>
<td>CNS abnormality</td>
<td>2277 (8)</td>
<td>2130 (7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>27557 (100)</td>
<td>30135 (100)</td>
</tr>
<tr>
<td><strong>Mental health assessment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>26811 (97)</td>
<td>29148 (97)</td>
</tr>
<tr>
<td>Yes</td>
<td>746 (3)</td>
<td>987 (3)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>27557 (100)</td>
<td>30135 (100)</td>
</tr>
</tbody>
</table>

Note.

1. Triage category refers to the Australasian Triage Scale (ATS) level of acuity priority based on the severity of their presentation and is rated from 1 (immediately life-threatening) to less urgent (category 5).

2. Mental health assessment in ED indicates that the patient was referred to the Enhanced Crisis Assessment Treatment Team (ECATT).
Table 7.4 Comparison of Clinical and Demographic Information for all Presentations who required a Code Grey Response

<table>
<thead>
<tr>
<th></th>
<th>Code Grey Pre (N=465)</th>
<th>Code Grey Post (N=454)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>154 (33)</td>
<td>131 (29)</td>
</tr>
<tr>
<td>Male</td>
<td>311 (67)</td>
<td>323 (71)</td>
</tr>
<tr>
<td>Total</td>
<td>465 (100)</td>
<td>454 (100)</td>
</tr>
<tr>
<td><strong>Mode of Arrival</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>101 (22)</td>
<td>101 (39)</td>
</tr>
<tr>
<td>Ambulance</td>
<td>291 (63)</td>
<td>271 (48)</td>
</tr>
<tr>
<td>Police</td>
<td>73 (16)</td>
<td>82 (14)</td>
</tr>
<tr>
<td>Total</td>
<td>465 (100)</td>
<td>454 (100)</td>
</tr>
<tr>
<td><strong>Triage Category</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>39 (8)</td>
<td>11 (2)</td>
</tr>
<tr>
<td>2</td>
<td>101 (22)</td>
<td>78 (17)</td>
</tr>
<tr>
<td>3</td>
<td>260 (56)</td>
<td>281 (60)</td>
</tr>
<tr>
<td>4</td>
<td>57 (12)</td>
<td>76 (16)</td>
</tr>
<tr>
<td>5</td>
<td>8 (2)</td>
<td>9 (2)</td>
</tr>
<tr>
<td>Total</td>
<td>465 (100)</td>
<td>454 (100)</td>
</tr>
<tr>
<td><strong>Presenting Complaint</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>293 (63)</td>
<td>217 (47)</td>
</tr>
<tr>
<td>Mental Health</td>
<td>88 (19)</td>
<td>174 (38)</td>
</tr>
<tr>
<td>Drug and Alcohol related</td>
<td>33 (7)</td>
<td>36 (8)</td>
</tr>
<tr>
<td>CNS</td>
<td>51 (11)</td>
<td>36 (8)</td>
</tr>
<tr>
<td>Total</td>
<td>465 (100)</td>
<td>454 (100)</td>
</tr>
<tr>
<td><strong>Mental Health Assessment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>304 (65)</td>
<td>227 (50)</td>
</tr>
<tr>
<td>Yes</td>
<td>161 (35)</td>
<td>227 (50)</td>
</tr>
<tr>
<td>Total</td>
<td>465 (100)</td>
<td>454 (100)</td>
</tr>
</tbody>
</table>
**Time from triage to first Code Grey.** There was an increase in the time between triage and the first Code Grey following the introduction of violence risk screening (Pre: median = 71, IQR = 7-226 minutes, Post: median = 124, IQR = 21-304). The duration from triage to first Code Grey was not normally distributed (Kolmogorov-Smirnov statistic p < .001). The medians were compared using the Mann-Whitney U Test and were significant p < .001. Figure 7.5 shows the time from triage to first Code Grey.

*Figure 7.5 Time from Triage to First Code Grey*
Time from triage to mental health assessment for patients who require a Code Grey. Patients who required a Code Grey response were seen more quickly by a mental health clinician for assessment (*Median*=112 minutes, *IQR*=33-230) compared to baseline data (*Median*=114, *IQR*=36-233). The time from triage to mental health assessment was not normally distributed (Kolmogorov–Smirnov statistic *p*<.001). The median time to review by a mental health clinician was compared using the Mann-Whitney U Test which found no significant difference *p*<.118.

Time from triage to medical review. Patients who required a Code Grey response were seen more quickly by medical staff (*Median*= 47, *IQR*=19-106) compared to baseline data (*Median*=51, *IQR*=14-115). The time from triage to review by a Doctor for patients who required a Code Grey response was not normally distributed (Kolmogorov-Smirnov statistic *p*<.001). The medians were compared using the Mann-Whitney U Test which found a significant difference *p*<.002. Figure 7.6 shows the median time from triage to medical review.

*Figure 7.6 Time from Triage to Medical Review for Patients who have a Code Grey*
**Length of stay.** The median length of stay for patients who required a Code Grey response increased \((\text{Median}=333, \text{IQR}=180-604)\) compared to baseline data \((\text{Median}=310, \text{IQR}=166-508)\). The length of stay was not normally distributed (Kolmogorov-Smirnov statistic \(p<.000\)). The medians were compared using the Mann-Whitney U Test which found a significant difference \(p<.001\). Figure 7.7 shows the median length of stay for patients who required a Code Grey Response.

*Figure 7.7 Median Duration of Length of Stay for Patients who Required a Code Grey Response*

**Influence of Violence Risk Screening on Code Greys**

The influence of violence risk screening on the use of Code Grey responses was compared before and after the implementation of violence risk screening decision support at triage. A subset of 6 months of data from the retrospective audit of Code Grey responses from 1\(^{st}\) February to 31\(^{st}\) July 2010 was compared with the corresponding months in 2013 post-implementation.
Proportion of planned and unplanned Code Greys. There was no significant difference in the total number of Code Grey responses (Pre 904, Post 897), however, the proportion of planned Code Greys increased from 52% (468/904) to 62% (556/897) $p < .001$. Figure 7.8 shows the number of planned and unplanned Code Greys.

![Figure 7.8 Number of Planned and Unplanned Code Greys](image)

Duration of Code Grey response. The total time engaged in Code Grey responses decreased from 272hrs:30min pre to 243hrs:13min post. The median duration of each Code Grey response reduced from 14 to 13 minutes. The duration of Code Grey responses was not normally distributed (Kolmogorov-Smirnov statistic $p < .001$). The medians were compared using the Mann-Whitney U Test which found a significant difference $p < .009$. Table 7.5 shows the duration of planned and unplanned Code Greys.
Table 7.5 *The Duration of Planned and Unplanned Code Grey Responses (minutes)*

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th></th>
<th>Post</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Planned (n=467)</td>
<td>Unplanned (n=437)</td>
<td>Planned (n=556)</td>
<td>Unplanned (n=341)</td>
</tr>
<tr>
<td>Median</td>
<td>15</td>
<td>12</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>IQR</td>
<td>10,25</td>
<td>7,20</td>
<td>9,21</td>
<td>6,18</td>
</tr>
</tbody>
</table>

**Location of Code Grey response.** There was a significant reduction in the proportion of Code Greys at point of entry, including in the ambulance bay, waiting room, and triage areas, from 29% (258/904) to 22% (200/897), p < .001. There was an increase in the proportion of Code Grey responses that occurred inside the ED from 72% (646/904) to 78% (697/897). Figure 7.9 shows the location of Code Grey responses.

![Figure 7.9 Location of Code Grey Responses](image)

**Duration of Code Grey responses at triage.** The median duration of Code Grey responses at entry areas reduced from 17 (IQR = 14-20) to 16 minutes post (IQR = 17-30). The duration of Code Grey responses was not
normally distributed (Kolmogorov-Smirnov statistic $p<.001$). The medians were compared using the Mann-Whitney U Test, which found a significant difference $p<.001$.

**Use of existing patient alert.** There was a significant increase in the patient alert recorded on the patient registration system. The number of Code Greys where the patient had an alert for safety and security increased from 7% (66/904) to 24% (211/897) $p<.001$. Figure 7.10 shows the proportion of planned and unplanned Code Greys where the patient had an alert for past violence.

![Bar chart showing the increase in patient alert](image)

*Figure 7.10 Use of Patient Alert for Past violence and Frequency of Code Greys*

**Use of coercive interventions.** There was an increase in the total number of coercive interventions (mechanical or physical restraint or medication administered in the presence of security) used at Code Grey responses from 822 to 1007, $p<.001$. More than one coercive intervention may be used during a Code Grey response. The mean number of interventions at each Code Grey increased from .9093 pre to 1.1226 post-implementation of violence risk screening. The number of interventions used at Code Grey response was not normally distributed (Kolmogorov-Smirnov statistic $p<.001$). The medians were compared using the Mann-Whitney U Test, which found a significant difference $p<.001$. 


There was a 63% (250/396) increase in the number of interventions for planned Code Greys, and a 15% (65/426) reduction for unplanned Code Grey responses. Figure 7.11 shows the number of interventions for planned and unplanned Code Grey responses.

Figure 7.11 Number of Interventions at Planned and Unplanned Code Greys

The number of Code Greys that did not utilise coercive interventions remained constant and there was a reduction in Code Greys that utilised one coercive intervention. The proportion of Code Greys that used all three coercive interventions increased from 6% to (57/904) to 16% (143/897). Figure 7.12 shows the number of coercive interventions used at each Code Grey response.
Figure 7.12 Number of Coercive Interventions used at each Code Grey

There was a reduction in the number of Code Greys that used one coercive intervention. For Code Greys with only one coercive intervention, there was a reduction in the use of medication. Figure 7.13 shows the type of coercion used for Code Greys with one intervention.

Figure 7.13 Type of Coercion used at Code Grey Response with One Intervention

The use of physical and mechanical restraint for Code Greys when two coercive interventions were used remained constant. Physical restraint was used in 98% (215/219) and mechanical restraint was used in 76% (167/219) of these Code Greys. Medications were administered
during 26% (56/219) of Code Greys. Figure 7.14 shows the type of coercive interventions used during Code Greys with two interventions.

Figure 7.14 Type of Coercion used at Code Grey Response with Two Interventions

**Use of coercive interventions at planned and unplanned Code Greys.** There was an increase in the number of planned Code Greys that did not require any coercive interventions, and a decrease in the number of the unplanned Code Greys that didn’t use coercive interventions. It is possible that staff were intervening earlier at planned Code Grey response and there was no need for coercive interventions. Conversely, the reduction in unplanned Code Greys that didn’t use any coercive interventions could indicate that unplanned Code Greys are emergencies that involved patients who were less predictable, escalated more quickly, or presented an acute risk which required the use of coercive interventions. Figure 7.15 shows the number of planned and unplanned Code Greys that did not use any coercive interventions.
Figure 7.15 Number of Planned and Unplanned Code Greys that did not use any Coercive Interventions

**Frequency of coercive interventions used and type of Code Grey response.** There was a small increase in the proportion of planned Code Greys that used one intervention from 54% (132/243) to 57% (80/140). There was a small reduction in the proportion of unplanned Code Greys using one intervention from 46% (111/243) to 43% (60/140). Figure 17.16 shows the number of planned and unplanned Code Greys that use one intervention.

![Figure 7.15](image1.png)

Figure 7.16 The Number of Planned and Unplanned Code Greys that used One Intervention
The proportion of planned Code Greys that used two interventions increased from 47% (96/204) to 69% (15/219). The proportion of unplanned Code Greys that used two interventions reduced from 53% (108/204) to 31% (68/219). Figure 7.17 shows the number of planned and unplanned Code Greys with two interventions.

![Figure 7.17 Number of Planned and Unplanned Code Greys that used Two Interventions](image)

The total number of Code Greys that used three coercive interventions increased. The proportion of planned Code Greys that used three coercive interventions increased from 42% (24/57) pre to 62%(88/143) post-implementation. The proportion of unplanned Code Greys using three coercive interventions reduced from 58% (33/57) pre to 38% (55/143) post-implementation. Figure 7.18 shows the number of planned and unplanned Code Greys that used three coercive interventions.
Figure 7.18 Proportion of Planned and Unplanned Code Greys that used Three Coercive Interventions

Type of coercive interventions used at Code Grey responses. The proportion of Code Grey responses where medication was administered with security present increased from 24 - 27% but this was not significant $p = .096$. There was a significant increase, 40-49% ($p < .001$), of Code Greys in which physical restraint was used. There was a significant increase in the proportion of Code Greys that used mechanical restraint, from 27-36% $p < .001$. Figure 7.19 shows the proportion of Code Greys that used medication, physical or mechanical restraint interventions.

Figure 7.19 Proportion of Code Greys and use of Coercive Interventions
**The use of coercive interventions and violence risk screening.** The total number of coercive interventions used during Code Grey response for patients who were identified at risk of violence was greater for patients identified at risk \( (n=589) \) compared to patient not identified at risk \( (n=370) \). During the 6 month evaluation phase the use of coercive interventions for patients identified at risk reduced from 135 in February to 82 in July. The use of coercive interventions increased for patients not identified at risk increased from 46 in February to 85 in July. There was a significant association between the total number of coercive interventions and a positive risk screen for violence \( p<.001 \). Figure 7.20 shows the number of coercive interventions used each month at Code Grey responses and whether the risk of violence was identified at ED triage.

*Figure 7.20 Number of Coercive Interventions used each Month at Code Grey Responses and Violence Risk Identification at ED Triage*
Triage Nurse Self-Efficacy

The influence of implementing the violence risk decision support process on ED triage nurses’ perceived self-efficacy was explored using the Difficult Behaviour Self-Efficacy Scale (Hastings & Brown, 2002). The questionnaire was completed both before and after risk screening was implemented to allow for matched pair analysis by 74% (53/72) of nurses who worked in triage. Table 7.6 shows the demographic characteristics of participants.

Table 7.6 Demographic Characteristics of Triage Nurses (N=53)

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>79.2</td>
</tr>
<tr>
<td>Male</td>
<td>11</td>
<td>20.8</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>21</td>
<td>39.6</td>
</tr>
<tr>
<td>30-39</td>
<td>18</td>
<td>34.0</td>
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<tr>
<td>40-49</td>
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</tr>
<tr>
<td>50+</td>
<td>2</td>
<td>3.8</td>
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<tr>
<td>Employment</td>
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<tr>
<td>Full time</td>
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</tr>
<tr>
<td>Post Grad Cert</td>
<td>34</td>
<td>64.2</td>
</tr>
<tr>
<td>Post Grad Diploma</td>
<td>14</td>
<td>26.4</td>
</tr>
<tr>
<td>Masters Degree</td>
<td>2</td>
<td>3.8</td>
</tr>
<tr>
<td>Role</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RN</td>
<td>16</td>
<td>30.2</td>
</tr>
<tr>
<td>CNS</td>
<td>28</td>
<td>52.8</td>
</tr>
<tr>
<td>ANUM</td>
<td>5</td>
<td>9.4</td>
</tr>
<tr>
<td>Educator</td>
<td>3</td>
<td>5.7</td>
</tr>
<tr>
<td>Nurse Manager</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td>MOCA Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>39</td>
<td>73.6</td>
</tr>
<tr>
<td>No</td>
<td>13</td>
<td>24.5</td>
</tr>
</tbody>
</table>
Perceived self-efficacy scores were normally distributed (Kolmogorov-Smirnov statistic pre: \( p<.925 \), post: \( p<.963 \)). A paired-samples t-test was conducted to evaluate the impact of implementing violence risk screening at triage on nurses’ perceived self-efficacy. There was an increase in perceived self-efficacy following implementation (pre: \( M=24.5 \ SD=4.11 \), \( R 14-35 \), post: \( M=25.66 \ SD=3.29 \), \( 18-34 \), CI -2.065-.027) but it was not significant \( p<.056 \).

**Nursing experience.** Respondents had experience working in both ED and ED triage nursing roles. The duration of experience working in ED ranged from 18-348 months, and in triage from 3-300 months. Length of nursing experience in the ED is shown in Table 7.7.

Table 7.7 Length of Nursing Experience (months) (n=52)

<table>
<thead>
<tr>
<th></th>
<th>( M )</th>
<th>( SD )</th>
<th>( IQR ) ( (25^\text{th}, 75^\text{th} ) percentile)</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing Experience</td>
<td>127.04</td>
<td>87.69</td>
<td>110 (69,174)</td>
<td>96</td>
</tr>
<tr>
<td>ED Nursing Experience</td>
<td>92.88</td>
<td>65.73</td>
<td>78 (42,120)</td>
<td>72</td>
</tr>
<tr>
<td>Triage Nursing Experience</td>
<td>67.27</td>
<td>64.87</td>
<td>74 (21,90)</td>
<td>48</td>
</tr>
</tbody>
</table>

The relationship between perceived self-efficacy, demographic variables, and nursing experience was explored. Scatter plots showed no linear relationship and Person-product moment correlation analysis confirmed this. Furthermore, there was no significant relationship between having attended aggression prevention training and perceived self-efficacy.

