COGNITIVE FACTORS IN NHS STAFF RESPONSES TO VIOLENCE AND AGGRESSION

Emma Rebecca Bishop

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Academic Unit of Psychiatry and Behavioural Sciences

School of Medicine

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The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

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ABSTRACT

NHS staff frequently experience violence and aggression, and post-traumatic stress disorder (PTSD) is amongst the potential psychological consequences. Using a prospective design, the present study sought to establish whether cognitive factors, specified in Ehlers and Clark's (2000) model, could predict symptom severity over and above other established risk factors. The aim was to develop and refine a predictive tool, which could be used to identify individuals who may benefit from early, targeted interventions. Forty-eight healthcare workers completed questionnaires assessing a range of cognitive factors, immediately following an incident of violence or aggression. Of these participants, twenty provided data concerning PTSD symptoms at three-month follow-up, despite implementing strategies to maximise response rates. It was therefore not possible to address the original research question owing to the small sample size. However, several participants reported experiencing symptoms, and for some these were moderate to severe.

Several potential reasons for non-response were identified, including the possibility that healthcare workers appraise workplace incidents in such a way that subsequent effects are minimised. An experimental analogue study examined this hypothesis. Student nurses (N = 190) read a vignette as an analogue for a violent incident, in which the context was manipulated. Results indicated that neither organisational setting (work / non-work), nor cause of the perpetrator's behaviour (illness / non-illness) influenced the type of appraisals endorsed, or ratings of perceived distress. It therefore seems likely that other factors contributed to the low response rate observed in Study 1. However, in line with Ehlers and Clark's (2000) cognitive model, appraisals explained a significant amount variance in dysfunctional behaviours after controlling for perceived distress.

Study 1 indicated that a proportion of staff were adversely affected by incidents of violence and aggression. Replication of this research is warranted in light of the current literature, and recommendations are made for modification.

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ABBREVIATIONS

APA	American Psychiatric Association
ASD	Acute stress disorder
CAM	Controls Assurance Management
DOH	Department of Health
DSM-III-R	Diagnostic and Statistical Manual of Mental Disorders - Third Edition Revised
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition
DV	Dependent variable
ICN	International Council of Nurses
IV	Independent variable
LREC	Local Research Ethics Committee
MREC	Multicentre Research Ethics Committee
MVA	Motor vehicle accident
NAO	National Audit Office
NHS	National Health Service
NICE	National Institute for Clinical Excellence
PDS	Posttraumatic Diagnostic Scale
PTSD	Post-traumatic stress disorder
R&D	Research and Development
REC	Research Ethics Committee
SAM	Situationally accessible memory
SMS	Security Management Service
VAM	Verbally accessible memory
WHO	World Health Organisation

CLARIFICATION OF INDEPENDENT RESEARCH

Study 1 of this doctoral research project was carried out alongside a parallel thesis, conducted by Annie Moreland. The other candidate's thesis was concerned with investigating the mechanisms proposed in Ehlers and Clark's (2000) cognitive model of post-traumatic stress disorder (PTSD). In contrast, the current thesis was concerned with prediction, and had the primary aim of developing and refining a predictive tool for the identification of individuals who were at risk of developing persistent symptoms of PTSD. The common theme was that these predictions were informed by Ehlers and Clark's model.

The development and overall design of both studies was carried out independently. However, the aim was to collect a common data set that could be used to address the respective research questions. To facilitate sharing data, we collaborated about a) the inclusion of measures having independently reviewed the research and b) spreadsheet layout. While I was identified as the Lead Researcher for liaison with the ethic committees, the application for multicentre ethical approval for this programme of research was made jointly. I made the applications for Site-Specific and Research and Development (R&D) approval at Sites 1 and 3. With regards to the implementation and management of the research programme, I was responsible for Site 1, and the other candidate was responsible for Site 2; Site 3 was managed collaboratively. We contributed jointly to presentations and meeting staff at each location, where appropriate.

In summary, my independent contribution to the work has been to review the relevant literature, develop and design the study, manage Site 1 autonomously and Site 3 jointly, and report the findings in this thesis. I independently carried out all aspects of the research process for Study 2.

INTRODUCTION

NHS staff are frequently exposed to violence and aggression in the workplace (Department of Health [DOH], 2006; Healthcare Commission, 2005; National Audit Office [NAO], 2003). Such incidents can have substantial impacts, both for the individuals involved and their employing organisations. In addition to the physical consequences and experience of distress, violence and aggression can affect the way individuals feel about their work, leading to reduced job satisfaction and morale, absenteeism and commitment to the organisation (e.g. DOH, 2006; Fernandes, Raboud, *et al.*, 2002). Although it is difficult to quantify the financial costs, these incidents can result in staff taking time off work and ultimately may influence decisions to leave the organisation (e.g. DOH, 2006; Fernandes, Bouthillette, *et al.*, 1999). The development of post-traumatic stress disorder (PTSD) symptoms is perhaps one of the more severe potential psychological consequences for individuals exposed to violence. PTSD is a common response to traumatic events such as assault, serious accident or disaster. It is characterised by three clusters of symptoms, including unwanted and repeated re-experiencing, hyperarousal and avoidance of stimuli that are reminders of the traumatic event.

One possible response to incidents of violence would be to offer an early intervention to minimise the risk of long-term psychopathology. However, not all individuals exposed to such trauma develop PTSD, and initial symptoms often remit naturally. Furthermore, in addition to substantial resource implications, evidence currently suggests that provision of certain interventions for all those exposed to traumatic incidents is not effective, and may even be detrimental in the long-term (e.g. Murray, Ehlers & Mayou, 2002). The ability to make predictions about which individuals are vulnerable to develop persistent symptoms would therefore enable early, targeted intervention. Such strategies are therefore important (Ehlers & Clark, 2003); in addition to crucial benefits for the affected individuals, they may reduce the cost of widespread violence and aggression to NHS organisations.

Several risk factors associated with PTSD have been identified through research, although meta-analytic reviews have revealed inconsistent results for certain variables (Brewin, Andrews & Valentine, 2000; Ozer, Best, Lipsey & Weiss, 2003). While this finding is partly attributable to methodological issues such as inconsistent indices of PTSD symptom severity, the available evidence highlights the importance of the psychological processes involved.

Ehlers and Clark (2000) highlighted cognitive factors involved in the maintenance of PTSD symptoms, and this model represents an important attempt to establish predictive factors. Indeed, a growing body of evidence from both cross-sectional and prospective research provides support for the utility of these factors in predicting persistent PTSD symptoms in different populations exposed to trauma (e.g. Dunmore, Clark & Ehlers, 2001), including NHS staff exposed to violence and aggression (Salter, 2003).

The present study aimed to examine the role of cognitive factors hypothesised to be involved in the maintenance of PTSD symptoms in a population of health service employees exposed to violence or aggression in the workplace, using a prospective design. It sought to generate and refine a predictive tool that would enable identification of individuals who are at risk of developing persistent PTSD symptoms. Such symptoms may not reach the threshold for diagnosis of PTSD and yet may be distressing and benefit from intervention. The focus was therefore upon prediction of symptoms, rather than individuals meeting diagnostic criteria for PTSD diagnosis. These predictions were to be largely theory-based, informed by the cognitive model proposed by Ehlers and Clark (2000). It is hypothesised that cognitive factors would increase the accuracy of predictions, over and above factors such as assault severity. The purpose of the resulting instrument would be to facilitate identification of trauma-exposed individuals who might benefit from targeted early interventions.

The following literature review will first explore the problem and consequences of workplace violence and aggression, with particular emphasis on healthcare professionals as the focus of the present study. Having established PTSD as an important consequence, potential risk factors will be explored, converging on a need for psychological models to understand persistent symptoms of the disorder. Current important theories will be outlined and critically appraised, including the cognitive model proposed by Ehlers and Clark (2000). The latter will be put forward as a promising basis for predicting PTSD symptoms in healthcare professionals.

Literature Review

Workplace Violence and Aggression

Definition, Extent and Scope

Despite being a significant concern over the past decade, both nationally and globally, there remains no consensus about the most appropriate way to define violence and aggression in the workplace (Rippon, 2000). However, the World Health Organisation (WHO) provide a widely accepted description: 'Incidents when staff members are abused, threatened or assaulted in circumstances related to their work, including commuting to and from work, involving an explicit or implicit challenge to their safety, well-being or health' (1995). Such events as described in this definition will be the focus of this research, and encompass a broad range of incidents involving physical, sexual and verbal violence and aggression.

Violence occurs in all work environments, although it is recognised as a significant problem in health professions (Health and Safety Advisory Committee, 1987; Whittington, Shuttleworth & Hill, 1996). Findings from the British Crime Survey (Upson, 2004) indicate that healthcare workers in the UK are at relatively high risk of both assaults and threats while at work. A significant proportion reported being worried about assaults and threats at work, which reflects their high risk of victimisation. These statistics are likely to be an underestimate of

incidence because professionals may not take criminal action owing to the emotional, physical or mental state of the perpetrator and perceived diminished responsibility (Budd, 1999). Figures published by the NHS Security Management Service (SMS) in 2006 indicate that 60,377 physical assaults towards NHS staff were reported in 2004-2005. They estimate that on average 1 in 22 staff are exposed to such incidents. This data does not represent other types of aggression, involving verbal aggression or sexual assault. Furthermore, the actual incidence of workplace violence is difficult to estimate, owing to the lack of a consistent definition and the absence of standardised measures (Leather, 2003), as well as significant under-reporting within the NHS by healthcare workers, particularly doctors (British Medical Association, 2003). Indeed, the National Audit Office (NAO) estimates that as many as two out of five incidents are unreported (2003). However, the available data indicates that workplace violence and aggression towards NHS staff is a widespread problem.

Although healthcare workers from all settings are exposed to violence at work, some groups are at greater risk, with greatest vulnerability amongst nursing staff. In terms of populations, consistently high incidence is reported in mental health and learning disability services, followed by ambulance services and acute hospitals, including accident and emergency (A&E) departments (NHS SMS, 2006). The National Audit of Violence (Healthcare Commission, 2005) found that 78% of nursing staff working in the latter two areas had been personally attacked, threatened, or made to feel unsafe, and 89% reported witnessing such events ($N = 6330$). For psychiatric nurses, workplace violence has been described as a 'virtually normative experience' (Lanza, Zeiss & Rierdan, 2006).

Consequences

Research highlights that workplace violence and aggression in the health service is prevalent, and there are potentially significant implications at individual and organisational levels. Despite the considerable size of the problem, there is a relatively limited amount of empirical research into the consequences of workplace violence for health sector workers, particularly in comparison with other professions (Rippon, 2000). Furthermore, Walsh and Clarke (2003) highlight that research has often focused on physical rather than psychological outcomes (e.g. Cooper & Mendonca, 1991; Haller & Deluty, 1988; Hobbs, 1991; Nolan, Dallender, Soares, Thomsen & Arnetz, 1999). However, the paucity of literature concerning psychological and emotional consequences is being addressed through research in the UK and internationally.

Although individual responses vary, many healthcare workers report being emotionally affected by the experience of workplace violence and aggression (e.g. Budd, 1999; Lanza, 1983; Whittington *et al.*, 1996), and a significant relationship has been found between workplace violence and a range of emotional sequelae (e.g. Arnetz & Arnetz, 2001). The International Council of Nurses (ICN, 1999) highlight a range of consequences, including substantial

psychological impacts for those directly involved. These include increased stress, anxiety and depression, loss of morale and belief in own professional competence, and self-blame. In a prospective study in the UK, Whittington and Wykes (1992) also reported fatigue, irritability, increased substance use and nightmares following assault. Although this involved a relatively small sample ($N = 24$), which is characteristic of many similar studies, such experiences have been confirmed in a recent meta-analytic review (Needham, Abderhalden, Halfens, Fischer & Dassen, 2005). These authors present evidence from 25 studies for the non-physical impact of violence and aggression amongst nurses. This highlighted the range of emotional, cognitive and social consequences for individuals, identified through international research. Relatively high incidences of general psychological distress following violence and aggression have been reported in the literature, although there is substantial variation. For example, in an exploratory study involving psychiatric nurses who had been assaulted, 30% ($n = 12$) reported experiencing a range of emotional, physiological and cognitive responses such as those related to anxiety (Lanza, 1983). In contrast, incidence of distress, manifested in problems such as depression, flashbacks, sleeplessness and taking time off, was reported by 86% ($n = 75$) of A&E doctors (Zahid, Al Sahlawi, Shahid, Awadh & Abu Shammah, 1999). Although findings from this research should be interpreted cautiously, owing to the retrospective design and non-standardised measures of symptoms, they provide further indication that exposure to violence and aggression can have negative psychological sequelae for healthcare workers.

Furthermore, as PTSD is a common response to traumatic events such as assault or severe accidents, healthcare staff may develop symptoms through exposure to violence and aggression in the workplace. There are three main clusters of symptoms of this disorder, including repeated and unwanted re-experiencing of the trauma, hyperarousal, and avoidance of stimuli that are associated with the event; a more detailed exploration of PTSD follows in a later section. Indeed, the meta-analytic review discussed above identified PTSD as a predominant consequence (Needham *et al.*, 2005). Prospective studies have documented symptoms of PTSD in general psychiatric nursing staff, reporting incidences of 10% to 47 %, although sample sizes have tended to be relatively small (e.g. Adams & Whittington, 1995; Flannery, Fisher, Walker, Kolodziej & Spillane, 2000; Flannery, Fulton & Tausch, 1991; Flannery, Hanson & Penk, 1995; Richter & Berger, 2006). The Joint Programme on Workplace Violence in the Health Sector (International Labour Office, ICN, WHO and Public Services International) commissioned a series of case studies following its launch in 2001, which also indicate that PTSD symptoms are a common outcome. For example, in South Africa over 55% of healthcare workers surveyed who were exposed to workplace physical violence ($N = 91$) reported experiencing symptoms of PTSD, to a moderate or severe degree (Steinman, 2003).

There is evidence to indicate that PTSD reactions can be severe, and in some cases reach a diagnostic threshold. In the US, Caldwell (1992) found that 61% ($n = 137$) of 224 clinical staff surveyed in a psychiatric setting reported symptoms and 10% ($n = 23$) fulfilled

DSM-III-R criteria for PTSD diagnosis (American Psychiatric Association; APA, 1987). A concerning finding is the duration of the emotional impact of violence and aggression, and PTSD is considered a likely long-term outcome (Hoel, Sparks & Cooper, 2000). For example, Ryan and Poster (1989) found that although symptoms had improved within approximately six weeks of the incident for 82% of nursing staff ($N = 61$), some were experiencing at least moderate PTSD symptoms six and twelve months following assault.

Despite acknowledgement of PTSD as a potential outcome, there is limited research concerning prevalence and severity in the UK health sector. However, available evidence corroborates international findings. For example, 37% ($N = 156$) of staff working in psychiatry wards that experienced actual or threatened violence reported high category scores on the Impact of Events Scale (IES), a validated measure of PTSD symptoms (Wildgoose, Briscoe & Lloyd, 2003). In a prospective study within a community NHS trust, Walsh and Clarke (2003) found that 6.5% ($N = 126$) of staff reported at least moderate symptoms of PTSD on the IES three months post-incident. Overall subjective ratings of psychological impact on an idiosyncratic questionnaire were higher than specific symptom ratings, with 42% reporting at least a moderate impact. An important finding in the latter study was that verbal aggression, which occurs more frequently, was associated with greater psychological distress. Other similar studies have also established that physical injury is not a necessary condition for long-term psychological impact (e.g. Crabbe, Alexander, Klein, Walker & Sinclair, 2003).

There are a number of limitations associated with the current literature. For example, variation in incidence of PTSD symptoms has been found, ranging from 10% (Adams & Whittington, 1995) to 61% (Caldwell, 1992). Some studies have identified staff who fulfill diagnostic criteria (e.g. Caldwell, 1992), while others have not (e.g. Richter & Berger, 2000). Such discrepancies may be influenced by factors such as different assessment instruments. Furthermore, research has often involved small sample sizes, achieved low response rates, and employed nonstandardised measures to assess symptoms. It is also disappointing that many studies have not explicitly investigated PTSD, especially when they have involved large samples (e.g. $N = 8531$; Arnetz & Arnetz, 2001). Despite these issues, there is a consistent finding that workplace violence has negative emotional and psychological consequences, which include PTSD symptoms. Furthermore, these can be severe and persistent for some individuals.