**Components of self-efficacy.** Although the total self-efficacy score pre and post-implementation was normally distributed, each of the 5 items were not normally distributed. Therefore, the Wilcoxon Signed Ranks Test was used to compare the means as the sample is related. The last item of self-efficacy was the extent the triage nurses feels in control and this was significant \( p<.013 \) in
both this test, and when means were compared with the t-test. The last item of self-efficacy captures to what extent the triage nurse feels in control of patients who are at risk of aggression or violence. Table 7.8 shows the components of self efficacy

Table 7.8 Components of Self Efficacy

<table>
<thead>
<tr>
<th>Self Efficacy Item</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>How confident are you dealing with patients who are at risk of violence and aggression at triage?</td>
<td>.276</td>
</tr>
<tr>
<td>How difficult do you personally find it to deal with patients who are at risk of violence and aggression at triage?</td>
<td>.891</td>
</tr>
<tr>
<td>Do you feel the way you communicate with patients at triage who are at risk of violence and aggression has a positive impact on that person’s behaviour?</td>
<td>.640</td>
</tr>
<tr>
<td>How satisfied are you with the way you deal with patients who are at risk of violence and aggression at triage?</td>
<td>.059</td>
</tr>
<tr>
<td>To what extent do you feel in control of managing patients at risk of violence and aggression at triage?</td>
<td>.013</td>
</tr>
</tbody>
</table>

Discussion

This discussion will explore the principle findings from the evaluation of violence risk screening decision support process. The evaluation included exploring the influence of violence risk screening on Code Greys and access to clinical care. The predictive ability and the influence of violence risk screening on triage nurse self-efficacy will be discussed. The evaluation of violence risk screening at triage found 56% of patients who required a Code Grey were correctly identified at triage. There was no change in the number of presentations or frequency of Code Grey responses however the overall use of restraint increased. The increased use of patient alerts and violence risk screening resulted in staff being forewarned of the risk of violence prior to 61% of Code Grey responses for actual or potential violence.

Evaluation of the Predicative Ability of Violence Risk Screening at ED Triage

The predictive ability of violence risk screening established the sensitivity and specificity was acceptable. The violence risk screening support process using clinical judgement found that over half of patients who required a Code Grey response during ED treatment were identified at triage. The number of false positives was low and only a very small proportion of all presentations were identified at risk of violence. The specificity remained high (98%) and negative predictive value confirmed it was easier to identify who was not at risk of violence.

The positive likelihood ratio was consistently above 10 and the negative likelihood ratio was less than 1. These measures are considered useful to rule in or out a diagnosis (Deeks & Altman, 2004). The positive predictive value reduced for a 1-month period during the pilot phase when triage nurses increased the number of patients identified at risk, however, the sensitivity did not also increase during this period. This coincided with the PhD candidate leaving chocolate reminders at triage as one of the implementation strategies. Although the presence of chocolate reminders raised triage nurses’ awareness
and the number of patients identified at risk increased there was no increase in the sensitivity and the positive predictive value reduced.

During the final month of evaluation there was a higher than usual number of Code Greys without a medical record number and no reason could be found for this. The current process relies on security officers obtaining the medical record number and recording this on the Code Grey database. It is possible that workload or delays in accessing patient identification labels contributed to this.

**Comparison with existing research.** Comparisons with existing research are limited because most research on identifying patients at risk of violence on arrival is limited to observational studies (Jackson et al., 2014). Jackson et al., (2014) used non-participant observation with a small sample of 36 patients to test an 18 item violence risk assessment tool in ED. There were five behavioural cues that predicted physical violence: resisting care, yelling, aggressive statements, abusive language and prolonged or intense staring. The methodology for this research required observation to commence once a patient had displayed one of the violence cues. This is problematic as the current study has confirmed that not all patients will have warning signs of violence. In practice, noting the presence of one of the 18 items, then noting the presence of one of the 5 items, may be a challenge in an ED setting where rapid decisions are made. Furthermore, language and yelling may be interpreted differently between staff, so ultimately risk is determined based on the nurse’s clinical judgement and perception of risk.

The predictive ability of the violence risk screening process in the current study was comparable to previous research identifying who is at risk on admission to an acute hospital (Kling et al., 2006). The process developed by Kling et al., (2006) required a checklist to be completed on admission to acute health, but at times it was completed after an actual incident occurred. The sample was small (N=268) compared to the current study, but the sensitivity was higher at 71%, and the specificity was lower at 94%. Kling et al., (2006) examined the usability of using an alert process for violence, and found that staff did not rely on the checklist and preferred to use their own judgement. This
supports the approach described in this thesis to identify the risk of violence based on structure professional judgement, with decisions made during 2-5 minute triage interactions on arrival to ED. The maximum time each patient spends in ED is 24-hours.

The sensitivity established in the current study compared favourably to a more complex process described in a mental health setting. A brief five item tool was used on admission to a psychiatric hospital with 338 patients to evaluated aggressive behaviour during the admission (McNiel & Binder, 1994). This tool reported a sensitivity of 57.2%, specificity of 70.0%, positive predictive value of 59.0%, and negative predictive value of 70.6%. This study by McNeil & Binder (1994) had a similar sensitivity and a lower specificity, yet the process for identifying risk was more complex, and the time frame from assessment to violent incident was considerably longer than an episode of ED treatment.

McNeil et al., (1994) concluded static factors may be suitable to predict risk in long-term settings and dynamic factors were more able to predict the risk of violence in short-term settings, and this is relevant to ED triage. However, a violence risk identification process that combines past history of violence (static) and triage nurses perception of the risk of violence (dynamic) is preferable in an ED context.

Risk identification and violence prevention. Emergency department staff support the view that early identification of patients at risk of violence and appropriate intervention has a positive effect on the outcome of clinical situations (Chapman, Perry, Styles, & Combs, 2009b). The purpose of identifying patients at risk of violence on arrival is for prevention, however, this has been questioned by Kling et al., (2006). Although Kling et al., (2011) found an alert system for violence identified 71% of patients who were violent, it was not clear why the violent incident could not be prevented. Kling (2006) has stated, "Use of a flagging system should result in a decrease in overall violent events" (p.486). The expectation that identifying patients at risk of violence can prevent a Code Grey response in an ED setting is problematic. For example, an intoxicated person identified at risk may wake up and try to leave. In practice, a Code Grey response may be called to stop the person while he is reviewed to
ensure they are medically safe to leave. In this situation identifying the patient at risk prompts staff to be aware of the risk, clarify treatment plan, and seek early review but this may not prevent a Code Grey response. For this reason, expecting prevention of all violence may be unrealistic and could give staff false expectations. Early identification however should result in increased planning to improve the management of violence incidents when they do occur.

The identification of risk is therefore designed to increase staff awareness and potentially alter staff behaviour and care planning, however, it may not alter a patient's behaviour and prevent violence. A distressed patient who is psychotic will still be psychotic, and it is appropriate staff intervention that will provide optimal care and reduce the risk of a Code Grey response. If a Code Grey response is warranted then planning, early intervention, and de-escalation is the preferred intervention, rather than using coercive interventions.

**Limitations of predictive analysis.** Using sensitivity as a measure of effectiveness for violence risk screening is problematic. Violence prevention strategies may reduce the number of Code Greys and subsequently the sensitivity. Over half the patients who required a Code Grey were identified, and each month over 100 patients were identified at risk but did not require a Code Grey response. Although this may be seen as the violence risk screening not being accurate, it is possible that interventions for prevention minimised the likelihood of these patients requiring an emergency response. Not all actual or potential violence will require a Code Grey, and staff in the ED may have a high threshold for violence. Furthermore, the threshold to call a Code Grey is subjective and there is no agreed level of behavioural disturbance that warrants a Code Grey response. For this reason it is possible that patients who were identified at risk of violence and did not require a code grey response still exhibited some behaviours that may have been perceived as violent by some staff.

This phenomena has previously been described by Lamont and Brunero (2009), who noted that there is a conflict between using the measures of sensitivity to evaluate risk assessment from a research point of view when the awareness of risk may change behaviour. Also, prevention may reduce the
predictive ability of a risk assessment process because staff have intervened and effectively lowered the sensitivity of the tool being evaluated.

Sensitivity is a measure of predictive ability; however, this measure can be misinterpreted if the context and risk management is not addressed. This has been highlighted by Belfrage (2012), who reviewed 216 risk assessments conducted by police in Sweden to explore recidivism and preventative actions by police, following assessment of the risk of intimate partner violence. Although the predictive ability initially appeared poor, further analysis found police increased the number of interventions for preventions to people identified as high risk. In this group, there was a significant reduction in recidivism. Belfrage (2012) has called for research to address the relationship between the prediction of risk and risk management and prevention.

The use of sensitivity and specificity to determine the effectiveness of risk screening has been questioned, as there is no acceptable level of sensitivity and specificity (Almvik, 2000). In this study the sensitivity was 56% and in practice this means over half the patients were identified. Critics of risk screening processes will point out this also means nearly half of the patients were not identified on arrival to ED. Furthermore, if the sensitivity was 90% it is not clear that this would indicate staff and patients were any safer. It could be argued the higher the sensitivity the less effective prevention strategies were.

**Violence risk screening and affect on workload.** The usability of a risk screening process can determine if it will actually be used (Toll et al., 2008), and the impact it has on workload is a major consideration at ED triage. The number of patients identified at risk was monitored during the 3-month pilot and 6-month evaluation period. On average 1.8 patients per shift were identified at risk of violence. This number increased to 2.4 per shift when the PhD candidate left reminders, and returned to 1.8 per shift when no reminders were left. The reminders were a small wrapped chocolate with a note advising violence risk screening had commenced. There are approximately 170 presentations per day across the morning, afternoon and night shift. The small number of patients identified at risk of violence confirms introducing the integrated risk screening process at triage did not have a negative effect on the triage nurses workload.
What is interesting is that the number of presentations screened at risk of violence was not higher. An average of 1.8 patients were identified each shift confirmed the violence risk screen is not overused and triage nurses are conservative in their assessment of the risk of violence. It is possible ED nurses have a higher than usual tolerance to violence given staff experience nearly 2,000 Code Grey responses per year.

**Summary of predictive ability.** The perception of the risk of violence is subjective yet evaluated with an absolute measure. It is likely that the sensitivity for predicting violence at triage will never be 100%, however, the current sensitivity and specificity could be monitored to explore how this may change over time. The predictive ability of the violence risk screen was acceptable and comparable to more complex processes. This evaluation had a large sample size and the review of patients not identified correctly at triage allowed exploration of the proportion of patients that should be identified at risk of violence at triage.

**Influence of Violence Risk Screening on Code Grey Responses**

The influence of violence risk screening on the use of Code Grey responses was explored for 6 months before and after implementation. The frequency, location, duration and use of coercive interventions were explored.

**Frequency of Code Grey responses.**

There was no difference in the number of Code Grey responses activated, but there was a significant increase in the proportion of planned Code Greys. It is possible there was a lower threshold to call a Code Grey for patients that had been identified at risk of violence, and that this led to an increase in the number of planned Code Greys. There is a perception that planned Code Grey responses indicate a safer response for the patient and staff as they occur at a lower level of escalation and there is an opportunity for planning to minimise the impact of any violence. A Code Grey response, however, is also a coercive intervention and can be likened to a show of force. A show of force has been defined by Bowers (2012) as, “a number of staff are assembled within view of the patient, with the implicit or explicit threat the patient will be manually
restrained, or forced to undergo treatment, unless they comply voluntarily" (p.31). The reduction of unplanned Code Grey responses confirms staff are planning interventions and identifying warning signs of the increasing risk of violence. It is possible that the presence of the violence risk symbol prompted conversation about prevention and safety. The presence of the symbol may lead staff to be biased towards the patient. However, this study found there was no increase in the use of Code Grey responses.

**Duration of Code Grey responses.** The total time engaged in Code Grey responses decreased and from an organisational and resource managing perspective this could be viewed positively. The reduction in time engaged in Code Grey responses may also indicate improved decision making, clearer plans to intervene, and less waiting. From a consumer perspective, however, this may indicate there was less time engaged in de-escalation and seeking alternatives to coercive interventions.

**Location of Code Grey response.** There was a significant reduction in the proportion of Code Greys at point of entry, including in the ambulance bay, waiting room, and triage areas. In contrast, the number of Code Greys within the department increased. It could be argued that it is preferable to use Code Grey responses inside the department, where there are more staff members to assist, and more privacy for the patient. An alternative view is that more staff and other patients are exposed to a Code Grey response. From a triage perspective it is preferable to limit emergency responses in the waiting areas, as there are limited staff to contain the situation, and the triage has continuing clinical demands regardless of emergency responses in progress.

**Use of hospital alert process.** There was a significant increase in the use of patient alerts for past violence. During implementation staff were advised that an audit of the patient registration system for patient alerts and Code Greys in ED found only 2.9% patients had an alert for violence. This increased to 7% following the introduction of violence risk screening. The role of patient alerts for past violence (static), and identifying the risk of violence at triage (dynamic) raised awareness, and there was a significant increase in the use of the patient alert. The role of patient alerts and the violence risk screening decision support
process was accepted by staff. Staff members were clear that the two processes could be used simultaneously to determine past risk (static) of violence and current risk (dynamic).

Coercive interventions. There was an increase in the total number of coercive interventions used and a shift from intervening at unplanned Code Greys to planned Code Greys. Although it is preferable to intervene with a planned intervention, the overall increase in the use of physical and mechanical restraint was an unexpected finding. It would be unrealistic to expect the introduction of violence risk screening decision support process to prevent all violence. However, the purpose of violence risk screening is to increase awareness so staff can practice more safely, prevent violence if possible, and reduce the impact of violence on staff through planned and considered responses. Of concern, the number of Code Greys that used all 3 coercive interventions increased from 57 to 143. It is possible that with planning all three interventions occurred at the one Code Grey response, however, this does not explain the overall increase in the use of physical and mechanical restraint. There was no significant increase in the use of medication administered with security present, however the use of both physical and mechanical restraint increased. An alternative explanation is that there was less time engaging with the patient and restraint was used more quickly.

The number of Code Grey responses that used one coercive intervention reduced. A review of these Code Grey responses found medication use decreased, and physical and mechanical restraint use remained constant. Code Grey responses that used two coercive interventions mostly used physical and mechanical restraint. This is of concern as consumers report it is preferable to use medication (Allen & Currier, 2004). The use of medication may be seen as a form of chemical restraint, appropriate treatment of anxiety or clinical agitation. A further term has been coined “Therapeutic Sedation”. Therapeutic sedation is defined as the, “use of neuroleptics or anxiolytics (typically) to relieve excessive agitation and allow on-going care” (Knott et al., 2013, p.3). There is potential for therapeutic sedation to be perceived as a coercive intervention, especially if it is administered in the presence of security during a
show of force. Furthermore, in practice staff do offer an injection or oral form of medication, and although this is an implied choice, the degree of consent to medication administration is marginal at best.

The increasing use of coercive interventions is currently being addressed through Department of Health initiatives. The use of coercive interventions in ED has been noted and there is currently a focus to minimise the use of coercive practices for mental health patients in the ED (Department of Health, 2013). There is a lack of guidance for the management of acute agitation and minimising coercive interventions for patients not cared for under the Mental Health Act (2014) in an ED setting.

**Code Grey response and risk identification.** Introducing violence risk screening at ED triage resulted in staff being forewarned of the risk of violence prior to 61% of Code Grey responses. Using symbols on the ED work screen is consistent with other forms of practice, and there was support for this process. There were more planned Code Greys for patients correctly identified at risk than unplanned Code Greys for patients correctly identified. It is possible that staff had a lower threshold to call a Code Grey for this patient group, or the triage nurses correctly identified the patient who would require a planned intervention. This is supported by the finding that there were more unplanned Code Greys for patients not identified at risk of violence at triage. It is possible that this patient group were more unpredictable or escalated quickly and there was no opportunity to commence a planned Code Grey response.

**Use of violence risk screening and coercive practices.** The relationship between patients identified at risk of violence and the total number of coercive interventions was established there was an increase in the use of coercive interventions following the introduction of violence risk screening. There was potential for staff to use more mechanical restraint, and use the risk of violence as justification for this. The use of coercive practices and the identification of the risk of violence at triage found there were more coercive interventions used for patient who were identified at risk of violence. It appears that the triage nurses were identifying the correct population, however it was hoped that the frequency of coercive interventions might reduce. At the study
site, Code Grey data is monitored quarterly and there has been increasing use of coercive practices over the previous three year period. This indicates the introduction of violence risk screening did not account for this increase in isolation, as the increasing use of coercive intervention was noted prior to the implementation of violence risk screening. Regardless of this, the increasing use of coercive practices has become apparent when there are government initiatives to reduce the use of restraint for all patients treated under the Mental Health Act (1986). For patients who are not treated under the Mental Health Act (1986) the same standard of care should apply and the coercive interventions should be monitored and minimised where possible.

**Comparison with existing research.** There is limited comparable research to explore where these findings fit with other EDs management of Code Grey responses. There is no agreed definition of violence and this study used the presence of a Code Grey response as an indicator of actual or potential violence. The presence of a planned or unplanned Code Grey response indicates a staff member felt there was an immediate or potential risk of violence. This was considered preferable to using staff assault as an indicator of violence because Code Greys data captures all the other violent incidents, whether verbal, physical or threatened violence.

There is no accepted definition of violence and this is thought to limit the opportunities for prevention. The lack of a definition has been considered problematic for researchers, yet clinicians are providing care to patients who are potentially violent. For this reason, the standard practice of calling a Code Grey was considered confirmation that there was a risk of potential or actual violence. Code Grey responses had been used at the study site for several years, and these responses have been used consistently over that period.