Individual impacts are interlinked with those to the organisation. Therefore, widespread workplace violence can potentially cause immediate and long-term disruption in the delivery of healthcare services. In a DOH consultation paper (2006), the potential for violence and aggressive behaviour to negatively impact on the workplace environment is emphasised, regardless of incident severity. In addition to the immediate costs of absenteeism, such problems include potential deterioration of the quality of care provided and job performance (e.g. Fernandes, Raboud, *et al.*, 2002). For example, this can occur if staff engage in avoidance behaviours that may negatively affect the performance of duties (e.g. Richter & Berger, 2006).

Violence at work can also result in lower job satisfaction (Fernandes, Bouthillette, *et al.*, 1999) and commitment to the organisation (Barling, 1996), with some workers making subsequent decisions to leave the healthcare professions (e.g. Fernandes, Raboud, *et al.*, 2002). A retrospective study of 106 A&E personnel illustrates these outcomes, with 74% (n = 78) reporting reduced job satisfaction and 27% (n = 27) taking leave as a direct result of violence and aggression. Of those who had left their job, 67% (n = 18) reported that this was partly attributable to violence (Fernandes, Bouthillette, *et al.*, 1999). While this should be interpreted with caution due to the potential for biased responding, in the context of other findings it highlights the potential for violence to negatively impact on attitudes towards work.

Ultimately, workplace violence may result in a reduction in health services available to the general population (DOH, 2006) and an increase in health costs. Although research has established the potential impacts of workplace violence and aggression, no consistent data are available quantifying the impact and costs to the NHS (NAO, 2003).

Addressing this issue is a priority concern for all healthcare organisations. The NHS implemented a framework in 2003 concerning management of violence and aggression. While there is considerable emphasis upon prevention, training and facilitating prosecution of offenders (DOH, 2006), it is also recognised that NHS organisations should develop strategies that seek to reduce and manage the negative individual and organisational impacts associated with workplace violence. Consequently, published guidance is now available at national, occupational and professional levels for dealing with such events (e.g. Royal College of Nursing & NHS Executive, 1998). It is emphasised that organisations should deal with immediate distress, and prevent development of severe psychological problems amongst staff exposed to workplace violence and aggression (Richards, 2003). It would be impractical and costly to provide intervention to all staff following exposure to incidents. Moreover, evidence suggests that such a blanket approach may not be worthwhile. For example, single sessions of psychological briefing do not seem to be effective (e.g. Rose, Bisson & Wessley, 2002) and may be detrimental in the long term (e.g. Murray *et al.*, 2002). Taken with the knowledge that the majority of individuals will recover from symptoms of PTSD on their own, this suggests that strategies for identifying those who are likely to benefit from intervention is of great interest and importance (Ehlers & Clark, 2003). This would have obvious benefits to the affected individuals who experience distressing symptoms, which can impact on their functioning in personal and occupational life domains. In terms of resources, it would also offer NHS employers with a more achievable and effective strategy.

Summary

There are a number of limitations associated with the research concerning the incidence and prevalence of psychological consequences of workplace violence and aggression in healthcare workers. This includes low response rates, reliance on retrospective reporting and

the use of nonstandardised measures (Walsh & Clarke, 2003). Despite these, the available literature explored here suggests that psychological reactions are common, including symptoms of PTSD, and a proportion are severe. In addition to the distress experienced by the individual involved, these can have far-reaching consequences for the employing organisation. The following section will consider PTSD in more detail, including characteristics of the disorder, risk factors, and the need for developing valid psychological models.

PTSD

Definition, Prevalence and Incidence

PTSD is characterised by three clusters of symptoms, relating to repeated or unwanted re-experiencing of the incident, arousal, and a range of behavioural responses including subsequent avoidance of stimuli associated with the event. Symptoms can cause significant impairments in social and occupational functioning. Striking variability in prevalence following trauma has been reported in the current literature, with extremities of 17.5% to 42% at six months post-trauma, and 2% and 36% at twelve months. The discrepancy can be partly attributed to methodological issues (O'Donnell, Creamer, Bryant, Schnyder & Shalev, 2003). For example, potentially confounding factors include the use of self-report measures and mental or physical states such as pain following injury, which could influence symptomatology and have not been accounted for. The representativeness of some samples is also questionable (O'Donnell *et al.*, 2003); findings from biased samples, for example where prevalence of symptoms is over-represented owing to methodological limitations or some other factor, are unlikely to be replicated in further research.

However, PTSD is known to be a common response to the experience of trauma, with an epidemiological survey of a nationally representative sample of 5877 people aged between 15 and 45 in the US finding a lifetime prevalence rate of 7.8% (Kessler, Sonnega, Bromet, Hughes & Nelson, 1995). The disorder was first included as a diagnostic classification by the APA in 1980, although the symptoms which are now recognised as PTSD, were previously described under a variety of names including shell shock and rape-trauma syndrome. Aspects of its conceptualisation have continued to be modified over the past two decades, for example reflecting acknowledgement that traumatic exposure is relatively common.

Evidence suggests that a normative pattern is for individuals to initially experience a range of symptoms following trauma, but for the majority of people these will remit in the following weeks or months (Kessler *et al.*, 1995). However, PTSD symptoms persist for approximately one third of those exposed to trauma (Kessler *et al.*, 1995). The course of PTSD tends to be chronic, with a duration of at least three months. The National Comorbidity Survey (Kessler *et al.*, 1995) established that over 70% of cases lasted more than one year, and over a third remained symptomatic for at least three years. A significant disparity between lifetime

prevalence of exposure to a traumatic event (approximately 50%) and lifetime prevalence of PTSD (5 to 10%) has prompted investigation into individual variability in psychological response to traumatic stress (Ozer *et al.*, 2003). Traumas such as motor vehicle accidents (MVAs) and assault have been extensively studied, with less literature surrounding PTSD and workplace violence or aggression in civilian populations. However, evidence reviewed earlier indicates that employees exposed to actual or threat of physical violence and aggression may experience similar reactions (e.g. Whittington & Wykes, 1989; Wykes & Whittington, 1998).

Individual vulnerability factors for PTSD may be important in understanding the mechanisms of the disorder. Furthermore, they represent a way of identifying individuals who are at risk of developing persistent symptoms, and could therefore aid prediction. Such factors associated with PTSD will now be explored.

Risk Factors for PTSD

Risk factors are pre-existing variables associated with the development of a disorder. Such vulnerability factors are important in understanding PTSD, as this outcome does not occur in all individuals who are exposed to trauma. PTSD has been associated with pre-trauma risk factors such as personal or family history of psychological difficulties, childhood sexual or physical abuse, experience of other early trauma, gender, personality traits and lower intelligence (e.g. Breslau, Davis, Andreski & Peterson, 1991; Nishith, Mechanic & Resick, 2000). In addition, certain trauma characteristics have been associated with PTSD, such as stressor severity and preparedness, and post-trauma risk factors including perceived lack of social support and other stressful events. Although a number of processes through which these factors influence development of PTSD have been speculated on, they have received limited investigation (Brewin *et al.*, 2000). Indeed, the interpretation of such factors can be problematic. For example, in cross-sectional research it can be difficult to establish whether risk factors such as lack of social support are a cause or consequence of PTSD. Furthermore, findings for individual risk factors have been inconsistent across studies.

Meta-analytic studies have provided important insight into vulnerability for PTSD. Brewin *et al.* (2000) carried out a comprehensive meta-analysis of key risk factors for PTSD in adults. The findings are based on 77 studies, with sample sizes ranging from 1149 to 13,653, and the predictive utility of each risk factor is shown in Table 1. All predictors included were statistically significant ($p < .001$), but most varied in their effect size across studies. The exceptions to this were psychiatric history, reported childhood abuse and family psychiatric history, which were more consistent predictors of PTSD. It is of interest to note that peri-trauma and post-trauma variables (trauma severity, lack of social support and additional life stress) conveyed a stronger risk for PTSD compared with pre-existing variables. Furthermore, evidence suggests that subjective ratings of injury severity may be more important in

determining subsequent PTSD severity than objective ratings (e.g. Ehlers, Mayou & Bryant, 1998).

Table 1: Effect sizes of risk factors for PTSD[1]

Risk factor	Combined effect size *r*	Range
Gender (female)	.13	-.04-.31
Younger age at trauma	.06	.38-.28
Race (minority status)	.05	-.27-.39
Lack of education	.10	-.11-.37
Previous trauma	.12	-.05-.36
General childhood adversity	.19	.09-.60
Low SES	.14	.01-.38
Low intelligence	.18	.08-.38
Trauma severity	.23	-.14-.76
Lack of social support	.40	-.02-.54
Life stress	.32	.26-.54
Psychiatric history	.11	.00-.29
Reported childhood abuse	.14	.07-.30
Family psychiatric history	.13	.07-.28

Note. Cohen (1988) defines effect sizes ≤ .2 as small and ≤ .5 as medium.

Similar findings were obtained in a subsequent meta-review (Ozer *et al*., 2003), which confirmed the importance of factors that are more proximal to the traumatic event, such as perceived life threat and perceived lack of social support. Although there are limitations concerning the literature on which this review was based, such as reliance on self-report measures of PTSD, the findings from this meta-analysis suggest that psychological processes such as peritraumatic dissociation are better predictors of PTSD than pre-existing characteristics.

These reviews did not include all potential risk factors; several factors relating to the trauma, such as persistent medical and financial problems, and planned or initiated compensation, have been related to subsequent symptom severity (e.g. Ehlers *et al*., 1998). Furthermore, the studies included vary in terms of sample size and characteristics, and subsequently the cause of heterogeneity of risk factors is unclear.

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[1] Adapted from "Meta-analysis of Risk Factors for Post-traumatic Stress Disorder in Trauma-Exposed Adults" by C. R. Brewin, B. Andrews and J. D. Valentine, 2000, *Journal of Consulting and Clinical Psychology, 68,* p. 753. Copyright 2000 by the American Psychological Association. Adapted with permission of the author.

Limited evidence is available in the literature concerning risk factors assessed prior to trauma, owing to the inherent practicalities and ethical issues. Personality has attracted some interest, for example harm-avoidance and novelty seeking personality dimensions (Gil, 2005), and neuroticism, reflecting proneness to negative emotional states (e.g. O'Toole, Marshall, Schureck & Dobson, 1998). Other pre-existing characteristics have been assessed retrospectively and gained support, for example a general tendency to worry (Ehlers *et al.*, 1998). However, with retrospective measurement it is unclear whether scores are a consequence of trauma exposure or PTSD, or whether they reflect pre-existing risk for PTSD.

Initial PTSD Symptom Severity as a Predictive Factor

Initial PTSD symptoms have been identified as a strong predictor of later psychopathology (e.g. Mason, Turpin, Woods, Wardrop & Rowlands, 2006). Indeed, several studies suggest that a significant proportion of those who display acute stress disorder (ASD), that is traumatic stress symptoms in the initial month after trauma lasting for at least two days, later develop PTSD (Brewin, Andrews, Rose & Kirk, 1999; Bryant & Harvey, 1998, 2002; Harvey & Bryant, 1998, 1999b, 2000; Classen, Koopman, Hales & Spiegal, 1998; Holeva, Tarrier & Wells, 2001). However, lower proportions are reported in other studies (Schnyder, Moergeli, Klaghofer & Budeberg, 2001; Staab, Grieger, Fullerton & Ursano, 1996), and a subgroup of those who develop PTSD do not initially meet full ASD criteria (e.g. Carty, O'Donnell & Creamer, 2006). Furthermore, there are inconsistencies in the predictive power of early symptoms, and some have been shown to have little predictive power, such as presence or frequency of intrusions (e.g. Shalev, 1992; Shalev, Freedman, Brandes & Peri, 1997; Michael, Halligan, Ehlers & Clark, 2005). However, evidence suggests that PTSD rarely develops without initial symptoms, and subthreshold levels of symptoms should be considered as a risk factor for PTSD (Bryant & Harvey, 2002; Carty *et al.*, 2006). This is supported by Brewin *et al.*'s (1999) finding that three or more symptoms from the intrusive or arousal cluster demonstrated good predictive power, with approximately 80% overall accuracy. Initial symptom severity should therefore be examined in predictive models of PTSD.

Conclusions

Heterogeneity of the data concerning risk factors suggests that there is not a general vulnerability model of PTSD per se. While those with greater temporal proximity to the trauma appear more important in predicting outcomes, distal factors such as gender are relevant depending on the population under study. Furthermore, combining pre-trauma factors could improve their predictive utility (Brewin *et al.*, 2000). Data from both meta-reviews concerning risk suggest that psychological responses to trauma might be particularly important in conferring risk of developing PTSD symptoms. Psychological models of PTSD, which seek to explain this risk, will now be explored.

Psychological Theories of PTSD

PTSD is associated with disturbances in various psychological processes, including memory, attention, cognitive-affective reactions, beliefs and coping responses. Theories of PTSD must therefore account for these process disturbances, in order to be comprehensive and inform effective clinical interventions. Brewin and Holmes (2003) provide a detailed review of existing psychological theories. Earlier theories (e.g. Horowitz, 1976, 1986; Janoff-Bulman, 1992) can be divided into three categories; social-cognitive, conditioning and information processing. These are largely consistent with evidence but fail to account for all aspects of PTSD, and were based on limited available knowledge of the disorder and associated processes at the time they were put forward. However, they have contributed to the development of more recent theories and elements have been retained.

Three recent theories of PTSD, based on both extensive clinical experience and empirical research, are described and evaluated in detail by Brewin and Holmes (2003). The first of these is emotional processing theory (Foa & Riggs, 1993; Foa & Rothbaum, 1998), which builds on the notion of an associative fear network (Foa, Sketee & Rothbaum, 1989). It is postulated that trauma memories are represented in a distinctive way, in that the strength of interconnections in fear memories between trauma stimuli and emotional, behaviour and physiological responses leads to hypervigilance, involuntary recall of unpleasant trauma memories and subsequent avoidance of symptoms. Other characteristics of the trauma memory network make it vulnerable to selective activation, such as a low activation threshold and strong response elements. The authors also emphasise the role of pre-existing beliefs and appraisal processes. For example, negative beliefs about incompetence and danger are established or reinforced through appraisals of the trauma. The rigidity of pre-existing beliefs is thought to be particularly important, increasing vulnerability to negative re-appraisal following trauma. Although the treatment associated with emotional processing theory, prolonged exposure, is effective (Foa, 2006) and the model acknowledges the importance of subjective meaning of trauma, there is limited evidence for the associated mechanisms of change. Furthermore, the proposal that the trauma is represented in memory like an ordinary memory with a different structure may not account for all features of PTSD, such as the co-existence of intense flashbacks with disorganised and incomplete narrative memory (Mechanic, Resick & Griffin, 1998). As a single level model of memory it may provide only a simplistic account of human emotional experience (Teasdale & Barnard, 1993).

The second prominent theory was put forward by Brewin, Dalgleish and Joseph (1996), and suggests that memories are represented at two levels. Known as 'dual representation theory', it postulates that trauma memories are represented in a distinctive way, in that they become dissociated from the ordinary memory system and cannot be accessed intentionally. More specifically, PTSD re-experiencing symptoms arise when a trigger causes the trauma memory, which is represented in a situationally accessible memory (SAM), to be activated.

SAM is produced from lower-level perceptual processing. This is in contrast to a verbally accessible memory (VAM), which is more integrated into the autobiographical memory system. Negative appraisals of the trauma also feature in this account of PTSD, and can lead to psychopathology through producing negative emotions. Dual representation theory offers a comprehensive account of memory processes involved in re-experiencing, acknowledges the role of appraisals, and draws on evidence from both cognitive psychology and cognitive neuroscience (Brewin, 2001). However, certain elements of PTSD such as dissociative responses receive limited attention, and further research is required to provide support for central components of the theory (Brewin & Holmes, 2003).

Finally, Ehlers and Clark (2000) proposed a cognitive model of PTSD, which highlights the role of negative appraisals and cognitive processing leading to trauma memory deficits; a detailed description follows below.

These models are not mutually exclusive and all incorporate explanations for a wide range of psychological processes involved in PTSD. A major distinction relates to how they conceptualise the nature of trauma memories and associated processes, as well as how recovery from PTSD relates to changes in memory. Ehlers and Clark's (2000) cognitive model is attracting research that seeks to investigate the proposed mechanisms. Initial research suggests that the component cognitive factors may provide important insight into the processes involved in psychological responses to trauma. Furthermore, it has been suggested that this model may currently be the most comprehensive (Brewin & Holmes, 2003). It will now be described in detail, followed by critical appraisal of the evidence. Please note that the main limitations of the studies reviewed here are considered together in a later section, as there is considerable overlap.