The culture and organisational policy for the management of violence at this study site promotes planned Code Greys as an intervention when there is potential for violence. Activating a planned Code Grey generates a response from security staff and senior staff. Planned Code Greys are called usually to intervene when there is a potential risk of violence to staff or patients and there is an expectation that there has been some degree of planning. Calling a
planned Code Grey at this time avoids relying on security staff to intervene during an unplanned Code Grey when there is less time to plan the intervention. When unplanned Code Greys are called there is an immediate risk of violence and the level of arousal for both staff and patient is higher. Higher levels of arousal result in de-escalation being harder to use and less chance of diffusing the situation (Richmond et al., 2012). Furthermore, there is also less time to consider staff safety, time for consultation, and planning the required intervention.

**Influence of violence Risk Screening on Access to Clinical Care**

The evaluation of violence risk screening decision support process included a review of access to care for patients who required a Code Grey response before and after violence risk screening was introduced. This included the time from triage to review by ECAT and medical staff, and time to first Code Grey response. Although the number of Code Grey responses remained constant, the proportion of presentations that required a Code Grey response reduced. The prevalence reduced from 1.69 to 1.51 following the introduction of violence risk screening. This data does not support research and opinion that violence in the ED is increasing (Kowalenko et al., 2012a).

**Time from triage to first Code Grey.** There was an increase in the median time from triage to the first Code Grey from 71.5 to 124 minutes following the introduction of violence risk screening. This is consistent with the reduction in the number of Code Grey responses called to triage and the increased use of Code Grey responses within the ED. Furthermore, the increased time from triage interaction to first Code Grey response suggests the management of potential and actual violence on arrival has improved. Triage nurses may have received an increased level of support and earlier decision making given that senior ED staff were aware of the patients arrival and they were seen more quickly.
**Access to care.** There was no significant change in the time from triage to review by a mental health clinician. This was consistent with baseline data. It is still possible that there was verbal advice given by mental health staff earlier, however, organisational data only captured when the patient was seen. There was a statistically significant reduction in the time from triage to review by medical staff which suggests patients who have a Code Grey are prioritised and not avoided. The intention of the risk screen alert was to highlight this patient group at risk and therefore provide early intervention and care planning to manage the risk of violence. It is not known if nursing staff avoided this patient group due to the alert.

**Influence of Violence Risk Screening on Triage Nurse Self-Efficacy**

There was no significant difference in triage nurses' perceived self-efficacy following the introduction of a violence risk screen at ED triage. The perceived self-efficacy analysis used matched pairs to explore the influence of violence risk screening on self-efficacy. Perceived self-efficacy has previously been measured to explore the impact of aggression prevention training for ED nurses (Lee, 2001) and general nurses in a rural setting including the ED (Hills, 2008). In both of these studies, self-efficacy was measured at one time point, and it was lower than the current study at baseline. In the study by (Lee, 2001) self-efficacy was $M=20.38$, $SD=5.5$ and in the study by (Hills, 2008) it was $20.1$, $SD=6.4$.

It is possible that the triage nurses at the study site already have a reasonable level of self-efficacy, and that further education and feedback on the impact of risk screening may increase self-efficacy over time. There is potential for self-efficacy to be explored alongside prevention interventions to establish if nurses believe they can prevent/manage and intervene effectively to manage the risk of violence.
The one component of self-efficacy that did increase and was statistically significant was how “in control” the triage nurse felt to manage patients at risk of violence. This increase may have been due to the revised violence risk screening process establishing clear expectations for the triage nurse. Triage nurses had a clear role to establish if the person was at risk of violence, communicate that risk and clarify whether the patient had been searched. This process was integrated into the triage assessment and accepted by triage nurses. In comparison, the initial violence risk screen was not integrated into practice, used consistently or integrated into triage nurse practice.

Alternative ways to increase self-efficacy need to be factored into violence prevention strategies as they are implemented. Perceived self-efficacy may be higher at baseline in this study because staff members have access to training, support, and an in-service program that uses reflective practice to explore contributing factors for violence in the ED. This intervention focused on the development and implementation of a violence risk screen, and the final evaluation was unknown to participants when they completed the questionnaire.

The DBSES (Hastings & Brown, 2002) remains a useful instrument because it has a small number of items, is easily completed and can monitor perceived self-efficacy over time. Self-efficacy remains important because low self-efficacy leads to worker stress, avoiding intervention and attributing poor outcomes to their own capabilities (Bandura, 1986). The development of self-efficacy is influenced by experiencing success at a given task, overcoming failure, observing others succeed and social persuasions (e.g. Verbal persuasions) (Bandura, 1986). Given the low association between self-efficacy and aggression prevention training (Hills, 2008), and no association with the introduction of violence risk screening in the current study, further research is required to explore interventions that will increase and sustain perceived self-efficacy.
Summary

This chapter described the research conducted to explore the predictive ability and influence of violence risk screening decision support on use of Code Grey response, access to clinical care and triage nurse self efficacy. The predictive ability was acceptable and this was based on an understanding that not all patients have warning signs of violence at triage. There was improved management of the risk of violence on arrival with more timely review by medical staff and increased time from arrival to first Code Grey response. There was a small reduction in the proportion of presentations that required a Code Grey response and an increase in the use of coercive practices. The final chapters will discuss the principle findings and theoretical implications of this research. The strength and limitations of this research and the implications for patients, staff and the organisation will be addressed.
Chapter Eight: Discussion

The research described in previous chapters of this thesis was designed to evaluate the process and outcomes of violence risk screening at triage, and determine its influence on clinical care, emergency responses to patient violence (Code Grey events), and user self-efficacy. The risk factors for activation of an emergency response to patient violence, and the predictive ability of the risk screening process to identify the need for a coordinated clinical and security response was measured. This chapter integrates the outcomes of the literature review and key findings in relation to each of the research questions and then goes on to provide a critical analysis. The theoretical implications, strengths, and limitations of this research are presented and the utility of violence risk screening in the context of prevention are discussed.

A comprehensive critical review of the peer reviewed and grey literature from 1990 to 2015 found patient violence was a significant problem and prevention required a process to identify patients at risk. Although violence risk assessments have been developed for mental health settings, there has been no process validated for use at ED triage. Furthermore, there has been no evaluation of the accuracy of a violence risk screening decision support process or its influence on clinical care, use of emergency responses, and coercive practices.

Principal Findings

Observations of practice showed the existing violence risk screening process was not routinely used by triage nurses. Instead, triage nurses used clinical judgement in their assessment of the risk of violence and used both observed and reported information. Interviews with members of the general public, ED patients and their carers uncovered an expectation that patients who are at risk of violence would be identified and managed proactively. The retrospective audit of ED presentations requiring an emergency response for violence found the incidence of Code Greys to be 17 per 1000. Of these presentations, a small proportion of patients accounted for one third of all emergency responses. The median time from triage to first emergency
response was 77 minutes and identified the first 1-2 hours as a high risk period for violence. Alerts for past episodes of violence were rarely used in the ED.

The predictive ability of the violence risk screening decision support process found that the triage nurses could identify 56% (sensitivity) of patients who will require an emergency response for violence and 97% (specificity) who will not. The revised violence risk screen process was integrated into existing work flow and practices. An average of 1.8 patients were identified each shift as being at risk of violence, indicating a small proportion of ED patients are at risk of violence.

Post intervention it was found that patients who required an emergency response for violence were seen more quickly by medical staff but had a significantly longer length of stay in the ED when compared to baseline data. There was no increase in the number of emergency responses for violence however the proportion that occurred at triage as opposed to inside the department was significantly less after the intervention. The introduction of violence risk screening did not have a significant impact on the number of presentations that required an emergency response.

An unanticipated outcome of this study was the significant increase in the use of physical and mechanical restraint following the introduction of violence risk screening. Most concerning was an increase in the proportion of emergency responses that used all three coercive interventions, despite a significant reduction in the duration of time staff were engaged in resolving the incident.

Development and Implementation of Violence Risk Screening at Triage

An outcome of this research was the development of a process for triage nurses to identify who is at risk of violence based on clinical judgement. The final intervention required the triage nurse to complete one question on the electronic triage screen based on their clinical judgement rather than a set of scripted questions. The question was “At risk of violence/aggression”? If the triage nurse perceived the patient was at risk of violence, they clarified whether the patient had been searched and communicated the risk of violence to the receiving team. Once the triage nurse identified a patient at risk of violence, a symbol was visible next to the patient’s name to notify all staff who provide care
that the person was considered to be at risk. The violence risk screening process developed was congruent with a population based approach, rather than selective screening of subgroups, such as patients referred for a mental health assessment. This research found only one third of patients who required an emergency response were referred for a mental health assessment. This is supported by Lyneham (2000) who found ED nurses perceive waiting times and drug and alcohol use as contributing to more violence in ED compared to mental health issues.

Observation of triage practice found nurses identified the risk of violence using clinical judgement. Triage nurses did not rely on known risk factors such as intoxication or requiring a mental health assessment in isolation, but incorporated this information with the triage assessment to determine the risk of violence. Furthermore, observations showed that direct questioning for victims of assault to identify the risk of violence to others was not feasible. It could be potentially distressing to ask a victim of an assault if they have been involved in any assaults recently. In these cases, the triage nurses also applied their clinical judgement to ascertain the risk of violence. This patient group should not be asked direct questions at triage due to a lack of privacy; it may be therapeutically unhelpful to engagement and add to the trauma already experienced. Furthermore, this type of questioning is more suitable when conducted in private and not all information needs to be obtained at triage (Sulfaro, 2009).

The use of clinical judgement acknowledges risk is dynamic and incorporates known actuarial risk factors. Situational factors, such as intoxication, are also included in the determination of risk (National Institute for Clinical Excellence, 2005). Actuarial risk factors are static factors such as age, gender and history of violence and are rated in a standardised way, with no reference to clinical judgement (Grove et al., 2000). This information was available to the triage nurse during the existing triage assessment. Patient alerts for past violence were also displayed on the electronic triage screen and medical record.
To characterise static risk factors, a retrospective analysis of all presentations and emergency response data was conducted over a 12 month period. This analysis found a number of static factors increased the likelihood of an emergency response (arriving with the police or being referred to mental health for assessment). However, these static risk factors alone predicted 7% of patients who required an emergency response. Analysis of ED presentations who were screened as positive for risk incorporating dynamic risk factors was found to have a predictive ability of 56%. While these proportions need to be considered in the context of individuals positively screened at triage rather than all ED presentations, dynamic factors appear to contribute to substantially to violence risk. These findings are consistent with reports of warning signs for violence and short term prediction of violence (Luck et al., 2007; McNiel, Binder, & Greenfield, 1988). There was no guidance in the literature to support using direct questions to screen all presentations to ED for violence. Figure 8.1 shows the violence risk screen decision support process incorporating both actuarial risk factors and clinical judgement.

**Figure 8.1 Violence Risk Screening Decision Support Process Informed by Actuarial Risk Factors and Clinical Judgement**
Although a direct approach to questioning patients to determine risk for violence has been applied in other settings, such as mental health, the lack of privacy and time constraints in the ED waiting area limit this approach in practice (McNiel & Binder, 1994). Furthermore, the types of clinical presentations observed in the current study were not suitable for scripted questions due to intoxication, acute mental health symptoms or level of patient distress following an alleged assault. Observation of practice confirmed triage nurses were able to identify observable risk factors for violence and this is consistent with previous research (Luck et al., 2007).

A key aspect of the triage role is to balance the clinical need for care according to urgency with access to available resources. Although there was potential for violence risk screening to be overused, there was no evidence that this occurred. There was no literature found to establish whether ED triage nurses over or under estimate the risk of violence for comparison with the current study. The proportion of presentations identified at risk of violence was small and this was consistent with the number of presentations who required an emergency response for violence. The perception of violence is subjective and different triage nurses may have a higher or lower threshold when determining if a person is at risk of violence. If violence risk screening was overused, the presence of the violence risk symbol could elicit a minimal response from staff. Of all patients identified at risk, 1 in 4 required a Code Grey response for violence which was acceptable in clinical practice. It is reasonable and acceptable in clinical practice for patients to be identified at risk of violence but not require an emergency response for violence.

From a workload perspective, only 1.7% of presentations required an emergency response for violence, so utilising triage resources to ask all presentations direct questions was not supported by key stakeholder consultation. Direct questioning is more resource intensive compared to the violence risk screening process implemented in the research. Concerns have been raised by ED nurses that triage has been used to screen for several organisational initiatives with little regard to whether this is appropriate and will impact the triage nurse function (Sulfaro, 2009). Despite this, a process to
address the risk of violence for all presentations was consistent with the standardised triage process that prioritises safety as the first consideration for all triage interactions (Gerdtz et al., 2007).

Although the proportion of presentations requiring an emergency response for violence was small (1.7%), previous research confirms the negative impact of violence on the functioning of ED (Knowles et al., 2012). The ED is a time critical environment and observational research of violent incidents confirms that each incident disrupts the staff’s attention from other clinical tasks as several staff are required to safely respond to each incident (Knowles et al., 2012). The cost of responding to patient violence has not previously been estimated. This research established staff were engaged for 613 hours resolving emergency responses for violence in a 12 month period. This demonstrates that a substantial resource is being mobilised to manage the problem of patient violence. Violent incidents in the ED have been described as unpredictable and other patients are unlikely to have had previous exposure to such a level of verbal and physical violence (Knowles et al., 2012). Although research found no association between patients’ levels of anxiety and witnessing an emergency response for violence, patients wanted to be reassured and advised that the situation was under control (Lim et al., 2011).

The first 1-2 hours following triage was found to be a high risk period for an emergency response for violence. Identifying patients at risk of violence on arrival provides an opportunity to plan care that could reduce the risk of violence (Forster et al., 2005). Early identification of high risk patients provides an opportunity for senior staff to make rapid treatment decisions, prompt referrals, and prioritise and allocate required resources. In ED, interventions that occur include allocating the patient to a high visibility area, notifying staff of the risk of violence and being aware of the patient’s location in the ED. Although prevention is regularly promoted, there is a lack of evidence based interventions for violence prevention (Anderson et al., 2010).

The current study identified an increased risk of an emergency response for violence as the length of time in the ED increased. Waiting times are considered a precipitating factor for violence by staff (Lyneham, 2000) and
although the current study found patients who required a Code Grey were seen more quickly, any amount of waiting may be difficult for some patients and may still be perceived as a contributing factor by staff.

In addition, the length of stay for patients who required an emergency response was greater than patients who did not. It is possible that the length of stay was due to increased complexity of the presentation. Adequate patient flow through the ED is required and a National Emergency Access Target of 4 hours was introduced to reduce the period of time patients spend in the ED (Department of Health and Aging, 2011). For this reason, disruption to an EDs functioning due to emergency response for violence and increasing the length of stay has potentially serious implications for patient flow.

**Patient alerts.** The practice of using patient alerts for those with a history of violence was guided by hospital policy, but this study found they were not used as intended. This may have been because staff members were unclear of the process and the patient registration system recently had been changed. This is concerning, since research indicates that a past history of violence is the best indication for future violence (Sands et al., 2012). The patient alert for past risk of violence can be combined with dynamic and/or observable risk factors for violence utilising information available at triage. Prevention requires both processes to be implemented, evaluated, and monitored for effectiveness.

The current study confirmed that patient alerts for past violence were useful in a small proportion of patients who presented to the ED on more than one occasion in a 12 month period. This information could contribute to prevention by forewarning staff of strategies for prevention. At the study site there was a working group that developed management plans for patients who regularly present and require emergency responses for violence. For example, management plans can make recommendations advising who should see the person, the need for security to search for weapons, and what medical care is usually required. This is consistent with previous research by Drummond et al., (1992) that found developing management plans for high risk patients resulted in a reduction of incidents. The reduction of incidents was attributed to providing information to staff on individualised strategies for violence prevention.
A process to manage the static risk of violence is vital, as this study has identified that not all patients will have observable signs of violence at triage. This confirms previous research by McNeil and Binder (2003) that there is a role for identifying both dynamic and static risk factors. In short term settings such as the ED, identifying dynamic risk factors is likely to be more reliable than static factors which are more useful in longer term settings (McNeil & Binder, 2003).

**Establishing the Risk for Violence at Triage**

The violence risk screening decision support process used a combination of static (patient alert) and dynamic (observable) approaches to identify the risk of violence. Violence risk screening was integrated into triage nurse practice and not overused. Triage nurses identified who was at risk of violence on arrival and following pilot testing, a further 6 month evaluation found the sensitivity was 56% and the specificity was 97%. Triage nurses were able to use the revised violence risk screening process without interruption to their work flow.

Sensitivity was used to calculate the accuracy of risk screening at triage, however there was no intention that 100% of patients who are identified as at risk for violence at triage will go on to become violent. In practice though, the sensitivity had to be acceptable or the use of the violence risk screen would have been questionable. The positive predictive value was 24% and confirmed that not all patients who are screened positive for risk of violence at triage will go on to require an emergency response for violence. This finding provides some support to opponents of violence risk assessment processes that states they are not accurate and there are too many false positives (Large & Mullin, 2011). However, if every patient who was identified at risk became violent, then the role of interventions for prevention would need to be questioned. In the current study the rate of false positives was acceptable to key stakeholders. A negative risk screen is not a guarantee that a patient will not require an emergency response for violence, and violence risk screening does not replace monitoring the patient’s response to clinical interventions. There may be
environmental factors that were not evident at triage, but may increase the risk of violence (Kling et al., 2006).