Ehlers and Clark's Cognitive Model

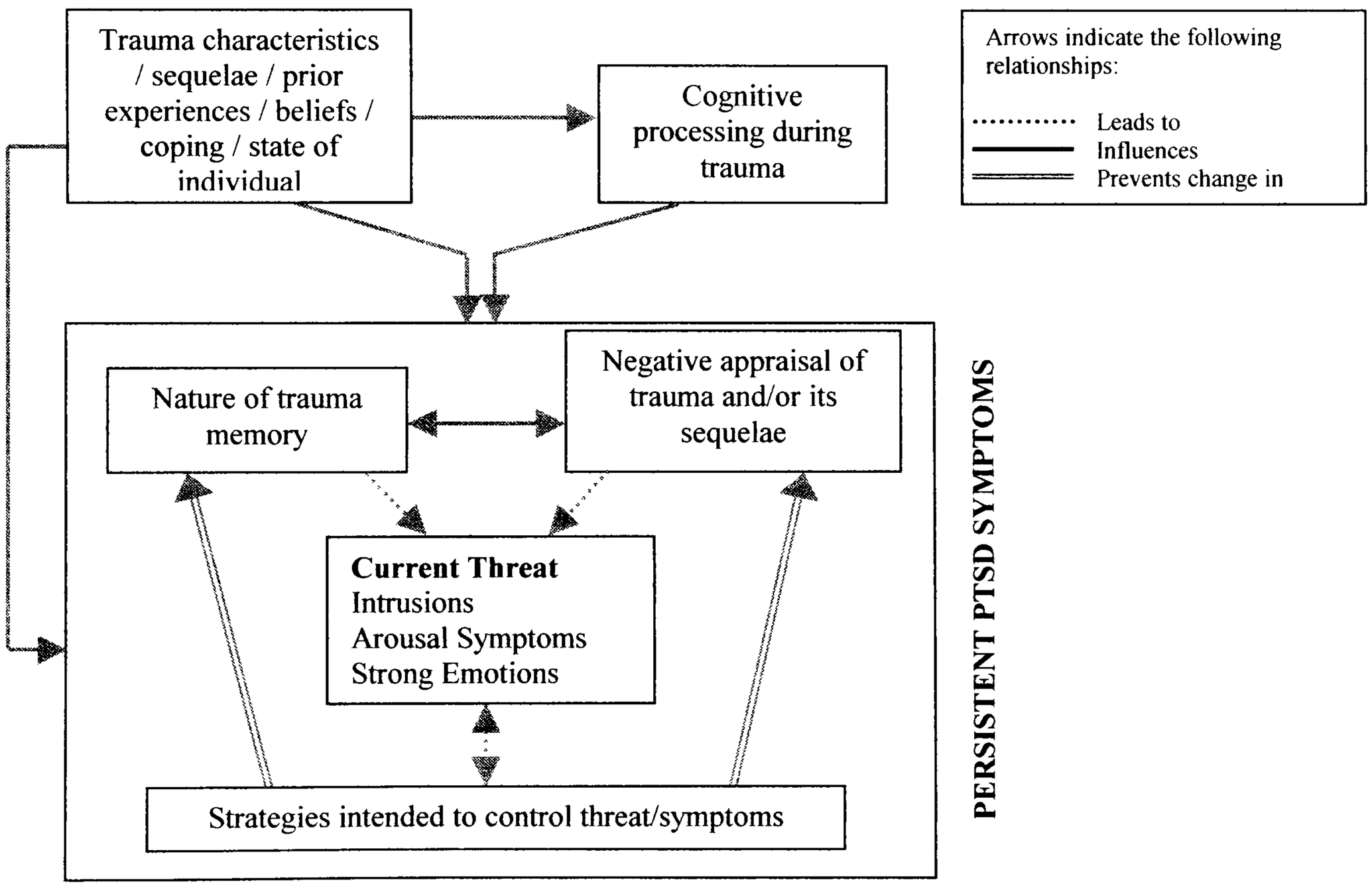
Context

The cognitive model of PTSD proposed by Ehlers and Clark in 2000 draws on extensive clinical experience, experimental tests and treatment research studies. Initial attempts to explain symptomology were based on the authors' understanding of other anxiety disorders, such as panic (Clark, 1986), which focus exclusively on appraisals and consequential cognitive and behavioural responses (Clark, 2004). However, a broader model was needed to incorporate an explanation of the nature of memory in PTSD. The model put forward in 2000 incorporates and extends ideas from other theorists (Brewin *et al.*, Joseph, 1996; Conway, 1997a, 1997b; Foa & Riggs, 1993; Foa & Rothbaum, 1998; Foa *et al.*, 1989; Horowitz, 1997; Janoff-Bulman, 1992; Joseph, Williams & Yule, 1997; Markowitsch, 1996, Resick & Schnicke, 1993; van der Kolk & Fisler, 1995; van der Kolk & van der Hart, 1991).

Overview

Ehlers and Clark's (2000) model of PTSD emphasises the role of cognitive processing and appraisals in the maintenance of symptoms. They suggest that persistent PTSD occurs when certain types of processing of the event produce a sense of a current, serious threat. This occurs through two key mechanisms; negative appraisals of the event and / or its sequelae, and trauma memory deficits. These give rise to re-experiencing symptoms such as intrusions, hyperarousal and emotional responses such as fear and anxiety that are associated with PTSD. Symptoms are maintained as the individual engages in behavioural or cognitive strategies that are intended to reduce distress and perceived threat, but ultimately prevent change at a cognitive level and lead to the sense of danger being maintained. Figure 1 provides a diagrammatic overview of the model:

Figure 1: A cognitive model of PTSD[2]



In a review of the model, the following sections describe its key components and provide an overview of the available evidence. The relationship between cognitive variables included in the model and subsequent PTSD symptoms are of particular interest to the present study. The discussion will then move to consider the status of the current literature.

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[2] From "A cognitive model of post-traumatic stress disorder" by A. Ehlers and D. M. Clark, *Behaviour Research and Therapy, 38,* p. 321. Copyright 2000 by Elsevier Science Ltd. Reprinted with permission of the author.

Key Components

Cognitive processing during trauma. Peri-traumatic processing is proposed to influence the nature of the trauma memory. Specifically, poor elaboration and integration with autobiographical memory, conditioning for associated cues and strong perceptual priming is postulated to lead to re-experiencing symptoms being easily triggered. Based on results from experimental cognitive psychology, three key types of processing are attributed to these memory deficits. It is important to note that there is conceptual overlap (Ehlers, Mayou *et al.*, 2003).

The first of these is 'data-driven processing', which refers to a processing style focused on sensory characteristics of the trauma situation. This leads to difficulty intentionally retrieving the trauma memory, and strong perceptual priming for stimuli associated with the event. Findings from experimental analogue studies support the hypothesis that data-driven processing produces PTSD-like memories and analogue symptoms (Halligan, Clark & Ehlers, 2002). Furthermore, prospective studies have found correlations with PTSD symptoms in adult survivors of assault (Halligan, Michael, Clark & Ehlers, 2003), workplace violence and aggression (Salter, 2003), child survivors of trauma (Ehlers *et al.*, 2003) and MVA, after controlling for dissociation (Murray, *et al.*, 2002).

The second key type of processing during the event is a lack of 'self-referent processing'. It is postulated that failure to establish a self-referent perspective during trauma, that is, not processing the event in relation to oneself, impedes integration with autobiographical memory. There may be some overlap with the dissociative experience of de-personalisation, but the latter is a more extreme sense of being disconnected from the surrounding situation. Disruption in self-referent processing has received relatively less emphasis in research, although correlations have been found with initial and later PTSD symptom severity in both cross-sectional and prospective studies, after controlling for trauma severity (Halligan *et al.*, 2003; Salter, 2003).

The third processing style is 'dissociation', a complex concept that refers to symptoms such as de-realisation, de-personalisation, detachment, altered time sense, emotional numbing and reduced awareness in surroundings. Dissociation during trauma is hypothesised to affect encoding and disrupt organisation of memory for the event. It is distinct from re-experiencing symptoms, caused by certain appraisals rather than trauma memory disorganisation. Evidence supporting the role of peri-traumatic dissociation has been gained in both retrospective (Dunmore, Clark & Ehlers, 1997, 1999; Engelhard, van Rij *et al.*, 2002; Halligan *et al.*, 2003; Laposa & Alden, 2003) and prospective studies (Dunmore *et al.*, 2001; Ehlers, Mayou & Bryant, 1998; Ehlers, Mayou & Bryant, 2003; Halligan *et al.*, 2003; Koopman, Classen & Spiegel, 1994; Murray *et al.*, 2002; Salter, 2003; Shalev, Peri, Canetti & Schreiber, 1996). It was also the sole predictor of PTSD severity in a medical population following cancer diagnosis (Kangas, Henry & Bryant, 2005). An analogue study also provides support for the role of

dissociation in the experience of intrusive memories, using a stressful film paradigm (Holmes, Brewin & Hennessy, 2004).

The importance of dissociative experiences in the development of PTSD symptoms was confirmed in a recent meta-analytic review (Ozer *et al.*, 2003), which produced a statistically significant, medium effect size of .35 (combined $N = 3534$). Although the data concerning dissociation were not homogenous, with effect sizes ranging from .14 to .94 depending on assessment method, population and period since trauma at time of assessment, it was the most salient and robust predictor. Dissociation may be related to development of specific symptoms rather than overall severity. For example, in a study of emergency workers, peri-traumatic dissociation was only related to re-experiencing symptoms (Laposa & Alden, 2003). Furthermore, although initial dissociation may be a risk factor for PTSD, a persistent dissociative response style is a stronger predictor of chronic symptoms (Murray *et al.*, 2002; Halligan *et al.*, 2003).

A further thought process which can occur during trauma is 'mental defeat'. This refers to perceived loss of all autonomy during the event, and is a state where an individual relinquishes efforts to maintain their human identity with a will of their own. It is thought to influence appraisals, and evidence indicates that those who experience this are more likely to infer that it is evidence for a negative view of themselves (Ehlers, Clark *et al.*, 1998; Ehlers, Maercker & Boos, 2000; Dunmore *et al.*, 1997, 1999, 2001). The relationship with PTSD severity was not maintained in the retrospective study of adults exposed to assault after controlling for previous history and perceived and objective severity of the trauma (Dunmore *et al.*, 1999). However, Ehlers *et al.* (2000) highlight that mental defeat is only expected to be experienced when trauma is of sufficient intensity.

Nature of the trauma memory. It is postulated that disorganised trauma memories are associated with PTSD symptoms, and a number of theorists agree with this view (e.g. Brewin et al., 1996; Foa & Rothbaum, 1988). Indicators of such disorganisation have correlated with PTSD symptoms in cross-sectional research (e.g. Koss, Figueredo, Bell, Tharan & Tromp, 1996). In a prospective study, Salter (2003) found that disorganised memory accounted for 44% of variance in persistent PTSD symptoms in a sample of healthcare workers following violence and aggression, after controlling for background and trauma characteristics. Furthermore, disorganised memory and dissociative content were more characteristic of memories in people with ASD following motor vehicle accidents than those without ASD (Harvey & Bryant, 1999a). In addition, an exposure-based intervention for PTSD provides preliminary evidence that improvement in symptoms is associated with more cohesive memory organisation (Foa, Molnar & Cashman, 1995). A number of limitations can be identified in this study, so these findings should be interpreted with caution and require further validation. For example, the sample size was extremely small ($N = 14$), which also restricted statistical analysis of the relationship between memory fragmentation and improvement in symptoms. In addition,

the methodology involved coding trauma narratives, a technique that can be criticised (e.g. Ehlers, Hackmann & Michael, 2004). For example, interpretation is confounded by reliance on verbal intelligence and difficulty identifying which memory processes are impaired. In summary, no consistent evidence is available to establish that improvement in therapy is associated with the hypothesised changes in trauma memories (Brewin & Holmes, 2003).

As described previously, evidence supports the contribution of certain types of peri-traumatic processing to subsequent PTSD symptoms, which are proposed to create encoding deficits and subsequent impairments in autobiographical memory. A relationship between cognitive processing style (i.e. data-driven, lack of self-reference and dissociation) and disorganisation in trauma memory has been found to support this hypothesis (Halligan *et al.*, 2003). Murray *et al.* (2002) also demonstrated this relationship after controlling for assault severity, and replicated previous findings that the extent of disorganisation predicts PTSD. There are limitations associated with research concerning trauma memories, such as inconsistent use of terminology, conceptualisation and indices of fragmentation. Such issues could contribute to discrepancies in findings and present difficulties with comparisons across studies. Further clarification of mechanisms is also required (Ehlers *et al.*, 2004). However, the evidence reviewed here suggests that both cognitive processing and trauma memory disorganisation should be considered as potentially useful predictors of persistent PTSD.

Furthermore, enhanced perceptual priming for stimuli shortly before and during trauma is identified as an important feature of trauma memories in PTSD, leading to re-experiencing symptoms. It is proposed that this processing advantage leads to intrusive memories being triggered involuntarily by cues associated with the traumatic event. Indirect evidence of a bias for threat material suggests that it is of theoretical importance in explaining development of PTSD (Michael, Ehlers & Halligan, 2005). However, Michael, Ehlers & Halligan (2005) found that perceptual priming did not explain severity after controlling for initial symptoms, suggesting that it is not of practical importance in predicting persistent PTSD.

Negative appraisals of the traumatic event and its sequelae. The way that an individual appraises the trauma and its sequelae are central to this model of PTSD. Excessively negative appraisals contribute to a sense of current, serious threat; it is this perception that is proposed to produce persistent symptoms (Ehlers & Clark, 2000). Furthermore, the type of appraisals will influence emotional responses. For example, guilt is associated with appraisals concerning responsibility for the trauma.

Idiosyncratic negative interpretations of the traumatic event concern emotions and actions during trauma. They commonly include overgeneralisations of danger, global negative thoughts about the self, and self-blame (Foa, Ehlers, Clark, Tolin & Orsillo, 1999). Evidence for a relationship between 'appraisals of emotions' during trauma and PTSD outcomes has been found in a retrospective study (Dunmore *et al.*, 1999), and replicated prospectively by the same authors (2001). The role of 'appraisal of actions' in PTSD is also supported in the literature

with a range of traumas (Dunmore et al., 1997; Frazier & Schauben, 1994; Joseph, Brewin, Yule & Williams, 1991, 1993; Foa, Rothbaum, Riggs & Murdoch, 1991). These findings are not consistent (e.g. Dunmore *et al.*, 1999, 2001), although in the former study this factor approached significance. The authors do not provide explanations for these nonsignificant findings, but methodological considerations such as small sample sizes in both studies and retrospective design in the former suggest that further investigation is warranted rather than rejecting its role in predicting PTSD symptoms. A prospective design is necessary to establish the role of variables as genuine predictors.

With regards to appraisal of trauma sequelae, 'negative interpretations of initial PTSD symptoms' appear important. Strong empirical evidence for the role of these appraisals in PTSD is reported for adults exposed to assault, after controlling for assault severity and previous history (Dunmore *et al.*, 1999, 2001), and has been replicated with healthcare workers exposed to violence and aggression (Salter, 2003). Negative appraisal of symptoms was also found to predict PTSD symptoms following pre-eclampsia (Engelhard, van Rij *et al.*, 2002) also independently of trait neuroticism following pregnancy loss (van den Hout & Engelhard, 2004).

Interpretation of intrusions has been extensively studied. Intrusive memories are hypothesised to be warning signals (Ehlers *et al.*, 2002) and concern stimuli that signal impending danger through association with the traumatic situation. Appraisals of intrusions have consistently predicted PTSD after controlling for frequency (Ehlers *et al.*, 1998; Ehlers *et al.*, 2003; Halligan *et al.*, 2003) and over and above trauma severity and catastrophic thoughts when anxious (Steil & Ehlers, 2000). These findings have been replicated in emergency service workers, although involved retrospective designs (Clohessy & Ehlers, 1999; Laposa & Alden, 2003). The finding that distress caused by intrusive memories is a predictor of persistent PTSD, rather than presence or frequency of such intrusions, has recently been replicated in assaulted adults, in both cross-sectional and prospective designs (Michael, Halligan, *et al.*, 2005). Halligan *et al.* (2003) extended the research into interpretation of initial symptoms and found evidence supporting the role of negative interpretations of trauma memory disorganisation.