The accuracy of risk screening is evaluated using estimates of sensitivity and specificity and these measures originated in diagnostic research (Altman & Bland, 1994). In diagnostic research, the higher the sensitivity, the more accurate the process. In comparison, when identifying the risk of violence, there are environmental factors that can influence the risk of violence and the perception of risk has some degree of subjectivity. A limitation of this approach to evaluation however is that violent incidents that have been prevented cannot be measured (Lamont & Brunero, 2009).

A review of triage presentations not correctly identified at risk of violence on arrival was conducted to help inform what was an acceptable and achievable level of sensitivity. This approach addressed criticisms of risk identification processes that do not explore the proportion of "false negatives" (Toll et al., 2008). Furthermore, this analysis identified that not all patients who required code grey responses had exhibited warning signs of violence at the time of triage.

The literature review showed there are few tools developed to identify the risk of violence on arrival to the ED. Kling et al., (2006) developed a set of 11 criteria to identify patients at risk of violence and used focus groups to explore the usability. Kling et al (2006) found nurses would override the tool, rely on their own clinical judgement, and they were not consistently used for all presentations on arrival. This is consistent with research that concluded that the usability of decision support processes must be appropriate to the context. Nurses will override algorithms or manipulate responses when they are aware of patient factors, not taken into account in the algorithms, to get an appropriate clinical outcome (Dowding et al., 2009). From an organisational perspective however decision making tools are implemented to improve consistency and if not used as intended or developed to suit the context in which they are used, consistency may actually reduce. Other tools have been developed but never evaluated or used in clinical practice (Wilkes et al., 2010; Work Safe, 2008).
The estimates of sensitivity and specificity established in the current study are comparable to existing research. A violence risk assessment checklist on admission to an acute hospital with a small sample of (n=268) found a sensitivity of 71% and specificity of 94% (Kling et al., 2006). An actuarial violence risk screening tool used on admission to a mental health unit had a sensitivity of 57.2% and specificity 70% (McNiel & Binder, 1994). Although the authors suggest different variables may be more relevant for other settings such as EDs, the current study had a much higher specificity and comparable sensitivity in the absence of a diagnostic interview and was completed in the challenging ED triage environment. This is significant because the current study relied on the existing triage assessment to determine the risk of violence. Furthermore, the triage assessment is time limited and structured checklists were not completed to determine the risk of violence for individual presentations.

Violence risk screening is more closely aligned with a process referred to as risk categorisation than risk assessment using actuarial tools. This approach requires the clinician to identify who is at increased risk of violence based on known risk factors, common sense, and collaboration which is considered to be in line with societal expectations (O'Connor, Allan, & Scott, 2014). Success is not measured by prediction, but through prevention and risk minimisation by controlling the factors that increase risk. A risk categorisation approach also uses information obtained from families and aims to explore the situation for the patient. This approach does not depend on “tick boxes” and is considered to be more useful in the real world. Commentators on risk assessment agree that the best care possible should be provided and that care should be individualised. O’Connor (2014) argues that this implies risk categorisation already occurs in practice. The risk categorisation approach (O’Connor et al., 2014) is consistent with the risk analysis model (Lamont & Brunero, 2009) in that they provide a framework to identify and manage the clinical care of patients identified at risk of violence.
Usability of the risk screening process. The revised violence risk screening process was integrated into triage nurse practice and there were no reports of a negative impact on workload. On average there were 1.8 presentations identified at risk of violence each eight-hour shift. The violence risk screening question was located on the triage screen and was the final component of the triage assessment to be recorded. Having an established communication pathway provided a clear expectation for triage nurses without increasing their workload. The revised violence risk screen was not intrusive, and did not delay access to care. Most importantly, the information required to complete the violence risk screen was available and obtained during the triage nurse’s assessment. Previously risk assessment processes have been criticised when the information required is not available to complete the assessment (Zarola et al., 2008).

The violence risk screening process was integrated into the existing electronic triage screen and did not require any capital expenditure. Interventions for implementation used existing nursing staff handover time and minimal questions were raised by staff. Although additional support was offered to nursing staff, this was not required. There was support from nurses working in the cubicles for their colleagues at triage to identify who was at risk of violence because this allowed them time to prepare, consider prevention, and their own safety. Moreover, because violence risk screening was integrated into the electronic triage screen, completion was mandatory and was not dependant on nurses completing paper based tools.

The violence risk screening decision support process applied a consistent approach to identifying patient at risk of violence specific to the ED triage context. It has been argued that introducing a risk screening process with education of specific risk factors could lead to improved outcomes even without a screening tool (Anthony, Parboteeah, Saleh, & Papanikolaou, 2008). This suggests that processes to identify patients at risk of violence should focus on awareness and building staff capacity, rather than developing a tick box form. Situational factors, such as communication skills, level of cooperation, and known observable risk factors are dependent on triage nurse perception of
behaviour (Sands et al., 2009). Although these items could be added to a checklist type tool that is quantifiable, it is still identifying the risk of violence based on perception of risk using clinical judgement. Furthermore, items may not be rated consistently due to known variability among triage nurses (Creaton et al., 2008), and the subjective nature of the perception of the risk of violence. Identifying the risk of violence requires staff to intervene, and for this reason self-efficacy is important, as nurses will not intervene if they do not perceive they are capable.

**Limitations of violence risk screening.** There is an expectation that organisations promote evidence based work practices. However, there is conflicting evidence in the literature both supporting and criticising processes used to identify patients at risk of violence (Muir-Cochrane & Wand, 2005). There are extensive criticisms of violence risk assessment and screening processes used in mental health settings (Large & Nielssen, 2011). These include poor predictive ability, lack of consumer involvement, and the potential for care to be based on an incorrect assessment of risk. These criticisms need to be considered in the context of the current study. First, any screening tool needs to be clear about what is being screened for and what is the context of the screening result. In the current study, the risk screen was completed at triage, and therefore is based on a brief interaction, and the prediction of risk of violence is limited to treatment in the ED. The expectation that identifying patients at risk of violence will result in a reduction in the number of violent incidents can be problematic. Kling et al., (2003) has questioned the usefulness of risk screening assessment and screening if there is no reduction in the number of incidents.

**The Influence of Violence Risk Screening**

The development and implementation of a violence risk screening decision support process has implications for the organisation, staff, and patient care. From an organisational perspective, the duration of emergency response and length of stay for patients who require an emergency response have been explored. From a staff perspective, there was a reduction in the number of
emergency responses at triage and an opportunity for prevention. Access to medical care and use of coercive practices during emergency responses can affect the patient’s experience in the ED.

**Duration of emergency responses.** Post intervention there was a reduction in the duration of emergency responses. This may be attributed to staff planning interventions prior to activating an emergency response for violence. Furthermore this resulted in a reduction in the resources required for the management of violence. This finding suggests there has been a structured intervention during the planned emergency response, however, it may also indicate that staff are more confident and therefore required less time to engage with patients at risk of violence. If, however, there was less time for de-escalation and coercive interventions were not used as a last resort to save time, this would have a negative impact on patients. There is no existing literature on the use of emergency responses for violence to make comparison. The economic cost of emergency responses for the prevention and management of violence in health care remains unknown.

**Emergency department length of stay.** A comparison of patients who required an emergency response at baseline and following the introduction of violence risk screening found the length of stay had increased. The increased length of stay for this patient group may indicate that the person was intoxicated or received sedating medication. This is supported by the increase in the proportion of emergency response that used medication in the presence of security, physical and mechanical restraint. Although sedating medications may be used to minimise or avoid physical and mechanical restraint and contain behaviour, these medications can delay discharge home or transfer to a mental health inpatient unit. The increased length of stay is a significant issue for ED because adequate patient flow is required to minimise access block and provide an appropriate disposition (Department of Health and Aging, 2011).
Emergency responses at triage. Following the intervention the number of emergency responses remained constant across the whole ED, however the proportion occurring at triage as opposed to in the ED patient cubicles reduced. This result was consistent with an increase in the median time from triage to first emergency response for violence. This is important as there are fewer staff available at triage, limited privacy for the patient, and new patients arriving constantly requiring triage nurse assessment.

Following the introduction of the violence risk screening decision support process, the number of presentations who required an emergency response for violence remained constant. The perception among ED nurses that the number of patients who become violent is increasing (Knowles et al., 2012) was not supported by this research. The reported increase of violence in EDs may be attributed to the methodological inconsistencies reporting prevalence and a lack of a standardised way to monitor violence in ED even though this has been called for (Kowalenko, et al., 2012b).

Access to medical treatment. Patients who required an emergency response for violence were seen more quickly by medical staff when compared to patients who had code grey prior to the introduction of violence risk screening. The reduced time from triage to review by medical staff was consistent with the expectation that the triage nurse notifies the receiving team that a patient is at risk of violence. Earlier review by medical staff may have provided some support for triage nurses who were monitoring patients following triage in the waiting room. This finding indicates that access to initial medical assessment was not hampered by the risk screening process.

Care planning and prevention. There was an increase in the proportion of planned emergency responses and a reduction in unplanned emergency responses following the introduction of violence risk screening. At the study site planned emergency responses are called to manage the potential for violence. In these situations security staff provide a “back up” role and allow staff to provide required care knowing security are in attendance should they be required. The increased use of planned emergency responses observed in this research suggests staff intervened earlier and the emergency responses were
activated at a lower level of escalation rather than waiting for the risk of violence to be considered immediate. Intervening at a lower level of escalation is consistent with prevention strategies that call for de-escalation to commence as soon as possible when they are most likely to be effective (Holloman & Zeller, 2012). The increased use of planned response indicates early warning signs for violence were recognised and responded to.

The introduction of violence risk screening may have led to changes in work practices. Practice changes could be attributed to triage nurses and nurses inside the department having an established process to identify who is at risk and a communication pathway in the ED. Following the introduction of violence risk screening ED nurses and doctors were forewarned of the risk of violence by the presence of the violence risk screening symbol for 61% of emergency responses. Being forewarned provided an opportunity for prevention such as early medical review, and access to a suitable cubicle within the department where there were more staff available to provide care.

Organisations often use multiple interventions for prevention. Combining a risk assessment process and violence prevention training has been successful in reducing the number of incidents of violence in mental health units (Needham et al., 2004). In acute settings there has been limited violence prevention and intervention studies. An approach developed in the UK called Safewards for use in mental health units has developed a model with six domains to reduce the conflict and need for containment (Bowers, 2014). This model acknowledges the modifications in the staff team, environment, stressors outside the hospital, patients community and patient factors that all interact within the regulatory framework. One example is to focus on shared expectations for both staff and patients rather than patient rules. Although this was developed in a mental health setting, there are some principles that could be incorporated into work practices in ED, particularly engagement with patients and a collaborative approach to care.
Use of coercive interventions. The increased frequency of coercive interventions used during emergency responses following the introduction of violence risk screening requires consideration. Locally, there are government initiatives (Department of Health, 2013) to reduce seclusion and restraint in mental health settings, however these initiatives need to be replicated in the ED for all patients. Only a third of emergency responses were activated for patients who required a mental health assessment, yet the same standard of care and monitoring should be required regardless of the Mental Health Act (1986). Patients who do not require a mental health assessment may still be experiencing a medical condition and be unable to consent to the necessary care or treatment. Regardless of the primary cause, the person’s capacity to consent to care has been impaired and treatment is provided against the persons will. What is problematic is the lack of central reporting or monitoring of mechanical restraint to manage the risk of violence in the ED for patients who are not treated under the Mental Health Act (1986). Without this, the rationale, frequency and duration of mechanical restraint remains unknown for patients not treated under the Mental Health Act (1986).

The use of the term chemical restraint is problematic. The term is used negatively and suggests that patients are sedated as the preferred management strategy to contain behaviour. Chemical restraint has negative connotations and is regarded as a practice to avoid, yet in an ED setting the emergency use of appropriate medications would be expected to reduce the person’s level of agitation. Sedative or antipsychotic medication may also be used due to advanced directives and be clinically appropriate so the term chemical restraint is not entirely accurate. Furthermore, the need for sedation may be required to allow for adequate medical examination and medical care. An alternative description of medication used to manage agitation is the term “therapeutic sedation” (Knott et al., 2013). Therapeutic sedation is used when medications are used to reduce agitation and the threat of harm to self or others.

There were more coercive interventions used at planned emergency responses than unplanned responses following the introduction of violence risk
screening. However, if coercive interventions were used as a last resort, then the reduction of these interventions during unplanned emergency responses suggests that coercive interventions were not used to manage an immediate risk. For this reason it is not clear that coercive interventions were in fact used as a last resort. An alternative view is that without some intervention, situations would have escalated, and medical care and assessment would not have been possible. This may result in the activation of an emergency response at a higher level of escalation which in turn increases the risk for patients and staff.

The concept of restraint use only being used as a last resort has been questioned. Ryan and Bowers (2006) conducted content analysis of incident reports when restraint was used on a psychiatric in-patient unit in the United Kingdom. They reviewed 403 incident reports and found nearly half of the requests for restraint used were made during a planned response. This has been highlighted by Bowers (2012), because if the incident is planned, it is not clear whether restraint was really used as a last resort. The rationale for restraint use was not always associated with violence. Restraint use was instead attributed to forced treatment and detention against a person’s will, rather than prevention and management of violence (Ryan & Bowers, 2006).

A UK study has highlighted that a “show of force”, which is designed to threaten the patient to comply, is also a coercive intervention (Bowers et al., 2012). This study was conducted in the UK where a policy of zero tolerance to violence had been used and then removed from government policy due to negative outcomes for staff and patients. This experience may have increased the awareness of coercive interventions. This view raises awareness of how interventions for safety such as emergency responses (Code Grey), although designed to make staff members and patients physically safe, are in fact a further coercive intervention. An alternative view is that a “show of force” provides support for staff to deescalate a situation and feel safe providing clinical care and this provides opportunities to safely trial less coercive interventions. It appears that coercive interventions are used on a continuum, and a show of force may be perceived as preferable to physically restraining a patient. McCue (2004) implemented a program of restraint reduction in one
American psychiatric hospital, and noted that a show of force through the presence of a crisis interventions team could be used as an alternative to physical restraint. Bowers et al., (2012) suggests that rules, routines and good ward structure may reduce the reliance on security and use of restraint. This approach is more aligned with a therapeutic milieu which mental health wards aim to create, however the same principles have not been integrated into ED.

Coercive interventions such as physical restraint and administering medication in the presence of security have not previously been reported. These practices have been used for several years, and the consent and monitoring process of these interventions have not previously been explored. Providing an opportunity for a patient to comply with medication administration with security officers present has not been addressed as a coercive intervention. Existing research promotes restraint reduction by organisational strategies such as improved documentation and practice guided by policy (McMahon & Fisher, 2003). The revised Victorian Mental Health Act (2014) has addressed this issue. Under this Act, patients receiving treatment as a compulsory treatment will experience the same process for approval, monitoring and review for the use of physical restraint as mechanical restraint.

The Influence of Violence Risk Screening Process on User Self Efficacy

Triage nurses’ self efficacy was not influenced by the introduction of violence risk screening. Staff at the study site had already been exposed to targeted aggression prevention training and had a higher self efficacy score at baseline than reported elsewhere (Lee, 2001). The capacity of staff to intervene in the prevention and management of violence requires an acceptable level of self-efficacy. If staff members don’t believe they can achieve a successful outcome they will not intervene. This contributes to ongoing violence, and in a way supports staff members who feel they can’t intervene and that prevention is never achievable.

There is an expectation that nurses identify who is at risk of violence and commence strategies for prevention yet there is a call for nurses to reject the idea that violence is part of the job (Pich et al., 2010). Furthermore, industrially led campaigns supporting a “zero tolerance” approach to violence that advises
nurses not to tolerate any aggression or violence (ANF, 2010). Industrial policies supporting zero tolerance appear to contradict organisational values and this may lead to inconsistency in the management of this patient group.

Terminology to describe patients who are violent while receiving healthcare is almost always negative. Terms such as “repeatedly disruptive” (Drummond et al., 1989), “perpetrator” (Lim, Bogossian, & Ahern, 2010), and “assailant” (Ferns, Cork, & Rew, 2005) have criminal connotations. A perpetrator is defined as, “someone who has committed a crime, or violent or harmful act”, and an assailant as, “a person who attacks another person” (Cambridge Dictionary 2011). It may therefore be argued that these terms, do not accurately represent situations where patients become violent while confused, frustrated, or attempting to remove medical devices.

The repeated exposure to violence for ED nurses and doctors has the potential to influence future behaviour towards patients who are at risk of violence. Triage nurses manage several competing demands and it has been acknowledged that situational factors such as the ED nurse’s behaviour can create or exacerbate a potentially violent situation (Jones & Lyneham, 2000). A study by Whittington and Wykes (1994) measured anxiety and coping in 24 psychiatric nurses following an assault by patients. This research identified a third of participants used coping strategies that will affect the therapeutic relationship with patients. The coping strategies were escape/avoidance and confrontational approaches to working in the same environment. Escape and avoidance coping strategies are used to minimise the distress experienced by the nurse, including increased alcohol use and avoiding patients. This can be evidenced by talking longer tea breaks, sick leave or avoiding patient contact by remaining in the office. The confrontative coping approach involves attempting to spend more time with the patient who assaulted the nurse or more time with patients in general. Confrontative behaviours include trying to take control of the situation by demonstrating to the patient the nurse is not fearful and will not retreat from contact, or discussing feelings of the incident with the patient. A negative consequence for staff members who use a confrontative coping
strategy is the increased anxiety experienced compared to the escape and avoidance coping style.

A confrontative approach to coping with assault is problematic and may increase the risk of further assaults. Whittington (1994) has explored how the coping strategies employed actually increase the risk of assault. For example, a confrontative approach can be interpreted by patients as hostile and rejecting, which can contribute to violent incidents. Nurses who use a confrontative approach may put themselves into situations that aim to increase their control but actually place themselves and patient at risk of further incidents. In contrast, avoiding patient contact in the ED is problematic, as early intervention is required for de-escalation and prevention. This research was conducted with psychiatric nurses, yet the influence of staff behaviour towards patients at risk of violence has also been identified in an ED setting (Pich et al., 2011).

The phenomenon of high risk but low probability events can draw attention to isolated incidents and change a clinician’s practice (Large & Nielssen, 2011). Although high risk events may raise the awareness of violence, it does little to explore interventions for prevention. Furthermore, internal reviews of violent incidents may be traumatic for staff and generate feelings of blame. The purpose of reviewing incidents should be to support staff in preventing further incidents and reviewing patient, staff and organisational factors that contributed to the incident (Lamont & Brunero, 2009).

The role of blame following serious incidents when staff have been assaulted has been explored. Lanza (2011) suggests that organisations blame the victim rather than acknowledging that violence experienced by nurses is a real problem. Of more concern, co-workers often blame their colleague unless they have been previously assaulted (Lanza, 1992). There is potential for blame, as identified by Lanza (1992) to be confused with identifying the nurse-patient interaction as a situational factor that may contribute to a violent incident. Situational factors, such as nurse-patient interaction as described by Duxbury (2002) acknowledge the role of communication and the interaction; however the nurse is not blamed for the violent incident.
Implications of Research

This research was conducted at a single hospital site, which is located in Melbourne, a large Australian city with a population of over 4 million people, therefore it is site-specific. The triage nurses at the study site had participated in aggression prevention training, and were aware of the violence in the ED Action Group that was formed to prevent and manage the risk of violence in ED. The violence risk screening decision support process tool would need to be tested at other hospitals with comparable electronic triage screens and triage processes. The usefulness of violence risk screening would also depend on the availability of parallel process to record and identify patients who have a history of violence. Comparison with other sites use of emergency responses has not been possible as emergency response practices have only recently been standardised in the state of Victoria (Knott et al., 2013). Benchmarking will be possible in the future once these standards have been implemented in all Victorian hospitals.

Limitations of research design. Emergency response data and clinical information was obtained from hospital databases. This limited the responses to binary data, however, the sample size was large and this amount of information could not have been collected manually. A limitation of this approach is that data is restricted to what is routinely collected and information such as the duration of coercive interventions was not collected. This information could have explored whether there was an increase in the number of coercive interventions used however the duration may have decreased. Recording the type of medication used during an emergency response was not possible, as security only record whether medication was given and not what was prescribed. History of violence is a known risk factor for future violent incidents, however there was poor compliance with completing the patient alert card to record this information. This item was not included in the regression analysis because it was poorly used at the time of baseline data collection, however, a history of violence should be used for future analysis.
There was some risk of observer bias, as only the PhD candidate conducted observation of triage practice. A further period of observation was planned with a second observer, however as the risk screening questions were not being used at all, this was not conducted. To minimise the risk of bias, raw data was checked with the triage nurse to confirm interpretation at the time of the observation, discussed with the primary supervisor, and ED nursing education staff members who provide education to triage nurses. A further limitation is that during the observation of triage practice, nurses did not ask the violence risk screening questions yet the intention of this phase was to observe how the questions were used in practice.

There was potential that the behaviour of triage nurses was altered by the presence of the PhD candidate. To minimise this, the template for observations was shown to the participants so they were aware of what was being observed. It is unlikely that their behaviour changed as the information recorded is part of a structured approach to point of entry assessment for all patients who attend the ED. The information that was recorded during the observation was ATS, gender, mode of arrival, a summary of the questions and if the violence risk screening questions were asked. The triage nurses were aware that the purpose of observation was to observe triage interaction to see how the existing violence risk screening questions could be used in practice.

To minimise this risk, the observation template was shown to the triage nurses so they were clear on what was being observed. The PhD candidate was known to some of the triage nurses who were observed. The triage nurses were aware the purpose of the study was to review how they were using existing risk screening questions in practice. Nine nurses were observed and there was no evidence triage practices were altered due to the presence of the PhD candidate. This was confirmed with ED nurse educators who were part of the ED Violence Action Group.

The number of triage interactions and the number of triage nurse observed aimed to reduce the potential for observation to influence triage nurse behaviour. Despite this, the possibility that triage nurse behaviour was altered
by the presence of the researcher cannot be excluded. The triage nurses were aware that the researcher had no experience working in triage and was not an ED nurse therefore I would not have been able to critique their triage interaction from that perspective.

This study has limitations as the research focussed on the development and implementation of a risk screen process at triage. Evaluation over a longer time period could determine whether initial practice changes were sustained. At an interactional level, this methodology did not capture if nursing staff spent more or less time with patients who required an emergency response for violence. A further limitation of this research was the lack of the patients’ perspective during the evaluation of violence risk screening. Although patient and carer consultation occurred in the context of appraisal of violence risk screening, the patients perspective was not captured in the evaluation of the revised violence risk screening decision support process.

A limitation of the violence risk screening process developed was the absence of a “gold standard’ or test to measure an absolute indication of the risk of violence. The decision making by triage nurses to determine the presence or absence of risk was not articulated and measured. The actual decision to determine the presence of risk was based on observable warning signs and known risk factors such as arriving with the police, needed an acute mental health assessment, or known risk of violence. Further research could establish which components of each triage interaction confirmed the presence or absence of risk but this was not feasible for each of the presentations in a triage setting in the scope of the current research.

The perception of risk is subjective, and can be dependent on the triage nurse. This resulted in sensitivity and specificity being used to measure the accuracy of the triage nurses perception of the risk of violence.
**Strengths of this research.** Evaluating the influence of violence prevention initiatives conducted in ED is a complex issue. For example, a reduction in the number of violent incidents has been suggested as an outcome measure for violence prevention yet literature has established under reporting of violence incidents. In an ED setting, other indicators to evaluate violence prevention may include a reduction in the duration and frequency of mechanical restraint use and emergency responses to manage actual or potential violence. Establishing a process to include patients in research, such as participant action research would enable the evaluation to be conducted in partnership with patients (Baum, MacDougall, & Smith, 2006). Engaging patients in research who have been acutely agitated is ethically problematic because consent needs to be obtained and not all patients would recall their experiences. Despite this, research could include the patient’s perspective at a later date.

A mixed methods approach was used to inform the development of a violence risk screening process for ED Triage. Using one approach in isolation would not have provided the same level of understanding required to develop and implement a successful nursing intervention. Complex nursing interventions can be challenging to evaluate as it is difficult to attribute changes to the interventions developed in a dynamic hospital environment.

Methodological triangulation was used to combine both qualitative and quantitative research methods to provide a comprehensive approach to development of violence risk screening decision support process. This approach can be criticised because it is assumed that data collected using different research methods can be compared (Bowling, 2009). This approach explored the development from observation of triage nurses practice, a review of risk factors at triage and public expectations and this provided data to inform and support the acceptability, feasibility and useability of the revised process in practice.
Influence of the Researcher as a Participant

The influence of the researcher as a participant in the action research process needs to be acknowledged and carefully considered in light of the study outcomes. On reflection this research was conducted at my workplace. I had previous contact with staff in the ED when working in a training role facilitating in-service education in the prevention and management of violence in ED. Four years previously I completed a Masters degree at the study site. The Masters study involved in minimising mechanical restraint in acute health. This previous research in conjunction with a clinical role contributed to my awareness of the challenges staff face providing care to patients who may be violent and the need for practical interventions.

As a result of my employment I have a long term investment in the development of policy and procedures to improve the safety of staff and to provide appropriate care for patients with behavioural disturbance. I have been involved in working groups in the ED including Violence in ED Action Group and the ED and Mental Health Liaison Group. My intent in conducting this research was to develop an evidence-based process for violence risk screening that was both accepted by staff and useful in practice.

I recognise the potential for bias due to my existing relationship with ED during the observation of triage practice and development of the revised violence risk screening decision support process. To manage this bias, data recorded during the observation period was structured and consistently reported. Being known to some ED staff raises the questions of staff altering their interactions however the opposite is also a true. It is possible that the staff were comfortable, knew why they were being observed, and continued to triage patients as usual.

At this time the intention was to improve the violence risk screening and inform the ED nurses about how they can improve and use this risk screening process. Although the observation of triage nurse practice found the four violence risk screening questions could not be used in practice,
some time was spent looking at the order of questions and changing the wording of the questions. There was also consideration as to whether all presentations should be asked the violence risk screening questions or only patients that are identified as at risk because they have an established risk factor such as arriving with the police. The option of using the one question “Is the person at risk of aggression/violence?” did seem as though the risk screening process was being minimised. On reflection though, the observational study confirmed that this was the appropriate level of violence risk screening to be applied during the triage interaction.

In hindsight, if the observation phase did not occur I would not have had an appreciation of how triage nurses identify the risk of violence and would still be trying to implement the four violence risk screening questions. Any challenges during implementation may have been labelled as resistance from staff and its unlikely the violence risk screening decision support process would still be used in practice at the conclusion of this research.

Being known to some ED staff allowed for informal discussion which contributed to my learning about how triage operates, what is useful for staff and the challenges of working on the triage. Although I am experienced in mental health nursing, I had no knowledge of how ED and triage operates so I was guided by the input of ED nurses, consultation with the violence in ED Action Group and the ED Nurse Manager at the time who was also a member of these working groups.

The challenge of being a clinician versus a researcher was apparent during the intervention phase. At this time I could have continued with further implementation strategies, yet the interventions need to be recorded, and have clear pilot dates to allow for a pre and post evaluation. These challenges were addressed during research supervision.

The concept of violence risk screening being a success or failure required careful consideration. The original violence risk screening process consisted of four questions developed through The ED and Mental Health Liaison Group of which I was a member. From a personal perspective I agreed
a process to identify who was at risk was required, yet I had no idea how this would occur during a triage interaction or if the violence risk screen process should occur for every presentation. For example if a netball player presented with an injury consistent with sport, why would the triage nurse ask about recent harm to others or ideas of suicide?

To determine if there was sufficient evidence to use violence risk screening as an intervention for prevention of aggression, I had to consider what measures would indicate success. From a clinical perspective success might be gauged by the degree of acceptance and usefulness for staff working on the floor. A research based intervention requires more robust evidence that demonstrates a measurable and sustainable impact. This approach to evaluation can be problematic when the same measure may be interpreted differently. For example a reduction in Code Grey events may be seen as positive yet, the threshold for calling a code grey is subjective, so reduction in the number of code greys is not necessarily an indication of success.

Through doing this research I have developed an awareness of the complexity of developing nursing interventions. Interventions developed, implemented and evaluated in a clinical setting present methodological challenges but also have the benefit of local knowledge that supports engagement in research. I have an appreciation how triage nurses use their clinical skills to manage multiple and complex competing demands.

**Translation of Research Findings to Practice**

Action learning principles (Revans, 1998) informed the development of violence risk screening and used experts within ED triage to demonstrate current practice and identify deficits in the current process. This contribution of triage nurses was significant and supported the findings of the observational phase of this research. Although violence risk screening was used in a complex environment, the final intervention was relatively simple. The violence risk screen was consistent with the triage guidelines used in Australia (Gerdtz et al., 2007). In practice, the triage nurse used reported and observed information to determine the urgency and then mobilise required resources. Practice changes have occurred. For example, the use of patient alerts for past violence has
increased and was used in combination with violence risk screening at ED triage.

In addition to action learning, insider action research principles allowed for the integration of violence risk screening into practice. Nursing education staff in ED were provided with written resources to maintain the profile of the violence risk screening process in triage training. A benefit of using an insider action research approach is that risk screening was not limited to the research period, real changes in practice occurred and the intervention was sustained after the completion of the study.

**Theoretical Implications Arising from the Research**

The theoretical basis for this research is informed by an explanatory model that identified causal factors in the internal, external and situational domains in a mental health inpatient setting by Nijman et al., (1999). The model is based on the premise that internal (patient) factors for violence remain relatively fixed but work by interacting with environmental and situational factors that may contribute to violence. The lack of predictive ability when relying on internal factors highlights that this research does not support Nijman’s model (1999). Furthermore, the quality of the interaction and use of clinical judgement in the situational model appears to be more effective than relying on actuarial factors when determining the risk of violence.

The observation of triage nurse practice identified nurses used their clinical judgement and the existing triage process to identify patients at risk of violence. The triage process requires the nurse to observe the patient, obtain a relevant history, and commence a triage assessment. Known risk factors included patients who presented for an acute mental health assessment, were intoxicated, transported by police, or had observable warning signs for violence. The triage nurses used clinical judgement to determine whether the risk factors in the current presentation did indicate that the patient was at risk. For example, not all patients who require a mental health assessment in ED will be at risk of violence.

Factors identified by triage nurses are also linked to the model for causative factors (Duxbury, 2002). Internal or patient factors include the history
of violence, and situational factors include the observed behaviour and quality of the triage-nurse patient interaction. Environmental factors include the need for police presence, workload, and space where the triage interaction occurs. Although these factors are thought to contribute to violence, the ability to predict violence by relying on actuarial and internal variables was poor and analysis of risk factors such as gender, referral to mental health and arriving with the police identified only 7% of patients who required a Code Grey. In this research, situational factors including the interaction, degree of engagement, and cooperation during the triage nurse interaction appear to identify a greater proportion of patients who require an emergency response compared to relying on internal factors alone. For this reason it appears that the factors identified by Nijman et al., (1999) in isolation do not predict violence in an ED setting.

This research has tested theory that identifying patients at risk of violence will lead to prevention. There was no reduction in violence (measured by number of Code Greys) yet there was an increase in the use of coercive practices used by staff. Although there was no change in triage nurses self efficacy, the “control” component of self efficacy identified a significant increase. The confirms that triage nurses felt more in “control” to manage patients at risk of violence following the introduction of violence risk screening. An alternate view on control experienced by triage nurses is that there was increased planning and management and no increase in the frequency of Code Greys which is a positive outcome.

In an ED setting, risk identification may lead to coercion because there is a lack of collateral history, time for engagement, and alternatives to restraint use for acutely agitated patients. Moving patients inside the department as opposed to the waiting room due to the risk of violence may have led to more restraint being used than preferred and increased containment compared to the patient moving freely in the waiting areas. So, although access to a cubicle is positive as the patient is not being avoided, there are less environmental options within the department to manage agitation.

There is an expectation that staff can identify the risk of violence, and violence can be prevented. This expectation was not supported by the current
study. The current study identified an increased in control experienced by triage nurses and increased use of coercive practices. These findings support the criticism of risk identification processes that highlight the focus on risk can increase use of coercion. The expectation that violence can be prevented through early identification needs to be reconsidered. This research found not all patients will have early warning signs of violence at triage, therefore not all violence can be identified and prevented. This expectation may lead to blame being attributed to nurses when this is not appropriate. What is realistic is to expect that early identification be used to prevent violence when possible and reduce the impact when it does occur. There is potential for staff to rely on the identification of risk of violence at triage, yet there is still a need for ongoing monitoring and awareness for patients not identified at risk at triage.

The intention of violence risk screening was to provide an opportunity for prevention and care planning to minimise the risk of violence. At the study site there is an existing algorithm of interventions for prevention developed from focus groups with ED nurses during aggression prevention training. This algorithm contains interventions in the environment, situation and patient domains that can assist in preventing violence.

There are organisational strategies such as the National Emergency Access Targets (Department of Health and Aging, 2011) to move patients through ED. The impact of working towards these targets on staff's ability to engage, problem solve and consider alternatives to coercive interventions to minimise the risk of violence is unknown. Furthermore, the influence of drug and alcohol use, which is thought to be increasing, may also be a contributing factor. For example, the use of methamphetamines and the impact of managing the associated violence for hospitals has been recognised as will be addressed through taskforce (Victorian Government, 2015).

Nurses using their clinical judgement to identify the risk of violence had an acceptable level of sensitivity and a high level of specificity. The process developed was integrated into existing triage nurse practice and specific to the ED triage context. This methodology allows for future comparisons with other sites that use the same emergency response process. However, using
emergency response data as a measure, does not record occasions when patient behaviour was not significant enough to warrant an emergency response, yet would have been considered violent by some staff.

The use of risk assessment processes using actuarial or structured clinical judgement approaches is regularly debated in mental health literature (Lamont & Brunero, 2009; Wand, 2012). Although the research focuses on predictive ability there is limited awareness of patient staff and organisational outcomes reported. In the current study the identification of risk has been established by using clinical judgement and the actuarial information such as a past history of violence from the patient alert system.

In Victoria, Australia, triage is based on guidelines to allocate a triage category based on clinical interaction and observation. Although the level of behavioural disturbance is part of the triage guidelines, how this was integrated into triage nurse practice was unknown. At the study site, an attempt was made to implement an actuarial tool several years prior to this research. Although actuarial tools have been used in other settings, it quickly became apparent that the same checklist approach would not be feasible at ED triage.