The concept of ex-consequentia reasoning provides additional support for the role of appraisals in persistent PTSD, as well as other anxiety disorders (Engelhard & Arntz, 2005). Individuals misinterpret the presence of anxiety responses and other symptoms as validation for thoughts of impending threat, and evidence of this type of reasoning has been found in cross-sectional research with both train crash survivors (Engelhard, van den Hout, Arntz & McNally, 2002) and Vietnam veterans (Engelhard, Macklin, McNally, van den Hout & Arntz, 2001).

'Negative perceptions of other peoples' reactions' following the trauma, such as thinking that others are unsupportive or hold the individual responsible for the event, show correlations with PTSD symptoms in both retrospective (Dunmore *et al.*, 1997, 1999) and prospective studies (Dunmore *et al.*, 2001). Although the relationship remained significant after controlling for previous history and trauma severity in the latter study, further analysis revealed

that this was mediated by initial symptom severity. The authors conclude that certain PTSD symptoms could arise from specific types of appraisal. For example, distrust of others leading to arousal and hypervigilance. Further support for the importance of perception of other's responses in persistent PTSD comes from adults following sexual assault (Davis, Brickman & Baker, 1991; Ullman, 1996).

Finally, 'perceived long-term negative consequences', for example in physical or financial life domains, may influence PTSD severity. Again, correlations have been established with PTSD following assault (Dunmore *et al.*, 1997, 1999, 2001; Ehlers, Clark, *et al.*, 1998), and following political imprisonment (Ehlers *et al.*, 2000). A prospective study found that this variable predicted symptom severity over and above previous history and assault severity, and at six months when controlling for initial symptoms (Dunmore *et al.*, 2001). Although trauma commonly results in objectively observable negative consequences, and these can predict PTSD (e.g. persistent health problems; Ehlers, Mayou & Bryant, 1998), it is noteworthy that not everyone who has persistent problems develops PTSD (e.g. Ehlers *et al.*, 2000).

Maladaptive control strategies. Ehlers and Clark (2000) suggest that individuals engage in cognitive and behavioural strategies that seek to reduce the sense of current threat and associated symptoms. These are coherent with the individual's appraisals, and are not necessarily intentional. Three mechanisms are proposed to maintain PTSD symptoms, and are shown in Table 2 alongside the associated strategies. Some control strategies directly produce symptoms of PTSD, for example, avoiding or suppressing thoughts inadvertently increases the frequency of intrusions. Other maladaptive control strategies have indirect effects, through preventing change in appraisals and / or the nature of the trauma memory. Strategies involving either cognitive or behavioural avoidance prevent individuals from disconfirming negative appraisals, and interfere with the formation of a more complete memory that is integrated with other autobiographical knowledge. A strategy that affects both is actively avoiding thinking about the trauma, for example through keeping the mind occupied or using substances. This prevents elaboration of the trauma memory, and also prevents re-appraisal of what would happen if the individual allowed thoughts about the trauma.

Table 2: Mechanisms involved in dysfunctional control strategies

	Proposed mechanism		
Strategy	Directly produces PTSD symptoms	Prevents change in appraisals of trauma and/or its sequelae [a]	Prevents change in the nature of the trauma memory [a]
Thought suppression	*		
Behaviours used to control symptoms	*		
Safety behaviours	*		
Give up or avoid activities	*		*
Avoid reminders of the trauma	*		*
Use substances or medication	*		*
Rumination	*		*
Avoid thinking about the trauma			*
Dissociation			*

[a] These mechanisms are proposed to indirectly produce PTSD symptoms.

Strategies, such as those linked with avoidance of circumstances associated with the stressor, are a predominant feature of behaviour in individuals following trauma exposure. While these have acquired recognition as symptoms, Ehlers and Clark (2000) highlight their role in producing and maintaining PTSD symptoms, either directly or indirectly.

Confirmation of the roles of both behavioural and cognitive strategies in PTSD symptom severity has been gained in a number of studies, and will now be explored. Of particular relevance to the present research, a prospective study of healthcare workers exposed to violence and aggression found that behavioural and cognitive strategies explained 10% of variance in PTSD symptoms over background and trauma characteristics (Salter, 2003). However, avoidance is a symptom of PTSD as well as a strategy, and the author did not investigate the relationship after removing the avoidance cluster of items from the predictor variable. This may have led to an overestimate of the variance explained by behavioural strategies.

Among the cognitive processes in response to trauma, accumulating evidence in the literature supports the notion that suppressing thoughts inadvertently leads to a resurgence of unwanted thoughts (Wenzlaff & Wegner, 2000). A retrospective study concerning PTSD has found that this cognitive strategy is linked with greater psychopathology in healthcare populations (Clohessy & Ehlers, 1999; Laposa & Alden, 2003), following assault (Dunmore *et al.*, 1999; Steil & Ehlers, 2000) and following pregnancy loss (Engelhard, van Rij, *et al.*, 2002). These findings have been corroborated prospectively following MVA (Dunmore *et al.*, 2001; Ehlers, Mayou & Bryant, 1998; Ehlers *et al.*, 2003), and predicted PTSD severity over and

above previous history, assault severity and initial symptoms (e.g. Dunmore *et al.*, 2001). Although Michael, Halligan, *et al.* (2005) did not replicate this relationship, the relatively small sample size should be taken into consideration. The authors also highlight that some forms of distraction may be adaptive.

Rumination, such as dwelling on intrusions or thinking about how the trauma could have been prevented, has shown substantial correlations with PTSD severity. This is confirmed by both retrospective and prospective investigation (e.g. Murray *et al.*, 2000; Michael, Halligan, *et al.*, 2005). Studies have found significant results after controlling for frequency of intrusions (Clohessy & Ehlers, 1999; Laposa & Alden, 2003; Steil & Ehlers, 2000), previous history, assault severity and initial symptoms (Dunmore *et al.*, 1999, 2001; Ehlers, Mayou & Bryant, 1998; Salter, 2003).

Dissociation is another maladaptive cognitive response to trauma that has been shown to interfere with recovery. Empirical evidence for this concept has been covered previously.

The role of behavioural avoidance and safety behaviours in anxiety disorders is well documented. Behaviours used to control symptoms in PTSD, particularly avoidance of reminders of the event, are consistently found to predict PTSD severity (Dunmore *et al.*, 1999, 2001; Salter, 2003). Avoidance of reminders was still related to PTSD after removing the avoidance cluster from symptom scores (Steil & Ehlers, 2000).

Multivariate Prediction of PTSD

Some of the aforementioned studies have examined the amount of variance in PTSD outcomes that can be accounted for by cognitive factors identified in Ehlers and Clark's model. Evidence suggests that these factors can significantly predict symptom severity in different populations, including assault (Dunmore *et al.*, 1999, 2001), MVA (Steil & Ehlers, 2000), in children following MVA (Ehlers *et al.*, 2003) and ambulance workers (Clohessy & Ehlers, 1999). Of relevance to the present study, Salter (2003) found that seven of the cognitive variables predicted 61% of variance over background and assault characteristics in a sample of healthcare professionals exposed to violence or aggression.

The following section will provide an overview of the strengths and weaknesses of the literature reviewed here, which should be considered before drawing final conclusions about the available research.

Overview of Strengths and Weaknesses of the Current Literature

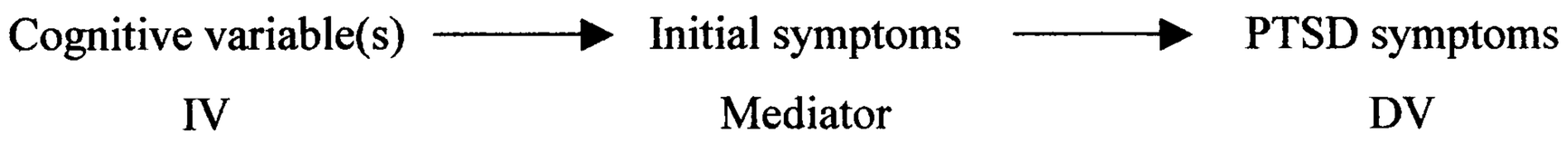
Research provides good support for a number of components of this cognitive model of PTSD. However, several limitations must be taken into consideration when interpreting the findings and planning future research. Firstly, retrospective designs have frequently characterised studies concerning PTSD and the role of cognitive variables, owing to obvious ethical and practical issues, creating potential for recollection biases. Additionally, current

PTSD symptoms may influence reports of event severity, as well as magnify perceptions of earlier symptoms and cognitions (Zoellner, Sacks & Foa, 2001). Even in prospective studies where initial measures are taken soon after the trauma, most are inevitably completed retrospectively. When trying to identify risk factors, interpretive difficulties arise because the variable in question may occur as a result of PTSD, rather than being the cause of it (McNally, 2003). However, evidence is being generated from prospective research, which offers support for cognitive variables proposed by Ehlers and Clark (2000) in predicting subsequent PTSD symptoms (e.g. Dunmore *et al.*, 2001).

Studies have also frequently relied on self-report measures to assess symptoms of PTSD and other cognitive variables. Use of validated measures is therefore important, but the possibility remains that certain biases will influence ratings, and potentially lead to inflated correlations. Furthermore, some studies had relatively small sample sizes (e.g. Dunmore *et al.*, 2001) and have therefore been unable to statistically correct for Type I errors. Some addressed this through cross-validation (e.g. Murray *et al.*, 2001), however further cross-validation of the cognitive variables would be beneficial. Relatedly, problems have been experienced with recruitment such as self-selection (e.g. Steil & Ehlers, 2000) and low response rates (e.g. Laposa & Alden, 2003).

Initial symptom severity or trauma factors could mediate the relationship between cognitive variables and PTSD symptoms, as illustrated in Figure 2.

Figure 2: Path diagram representing example mediation of cognitive variables and PTSD



Although not necessarily a causal relationship (Baron & Kenny, 1986), if trauma and initial symptom severity influence the relationship between cognitive variables and PTSD symptoms, this compromises the importance of these factors in contributing to the mechanisms involved.

Some studies have controlled for such potentially mediating factors and demonstrated that certain variables continue to influence later PTSD symptoms. For example, through partial correlation and path analysis, Dunmore *et al.* (2001) controlled for initial severity of symptoms and found that the interpretation that PTSD symptoms were mediated by initial symptom severity was not upheld for the following: negative appraisal of initial PTSD symptoms, negative beliefs before trauma and avoidance or safety behaviours. It is important that research studying predictors of PTSD severity examines factors such as initial symptom severity, and other established risk factors such as previous history and assault severity.

Brewin and Holmes (2003) argue that relatively little research has investigated data-driven processing during trauma, and highlight the need for more real world research rather than

analogue-based studies. However, preliminary studies cited earlier indicate that peri-traumatic cognitive processing is important (e.g. Ehlers *et al.*, 1998; Murray *et al.*, 2002; Dunmore *et al.*, 2001; Halligan *et al.* 2002; Ehlers *et al.* 2003).

The final potential weakness concerns the measures associated with many of the cognitive factors in the Ehlers and Clark (2000) model. These have not been validated and there is overlap in the concepts that they seek to assess. However, they have good face validity, being derived from extensive clinical experience, and studies have demonstrated their relationship with PTSD outcomes.

Among the strengths of research investigating components of Ehlers and Clark's model, validation is being sought through a combination of study designs, including experimental and real world research. Furthermore, studies have covered populations exposed to different traumatic events, such as road traffic accidents, sexual and physical assault, and political imprisonment. More recently the model has been investigated with children (e.g. Ehlers *et al.*, 2003). Only three studies have explicitly considered factors within the model with healthcare professionals (Clohessy & Ehlers, 1999; Laposa & Alder, 2003; Salter, 2003). It is important that predictors of PTSD are indexed for a range of traumatic events, as differences in risk factors have been previously found (Brewin, *et al.*, 2000).

Recent studies also suggest that clinical interventions associated with this model are effective (e.g. Ehlers *et al.*, 2003; Ehlers, Clark, Hackmann, McManus & Fennell, 2005; Gillespie, Duffy, Hackmann & Clark, 2002). Although it should not be assumed that effective treatments arising from theoretical models provide absolute validation (McNally, 2001), in the context of other evidence, such findings offer further support.

Multivariate predictor studies. Studies that have employed regression to investigate the relationship between cognitive variables and persistent PTSD symptom severity are associated with a number of limitations. For example, studies have included different combinations of variables. Dunmore *et al.* (2001) considered a range of variables, but compensated for a small sample size by performing separate regression for each cognitive factor. Results may therefore be misleading because variance shared with other cognitive factors would not be removed. Furthermore, not all studies have tested whether cognitive factors increase prediction over and above potentially mediating factors such as initial symptom severity. Although retrospective designs are infrequent when investigating prediction, studies have failed to achieve adequate sample sizes to justify the multiple regression analysis, which confounds interpretation of results. Despite these limitations, the consistent ability of cognitive factors from this model to predict PTSD outcomes indicates that further research is warranted, but should involve prospective designs with adequate sample sizes.

Summary and Conclusions

The model proposed by Ehlers and Clark (2000) may currently be the most comprehensive account of PTSD (Brewin & Holmes, 2003). Weaker, cross-sectional research has established correlations between PTSD symptoms and all of the cognitive variables, and more importantly, these findings have been replicated in prospective designs. Dissociation is the only cognitive variable that has been reviewed in a meta-analysis, and was identified as the most salient and robust predictor of symptoms across populations (Ozer et al., 2003). Some variables have received less attention, such as self-referent processing and mental defeat. The available studies indicate that these factors may contribute to symptoms, although the latter may only be relevant with severe stressors. Cognitive processing styles (data-driven processing, self-referent processing and dissociation) and disorganised trauma memory have also been investigated through experimental analogue studies, which provide additional support for their role and insight into the mechanisms involved. Treatment studies are also suggestive of the role of cognitive factors, particularly for disorganised trauma memories, but evidence about mechanisms is inconclusive owing to methodological problems.

Furthermore, some studies have explored the importance of cognitive factors over previous history and trauma characteristics, or other factors that could mediate the relationship with PTSD symptoms. Findings are promising where this has been done, for example, Salter (2003) established that the seven cognitive variables accounted for a significant proportion of the variance.

Despite certain methodological limitations, research concerning the relationship between cognitive factors and persistent PTSD symptoms has yielded generally consistent results. Findings from cross-sectional research have been replicated in prospective designs, although further validation with larger sample sizes would still be important. It is therefore possible to reliably conclude that certain cognitive factors have utility in predictive models of PTSD. However, it is difficult to make judgments about the relative importance of individual predictors, as studies have included different combinations, and have not yet been systematically replicated across a range of traumas.

Developing a Predictive Tool

Given that not all healthcare staff who experience violence and aggression in the workplace will develop PTSD, it is of interest to investigate who is at risk of developing this outcome. The fact that the majority of individuals who experience trauma will recover naturally without formal intervention suggests that providing therapy for all is not appropriate (Ehlers & Clark, 2003). However, identifying those who experience reactions that will persist is important, as the likelihood of developing a long-term psychological problem such as PTSD can be reduced if the individual receives early effective interventions (Bryant, 2003; National Institute for Clinical Excellence [NICE], 2005). Preventing this outcome would therefore

reduce the costs for the individual, the workplace, and the community at large. The need for early intervention highlights the need for developing reliable means of identifying people who require intervention (e.g. Brewin *et al.*, 2002; Ehlers & Clark, 2003; McNally, Bryant & Ehlers, 2003).

The NICE guidelines for the management of PTSD (2005) also confer the benefits of developing ways of predicting which individuals are at high risk of developing PTSD at a later stage. This is considered in addition to the use of screening instruments to identify the presence of PTSD, which is recommended for routine use following trauma. The guidelines summarise the findings concerning risk factors from the important meta-analyses by Brewin *et al.* (2000) and Ozer *et al.* (2003), reviewed in an earlier section. However, they highlight the paucity of prospective, large-scale research demonstrating a relationship between variables and persistent PTSD symptoms. Consequently, the guidelines state that there are currently no accurate ways of screening *later* PTSD. While the guidelines do not explicitly review the role of cognitive factors in screening persistent PTSD, they refer to Bryant's (2003) argument that such factors are potentially useful in predicting PTSD outcomes.

Brewin (2005) reviewed and identified 13 existing screening instruments for PTSD in adults. These have tended to focus on symptom patterns to identify and predict cases of PTSD. The Trauma Screening Questionnaire is one example, in which a threshold of six symptoms produced overall efficiency of around 90% (Brewin, *et al.*, 2002). Such symptom-based instruments hold advantages over other well-established risk factors, such as gender, which do not account for sufficient variance to be useful predictors and are not consistent across studies. However, few have been adequately validated (Brewin *et al.*, 2002; Brewin, 2005). A particular problem is that these have been assessed as screening tools to be used as a replacement for time-consuming diagnostic tools such as the Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams, Gibbon & First, 1990), and have not been assessed as longitudinal predictors. Moreover, focus on symptoms neglects cognitive factors, which are known to be important predictors of persistent PTSD, and may predict over and above factors such as initial PTSD symptom severity (e.g. Salter, 2003). It may also fail to identify those individuals whose development of PTSD symptoms is delayed (Bryant, 2003). Brewin (2005) also highlights that initial symptoms immediately following trauma are a normative experience, and may not good predictors of later symptomology (e.g. Shalev, 1992). Indeed, few studies have explicitly investigated the use of symptom-based instruments immediately post-trauma. In contrast, cognitive factors offer potential for early assessment and therefore early identification of those with demonstrable need for targeted interventions. No screening instruments are currently available which consider the possibility of combining symptoms and risk factors (Brewin, 2005).

Ehlers and Clark (2003) have recently acknowledged the importance of developing strategies to address this. Therefore it would be valuable to develop a tool that enables

healthcare workers to be assessed around the time of an incident to identify who falls into the category of 'at risk'. Although research has implicated a number of factors that are likely to be involved in developing and maintaining PTSD, only one study has specifically investigated a predictive tool with NHS staff (Salter, 2003). With support from research, the cognitive model implies that identification of individuals with a high risk of developing persistent PTSD can be enhanced by recognition of cognitive appraisals and processing that leads to disturbed trauma memories and subsequent dysfunctional control strategies. Salter (2003) investigated a predictive instrument based on the cognitive model. However, the tool has only been used in one healthcare sample and did not include a number of important cognitive factors, including, for example, mental defeat and cognitive coping strategies such as rumination and thought suppression. Furthermore, significant refinements can be made to increase the validity of an instrument by maximising specificity and sensitivity. Brewin (2005) highlights that prevalence of PTSD, or severity of trauma, can influence the requirements for these criteria (Baldessarini, Finklestein & Arana, 1983). Sensitivity (true positive identification) is of particular importance with low prevalence and perhaps less severe traumas, and specificity (true negative identification) in populations with greater rates of pathology. There is also a need for such research to be prospective and involve large sample sizes (Bryant, 2003).

Summary

Review of policy and research indicates that workplace violence and aggression in the NHS is a burgeoning concern. PTSD is amongst the individual psychological consequences that can result from exposure to such traumatic experiences in the workplace. The accumulating evidence suggests that a cognitive model of PTSD (Ehlers & Clark, 2000) offers utility in predicting who will develop persistent PTSD symptoms, and this study seeks to develop and refine a tool which can be used as means of reliably assessing such risk.

Research Questions

The principal research question is to examine the role of cognitive factors hypothesised to be involved in the development and maintenance of PTSD in a population of health service employees exposed to violence or aggression in the workplace, using a longitudinal design.

The objective of this study is to generate and refine a predictive tool, consisting of a collection of measures, which will enable identification of individuals who are at risk of developing persistent PTSD symptoms. These predictions will be largely theory-based, informed by the cognitive model proposed by Ehlers and Clark (2000). The resulting instrument would be used to facilitate the selection of trauma-exposed healthcare staff who would benefit from targeted, early interventions.

Hypotheses

1. Cognitive variables[3] (cognitive processing during assault, nature of trauma memory, appraisal of trauma sequelae and dysfunctional control strategies) proposed in Ehlers and Clark's model (2000) will significantly increase the amount of variance explained in persistent PTSD symptom severity over and above demographic, historical and stressor variables.
2. Using a risk index of the aforementioned cognitive variables, it will be possible to predict, to a level better than chance, which individuals will have moderate or above symptoms of PTSD at three months post-trauma. This will be defined by a score of 11 or more on the symptom scale of the Post-traumatic Diagnostic Scale (PDS; Foa, 1995).
3. The accuracy of predictions will be increased to a statistically significant degree through a) refinement of cut-offs of the risk index variables and b) selection of variables for inclusion in the risk index that are most predictive. This will be established by comparison of the area under the curve, as specified by Hanley and McNeil (1983).

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[3] A full list of variables can be found in Method I.

METHOD: STUDY 1

Design

This study involved a longitudinal, repeated-measures design. There was no control group, because the focus was on measuring the course of symptoms over time rather than manipulation of variables. NHS staff within three trusts who experienced a violent or aggressive incident at work were identified through the respective organisations' existing incident reporting systems. Cognitive factors hypothesised to be important in persistent PTSD were assessed soon after the incident occurred (Time 1) through a range of questionnaires that have been developed through previous research (e.g. Dunmore *et al.*, 1999). These measures have been used with similar populations of health professionals (Clohessy & Ehlers 1999; Laposa & Alden, 2003), assault victims (e.g. Dunmore *et al*, 2001) and with reference to workplace violence and aggression (Salter, 2003). Data regarding other relevant factors (trauma severity, demographic information, use of psychological services and informal support) were also gathered. Participants were followed up by mail three months after the incident (Time 2) to measure PTSD symptom severity, general psychological distress and use of psychosocial support.

Site Selection

Two NHS Trusts were initially recruited into the study (Sites 1 and 2). These were selected based on the reported high incidence of violence and aggression in their respective staff populations of mental health and ambulance workers. This selection also offered potential for the final sample to include a range of health professionals.

Sample Size

GPower software was used to calculate the required final sample size. For a medium effect size of .25, with alpha set at .05, power set at .8, and 12 predictors, this would mean a sample size of 127. Attrition rates from a previous similar study (Salter, 2003) were then used to estimate the number of participants required at Time 1 to take into account drop-out (N = 233). These figures were 27.3% dropout at Time 1, 27.3% at Time 2 and 12.5 % at Time 3[4].

Ethical Approval

As this research involved more than one site, ethical approval was sought at two levels. First, it received approval from a regional multicentre ethics committee (MREC). Site-specific approval was then also sought from the respective local research ethics committees (LREC).

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[4] A follow-up period of six months was planned for this research study, after completion of the doctoral thesis.

All subsequent amendments to the recruitment process were reviewed by the MREC. Research and Development (R&D) approval was also obtained as necessary, in line with the Research Governance Framework (DOH, 2001). These applications were made jointly with a colleague who was conducting a parallel doctoral thesis. Key approval letters can be found in Appendix A. These are not provided for amendments relating to minor changes in the protocol, to conserve space.

Measures

A summary of the measures used and their respective times of distribution can be seen in Table 3; copies of the measures are provided in Appendix B.

The cognitive variables and associated measures selected for this study differ from Salter (2003) in the following ways. Firstly, two additional variables were assessed: mental defeat and interpretation of intrusions. Correlations have been found between both variables and PTSD symptom severity (e.g. Dunmore *et al.*, 2001), and the latter may be particularly important with the population of healthcare workers, which are the focus of the present study (Clohessy and Ehlers, 1999). In addition, the Post-traumatic Cognitions Inventory (PTCI; Foa *et al.*, 1999) was used to allow more extensive investigation of negative appraisals relating to the trauma. As reported in a later section, this measure has been shown to have good psychometric properties that have been replicated in a number of studies. Finally, trait dissociation (i.e. a pre-existing tendency to dissociate) was not included in the present study. This was because prospective studies provide indication that peri-traumatic dissociation has greater predictive utility than a general tendency to dissociate (e.g. Murray *et al.*, 2002). While Salter (2003) found that trait dissociation was related to PTSD symptom severity, it seemed preferable to include the most predictive variables, where known, to minimise the number of measures. There would also have been interpretive difficulties associated with assessing such a pre-existing characteristic post-trauma that would have limited the validity of a correlation between this variable and symptom severity (i.e. inflated correlations).

Table 3: Summary table of cognitive variables and related measures

Variable description	Measure	No. of Items	Time [a]	Reference
Cognitive processing during assault				
Data-driven processing	Data-driven Processing Style Questionnaire	8	1	Halligan *et al.* (03)
Self-referent processing	Lack of Self-referent Processing Scale	8	1	Halligan *et al.* (03)
Peri-traumatic dissociation	State Dissociation Questionnaire	9	1	Murray *et al.* (02)
Mental defeat	Modified Thoughts and Feelings During Trauma	11	1	Dunmore *et al.* (99, 01)
Nature of trauma memory				
Disorganised memory and intrusions	Unpleasant Memories Questionnaire	13	1	Halligan *et al.* (03)
Appraisal of trauma and its sequelae				
Negative thoughts about self, world, self-blame	Posttraumatic Cognitions Inventory	33	1	Foa *et al.* (99)
Dysfunctional control strategies				
Behaviour – avoidance/safety seeking	Maladaptive Control Strategies Questionnaire	26	1	Dunmore *et al.* (99, 01)
Thoughts – rumination/avoidance	Response to Intrusions Questionnaire	18	1	Dunmore *et al.* (99, 01)

Table 3 continued

Variable description	Measure	No. of Items	Time[a]	Reference
Other independent variables				
Demographic information	Background Factors Questionnaire	13	1	Dunmore *et al.* (99)
Prior emotional problems	As above			
Subjective injury severity	Incident Severity Questionnaire	14	1	Dunmore *et al.* (99)
Formal / informal support	Psychological Services and Social Support Questionnaire	4	1,2	Dunmore *et al.* (99)
Depression, anxiety	Hospital Anxiety and Depression Scale	14	1,2	Zigmund & Snaith (83)
Dependent variable				
Symptom severity	Posttraumatic Diagnostic Scale (Symptom Severity Score)	17	1,2	Foa (95)

[a] Time 1 = immediately after the incident; Time 2 = three months following the incident.

Outcome Measures

Symptoms of PTSD

The dependent variable was the severity of PTSD symptoms at three months post-incident (Time 2), and was assessed using the symptom severity scale of the Posttraumatic Diagnostic Scale (PDS; Foa, 1995). This measure was also completed at Time 1 to establish initial symptom severity. This standardised self-report measure parallels DSM-IV criteria for PTSD (APA, 1994) and includes 17 items: re-experiencing (five items), avoidance (seven items) and arousal (five items). It was decided to focus on symptom severity following incident exposure rather than fulfillment of diagnostic criteria for PTSD. This was because experience of sub-threshold symptoms can be distressing and impair functioning at work and in other life domains, and therefore require intervention. A cut-off of 11 was selected on the PDS as this represents individuals with at least moderate PTSD symptoms. Information from a previous study (Salter, 2003) indicated that this level of symptom severity was commonly experienced in a clinical population.

The PDS asks participants to rate the frequency of symptoms on a scale from 0 (*not at all/only one time*) to 3 (*five or more times a week/almost always*). Using a 'yes-no' dichotomy, participants also recorded the impact on different areas of functioning, corresponding to DSM-IV Criterion F. Evidence indicates that the PDS has good levels of validity and reliability for use with diverse traumas (Foa, Cashman, Jaycox & Perry, 1997). Validity is evidenced through strong relationship with PTSD diagnosis using the SCID (Spitzer, Williams, Gibbon & First, 1990), with 82% diagnostic agreement. Furthermore, significant correlations were established with respective subscales of the Revised Impact of Events Scale (Weiss & Marmar, 1997). Internal consistency was $\alpha = .92$ for Total Symptom Severity, $\alpha = .78$ for the Re-experiencing subscale, $\alpha = .84$ for Avoidance and $\alpha = .94$ for Arousal. Test-retest reliability coefficients were between .77 and .85.

Depression and Anxiety

The Hospital Anxiety and Depression Scale (HADS; Zigmund & Snaith, 1983) was used to assess general levels of distress at Times 1 and 2. A recent review has confirmed the reliability and validity of this tool for symptom severity and caseness with diverse populations (Bjelland, Dahl, Haug & Neckelmann, 2002). This meta-review reported an internal consistency of $\alpha = .83$ (range .68 – .93) for the anxiety subscale and $\alpha = .82$ (range .67 – .90) for the depression subscale. The correlation between the Beck Depression Inventory (BDI; Beck, Ward, Mendelson Mock & Erbaugh, 1961) and HADS Total Score was reported as .70.

Cognitive Predictor Variables

A range of variables, derived from Ehlers and Clark's model, were included to maximise the possibility of predicting PTSD. Studies report good internal reliability for each measure, and are reported in subsequent sections. Although validity does not appear to have been objectively established for the measures, previous studies have consistently demonstrated statistically significant correlations with persistent PTSD symptoms (e.g. Dunmore *et al.,* 1999; 2001), providing support for their use in predicting PTSD outcome. The concepts, which these measures are designed to evaluate, were drawn out of extensive clinical experience, working with individuals who presented with persistent PTSD symptoms. The items were designed to draw on these concepts and appear to have satisfactory face validity.

This selection of cognitive variables and related measures was reviewed and approved by widely published experts in the field.

Cognitive Processing During the Assault

Data-driven processing. The extent to which an individual engaged in surface level, perceptual processing, as opposed to conceptual processing, was measured using the Data-Driven Processing Style Questionnaire (Ehlers, 1998). Previous studies have reported satisfactory to good levels of internal consistency, with $\alpha = .70$ or above (e.g. Ehlers, 1998).

Self-referent processing. The Self-Referent Processing Questionnaire (Halligan *et al.,* 2003) was used to assess the extent to which an individual established a self-referent perspective during the trauma. This involves processing experiences with respect to oneself and subsequent integration with autobiographical memory. Highly self-referent processing is reflected in a lower score. Internal consistency was $\alpha = .88$ in a recent study with assault victims (Halligan *et al.* 2003).

Peri-traumatic dissociation. Dissociation during the event was measured using the State Dissociation Questionnaire (Murray *et al.*, 2002). This comprises nine items that measure different aspects of dissociation including derealization, depersonalization, detachment, altered time sense and emotional numbing, and has been shown to have good reliability and validity, with internal consistencies above $\alpha = .75$ (e.g. Halligan, *et al*., 2003; Murray *et al*. 2002).

Mental defeat. A subscale of the Modified Thoughts and Feelings During Trauma questionnaire (Dunmore *et al*., 1999, 2001) was used to assess the extent to which an individual felt that they had lost psychological autonomy during the incident. The full 12-item subscale achieved a good level of internal consistency ($\alpha = .90$) in a previous study (Dunmore *et al.*, 2001).

Nature of the Trauma Memory

Disorganised memory and intrusions. The Trauma Memory Questionnaire (Halligan *et al*. 2003) comprises two subscales. Five items assessed the extent to which trauma memories

are disorganised or incomplete, and a further eight items assessed perceptual elements, ease of triggering and reexperiencing quality of the trauma memory. Internal consistency has been reported for the subscales as $\alpha = .88$ and $\alpha = .90$ respectively (Halligan *et al.*, 2003).

Appraisal of Trauma and its Sequelae

Appraisal of the trauma. The Posttraumatic Cognitions Inventory (PTCI; Foa *et al.*, 1999) was used to assess trauma-related appraisals concerning the self, the world and self-blame. A validation study of this measure demonstrated excellent internal consistency for the total score ($\alpha = .97$) and its component subscales (Negative Cognitions about the Self $\alpha = .97$; Negative Cognitions about the World $\alpha = .88$; Self-Blame $\alpha = .86$). Test-retest reliabilities all exceeded $\alpha = .74$ (Foa *et al.*, 1999). Good psychometric properties of the PTCI have been replicated in subsequent validation studies, although poor concurrent and discriminant validity was found for the self-blame subscale in victims of MVAs (Beck *et al.*, 2004). Some caution should therefore be applied when interpreting data.

Dysfunctional Control Strategies

Behaviour – avoidance and safety seeking. Behaviour following the trauma was assessed using a subscale from the Maladaptive Control Strategies Questionnaire (Dunmore *et al.*, 1999; 2001). This comprises 26 items that assess avoidance of related situations, cognitive avoidance and safety-seeking behaviours is assessed ($\alpha = .92$).

Thoughts – rumination and avoidance. The Response to Intrusions Questionnaire (RIQ; Clohessy & Ehlers, 1999) was employed to assess interpretation of intrusions, and other responses including rumination, suppression and dissociation. Good internal consistency has been reported for the subscales, ranging from $\alpha = .72$ to $\alpha = .82$, with the exception of rumination, where coefficients have been reported as $\alpha = .31$ and $\alpha = .38$ respectively (Clohessy & Ehlers, 1999; Laposa & Alden, 2003). Furthermore, the alpha for the dissociation subscale was also low in the derivation sample ($\alpha = .40$; Clohessy & Ehlers, 1999), although higher in a subsequent study ($\alpha = .82$; Laposa & Alden, 2003). Scores on the latter two subscales should therefore be interpreted with caution.