Action learning principles (Revans, 1998) enabled the development of the violence risk screening decision support process to take into account the risk of violence and ED work practices to develop suitable process. Incorporating the skills and knowledge of triage nurses and learning from them about the scope and purpose of the triage interaction allowed the integration of violence risk screening into the triage interaction. Rather than an absolute prediction of risk, identifying the risk at triage is providing a reminder to the staff who receive the patient that there is a risk of violence. Although qualitative data on the benefits of violence risk screening were not formally collected, ED nurses reported they had the “heads up” to be mindful of the risk of violence. Similarly, ED medical staff reported supervising junior doctors more closely when they were allocated a patient who was identified at risk of violence. The senior ED nurse on duty is able to see on a central screen the number of patients in the waiting room who were identified at risk of violence. This provides a further
support for the triage nurse who may need access to cubicles or assistance to manage periods of increased demand.

An unintended consequence of violence risk screening was the increased use of coercive practices and this highlights the urgent need to understand alternatives to physical, mechanical and chemical restraint in an ED setting. It is possible that nursing interventions may have positive outcomes for the organisation but this may have negative implications for patients. An example of this was the use of emergency responses following the introduction of violence risk screening. There was an increase in the proportion of planned emergency responses and a reduction in the proportion of unplanned emergency responses.

Although, the number of emergencies remained constant and the duration of emergency responses reduced, this may indicate there was less time engaging with patients to explore alternatives to using coercive interventions. A more positive explanation is that staff commenced planning prior to the activation of the emergency response because they had been forewarned of the risk of violence. The prevalence of presentations requiring an emergency response reduced, yet the increase in coercive interventions requires careful and ongoing consideration. The increasing use of coercive interventions is being addressed though Department of Health initiatives for patients treated under the Mental Health Act (1986), however, all patients with reduced capacity to consent for treatment should receive the same standard of care.

This study has provided data and increased awareness regarding the number of coercive interventions used at baseline in 2010 in comparison to a six month period in 2013. This data supports further research to examine micro skills used during emergency responses, including communication, leadership, and interventions for violence prevention. There is also the need to conduct root cause analysis to examine factors and work practices that lead to the use of coercive interventions. It is only then, with greater understanding of the challenges that staff face, can reduction of coercive interventions commence.
Benefits of Violence Risk Screening

The process of identifying who is at risk of violence on arrival at ED triage and communication of that risk has been standardised. The perception of risk is captured and there is a clear communication process. The use a symbols is consistent with ED work practices and the communication pathway has been integrated with existing staff roles. This study has shown that ED triage nurses can identify over half the patients who will require an emergency response. Identifying the risk of violence on arrival resulted in ED staff members being forewarned of the risk of violence prior to 61% of emergency responses. The intervention developed was brief, able to be completed during the existing triage interaction, and did not increase the workload of the triage nurses. The development of violence risk screening raised the awareness for staff on the use of the patient alert for past violence. This has allowed a process using dynamic (violence risk at triage) and static (patient alert) risk factors in combination at triage.

There was potential for staff to avoid patients thought to be at risk of violence however the data showed that patients who required an emergency response were seen more quickly by medical staff than other patients. The increase from time of arrival to first emergency response indicates that there are fewer emergencies called on arrival, and this allows triage nurses to manage the needs of incoming patients. There is a clear expectation that senior staff members participate in care planning for patients at risk of violence, and provide support and decision-making assistance to junior staff. Staff members working in the cubicles reported forewarning of the risk of violence prepared them to care for someone who may require an emergency response. Furthermore, the presence of the alert symbol was a reminder of the risk of violence. Caring for a patient identified at risk of violence was not perceived negatively; rather the staff members were grateful for the reminder to manage staff and patient safety.

Conclusion

This research explored the development and influence of a violence risk screening decision support process at ED triage. Action learning principles (Revans, 1998) were vital and consultation with triage nurses and the ED
violence working group in conjunction with the data informed the context appraisal of the revised risk screening process.

Observation of practice and analysis of risk factors for violence did not support developing a checklist approach to identifying patients at risk of violence. A structured approach to identifying the risk for violence at triage was integrated with current triage practice and ED processes for communication. Violence risk screening incorporated both static and dynamic risk into violence risks screening at ED triage.

Following the introduction of violence risk screening there were fewer emergency responses at triage and patients who required a Code Grey response had an earlier review by medical staff. There was evidence of increased planning for prevention as the duration of emergency resources reduced and responses were activated at a lower stage of escalation. However, there was an increase in the use of coercion during emergency responses for patient violence. The increase in control experienced by triage nurses is consistent with an increase in the use of coercive practices. There is potential for the violence risk screening process to empower nurses but not patients.
Chapter Nine: Conclusion

This research has reported on the development and evaluation of an integrated violence risk screening decision support process at ED triage. This concluding chapter will focus on the translational elements, discuss implications for further research and make recommendations for practice and violence prevention.

Translational Elements of this Research

Research exploring the identification of the risk of violence in ED is limited, with few studies and minimal reports of violence risk screening actually used in practice. A significant gap in the literature is the lack of risk screening processes for use at ED triage. Although nursing staff are expected to identify who is at risk of violence, there has been no research to explore what approach should be used. This research demonstrated violence risk screening using clinical judgement can be used in practice and has an acceptable level of sensitivity and specificity in an ED triage setting.

This research established there is role for violence risk screening at triage to be used in conjunction with alerts for past violence. This process for identifying the risk of violence using clinical judgement was implemented, acceptable to staff, and continues to be used as intended.

The development of risk screening used the principles of action learning and this resulted in the final interventions being compatible with clinical practice (Kolb, 1984). Although action learning and research is a continual process of adapting interventions, this research required a conclusion and additional opportunities for ongoing research have been established.

Recommendations for Practice

Findings from this research have been used to inform recommendations for practice and violence prevention in the ED. This research developed a screening process that correctly identified 98% of patients who would not become violent. The patients that were identified at risk of violence could be prioritised for further violence risk assessment by ED staff to identify individualised strategies for prevention. Although the intention was to initially
identify which risk factors led to a positive violence risk screen this was not feasible in a triage setting. The opportunity to conduct targeted violence risk assessments for this high risk population once the person is within the ED allows for a more comprehensive assessment than would be possible in a triage setting. This risk assessment for violence could also inform opportunities for minimising the use of coercion within the ED.

**Minimising the use of coercion.** This study has shown an increase in the use of coercive practices and the proportion of emergency responses that required both physical and mechanical restraint and medication given in the presence of security. This increase is concerning and there is no existing literature that has explored the use of coercion in an ED setting. The decision making processes that instigate the use of coercive interventions once an emergency response has been activated, have not previously been described.

The introduction of violence risk screening is not thought to have caused an increase in the use of coercive interventions. At the study site organisational audits have noted an increase in frequency of coercive interventions over several years; however we had hoped to reduce this. The reduction of coercive interventions now needs to be addressed at the study site.

The factors that increase the use of coercive practices in ED warrant exploration. An action learning model (Kolb, 1984) could be employed to review and develop local violence prevention initiatives to focus on solutions informed by local knowledge and expertise. There is potential for further research to use a participant action research approach. Participant action research aims for patients to be involved in the research process rather than be passive participants (Baum et al., 2006). This approach would empower patients who could use their experience to inform research and changes in clinical practice.

Research using a participant action research approach could explore to what extent restraint reduction could be possible in the ED. Although restraint reduction is promoted theoretically, ED staff report they do not see any alternatives that can be used for acutely agitated patients. Furthermore, the level of de-escalation used in practice before, during and after an emergency response could be explored to clarify how the concept of a “last resort” is
interpreted in the ED and used in clinical practice. Coercive interventions are high-risk interventions for patients and staff. Although there have been some reports in the literature of restraint reduction initiatives in the ED, these are limited (McMahon & Fisher, 2003). In particular, alternatives need to be explored that are specific to acutely agitated patients in the ED.

The use of coercive practices should be included in ongoing reviews of patient safety and quality of care processes. The duration, frequency and rationale for all coercive interventions should be recorded to raise awareness of how and why these practices are used. This should occur regardless of the person’s status under the (The Mental Health Act, 2014). The use of coercive practices could be considered on a continuum from least to most restrictive. Coercion may range from a show of force with security staff present to receiving mediation while being physically held and mechanically restrained during an emergency response.

**Communication for patients at risk of violence.** Communication and clinical interventions for violence prevention once a patient has been identified at risk of violence have not been observed or evaluated. Further research to examine clinical skills used during emergency responses, including communication, leadership, and interventions for violence prevention could explore flashpoints and opportunities for prevention specific to an ED setting.

Identifying a patient at risk of violence requires communication between triage nurse and receiving team. It is not known how this occurs or if staff members rely on the violence risk symbol on the bedside computer screen to communicate the risk of violence. There is potential for observational studies to explore initial care planning, communication and interventions to reduce the impact of the risk of violence.

The skills required including communication and leadership used during emergency responses for violence should be explored to establish best practice. Although emergency responses frequently occur, they remain high risk for both staff and patients. There is potential for an advanced practice nurse role to provide rapid assessment and intervention for patients who require an emergency response for violence.
**Local governance of violence prevention initiatives.** Interventions for prevention of violence need to be guided by a governance structure to engage key stakeholders and include patient and care representatives. At the study site, support from ED medical and nursing staff was vital in the design and implementation of violence risk screening decision support. Interventions for prevention require monitoring and review, and this is a long-term commitment to develop local skills and resources rather than a short-term “quick fix” approach. Furthermore, the extent of under reporting of violent incidents limits using prevalence as an outcome measure. There is potential to establish the use of coercion as a measure. For example, the frequency and duration of restraint and the need to use security as a show of force could be monitored over time to evaluate violence prevention interventions. There is a role for ongoing patient empowerment in monitoring the quality of care provided rather than consultation in isolation.

**Implications for Future Research**

This research has identified two key areas for future research. Firstly, the factors that increase the use of coercive practices in ED warrant exploration. In addition communication and interventions for violence prevention once a patient has been identified at risk have not been observed or evaluated. Further research to examine clinical skills used during emergency responses, including communication, leadership, and interventions for violence prevention could explore flashpoints and opportunities for prevention specific to an ED setting.

**Contribution of this Work to Knowledge**

This research has established a decision support process for ED nurses to identify who is at risk of violence at triage and explored the assumption that identifying who is at risk of violence can lead to prevention. The effectiveness of a violence risk screening process was estimated by identifying the sensitivity and specificity.
Conclusion

This research has developed a valid and useable violence risk screening decision support process for use at ED triage by integrating research findings into practice. The evaluation identified improved management of the risk of violence on arrival and highlighted the increased use of coercive practices. Areas for improvement have been identified and recommendations for practice and future research have been made.

This research has contributed to one component of violence prevention for ED staff and patients. Violence risk screening needs to be considered in the context of service delivery that prioritises patient care and supports a comprehensive approach to violence prevention. Identifying patients who are at risk of violence will not prevent all episodes violence. For this reason, how staff members are supported in the short and long-term following incidents will influence the degree of distress experienced by staff.

The management of patients at risk of violence remains a priority and such patients will continue to require emergency care. The challenge for health care providers is to prevent and manage the risk of violence for both staff and patients.
Reference list


Everyday Practice. Academic Emergency Medicine, 12(10), 948-956. doi: 10.1197/j.aem.2005.04.024


Jaeschke, R., Guyatt, G., & Lijmer, J. (2002). Diagnostic tests. In Guyatt G & Rennie D (Eds.), *Users' guides to the medical literature* (pp. 121-140.). Chicago: AMA Press.


Ministry of Health. (1998). Guidelines for Clinical Risk Assessment and Management in Mental Health Services Ministry of Health in partnership with the Health Funding Authority.

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Thomas, C. M. (2010). Teaching nursing students and newly registered nurses strategies to deal with violent behaviors in the professional practice environment. *Journal Of Continuing Education In Nursing, 41*(7), 299-293.


Wand, T., & White, K. (2007). Examining models of mental health service delivery in the emergency department. *Australian and New Zealand...


Appendices
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Appendix A
16/03/2011

Dear Ms. Daniel

RE: QA2011002 Violence Risk Screening at Triage in the Emergency Department

I write in response to your request for approval of the above named project.

It is understood that Violence risk screening was implemented in the ED in 2009. To date there has been no evaluation of risk screening and since the introduction of Symphony® (electronic medical record and patient tracking system), there is an opportunity to improve current practice.

The aim of the project is to obtain pilot data on the current use of risk screening in ED and consumer satisfaction with the risk screening process. This project will pilot the feasibility of a risk screening process at triage.

The project involves observations of triage nurses risk screening assessment and obtaining patient feedback via consumer interviews. All triage nurses will be provided with information about the project and invited to participate. Consent will be obtained. Additionally the triage nurses will complete a questionnaire and a self-sufficiency scale. The name of participating triage nurse will be recorded on data collection sheets to ensure that no nurse is observed more than twice. The nurse's name will be removed once data collection is completed and an ID number allocated.

A random sample of consumers who experience risk screening at triage (n=20) will be invited to participate in an interview to determine how they perceived the risk screening process. No identifying data will be collected. It is anticipated that the interview will take 5-10 minutes and would be completed while the patient was waiting to be seen.

The project has been reviewed by a member of the HREC and myself, against the criteria outlined in the National Statement on Ethical Conduct in Research 2007. We are satisfied that it meets the criteria for a QA project that does not require the review of the full HREC.

Accordingly your project is approved. Your project number is QA2010002. Please use this number in future correspondence. Please note that all documentation regarding this project must be kept for 12 months from completion. However if you intend to publish the results, documentation must be kept for 5 years post publication or 5 years from the decision not to publish.

Regards

[Signature]

Manager HREC
Office For Research
Melbourne Health
A/Prof Marie Gerdtz  
University of Melbourne  
Emergency Department  
The Royal Melbourne Hospital  
Grattan Street  
Parkville VIC 3050

19 October 2011

Dear A/Prof Marie Gerdtz,

**MH Project Number:** 2011.151

**Project Title:** An evaluation of violence risk screening at triage in one Australian emergency department

**HREC Approval Date:** 19th October 2011

I am pleased to advise that the above project has received ethical approval.

**Participating Sites:**
- The Royal Melbourne Hospital

**Approved Documents:**
- Research Protocol version 2, dated 23rd September 2011
- Participant Information and Consent form (Triage Nurse Questionnaire) version 2, dated 19th September 2011
- Triage Violence Risk Screening - Demographic Information

**Site Specific Assessment:**

Please note: You cannot commence this study until you have completed all the requirements of the Site Specific Assessment and have received the "Approval to Conduct a Research Project at Melbourne Health" certificate.

**Conditions of Ethics Approval:**

In order to comply with the National Statement on Ethical Conduct in Human Research 2007, Guidelines for Good Clinical Research Practice and Melbourne Health Research Policies and Guidelines you are required to:

- Submit a copy of this letter to the Radiation Safety Officer (RSO) at Melbourne Health, for addition of the project to the Licence for Research Involving Human Volunteers held by the Department of Human Services Radiation Safety Section Radiation Safety Licence (if your project involves exposure to ionising radiation). Note: You cannot commence the project until you have received notification from the RSO that the project has been added to the Licence;

The Melbourne Health HREC operates and is constituted in accordance with the National Statement on Ethical Conduct in Human Research 2007.
• Notify the HREC of the actual start date of the project;
• Submit to the HREC for approval any proposed amendments to the project including any proposed changes to the Protocol, Participant Information and Consent Form/s and the Investigator Brochure;
• Notify the HREC of any adverse events in accordance with the Melbourne Health Guidelines for Monitoring and Reporting of Safety in Clinical Trials Involving Therapeutic Products and Other Clinical Research, July 2009;
• Notify the HREC of any unforeseen events;
• Notify the HREC of your inability to continue as Principal Investigator or any other change in research personnel involved in the project;
• Notify the HREC if a decision is taken to end the study prior to the expected date of completion or failure to commence the study within 12 months of the HREC approval date;
• Notify the HREC of any other matters which may impact the conduct of the project.

Reporting

You are required to submit to the HREC:

• An Annual Progress Report every 12 months (or more frequently as requested by the reviewing HREC) for the duration of the project. This report is due on the anniversary of HREC approval. Continuation of ethics approval is contingent on submission of an annual report in a timely manner; and
• A comprehensive Final Report upon completion of the project.

The HREC may conduct an audit of the project at any time.

Please refer to the Office for Research website to access forms such as the Amendment Form, Annual Report/Final Report Form, Guidelines for Monitoring and Reporting of Safety in Clinical Trials Guidelines and Adverse Event Report Forms, and other information and news concerning research at Melbourne Health:

A list of those HREC members present at the review of this project can be obtained from the above website.

Yours sincerely,

[Signature]

Ms. Angela Gray  
Manager, Melbourne Health Human Research Ethics Committee  
Ph: 9342 3006  
E-mail: angela.gray@mh.org.au

The Melbourne Health HREC operates and is constituted in accordance with the National Statement on Ethical Conduct in Human Research 2007.
Appendix C
17 November 2011

A/Prof M.F. Gerdz
Nursing, School of Health Sciences
The University of Melbourne

Dear A/Prof Gerdz

I am writing to advise you that this project has been registered at this University as approved by another Human Research Ethics Committee. Please take note of the Human Research Ethics Committee ID Number below.