Other Predictor Variables

This study is investigating whether the cognitive variables derived from Ehlers and Clark's model (2000) predict PTSD symptoms, over and above other potential predictors. Based on the PTSD literature (e.g. Brewin *et al.*, 2000), these are grouped into the following areas: background information, incident severity and psychological and informal support.

Background Information

Demographic information was collected, including age, gender, socio-economic status and ethnicity. Other risk factors such as previous history of trauma, abuse and psychiatric

illness, were also assessed in a questionnaire, adapted from a semi-structured interview used by Dunmore *et al.* (1999).

Incident Severity

Subjective severity of the traumatic incident was also established using items drawn from an existing questionnaire (Dunmore *et al.*, 1999).

Psychological and Informal Support

At Time 2, participants were asked whether they had sought support from a trained professional, or informally from social or work networks.

Participants

Introduction

Participants were staff, initially recruited from two NHS Trusts in the north of England, who had directly experienced or witnessed an incident of violence or aggression in the workplace. Recruitment commenced once all aspects of ethical and R&D approval had been confirmed, and all necessary plans were in place at the respective research sites, which was in June 2005 for Site 1 and May 2005 for Site 2.

Response rates were continually monitored at each site, and by the end of August 2005 only nine participants had been recruited into the Time 1 stage of the study. Owing to such low response rates, a number of steps were taken to boost recruitment, which are detailed in a later section. These included plans, which were implemented in September 2005, to add a further NHS Trust from the region (Site 3). A number of factors informed the decision to involve this trust. These included involvement of the head of clinical psychology services to support and champion the research within the Trust, the large size of the Trust and rate of violent and aggressive incidents, and the incident recording system, which could accommodate efficient recruitment with minimal impact on Trust resources. Following ethical and R&D approval for this substantial amendment, staff who experienced an incident between October 2005 and the beginning of March 2006 were invited to take part in the study.

Furthermore, additional services within the Site 1 Trust were invited and joined the study in November 2006. These included older adult inpatient services and community rehabilitation. Packs were also made available for self-collection at Sites 1 and 2; this change to the protocol is discussed in more detail in a later section.

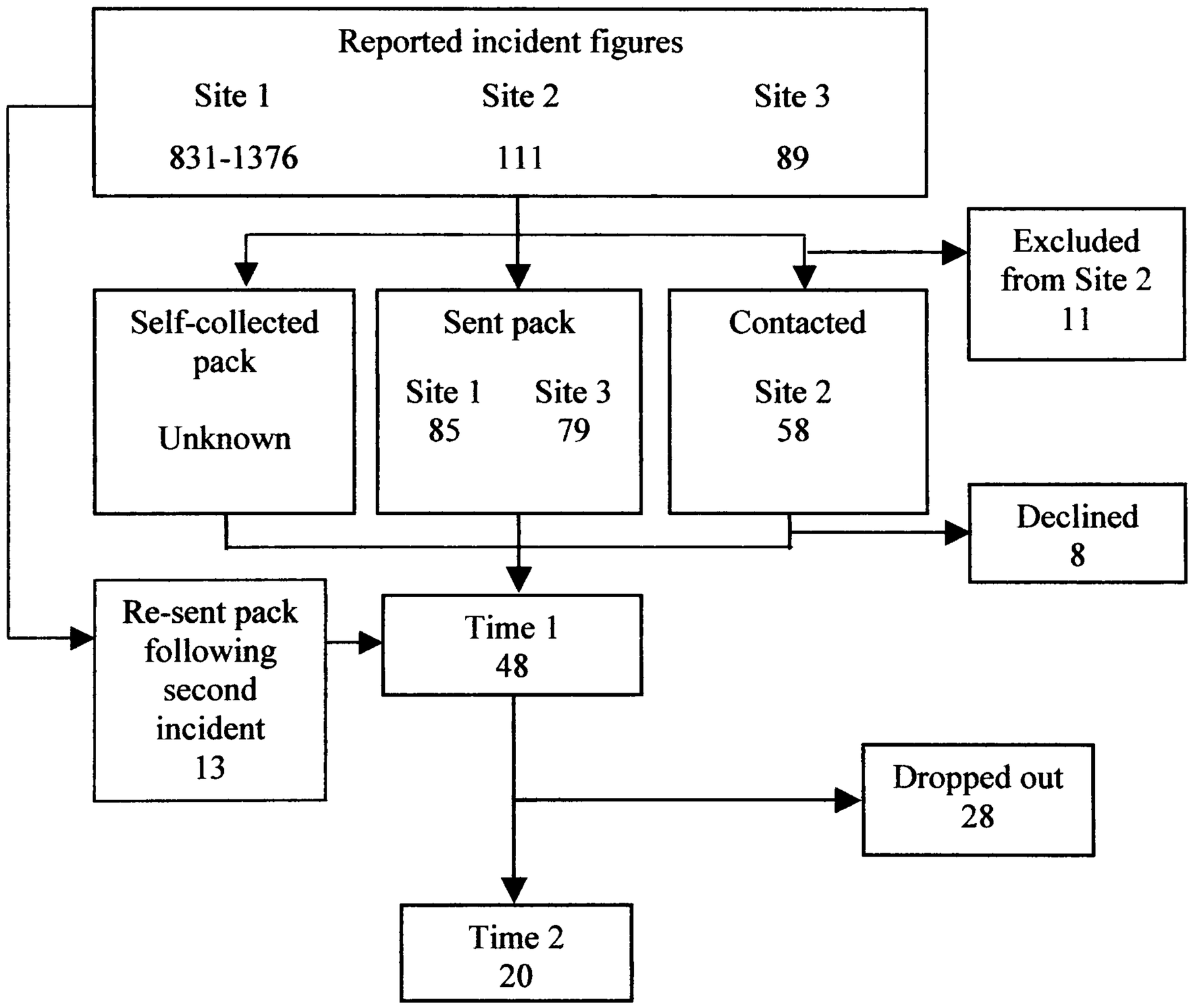
Sample

The final sample comprised staff recruited from three NHS Trusts who had directly experienced or witnessed an incident of violence or aggression in the workplace between June [Site 1] / May [Site 2] / October [Site 3] 2005 and the beginning of March 2006. The number of

recorded incidents at Site 1 is a substantial overestimate as it includes areas of the trust not involved in the research owing to the limitations of the Trust incident recording system. A range is reported, which reflects that a large proportion of incidents could not be accurately classified by age; older adult services at this site only entered the study in November 2005.

Details of the sample population are shown in Figure 3. A total of 219 staff were directly invited to take part, although this does not include participants who self-collected packs. It was not possible to calculate a response rate owing to the lack of: (a) accurate data concerning the frequency of incidents; and (b) information regarding the recruitment source of participants, that is, whether they were sent a questionnaire pack or collected it themselves.

Figure 3: Study participation rates



Inclusion Criteria

Incidents were included if the potential participant considered them as involving verbal, physical or written violence or aggression while at work. Sexual assault was also included. Staff were invited to participate regardless of their perception of the impact of the event.

Completion of the initial questionnaires relied on memory of the incident. To minimise difficulties with recall, participation depended on staff having access to the questionnaire material within 10 days of the incident occurring. It was also necessary for the member of staff to be literate in English. Those involved in recruitment were given a clear protocol about the inclusion criteria, and an example from Site 1 can be seen in Appendix C. The inclusion criteria

were also presented on a poster at locations where potential participants could self-collect questionnaire packs.

Procedure

Staff who experienced a violent or aggressive incident at work were identified through existing incident reporting systems in the respective Trusts:

- Site 1: Submission of an incident reporting form triggered the relevant senior manager sending out the initial questionnaire pack to their work location, with the exception of older adult and community rehabilitation areas, where staff collected a questionnaire pack from a location in their ward. A poster located with the packs provided instructions for participation.
- Site 2: Potential participants were invited to take part in the research by a member of the Controls Assurance Management (CAM) team, who sought verbal consent to send the first questionnaire pack by telephone. This was triggered through reporting of an incident on electronic software.
- Site 3: On receipt of an incident reporting form, the Clinical Risk Manager or Clinical Risk Administrator sent the initial pack to the potential participant at their work location.

The initial questionnaire pack (Time 1) contained the information sheet and written consent form, which conformed to REC proforma. The master template for the cover letters can be found in Appendix D.

Participants were sent follow-up questionnaires by the researcher to their preferred address, three months after the incident (Time 2), to measure PTSD symptom severity, general psychological distress and use of psychosocial support. A reminder letter was sent if a response was not received within seven days (shown in Appendix D).

Those who were involved in further incidents during the course of the study were invited to re-complete the questionnaires in relation to a subsequent incident on one occasion only. A master template for this letter can be found in Appendix D. The criterion for re-starting was that the participant perceived this as a more significant event, in terms of its severity or impact on their psychological well-being. However, for ethical reasons there was a limit on the number of times potential participants could be approached (two). This aspect of the methodology also gave staff another opportunity to participate if they had not done so in relation to their previous incident.

Each site was asked to record details of questionnaire packs sent. It was initially hoped that this would enable monitoring of response rates, although changes to the recruitment protocol and limitations to trust incident systems created difficulties with calculating accurate responses rates. Recording participants also sought to facilitate monitoring of the number of times a member of staff had been invited to take part. Recruitment staff were also asked to note when a potential participant was excluded from recruitment, and to identify the reason. Key

people involved in recruitment at the site used their preferred recording method. Site 1 employed paper recording, while an electronic spreadsheet was used in sites 2 and 3. Detailed written protocols and supporting flow diagrams were available to those involved in recruitment in each Trust, and an example from Site 1 can be found in Appendix C. Training regarding the recruitment protocol was also provided.

Strategies to Maximise Participation

Raising Awareness

Throughout the course of this research, a number of steps were taken to enhance the participation rate. These included informing management and potential participants about the purpose of this research. In addition to ongoing consultation with the sites and research supervisors, the main actions are outlined in Figure 4. Items are shown in chronological order.

Figure 4: Steps taken to raise awareness of the study

Site 1	Site 2	Site 3
Informing managers about the study and addressing questions, through a presentation and letter, which included information sheet. [a] *April 2005*	Informing staff representatives about the study and addressing questions, through a presentation and information sheet. [a] *February 2005*	Clinical Risk Manager attended relevant meetings to inform managers and modern matrons. Email and letter to senior and ward managers. [a] *October 2005*
⇩	⇩	⇩
Liaison with key recruitment staff to provide training and clarify procedure. [a] *June 2005*	Informing CAM team and Health and Safety Manager about aims and benefits of research and recruitment, through presentation and information sheet. [a] *March 2005*	Meeting staff, targeting high incident areas including A&E, medical admissions, maternity and security. *November – December 2005*
⇩	⇩	⇩
Meeting staff on wards and their respective managers to inform about the study and encourage participation. *September – October 2005*	Training for key recruitment staff. [a] *April 2005*	Flier summary to all staff distributed via ward managers and in person; also placed in prominent places to serve as reminder. October – December 2005
⇩	⇩	⇩

Site 1	Site 2
Flier summary to all staff, given in person where possible. September – October 2005	Prompt on reporting system informing of research; newsletter to staff and on internal TV network to raise the profile of the research project and highlight the low response rate. [a] *May 2005*
Fliers placed in prominent places on wards to serve as ongoing reminder. *September – October 2005* ⇩	Meeting staff at large ambulance station to discuss research / consultation about maximising response rate. *August 2005* ⇩
Attending directorate management meeting to seek consultation about addressing low response rate. *November 2005* ⇩	Newsletter sent out to staff and shown on internal TV network to raise the profile of the research project and highlight the low response rate. *August 2005* ⇩
Attending senior manager's briefing to feedback about low response rate, and need for continued participation. *November 2005* ⇩	Presentation to staff-side representatives to raise profile of study and seek further consultation about maximising response rate. *August 2005* ⇩
Update flier informing of progress and continued need for participation. *November 2005* ⇩	Flier summary distributed to all staff. *September 2006* ⇩
Re-visiting wards with senior manager to maintain awareness of study, remind of availability of packs on wards, highlight the low response rate and show support. *November 2005* ⇩	Meeting staff at 18 ambulance stations to managers to inform about the study, encourage participation and distribute fliers. *October 2005* ⇩
Meeting with staff, matron and ward managers of older adult services to inform about research and distributing fliers. *November 2005* ⇩	Presentation to Operations / Area Managers of large stations to inform about research and continued need for participation. *October 2005* ⇩
Further consultation sought regarding addressing low response rate. *January 2006*	Letter to station / operations managers and control staff with information sheet, encouraging them to draw staff attention to the study; update flier. *November 2005*

[a] Undertaken prior to commencing recruitment.

Availability of Packs

As part of the protocol amendments which were implemented following realisation of the low response rate, initial questionnaire packs were made available on the wards [Site 1] and ambulance stations or from the Operations / Station Manager [Site 2] three months into recruitment to maximise accessibility to the study. A poster was located with the questionnaires to provide details of the study and instructions for taking part. This amendment was initiated following feedback from the research sites, which suggested:

- Some potential participants may not have received the pack despite meeting inclusion criteria;
- Delay in receiving packs, resulting in difficulties remembering the incident, particularly if further incidents had occurred;
- Unreported incidents, particularly if minor, when the staff member felt unaffected or that the incident would not be followed up effectively; and
- A proportion of staff at Site 2 did not have access to the electronic incident reporting system.

Packs were not made available on wards in Site 3 owing to the efficiency of their existing incident reporting procedures and resource implications owing to the population size.

Reminder Sheet

A reminder sheet was added to the questionnaire packs, highlighting key points about the research, and can be found in Appendix E. In particular, this emphasised the need for participation regardless of whether staff perceived that they had been affected by the incident and highlighted the brevity of subsequent questionnaires.

RESULTS: STUDY 1

Background Characteristics

A summary of background characteristics of the sample can be found in Table 4. Approximately two thirds of participants were female, and nearly all were of White British origin. Three quarters of the sample were earning over £20,000 per annum, and there were approximately equal numbers who continued their formal education beyond school as did not. Few participants (9%) had not achieved any educational qualifications. Approximately one quarter of the sample reported experiencing a trauma in childhood, and few reported an event involving abuse (11%). In adulthood, over half the participants reported experiencing an adverse event. The majority (79%) did not report pre-existing psychological difficulties, or identify psychological problems within their families (91%).

Table 4: Background characteristics of Study 1 sample

Characteristic (*N*)	*n*	%
Sex (47)		
Male	16	34
Female	31	66
Ethnicity (46)		
White British	44	96
White Irish	1	2
Black Caribbean	1	2
Income (44)		
£10,000 - £20,000	10	23
Over £20,000	34	77
Education (45)		
GCSE / O' Level / A' Level	23	51
Degree or above	18	40
None	4	9
Prior trauma - childhood (other than child abuse) (46)	11	24
Abused as child (46)	5	11
Prior trauma - adulthood (45)	26	58
Psychological difficulties pre-assault (46)	9	19
Family psychological difficulties (46)	4	9
	Mean	*SD*
Age at time of incident (43)	37	10.5

Note. Percentages are calculated for different sample sizes because data were missing for some cases. Data are presented as percentages, except for age (years).

Incident Characteristics

Details of the incidents are summarised in Table 5. Over three quarters of participants directly experienced rather than witnessed the violence or aggression. Approximately half of the incidents exclusively involved verbal aggression; the others were physical or physical and verbal incidents. Similar numbers reported the event occurring during the day and night, although not all participants indicated a time. Incidents tended to last less than 10 minutes, and involve one assailant. In situations where a weapon was present (13%), it was not used. Specific threats of harm were made in approximately half of the incidents but less than a third of participants suffered physical injuries. Less than one-quarter of assailants were arrested or subject to other action, and few participants (7%) were pursuing legal action or compensation.

Table 5: Incident characteristics

Characteristic (*N*)	*n*	%
Time of incident (39)		
Day (6am to 5.59pm)	22	56
Night (6pm to 5.59am)	17	44
Incident duration (46)		
10 minutes or less	30	65
11 – 60 minutes	12	26
More than 60 minutes	4	9
Type of incident (42)		
Verbal	20	48
Physical	9	21
Both	13	31
Type of involvement (45)		
Witnessed	11	24
Experienced	34	76
Number of assailants (45)		
One assailant	37	82
Two or more assailants	8	18
Presence of weapon (45)	6	13
Use of weapon (45)	0	0
Aggressor threatened harm (45)	24	53
Extent of injury (45)		
No injuries	32	71
Minor cuts/bruises	7	16
Head injury	1	2
Other (not specified)	2	4
Multiple injuries	3	7
Arrest or other action (46)	10	22
Legal action (46)	3	7

Table 5 continued

Characteristic (*N*)	*n*	%
Compensation (46)	3	7
	Mean score/100	*SD*
Perceived threat to life (46)	10	25
Perceived threat of serious injury (45)	22	25

Note. Percentages are calculated for different sample sizes as data was missing for some cases. Data are presented as percentages, except for perceived threat to life and serious injury (mean score out of 100).

Psychological and Social Support

Of those providing data at Time 2 ($N = 20$), one participant reported having received support from a trained psychotherapy professional in relation to the incident. Over half ($n = 12$) received informal support from friends, family or colleagues.

PTSD, Anxiety and Depression Symptoms

Table 6 summarises scores on the symptom scale of the PDS and the HADS.

Table 6: PTSD, depression and anxiety symptoms

	Time 1			Time 2		
Measure	*M*	*SD*	Range	*M*	*SD*	Range
PDS [a b]	5.2	8.3	0-30	7.6	11.0	0-36
Avoidance	1.8	3.3	0-14	2.8	5.4	0-20
Arousal	2.3	3.6	0-13	3.5	4.3	0-12
Re-experiencing	1.2	2.0	0-8	1.6	2.5	0-9
HADS Depression	2.3	3.9	0-18	3.8	4.4	0-14
HADS Anxiety	4.6	4.3	0-15	5.5	4.6	0-15

Note. Time 1: $N = 48$ unless otherwise specified; Time 2: $N = 20$ unless otherwise specified. PDS = Posttraumatic Stress Diagnostic Scale; HADS = Hospital Anxiety and Depression Scale.

[a] N=47. [b] N=19.

PDS scores were explored further to assess severity of PTSD symptoms in the sample, as shown in Table 7. This revealed that over half the participants did not report experiencing any symptoms at Time 1. However, over one-quarter of participants indicated mild symptoms, and a further 19% were classified as having moderate to severe symptoms. Over half the participants who provided data at Time 2 were experiencing persistent symptoms.

Table 7: Severity of PTSD symptoms at each time point

		Time 1		Time 2	
Cut offs	Rating category	*n*	%	*n*	%
0	No symptoms	25	53.3	8	40
1 to 10	Mild	13	27.7	8	40
11 to 20	Moderate	4	8.5	1	5
21 to 35	Moderate to severe	5	8.5	2	10
36 or above	Severe	0	0.0	1	5

Note. Time 1: $N = 47$; Time 2: $N = 20$.

Of those with moderate or moderate to severe symptoms, five experienced a reduction in symptoms, two reported increased severity of symptoms and a further two did not provide data at Time 2.

Severity of depression and anxiety symptoms are shown in Table 8. Of those participants within borderline or caseness categories for anxiety ($n = 14$), symptoms reduced for six individuals, maintained or increased for three, and five did not provide data at Time 2. For depression scores in these categories ($n = 8$), symptoms reduced for one individual, and increased or stayed the same for two; a further two did not participate at Time 2.

Table 8: Severity of depression and anxiety symptoms at each time point

	Time 1		Time 2	
Rating category [a]	*n*	%	*n*	%
	Anxiety			
Normal	34	71	16	80
Borderline	10	21	1	5
Caseness	4	8	3	15
	Depression			
Normal	40	83	16	80
Borderline	7	15	2	10
Caseness	1	2	2	10

[a] Scores are classified as normal (0-7), borderline (8-10) or caseness (≥11).

Relationship Between Cognitive Variables and PTSD Severity

The sample at Time 2 ($N = 20$) did not reach the minimum acceptable size for regression analysis (Green, 1991; Miles & Shevlin, 2001). It was therefore not possible to assess the hypotheses associated with the original research question. However, a summary of mean scores on the measures designed to assess cognitive variables can be found in Table 9,

which also provides the maximum possible score for each measure. Missing data was spread throughout cases and cognitive variables. Group means were calculated from the data and used to replace missing values ($n = 6$). The data indicate that although there was variation within the sample, mean scores on measures of cognitive variables tended to be low.

Table 9: Cognitive variables at Time 1

Variable	Range	*M*	*SD*	Maximum score
Data-driven processing [a]	0-23	7.5	6.1	32
Lack of self-referent processing [a]	0-21	3.8	6.0	32
State dissociation [a]	0-31	4.8	6.2	36
Modified thoughts/feelings during trauma	0-40	5.8	8.9	44
Unpleasant memories	0-18	2.9	4.6	20
Posttraumatic cognitions [a]	17-178	71.0	39.3	231
Self	1.0-4.8	1.6	1.1	7
World	1-7	3.7	1.7	7
Self-blame	0.8-6.8	2.3	1.7	7
Maladaptive behaviour	0-59	10.1	12.3	78
Response to intrusions	0-42	10.1	11.3	72

Note. For all measures, higher scores indicate greater endorsement of negative cognitive processing, cognitions or control strategies. $N = 48$ unless otherwise specified.

[a] N = 47.

DISCUSSION: STUDY 1

A summary of the main findings from the study will be outlined first, concerning the presence of symptoms of PTSD, depression and anxiety observed in the sample. Recruitment will then be appraised, as this was a key limitation and prevented the intended analysis of the relationship between cognitive variables and subsequent symptom severity. Several potential explanations for non-response are presented, which relate to the study design, organisational issues and experience of symptoms.

Summary of Findings

This study aimed to establish whether cognitive factors, based on a cognitive model of PTSD (Ehlers & Clark, 2000), predicted which individuals exposed to violence and aggression were experiencing persistent symptoms of PTSD. It was of particular importance to ascertain whether these factors could account for variability in persistence of symptoms over and above other factors such as demographic characteristics and previous history.

PTSD, Depression and Anxiety Symptoms

A large proportion of participants indicated the presence of PTSD symptoms (45%, n = 23). Moreover, 23% of the sample (n = 11) endorsed negative appraisals on the PTCI to the same extent as a large sample of traumatised individuals with PTSD (N = 562; Foa *et al.*, 1999). That is, these participants achieved a score greater than 89 on the PTCI. Furthermore, mean scores for negative cognitions about the world and self-blame reached cut-offs observed in the same sample. Some participants also reported feelings of anxiety (29%, n = 14) and depression (17%, n = 8). While the severity of symptoms tended to be relatively low, some participants were experiencing these to at least a moderate degree, which indicates that this population may develop problematic symptoms. This is commensurate with findings from other research concerning PTSD in NHS workers following violence and aggression (Salter, 2003; Walsh & Clarke, 2003).

In line with studies showing a decline in the prevalence of PTSD over time (e.g. Perkonigg *et al.*, 2005), symptoms reduced for many of those providing data at follow-up. However, this should be interpreted cautiously owing to the number of participants that did not provide data at this time point. It is unlikely that this was a representative sample owing to the small number of participants and potential for selection bias. On the one hand, more severely affected staff could have been motivated to take part, which would potentially cause an overestimate of prevalence. However, there is evidence from previous research to suggest that non-response is related to PTSD symptom severity, with those experiencing higher rates of pathology being less likely to participate (Weisaeth, 1989), which would lead to an underestimate of prevalence. Furthermore, the finding that emergency-service personnel exhibit

a tendency to minimise severity of symptoms (e.g. Pole *et al.*, 2001) could generalise to healthcare professionals who are also frequently exposed to traumatic incidents, and contribute to low response rates or underestimates of prevalence.

Relationship Between Cognitive Variables and PTSD

The original research question could not be addressed owing to the small sample size. This was disappointing, as the selected sites comprised staff populations who are frequently exposed to violence and aggression (e.g. Upson, 2004) and discussions with the respective research sites in the planning stages suggested that the number of incidents would provide an adequate sample. Furthermore, it was hoped that involvement of multiple sites would maximise recruitment. However, the sample size was not achieved despite targeted interventions to address the low response rate, which were implemented from an early point in the study; these were outlined in the method section. Although 48 staff participated at Time 1, less than half provided data at Time 2. Even with one predictor and a small effect size, a minimum of 30 participants would have been required for multiple regression (Miles & Shevlin, 2001).

High levels of non-response have been found in similar samples (e.g. Richter & Berger, 2006; Wykes & Whittington, 1998), and following other traumas such as disaster (Weisaeth, 1989). There are a number of possible explanations for the low response rate in the present study, which will now be considered. Several of these emerged through conversations with staff from the research sites, either in response to being contacted by potential participants, at information-giving sessions, or through consultation with managers and staff representatives. It is important to note that the response rates were comparable across the sites.

Sample Size

Questionnaires

The initial questionnaire pack comprised several measures to allow (a) inclusion of a range of variables that offer potential predictive utility, and (b) collection of information regarding risk factors. Participation therefore involved a reasonable time commitment at Time 1; Time 2 packs were relatively brief. Although there was agreement that these could be completed in work time, this may have been difficult to accommodate and staff were already required by their employees to complete documentation following incidents. This 'burden of paperwork' has been attributed to non-response in a previous similar study (Walsh & Clarke, 2003). However, piloting the questionnaire packs may have revealed a problem with measure burden (i.e. identified that the packs were unreasonably long). Some staff also indicated that they were deterred by questions regarding background characteristics, and did not perceive this as relevant information. Concerns about confidentiality are perhaps a particular issue for staff, for example regarding how the information would be used. Potential barriers to participation related to the questionnaire were addressed by informing staff about the purpose of the research

and particular items, and the shorter time commitment at Time 2; this was done through various methods in each site.

Recruitment

The number of incidents recorded during the research period was less than expected in Sites 2 and 3, based on data from previous years. There could be several reasons for this, such as under-reporting of incidents, which is widely acknowledged in the NHS (e.g. British Medical Association, 2003). Another reason in Site 2 concerned limited access to the electronic reporting system, which was a central part of the recruitment protocol in that it triggered potential participants being sent a questionnaire pack. Discussions with staff at sites 1 and 2 also revealed that eligible potential participants may not have received packs, or they were delayed and thereby contravened the inclusion criteria. In response to these issues, packs were made available for staff to collect in Sites 1 and 2, but this did not appear to change the pattern of responding.

In these sites, the number of packs distributed by trust staff involved in recruitment did not reflect the number of recorded incidents. It is important to note that the figure representing the number of packs distributed for Site 1 is a substantial overestimate as it includes data from areas of the directorate not participating in the study; data could not be provided by the trust in terms of specialty. The discrepancy was smaller in Site 2, equaling 42 incidents, and could not be accounted for by the trust. Other reasons that may have contributed to the inconsistent figures therefore remain unclear. However, it is likely that many incidents were minor and frequent, and staff could only be approached twice. The sampling population could therefore have been exhausted, which could account for the observed discrepancies.

Impasses in the recruitment protocol could also have occurred. For example, there were occasions where some managers made idiosyncratic decisions about recruitment and stopped sending out packs when they became available for staff to collect directly. Indeed, a major limitation of the methodology was that the researchers could not be directly involved with recruitment owing to ethical issues such as data protection. A previous study (Salter, 2003) achieved a higher response rate when the researcher was able to contact staff and speak to them personally prior to sending packs. Although strategies were implemented to train those involved with recruitment and inform potential participants about the research, inevitably some would have received packs without prior knowledge of the research. Potential participants were not approached directly by a researcher, who would have been able to address questions or concerns thoroughly. Furthermore, increasing availability of packs by enabling staff to collect them directly would have exacerbated this problem by reducing contact with trust staff involved in recruitment at the research sites.

Further information from staff indicated that some did not take part because they had experienced repeated incidents and were unclear which to focus on if these had occurred within a short time period.

Organisational Issues

It is acknowledged that organisational issues may have influenced participation. These are difficult to identify, particularly as the researchers were external to the trusts involved. However, conversations with staff revealed that some perceived that limited action is taken in response to incidents that are formally reported. This may have directly led to non-participation because of subsequent non-reporting of incidents, or indirectly if staff perceived that the findings would be treated in the same way. It is also recognised that other research and audit is likely to have been taking place within the organisations, placing additional demands on staff time and resources. For example, one of the trusts was participating in a national audit of violence and aggression in 2005. Perceptions of management support for this research could also have been important. For example, staff may have been deterred from participating if their manager did not encourage participation, address questions, or allow time to complete the questionnaires. Although some key senior managers were demonstrably supportive, it was not possible to meet or discuss the research directly with all managers owing to the size of each trust.

Experience of Symptoms

It is possible that the experience of PTSD symptoms was associated with non-response (Weisaeth, 1989), which may be linked to avoidance of thinking about the incident. Completion of the questionnaires involved focusing on the incident and its sequelae, which is potentially difficult for individuals experiencing distress. Additionally, discussion with staff indicated that many felt that exposure to these incidents is an inevitable part of their job, and that they are expected to be able to cope. It is conceivable that some staff may have feared stigmatisation if they acknowledged difficulties through participation in the study.

An alternative hypothesis is that the majority of staff working in these areas were not adversely affected by incidents of violence and aggression. This may reflect the tendency for incidents to be relatively minor and therefore not constitute sufficiently traumatic events. However, another question that arises is whether psychological processes may minimise the impact of such incidents. For example, it is possible that these events tend to be interpreted in a way that makes them distinct from other traumas, and are therefore less likely to produce symptoms.

Summary and Implications

It is apparent that several factors could have contributed to the low response rate in this study, and different combinations of these may have been instrumental at the respective research sites. These factors are related to aspects of the design, organisational issues and the experience of PTSD symptoms. However, the validity or relative importance of some will remain unknown.

Many strategies were implemented from the outset and in response to poor recruitment, and data collection continued in the hope that the combination of strategies would improve recruitment into Time 1 and reduce drop out at Time 2. However, uptake was persistently low. Whilst conducting Study 1, it was of particular interest that staff often seemed to perceive encountering violence and aggression as an inevitable part of the their work, and also emphasised that incidents tended to be perpetrated by someone with an illness such as dementia. Some comments, from participants written on questionnaires and expressed verbally to the lead researcher, and from other staff working in the research sites, suggested that staff members could be taking these factors into account when appraising the event. If this was the case, it is conceivable that the impact of such incidents was minimised. As highlighted previously, it could therefore be hypothesised that exposure to violence and aggression in a healthcare setting is less distressing than other traumatic events. This could have contributed to the low response rate observed in Study 1, for example if staff did not feel that it was necessary to participate when they perceived themselves as unaffected. It was decided to investigate this further, owing to the frequency with which healthcare workers expressed these ideas. A second study was implemented with this aim in January 2006.

STUDY 2

Ehlers and Clark's (2000) cognitive model of PTSD can be applied to understand the mechanisms involved in minimising symptoms following exposure to workplace violence and aggression. As highlighted in the literature review, this may currently be the most comprehensive account of PTSD and is supported by a growing body of evidence (Brewin & Holmes, 2003). Drawing on this model, it is possible that the way violent and aggressive events are appraised by healthcare workers minimises long-term distressing symptoms. More specifically, incidents could be perceived as not having global negative implications for the future, which therefore does not lead to a sense of current serious threat that is thought to be central in the maintenance of symptoms (Ehlers & Clark, 2000). There could be a number of reasons that contribute to this. Firstly, these incidents take place within a discrete setting (i.e. the workplace) and therefore do not impact on other life domains. Secondly, staff may receive support from colleagues, who may also have shared similar negative experiences. Finally, incidents are frequently perpetrated by someone who is experiencing pain, emotional distress, mental health problems, or cognitive impairment. If the perpetrator's behaviour is attributed to

illness, this could preclude excessively negative appraisals concerning competence and the safety of the world. Study 2 therefore sought to establish whether the healthcare context of incidents influences appraisals, which are thought to be important in persistent PTSD symptoms. Two relevant factors were investigated: incident context (work / nonwork) and perceived perpetrator responsibility (illness / nonillness).