Project title: An Evaluation of Violence Risk Screening at Triage in one Australian Emergency Department
Researchers: A/Prof S J Elsom, A/Prof M F Gerdz, Dr J Knott, Miss R K Prematunga, C Daniel
Ethics ID: 1137073

As a condition of registration, you are required to keep the Behavioural and Social Sciences Human Ethics Subcommittee informed of any subsequent variations or modifications you have made to the project. Any such changes must be approved by the primary HREC responsible for this research.

Please note that you will need to submit an annual report to the Human Research Ethics Committee at the end of each year, or at the conclusion of the project if it continues for less than this time. Requests for annual reports will be sent out via Themis.

Yours sincerely

[Signature]

Mr Tony Callahan - Secretary
Behavioural and Social Sciences HESC
Phone: 8344 2067, Email: t.callahan@unimelb.edu.au

cc: HEAG Chair - Nursing, Physiotherapy & Social Work
## Appendix D
Triage Nurse Observation Template

<table>
<thead>
<tr>
<th>Observation Template (completed when risk screening is observed)</th>
<th>Date</th>
<th>Time</th>
<th>Shift</th>
<th>AM</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triage Nurse Gender M F</td>
<td>ID Number</td>
<td>Observer Name</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triage category</td>
<td>1 2 3 4 5</td>
<td>Patient Gender M F</td>
<td>Able to engage with patient? Yes /No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presenting complaint</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Observable</strong> behaviours that may indicate patient is at risk of violence and/or aggression?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Communication with patient</strong></td>
<td>Language</td>
<td>Engagement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.e. was the interaction routine, tense, jovial, concise, abrupt, supportive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Care planning</strong></td>
<td>Decisions</td>
<td>Communications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interventions</td>
<td>I.e. what interventions were identified by the triage nurse, what decisions were made?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Any other comments;</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PARTICIPANT INFORMATION AND CONSENT FORM – TRIAGE OBSERVATIONS

The Royal Melbourne Hospital

Participant Information and Consent Form
Quality Assurance Project: Violence Risk Screening at Triage

Investigator: Cathy Daniel 9342 4074 and A/Prof Marie Gerdtz

You are invited to take part in this quality assurance project. Participation is voluntary and you may decline if you wish. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. If you choose not to participate in this study you will still receive all the normal standard care.

Please read this information and ask questions if you need more information. You may also discuss the project with a relative or friend or your local health worker. Once you understand what the project is about and if you agree to take part in it, you will be asked to give your consent to participate by signing the Consent Form.

2. Purpose
This project aims to improve how the triage nurses identify patients are at risk of aggression and violence. Improving risk screening processes is vital in preventing aggression and violence towards staff in the emergency department. Information will be used to refine the current risk screening processes and contribute to education resources for triage nurses.

You are invited to participate in this research project because you have experience working as a triage nurse.

3. Procedures
Participation in this project will involve Cathy Daniel or Vikki Dearie observing how you triage patients who are at risk of aggression or violence. Observations will occur for 1-2 hours on a range of shifts. No nurse will be observed more than twice. If the workload prevents dialogue between the researcher and triage nurse, observations will not occur. There will be an opportunity to provide feedback on the risk screening process and complete a questionnaire to explore how confident you feel when triaging patients at risk of violence and aggression.

4. Possible Risks (if applicable)
When discussing risk screening for violence you may recall past incidents which were distressing. If you feel distressed, you will be offered initial support and will be provided with information on the Melbourne Health Peer Support resources.

5. Privacy, Confidentiality and Disclosure of Information
The information you provide will be stored in a locked filing cabinet and only available to Cathy Daniel and A/Prof Marie Gerdtz. Your name will initially be recorded to ensure that you are not approached more than twice to be observed. Your name will be removed from the observation data, once data collection is completed. The data is not identifiable after this time. The data will be destroyed 5 years after publication.
Any information obtained in connection with this project and that can identify you will remain confidential. It will only be disclosed with your permission, except as required by law. In any publication of the results of the project, information will be provided in such a way that you cannot be identified.

6. **Results of Project**
All nurses who provide triage will he sent a summary of the project including results and recommendations. It is anticipated that this report will be available late in 2011.

7. **Other Issues**
If you have any complaints about any aspect of the project, the way it is being conducted or any questions about your rights as a research participant, then you may contact

Name: **Ms Angela Gray**
Position: **Assistant Manager, Office for Research**
Telephone: **(03) 9342 7550**

You will need to tell Ms Gray the name of Investigator. (refer to page)

Consent

I freely agree to participate in this project according to the conditions in the Participant Information.

Participant's Name (printed) .................................................................

Signature ..........................................................................................
Date ....................................................................................................

Investigators Name (printed) ..............................................................

Signature ..........................................................................................
Date .....................................................................................................
PARTICIPANT INFORMATION AND CONSENT FORM

The Royal Melbourne Hospital

Consumer Interview Participant Information and Consent Form
Quality Assurance Project: Violence Risk Screening at Triage

Investigator: Cathy Daniel 9342 4074 and A/Prof Marie Gerditz

You are invited to take part in this quality assurance project. Participation is voluntary and you may decline if you wish. If you decide to take part and later change your mind, you are free to withdraw from the project until the time the nurse researcher presents you with the written comments she has recorded. After that time we will not be able to retrieve your individual data because we will not be collecting any information that will identify you by name. If you choose not to participate in this study you will still receive all the normal standard emergency care.

Please read this information and ask questions if you need more information. You may also discuss the project with a relative or friend or your local health worker. Once you understand what the project is about and if you agree to take part in it, you will be asked to give your consent to participate by signing the Consent Form.

2. Purpose

This project aims to improve the way staff communicate with patients about their physical and environmental safety at triage. Improving physical and environmental safety at triage is a critical step to ensuring patients are cared for in an environment that promotes the delivery of safe high quality care. The information we obtain from this work will be used to refine the current triage system and develop educational resources for triage nurses to optimise the quality of care that is delivered to all people in the emergency department.

You are invited to participate in this research project because when you spoke with the triage nurse you were asked some questions about your personal safety.

3. Procedures

Participation in this project will involve speaking briefly with an experienced Registered Nurse (Cathy Daniel or Vikki Dearie). This will take approximately 5-10 minutes. Specifically, you will be asked about how applicable and acceptable you found the questions that were put to you at triage. We will be seek your opinion about how communication between staff and patients may be improved when people first arrive in the emergency department. We will document your opinions and then show you the interview schedule for you to confirm the content is correct. We will not record your name or any other information that might identify you from the interview.

Participating in this brief interview will not delay your access to medical treatment in the Emergency Department.

4. Possible Risks (if applicable)

It is unlikely that there will be any risks to you and we will ensure that you are asked these questions in an area where other patients or staff may over hear you. If
answering questions or your current medical condition causes your distress at all the interview will be terminated.

5. Privacy, Confidentiality and Disclosure of Information

The information you provide will be stored in a locked filing cabinet and only available to Cathy Daniel and A/Prof Marie Gerdtz. Your name will not be recorded. The data will not be identifiable. The data will be destroyed 5 years after publication.

Any information obtained in connection with this project and that can identify you will remain confidential. It will only be disclosed with your permission, except as required by law. In any publication of the results of the project, information will be provided in such a way that you cannot be identified.

6. Results of Project

If you want to be provided with the project results please email Catherine.daniel@mh.org.au and a summary will be forwarded to you. It is anticipated that this report will be available late in 2011.

7. Other Issues

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about your rights as a research participant, then you may contact

Name: Ms Angela Gray
Position: Assistant Manager, Office for Research
Telephone: (03) 9342 7550

You will need to tell Ms Gray the name of Investigator. (refer to page 1)

Consent

I freely agree to participate in this project according to the conditions in the Participant Information.

Participant's Name (printed) ..............................................................
Signature ................................................................................................
Date

Investigators Name (printed) ..............................................................
Signature ................................................................................................
Date
Appendix G
ED Carer and Patient Interviews Template

"When you arrived at the emergency department the triage nurse may have asked you some questions about safety. The hospital is currently reviewing how we talk to patients about safety procedures and I would like to talk to you about this process. If you agree to be interviewed, please read the participant information and consent form."

When you spoke to the triage nurse you may have been asked some questions about safety. For example;

If you have any weapons or dangerous items in your possession?  
If you have been involved in any violent incidents recently?  
If you have any thoughts of harming yourself or others?  

1. Do you think any of these questions are relevant to your situation today?
2. Is the language used to ask these questions appropriate?
3. Do you think the questions are clear?
4. Have you ever been asked these questions before? If yes, when?
5. Description of your presentation to ED today
Appendix H
Mental Health Consumer Consultation
NWMH Consumer Consultation – Risk Screening in ED

At RMH ED we are implementing a risk screening process and some consumers will be asked questions about safety at triage. The hospital is currently reviewing how we talk to consumers at triage and all triage nurses will receive education on conducting risk screening.

**Screening will occur when consumers present with;**
- Involved in an assault
- On alert
- Affected by substances
- Acute symptoms of a mental illness
- Odd or unusual behaviour

The triage nurse will **ask 3 questions** once they have determined the reason for presentation;
1. Do you have any thoughts of harming yourself or others?
2. Have you been involved in any violent incidents recently?
3. Do you have any weapons or dangerous items in your possession?

**Discussion prompts**
- What should be included in triage nurse education? (How, language, what to avoid, what is most helpful/unhelpful)

- Is it acceptable to be asked these questions at triage?

- Are the questions clear?

- Have you ever been asked these questions before by staff at ED?

Notes from consultation will be typed by Cathy Daniel and distributed back to you for confirmation that the information was accurately recorded.
Appendix I ED Carer Consultation

NWMH Consumer Consultation – Risk Screening in ED

At RMH ED we are implementing a risk screening process and some consumers will be asked questions about safety at triage. The hospital is currently reviewing how we talk to consumers at triage and all triage nurses will receive education on conducting risk screening. Consultation will also occur with NWMH consumer consultants and non mental health consumers who experience risk screening.

Screening will occur when consumers present with;

- Involved in an assault
- On alert
- Affected by substances
- Acute symptoms of a mental illness
- Odd or unusual behaviour

The triage nurse will **ask 3 questions** once they have determined the reason for presentation;

1. Do you have any thoughts of harming yourself or others?
2. Have you been involved in any violent incidents recently?
3. Do you have any weapons or dangerous items in your possession?

Discussion prompts

- What should be included in triage nurse education? (How, language, what to avoid, what is most helpful/unhelpful)

- Is it acceptable to be asked these questions at triage?

- Are the questions clear?

- Have you ever been asked these questions before?

Notes from consultation will be typed by Cathy Daniel and distributed back to you for confirmation that the information was accurately recorded.
# Appendix J
Triage nurse questionnaire

## Triage Violence Risk Screening
Demographic Information - Circle appropriate response

<table>
<thead>
<tr>
<th>Age</th>
<th>20-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position</td>
<td>FT</td>
<td>PT</td>
<td>Casual</td>
<td></td>
</tr>
<tr>
<td>Year of Nursing experience</td>
<td></td>
<td>yrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year of ED Nursing experience</td>
<td>yrs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year of ED Triage experience</td>
<td>yrs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you completed the 8 hour Management of Clinical Aggression program?</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, which year?</td>
<td>..........</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Have you attended an in service education session on risk screening? | Yes/No |

<table>
<thead>
<tr>
<th>Roster</th>
<th>Days</th>
<th>Nights</th>
<th>Rotating</th>
</tr>
</thead>
</table>

## Nursing Qualifications

<table>
<thead>
<tr>
<th>Hosp trained</th>
<th>Degree</th>
<th>P. Grad cert</th>
<th>P. Grad dip</th>
<th>Masters</th>
</tr>
</thead>
</table>

### Self Efficacy - Triage Risk Screening for Violence and Aggression*

1. How confident are you dealing with patients who are at risk of violence and aggression at triage?

   - 1   2   3   4   5   6   7
   - Not at all confident
   - Very confident

2. How difficult do you personally find it to deal with patients who are at risk of violence and aggression at triage?

   - 1   2   3   4   5   6   7
   - Very difficult
   - Not very difficult

3. Do you feel the way you communicate with patients at triage who are at risk of violence and aggression has a positive impact on that person's behaviour?

   - 1   2   3   4   5   6   7
   - Has no positive effect
   - Has a very positive effect

4. How satisfied are you with the way you deal with patients who are at risk of violence and aggression at triage?

   - 1   2   3   4   5   6   7
   - Not satisfied at all
   - Very satisfied

5. To what extent do you feel in control of managing patients at risk of violence and aggression at triage?

   - 1   2   3   4   5   6   7
   - Not in control at all
   - Very much in control

---

Self Efficacy of Triage Risk Screening for Violence and Aggression*

1. How confident are you dealing with patients who are at risk of violence and aggression at triage?
   - 1 2 3 4 5 6 7
   - Not at all confident
   - Very confident

2. How difficult do you personally find it to deal with patients who are at risk of violence and aggression at triage?
   - 1 2 3 4 5 6 7
   - Very difficult
   - Not very difficult

3. Do you feel the way you communicate with patients at triage who are at risk of violence and aggression has a positive impact on that persons behaviour?
   - 1 2 3 4 5 6 7
   - Has no positive effect
   - Has a very positive effect

4. How satisfied are you with the way you deal with patients who are at risk of violence and aggression at triage?
   - 1 2 3 4 5 6 7
   - Not satisfied at all
   - Very satisfied

5. To what extent do you feel in control of managing patients at risk of violence and aggression at triage?
   - 1 2 3 4 5 6 7
   - Not in control at all
   - Very much in control

Appendix K
Feasibility and need for violence risk screening at triage: an exploration of clinical processes and public perceptions in one Australian emergency department

Catherine Daniel, Marie Gerdz, Stephen Elsom, Jonathan Knott, Roshani Prematunga, Elizabeth Virtue

ABSTRACT

Background Research on patient aggression in hospital emergency departments supports the development of a systematic process for identifying individuals at risk of becoming violent. The feasibility and community acceptance of this approach is unknown. In this study, we determine the feasibility and explore the need for a violence risk screening process in one Australian emergency department.

Method We used a descriptive exploratory design that involved semistructured interviews and observations of practice. The setting was an adult tertiary referral hospital and major trauma centre located in Melbourne, Australia. A convenience sample of nine triage nurses were observed assessing patients to explore how risk screening was undertaken in practice. Semistructured interviews were conducted with emergency department (ED) service users (N=19) to explore community perspectives on the process of violence risk screening.

Results Observations of practice revealed that nurses used observed and reported information to screen for potential risk of violence rather than employing a direct questioning approach. Interviews with community members in the emergency department waiting room highlighted a public expectation that nurses screen and accurately identify patients at risk of violence on arrival to the ED.

Conclusions Consistent with local prevalence data, public expectations of emergency care supported the need to adopt a uniform approach to identifying people at risk of becoming violent on arrival to hospital. Observations of triage nurses interactions with patients revealed that the existing violence risk screening approach was not being consistently used by triage nurses. An Integrated approach to determining violence risk during triage assessment is recommended.

INTRODUCTION

The problem of patient aggression and violence in hospital emergency departments (ED) is well documented. WHO defines violence as ‘the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation’ (p. 5). In healthcare, the terms, aggression and violence, are often used interchangeably. In Australia, the prevalence of patient aggression in hospital EDs is thought to be increasing. Similar to the experience of other developed countries, patient aggression and violence in Australian EDs adversely affects the safety and wellbeing of nursing and medical staff.

Currently, the methods used to measure the prevalence of patient aggression and violence include hospital incident and staff self-reports. The variability in methods used to count episodes of patient aggression and violence limits potential comparisons between hospitals. What is evident, however, is that ED staff are frequently exposed to more verbal aggression than physical aggression. This was confirmed by a survey of 272 ED residents and physicians, that found 78% had at least one exposure to violence in the previous 12 months. Of these, 75% were verbal threats and 21% were physical assaults. Further, a survey of 3465 ED nurses found 25% had experienced physical violence on more than 20 occasions and reported over 200 incidents of verbal abuse in the past 3 years.

Within our jurisdiction (Victoria, Australia) reports of patient aggression have been measured...
by counting the number of hospital-wide Code Grey responses to manage actual or potential violence. Code Grey responses are activated when clinical staff anticipate a potential or actual risk of violence from a patient. This may include managing patient attempts to leave the ED when it is unsafe to do so, treatment interference, and/or potential harm to self or others. Individual patients who have a history of violence in the ED may be identified using an electronic alert system which is linked to their clinical record.

A study of 4 hospitals over 6 months identified 2662 code greys, with half of these occurring in the ED.9 There was an average of 14.6 events per day, and the mean duration of each Code Grey response was 23.3 min which has a significant impact on ED, hospital, and security resources. At one major metropolitan hospital, the prevalence of Code Grey responses was 3.2/1000 ED presentations.10 In 2011, the Victorian Drugs and Crime Prevention Committee conducted a Parliamentary inquiry into violence and security arrangements in Victorian health services focusing on EDs. The Committee’s final report made specific recommendations for screening patients for aggression and violence at point of entry to the ED.1

A large body of research indicates that patient aggression and violence negatively impacts on the safety and the quality of care provided in the ED by undermining the therapeutic relationship between clinicians and patients and by placing staff, patients and visitors at risk of physical and/or psychological injury. Clinical practice guidelines for the prevention and management of patient aggression and violence in healthcare settings emphasise the need for staff to identify patients who are at risk of becoming violent; however, there is no evidence-based system for violence risk screening on arrival to the ED. Moreover, research also indicates that most episodes of aggression occur within 1–2 h of arrival at ED.10

An extensive review of aggression risk factors has informed a Clinical Practice Guideline for Violence Risk Assessment at point of entry to mental health services and hospital ED (triage).12 This review identified that behaviours and observable signs, such as hostility and uncooperativeness, should be included in a standard risk screening process. Importantly, the first step in any triage process is to consider safety hazards.13 Safety at triage requires that staff are aware of the factors that increase the risk of violence.14 Previous research shows that nurses have the ability to observe warning signs for aggression,15 and identify those at risk.16 Observable warning signs for violence include engaging in verbal abuse or making threats, damaging property, being uncooperative or boisterous, and intruding into the personal space of others.12

The development of a valid and reliable risk-screening process for identifying patients at risk of violence at point of entry to the ED has the potential to improve staff and patient safety. This approach would assist in identifying those at risk of becoming violent, and also guide specific strategies for managing aggressive behaviour. Public perceptions of processes for risk screening practices within the ED have not been described in the published literature.

**Objectives**

This study was undertaken to determine the feasibility of, and explore the need for, a violence risk screening process at triage. The study aimed to:

1. Observe how triage nurses identify risk for violence.
2. Describe public perception of violence risk screening and weapons searches in the ED.

**METHODS**

**Ethical considerations**

Approval to conduct the study was obtained via institutional board review (QA2011.002 and 2011.151). All participants who were interviewed, and staff who were observed, provided written consent.

**Setting**

The study was conducted at one Australian ED located in an adult tertiary referral hospital and major trauma centre. The ED has an annual census of 65,000 adult presentations and an admission rate of 40%. Audit data for a 12-month period (1 January 2010 to 31 December 2010) indicated that 1.7% (950/57,304) of all ED presentations required a Code Grey. The incidence of Code Grey responses was 34.8 codes per 1000 patient visits and median duration was 15 min and IQR was 10–24. Of these, 25% (496/1959) occurred at point of entry to the ED (triage). Only 2.9% (25/875) of patients who required a Code Grey had an existing alert for the risk of violence and aggression. Overall, 1.7% (950/57,304) of presentations required a code grey response, and 37% (350/950) of those were referred for an acute mental health assessment.

Figure 1 displays a Kaplan–Meier survival curve that shows the time from triage to first Code Grey (N=944) ranged from 0 to 1417 min, median 77.5, IQR was 11 to 213, and 95% CI (66.96 to 87.03) (see figure 1).

The process of risk screening for violence at triage was guided by a working group that was responsible for implementing Code Grey policy, monitoring events, and aggression prevention and management training in the ED. In 2009, this working group developed a 4-question violence risk-screening process based on expert opinion for use at triage.17 This was coupled with internal processes for communicating risk for violence and allocating resources according to patient needs and behaviours. The risk screening questions were added to the triage computer screen and required triage nurses to directly question patients about (1) thoughts of self harm, (2) recent involvement in violent incidents, (3) presence of weapons or dangerous items and (4) if the staff member considered the patient at risk for violence. This process had never been evaluated and it was unknown how the risk-screening process was used.

![Figure 1: Proportion of study population who have had a Code Grey.](image-url)
Design
This study used a descriptive exploratory design incorporating observation of triage nurse practice and semistructured interviews with ED service users.

Observation of triage nurse practice
Triage nurses were observed during business and after hours including weekends. Staff were advised of the study at an in-service education session and self-nominated to participate. The duration of observation was restricted to a maximum of 4 h per nurse to ensure several nurses were observed, and to limit the intrusiveness of observation on individual nurses.

Staff provided written consent and were advised that the researcher would observe discreetly, and once it was clear a person was at risk, then observation and note taking would commence. Notes were shown to the triage nurse for confirmation and clarification. Data was collected using a template that recorded use of direct questioning, agreement between the researcher and the triage nurse, and brief description of each presentation. Agreement between the researcher and triage nurse was important to collect to ensure the researcher had a clear understanding of how risk was established in triage nurse practice. For each presentation, the observer and triage nurse discussed the risk identified and whether the risk-screening questions were able to be asked. The observer was a mental health nurse and an aggression prevention trainer, but had no experience working in ED triage.

Semistructured interviews with ED service users
The triage nurse was asked to identify individuals who would be physically able to participate in an interview. No one declined to be interviewed. Patients who were sedated, acutely agitated, requiring a security response, presented with acute mental health symptoms, in pain, or any medical condition that may make participating in an interview uncomfortable were excluded. Participants completed a consent form and all respondents remained anonymous. The researcher documented each participant’s responses on an interview schedule and confirmed the content was correct with each person. See table 1 for the ED service user interview schedule with the existing risk-screening questions. Thematic frameworks analysis was used to explore participant responses. All responses were tabulated and reviewed by the researcher and second author (MG) separately to optimise rigor. Themes were identified separately in the first instance and then finalised collaboratively. There were no disagreements. Data was reviewed after 15 interviews, and a further 4 interviews were conducted to confirm data saturation.

Table 1  ED service user interview schedule with the existing risk-screening questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Were you asked any of the following questions by the triage nurse?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) If you have any weapons or dangerous items in your possession?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>(b) If you have been involved in any violent incidents recently?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>(c) If you have any thoughts of harming yourself or others?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2. Regardless of response to question 1, the following questions were then asked.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Do you think any of these questions are relevant to your situation today?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Is the language used to ask these questions appropriate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Do you think the questions are clear?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) Have you ever been asked these questions before? If yes, when?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e) Would it be reasonable to search belongings prior to entering ED?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ED, emergency department.

RESULTS
Observation of triage nurse practice
Triage nurses (N=9) were observed conducting triage assessments (N=167) over 30 h (23 May 2011−22 July 2011). Of the 167 triage interactions observed, 6/6 (10/167) of patients were considered at risk. Triage nurses were able to identify who was at risk and the researcher agreed with the triage nurse on all occasions. Observations found that the nurses did not use the tool to directly question patients to determine the risk for violence. For each case, the triage nurse provided an explanation in real time of the factors used to determine risk. Based on this data, direct questioning was not used because the risk-related information could be elicited within the standard triage interview, observations, or reported from the accompanying person, ambulance, or police officers. The risk-screening questions were not asked directly, and the clinical presentations were not appropriate for this type of questioning. Triage nurse interactions to explore the risk of suicide and self-harm were not altered by this process.

Discussion with triage nurses confirmed direct questioning was not used due to the clinical presentation and environmental constraints such as lack of space, time and privacy. The triage nurses used clinical judgement to prioritise information requested of the patient and it would have been clinically inappropriate to ask the risk-screening questions of the patients identified at risk. Of the 10 patients who were identified at risk, 3 were waiting for an acute mental health assessment, 4 were intoxicated, 2 were victims of assault, and 1 was in police custody. Emergency services personnel provided information on risk of violence by describing the level of cooperation, reason for presentation, and use of restrictive measures such as handcuffs and transport by police. The nurse used an established triage assessment process to enquire about risk without asking scripted risk-screening questions. For example, a nurse asked an intoxicated person “What happened to your hand?” The patient replied that he had been in a fight. Table 2 provides a summary of patients identified at risk of aggression at point of entry.

The triage nurses reported using their clinical judgement rather than the structured and direct questions provided in the tool. Additionally, in some cases, nurses indicated that to persist with direct questioning may increase the risk of aggression and violence. This outcome would be potentially harmful for the nurse and patient, and also limit access to important information required to complete a triage assessment. For example, in observation No. 3, the triage nurse approached a patient who presented with a seizure, recent alcohol use and a history of an acquired brain injury. The patient was mildly irritable during the triage interaction. The triage nurse prioritised obtaining clinical information that was required from the patient, rather than...
directly questioning the patient about their risk of violence. The information contained in the ambulance handover and initial triage interaction confirmed the potential for violence, and further direct questioning would not have elicited further information.

**Semistructured interviews with ED service users**

There were 19 interviews completed (23 August 2011 to 25 September 2011) and 53% (10/19) were female and 47% (9/19) were male. Of these, 74% (14/19) were patients seeking treatment and 26% (5/19) involved the accompanying person.

None of the participants had been asked the risk-screening questions, however, 2/19 thought it may be relevant to them. The rationale provided by these participants was that ‘you never know’ who may become aggressive or violent. One participant felt the questions were relevant because he had been involved in an incident and pushed by security staff when being escorted from a hotel. The remaining participants (16/19) considered risk screening irrelevant to their situation. Only 3/19 participants had been asked some of these questions before at an airport, by the police and by a doctor. The remaining participants were aware of the purpose of the questions. The respondents were shown a paper copy of the risk-screening questions, and agreed the risk-screening questions were clear, and only one person thought they were inappropriate.

There were two main themes identified. The first theme is perceived limitations of risk screening and includes the impact on the patient, the effectiveness and perceived bias. Table 3 shows the perceived limitations of aggression risk screening.

The second theme identified is the attitudes and skills required for effective implementation including empathy, respect and communication skills. Table 4 identifies the skills and attitudes required to implement risk screening. Each subtheme identified is supported by direct quotes from participants.

Participants consistently reported the process of searching belongings is important, particularly the skills of the person conducting the search. There was an awareness of other places where bags are searched, such as the airport or when leaving shops (see table 4).

**DISCUSSION**

In this study, we set out to explore the feasibility and need for violence risk screening at triage. A review of our practice applying an alert for violence to the patient record was identified as problematic, and we found poor compliance with this process. This is problematic because research shows that decision support for violence risk screening should take into account dynamic factors (clinical) such as observed behaviour, and also static factors (actuarial) such as a history of violence.

The time from triage to first Code Grey response confirms the first 1–2 h were a period of high risk. Staff needed to use this time to plan care that would reduce the risk of violence. This includes allocating the patient to a high-visibility area, notifying staff of the risk of aggression, and being aware of the patient’s location in the ED. Early identification of high-risk patients provides an opportunity for senior staff to make rapid decisions about the patient’s clinical care.
treatment decisions, prompt referrals, and prioritise and allocate required resources. Based on this, identifying patients at risk of violence should occur at triage rather than during the primary assessment.

Observations of triage nurses showed the existing risk screening tool was not used. In practice, they incorporated elements of unstructured risk screening into their assessment of urgency using observed and reported information. Although a direct approach to questioning patients to establish risk has been used in other settings such as mental health, the open environment and time constrains at triage limits this approach. Further, the types of clinical presentations observed were not suitable for direct questioning and a tick-box approach to identifying the risk of violence. The observations confirmed triage nurses were able to identify observable risk factors for violence, and this is consistent with previous research. Observations showed that a tick-box approach to identifying the risk for violence at triage was not feasible. During 30 h of observation, of 167 patients, only 10 were identified at risk of violence. There were many more patients who may belong to a group considered high risk, such as patients who are intoxicated or require an acute mental health assessment. In these cases, the triage nurses used clinical judgment to determine the risk of violence.

Furthermore, observations showed that questioning victims of assault to identify the risk of violence to others was not feasible. It could be potentially distressing to ask a victim of assault if they have been involved in any assaults recently. In these cases, the triage nurses also applied their clinical judgment to ascertain risk of violence.

Interviews with patients and carers confirmed the public were aware of violence in ED and highlighted an expectation that triage nurses identify individuals at risk, and actively manage this risk. Although there was support for triage nurses to identify the risk of violence, only 2/19 respondents thought risk screening was relevant to them. This raises an ethical issue of triage nurses deciding who is at risk of violence, yet it is unknown if triage nurses can accurately identify who is at risk of violence. This raised the complex question of determining if all presentations should be screened for the risk of violence or only subgroups, such as those with a mental illness, past history of violence or were intoxicated.

The acceptability of searching belongings elicited a mixed response. Although it is generally accepted that belongings will be searched on arrival at large sporting venues, there is an expectation that hospitals are safe places. Alternatives, such as metal detectors used in airports were preferred to manually

Table 3: Limitations of aggression risk screening

<table>
<thead>
<tr>
<th>Sub theme</th>
<th>Limitations of aggression risk screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential impact on the patient</td>
<td>Asking if a person has been involved in violent incidents recently is not appropriate if the patient is a victim of domestic violence, no privacy, very public, not going to get an answer and the report has not been established. (P:5) Although it is appropriate if it depends on the person but this also prejudices some people, nurses should be able to tell who should be asked, e.g. patient on drugs. (P:17)</td>
</tr>
<tr>
<td>Effectiveness of risk screen</td>
<td>Even if bags are searched, there is potential for dangerous items to be hidden. (P:4) Asking about harm to self and others, people may not tell the truth anyway if they have ideas to harm self or others. (P:2) If you saw someone come in and get checked by security you would feel safer especially when someone wild came in, you feel someone was looking after the place. (P:18)</td>
</tr>
<tr>
<td>Perceived bias in screening</td>
<td>These questions should be asked when patients have been in fights, have problems or injuries. (P:3) Would expect to have bags searched, would want to know that hospital searched ‘drugs trash bags’ so you would be safe. (P:16) The media leads to false ideas about people, for example, not everyone with a beard is a terrorist. If a person presents with using drugs, then the safety questions should be asked, but if a person has a standard presentation then they should not be asked. (P:11) Would wonder what the staff thought of her if her bags were checked. (P:1)</td>
</tr>
</tbody>
</table>

P. participant number.

Table 4: Skills and attitudes required to implement risk screening

<table>
<thead>
<tr>
<th>Sub theme</th>
<th>Skills and attitudes required to implement risk screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication skills</td>
<td>Do it in a way that doesn’t make the patient look like a criminal. (P:14) Manner should be pleasant. (P:15) Need to ask in a diplomatic way and explain why, work out who to ask, maybe the ones who get asked will be offended. (P:17)</td>
</tr>
<tr>
<td>Respect and dignity</td>
<td>Private, done in a dignified way and there should be signs. (P:14) Needs to be signs, depends on how it is said, information available in different languages, respectful and private process. (P:5) If a person went through my handbag contents that would be offensive, but okay to ask what is in there and open to show contents same as what you would do at a supermarket. (P:13)</td>
</tr>
<tr>
<td>Acceptability</td>
<td>Unreasonable to be searched by hospital, use of a scanner would be more acceptable than being searched by a person. (P:7) She saw a person yesterday who came in, blood on head, possible on drugs, had been injured in a fight with others, need more security for those patients. (P:3) If it’s a routine procedure you would not be offended. (P:18) A metal detector would be fine, they use them when you go to court to check you and your bags. (P:1) Expect the hospital to consider safety for patients who are drunk—we would hope that the hospital is searching those at risk properly and that would be expected for everyone’s safety. (P:11)</td>
</tr>
</tbody>
</table>

P. Participant number.
searching belongings as this was considered less intrusive. The interpersonal skills of staff who may search belongings for weapons was considered important, and there was agreement that the dignity of the person at risk of violence should be maintained. No respondents suggested a zero tolerance approach to violence.

Outcomes

Having established that the existing risk screen was not used, and following consultation with ED triage nurses, a revised violence risk-screening decision support process was developed. The direct questions were removed from the triage screen and replaced with one question answered by the triage nurse to indicate if they perceive there is a risk of violence based on their triage interaction using observed and reported information. This question is completed for all presentations, and is mandatory. If the patient is considered at risk, a symbol is generated next to the person’s name and the team leader of the relevant area is notified. This process has integrated identifying the risk of violence with triage practice and was developed after consultation with key stakeholders in ED, and continued engagement with ED triage nurses to develop an acceptable and useable process. The triage nurses are supportive of the revised process, and it was implemented with minimal education and changes to the existing triage screen.

The authors are currently undertaking an extensive evaluation of this revised process including analysis of sensitivity, specificity and influence of implementing a violence risk-screening decision support process on Code Greys, use of coercive practices to manage violence and clinical care.

Limitations

The study occurred at one site only and requires further evaluation. None of the participants were actually asked the risk-screening questions they provided feedback on. It is possible that the attitudes of those questioned may differ if they were actively screened for risk of violence.

Implications for practice

A structured approach to identifying risk for violence at triage must be integrated with current triage practice and processes rather than standalone questioning. The electronic patient record has potential to link alert information, risk-screening information, and outcomes of specific episodes of care to comprehensively evaluate the impact of multiple prevention strategies. Once individuals are identified, an evidence-based approach to prevention and minimising the impact of aggression care pathways should be developed.

CONCLUSION

The existing hospital alert is not adequate for ED, and a supplementary process for identifying patients at risk of violence at triage is warranted. Triage nurses can identify who is at risk, and it is feasible to do this at triage; however, risk identification needs to be integrated into practice rather than a standalone process.

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Contributors

CD, MG, SE, JK and Ev conceptualised the research protocol and obtained ethics approval. EV and JK specifically contributed to the development of the protocol in terms of feasibility and data management. CQ, extracted Code Grey Data, interviewed ED patients, observed triage nurse practice and conducted preliminary analysis. CD and MG conducted the analysis of qualitative data. CD, RP and JK analysed is of Code Grey Data. CD drafted the manuscript and all authors contributed to its revision and final version.

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Competing interests None.

Ethics approval

Melbourne Health HREC and The University of Melbourne HREC.

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REFERENCES

Feasibility and need for violence risk screening at triage: an exploration of clinical processes and public perceptions in one Australian emergency department

Catherine Daniel, Marie Gerdtz, Stephen Elsom, et al.

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