In addition to appraisals of the trauma and its sequelae, Ehlers and Clark (2000) also highlight the role of dysfunctional control strategies in the development and maintenance of PTSD symptoms. It is proposed that such behaviours are intended to reduce the sense of ongoing threat and associated symptoms, but inadvertently have the effect of directly producing and / or maintaining symptoms. As discussed earlier in the literature review, there is evidence from cross-sectional studies (e.g. Laposa & Alden, 2003) and prospective research (e.g. Salter, 2003) to support the role of such maladaptive behaviours in PTSD in healthcare workers exposed to trauma, as well as other populations (e.g. Dunmore *et al.*, 2001). Furthermore, many of the key studies have focused on the relationship between cognitive factors and symptom severity, rather than the relationship between appraisals and behaviours. Study 2 therefore sought to explore this relationship and test whether negative appraisals of the incident and its sequelae predicted endorsement of dysfunctional control strategies.

It was decided to employ an experimental analogue design, as this offered an opportunity to address the research question while avoiding certain methodological and practical difficulties associated with real-world empirical research into PTSD (Engelhard & Kindt, 2005). It was possible to manipulate the scenario which participants were exposed to through a vignette and recruit an adequate sample size for statistical analysis.

Hypotheses

The following hypotheses were identified for investigation in Study 2.

1. Incident context (work or nonwork) will influence the extent to which participants endorse negative appraisals, with those taking place at work leading to less negative appraisals.
2. Responsibility for the incident (illness or nonillness) will influence the extent to which participants endorse negative appraisals. When the perpetrator's behaviour is caused by their health problem, participants' appraisals will tend to be less negative.
3. Incidents at work, or where aggression is attributable to the perpetrator's illness, will be perceived as less distressing relative to those outside work or attributed to the perpetrator's deliberate choice.
4. Participants who endorse negative appraisals will be more likely to endorse dysfunctional behavioural and cognitive coping strategies.

METHOD: STUDY 2

Design

This was an analogue study involving a 2 x 2, between-subjects design. Participants were randomly allocated to one of four experimental groups; a random numbers generator was used to determine the order in which questionnaires were distributed. Each of the groups read a different scenario that described a violent and aggressive situation in either a work or non-work setting, as shown in Table 10. The perpetrator's behaviour was attributable to either an illness (dementia), or alcohol consumption. Participants were presented with three sets of questions in relation to the incident, concerning how they would appraise what happened and what they might do in response. Data were also gathered regarding other relevant factors that could influence responses to the incident. These included prior experience of similar incidents, gender, age, marital status, course type and year of training.

Table 10: Experimental groups A-D

		Organisational context	
		Work	Non-work
Cause of behaviour	Illness	A	B
	Non-illness	C	D

Sample size

As there were no samples available in previous studies, it was aimed to recruit 50 participants into each experimental group. With four groups and a medium effect size of .25, this would have a power of .85. For a small effect size of .1 this would have a power of .19, and for a large effect size of .4 this would have a power of 1.

Ethical approval

Ethical approval was received from the Educational Research Ethics Group in the School of Nursing at the relevant University.

Questionnaire

Four scenarios were developed in which the context and cause of the violent and aggressive behaviour were manipulated. Specifically, the scenarios differed according to whether the incident occurred inside or outside the workplace, and whether the perpetrator had a clearly identifiable illness that could be attributed to the cause of their behaviour. All other characteristics of the incident, such as age and gender of the perpetrator, were kept consistent. Members of the nursing profession were consulted regarding the vignettes to assess their ecological validity. The scenarios can be seen in Appendix F.

After reading the scenario, the questionnaire presented participants with a list of possible appraisals about the incident (six items) and its sequelae (seven items), and behavioural / cognitive coping strategies (six items). These were drawn from measures developed through previous research related to Ehlers and Clark's cognitive model of PTSD (2000), which is based on extensive clinical experience, and have been used in a number of studies. These include the Post-traumatic Cognitions Inventory (Foa *et al.*, 1999), the Behaviour After Incident questionnaire (Dunmore *et al.*, 1999, 2001), the Response to Intrusions questionnaire (Dunmore *et al.*, 1999, 2001) and the Interpretation of Reactions Since Assault questionnaire (Halligan *et al.*, 2003). With the exception of the latter, it was not feasible to use the full questionnaires owing to the number of items. Restricting questionnaire length aimed to maximise validity without compromising participation rate. Items from each questionnaire were therefore selected to cover a range of types of appraisals and behaviours, as shown in Table 11. The instructions and scales were amended to reflect the analogue nature of this study, because the original questionnaires were designed for completion following an incident. Even-numbered likert-type scales were used to prevent neutral responses.

Table 11: Origin of questionnaire items

Aspect of cognitive model	Original questionnaire	Item used	Scale
Appraisal of the trauma	Post-traumatic Cognitions Inventory (Foa *et al.*, 1999)	2 / 26 - Blame 8 / 28 - World 22 / 33 - Self	0 'Disagree very much' to 5 'Agree very much'
Appraisal of trauma sequelae	Interpretation of reactions since assault (Halligan *et al.*, 2003)	All	0 'Disagree very much' to 5 'Agree very much'
Dysfunctional control strategies	Behaviour after incident questionnaire (Dunmore, *et al.*, 1999, 2001)	3 - Avoidance 7 / 16 - Cognitive strategy 18 / 26 - Safety behaviour	0 'Never' to 3 'Always'
	Response to intrusions questionnaire (Dunmore *et al.*, 1999, 2001)	8 - Rumination	0 'Never' to 3 'Always'

The items appear to have satisfactory face validity. Although studies report good internal reliability for each measure in its original form, amendments have been made for use in the present study. Results of internal consistency analysis for the scales used in this study are shown in Table 12.

Table 12: Internal consistency of scales

Scale	*N*	No. items	Cronbach's alpha
Appraisal of trauma	186	6	0.68
Appraisal of trauma sequelae	183	7	0.84
Dysfunctional control strategies	187	6	0.72

Cronbach's coefficient alpha should be at least .60 for a self-report instrument to be reliable (Nunnally & Bernstein, 1994). The consistency of the scales measuring 'appraisal of trauma sequelae' and 'dysfunctional control strategies', therefore appears satisfactory. Although the scale measuring 'appraisal of trauma' approached a reasonable level of internal consistency ($\alpha = .68$), it should be interpreted with caution.

Participants also rated their distress about this incident, using a visual analogue scale. They were asked about the ease of imagining the scenario using a four-point Likert-type scale from 'very easy' to 'very difficult', to allow validation of the methodology. At the end of the questionnaire, participants were asked to provide information about relevant factors that could influence their response to the incident, including prior experience and likelihood of future incidents, and demographics. A copy of the questionnaire can be found in Appendix F.

Participants

Participants were students of the Advanced Diploma in Nursing and BHSc (Hons) Nursing Adult course at a large university in the north of England. A nursing population was used because this professional group is at high risk of violence and aggression in the workplace. Of the 478 questionnaires given out, 190 were returned, yielding a 40% response rate.

Procedure

The researcher attended teaching sessions to give verbal instructions and distribute the questionnaires along with a written information sheet. These sessions were pre-arranged with the programme managers for the respective training courses. Participants were asked to complete the questionnaire in their own time and to place it in a box in the School of Nursing, in the envelope provided. There was an optional prize draw to win a £25 book voucher. Participants were invited to provide contact details on a slip to be entered into the draw. A person who was independent from the research separated this from the questionnaire to maintain anonymity.

RESULTS: STUDY 2

Background Characteristics

Background characteristics of the sample are summarised in Table 13. Nearly all participants were female. Over half the sample were aged between 18 and 24, and single. The majority were students of an advanced diploma nursing programme. Approximately one third of participants had experienced a prior incident similar to that presented in the vignette.

Table 13: Background characteristics of Study 2 sample

Characteristic (*N*)	Total sample	
	n	%
Sex (187)		
Male	16	9
Female	171	91
Age (190)		
18-24	116	61
25-34	44	23
35-49	28	15
50-64	2	1
Marital status (189)		
Single	118	62
Married	37	20
Cohabiting	27	14
Divorced	5	3
Widowed	2	1
Year of training (184)		
1	103	56
2	50	27
3	31	17
Course type (184)		
Advanced diploma	170	92
Degree	14	8
Prior similar incident (190)	64	34
No. of similar incidents (182)		
0	126	69
1 or more	56	31

Note. Percentages are calculated for different sample sizes because data were missing for some cases.

Data Screening

Missing values were scattered throughout cases and cognitive-behavioural variables. Group means were calculated from the data and used to replace missing values ($n = 7$). Two

cases were removed as these represented participants who had only provided responses to one item within each scale.

Accessibility of Scenarios

The majority of participants rated the scenarios as easy or very easy to imagine. Ratings for the scenarios are summarised in Table 14. There was no statistically significant difference between the groups with regards to ease of imagining the event ($\chi^2(3, N = 188) = 2.851, ns$).

Table 14: Ratings for ease of imagining scenarios ($N = 188$)

	Scenario							
	N				%			
Rating	A	B	C	D	A	B	C	D
Very easy / easy	44	40	37	42	90	91	82	84
Difficult / very difficult	5	4	8	8	10	9	18	16

Covariates

Relationship Between Potential Covariates and Dependent Variables

Correlations between background characteristics / other potential independent variables and cognitive-behavioural variables are presented in Table 15. Note that marital status was dichotomised to represent cohabiting and non-cohabiting participants. Of the demographic characteristics, marital status was significantly correlated with negative appraisals of consequences and dysfunctional control behaviours. Perceived likelihood of future incidents was significantly negatively correlated with negative appraisals of the incident. Anticipated upset caused by the incident was significantly correlated with all three dependent variables.

Table 15: Correlations between covariates / other independent variables and dependent variables

	N	Negative incident appraisal	Negative appraisal of consequences	Dysfunctional control behaviours
		Covariates		
Year of training [b]	182	-.09	.01	-.02
Course type [c]	182	-.18	.04	.03
Gender [c]	185	.06	.07	.13
Age [b]	188	-.04	.06	-.02
Marital Status [c]	187	-.02	-.17*	-.20**

Table 15 continued

	N	Negative incident appraisal	Negative appraisal of consequences	Dysfunctional control behaviours
		Other independent variables		
Upset by incident [a]	188	.37**	.38**	.42**
Ease of imagining event [b]	188	.02	.10	.13
Experience of incidents [c]	187	-.06	-.07	.11
Number of prior incidents [a]	177	.09	.11	-.08
Likelihood of future incident [b]	187	-.18*	.04	.04

Note. Correlations are based on data screened for outliers, described in the following sections. *N* for dysfunctional control behaviours excludes one case.

[a] Pearson's product moment coefficient. [b] Spearman's rho. [c] Mann Whitney U, point-biserial *r* for effect size.

*$p < .05$. **$p < .01$ (2-tailed).

Hypotheses 1 and 2

Relationship Between Cognitive Variables and Scenario Characteristics

The first two hypotheses were concerned with whether organisational context and perceived responsibility for the incident influenced the type of appraisals endorsed by participants. Two-way analyses of variance (ANOVA) were performed on 'appraisal of the incident' and 'appraisal of consequences'. Independent variables were organisational context (work and nonwork) and cause of perpetrator's behaviour (illness and nonillness). Results of the evaluation of the assumptions of normality of sampling distributions and homogeneity of variance were satisfactory for 'appraisal of the incident', and no univariate outliers were identified through assessment of standardised scores within groups. However, identification of two univariate outliers and substantial positive skewness of 'appraisal of consequences' led to square root transformation of this variable. No outliers remained after transformation and the nonnormal distribution was adequately improved. The homogeneity of variances assumption was not violated.

Appraisal of the Incident

Analysis did not reveal a statistically significant main effect of either organisational context ($F(1, 187) = .684$, *ns*) or cause of behaviour ($F(1, 187) = .012$, *ns*). Nor was there a significant interaction between these variables ($F(1, 187) = 1.841$, *ns*). The means are shown in Table 16.

Table 16: Mean scores for appraisal of the incident within each group ($N = 188$)

Variable	*n*	*M*	*SD*
Cause of behaviour			
Illness	92	10.2	4.8
Non-illness	96	10.1	4.6
Organisational context			
Work	94	10.4	4.8
Non-work	94	9.9	4.6

Relationship Between Likelihood of Future Incidents and Incident Appraisal. As previously noted, likelihood of future incidents was negatively correlated with negative incident appraisals. The relationship was maintained once likelihood of future incidents was dichotomised (likely and unlikely; $U = 2851.5$, $p < .05$), with participants who perceived future incidents as more likely to endorse more negative appraisals. A three-way ANOVA was carried out to explore differences between the experimental groups, with organisational context, cause of perpetrator's behaviour and likelihood of future incidents as independent variables. All assumptions of ANOVA were met. There was no main effect for likelihood of future incidents ($F(3, 186) = 2.328$, ns). Furthermore, interactions between organisational context and likelihood of future incidents ($F(3, 186) = .995$, ns), and cause of behaviour and likelihood of future incidents ($F(3, 186) = 1.785$, ns) were nonsignificant.

Appraisal of Consequences

Analysis revealed that organisational context ($F(1, 187) = 1.397$, *ns*) and cause of the perpetrator's behaviour ($F(1, 187) = .163$, *ns*) had no effect on appraisals concerning the incident's sequelae. Nor was there a significant interaction between organisational context and cause of behaviour ($F(1, 187) = .407$, *ns*). The means are almost identical in each group:

Table 17: Mean scores for appraisal of consequences within each group ($N = 188$)

		Transformed		Untransformed	
Variable	*n*	*M*	*SD*	*M*	*SD*
Cause of behaviour					
Illness	92	2.5	1.0	6.6	6.2
Non-illness	96	2.4	1.0	6.0	5.2
Organisational context					
Work	94	2.4	1.0	6.0	6.0
Non-work	94	2.6	1.0	6.6	5.5

Note. Means are reported for the dependent variable both transformed and untransformed.

Marital status was significantly correlated with the dependent variable (r_s = -.17, p < .01). However, it was not included in the main analysis as a covariate as there were only a small number of cases in some categories. Inclusion as a dichotomous covariate did not influence the pattern of results, making its exclusion acceptable.

Hypothesis 3

Relationship Between Scenario Context and Perceived Distress

The following analysis sought to establish whether the scenarios were perceived as differentially distressing. Data were screened prior to statistical analysis. Two univariate outliers were identified through screening and represented individuals who did not report any distress. However, these cases were included in the analysis; their removal did not improve skewness and kurtosis. Evaluations of homogeneity of variance yielded unsatisfactory results; however ANOVA is robust when there are approximately equal group sizes (Field, 2005).

A two-way independent samples ANOVA revealed that organisational context (F(1, 185) = .025, *ns*) and cause of perpetrator's behaviour (F(1, 185) = .636, *ns*) did not affect ratings of perceived distress that would be caused by the incident. Nor was there a significant interaction between these variables (F(1, 185) = .002, *ns*). The means are presented in Table 18.

Table 18: Mean scores for upset caused by incident within each group (N = 186)

Variable	*n*	*M*	*SD*
Cause of behaviour			
Illness	90	57.0	20.7
Non-illness	96	60.0	25.3
Organisational context			
Work	93	58.5	21.3
Non-work	93	58.1	25.0

Hypothesis 4

Relationship Between Negative Appraisals and Dysfunctional Control Strategies

The final hypothesis sought to investigate a specific component of Ehlers and Clark's (2000) cognitive model, and establish whether participants who endorse negative appraisals were more likely to endorse dysfunctional control behaviours. Correlations between these variables are shown in Table 18. Appraisals concerning both the incident and its consequences were significantly correlated with one another, and with dysfunctional control strategies.

Table 19: Correlations amongst cognitive variables

	Negative appraisal of consequences [a]	Dysfunctional control strategies [b]
Negative incident appraisal	.40**	.29**
Negative appraisal of consequences		.46**

[a] $N = 188$. [b] $N = 187$.

** $p < .01$ (1-tailed).

A square root transformation was performed on the independent variable 'negative appraisal of consequences' to reduce skewness, reduce the number of outliers and improve the normality. The dependent variable, dysfunctional behaviours, was mildly positively skewed without transformation ($z = 2.18$, $p < .05$) and negatively skewed with it ($z = -.249$, $p < .05$); it was therefore not transformed. A higher cases-to-independent variables ratio is required when the dependent variable is skewed; for a large effect size (.35), the sample ($N = 187$) exceeded the minimum number of cases required (68)[5]. With the use of a $p < .001$ criterion for Mahalanobis distance, one case was identified as a multivariate outlier. This case also had a large standardised residual (< 3.29; Tabachnick & Fidell, 1996) and was deleted in the final regression analysis; its removal did not influence the pattern of results. Assumptions of homogeneity of variance, linearity and homoscedasticity were assessed through observing the histogram, normal P-P plots of normally distributed residuals and partial plots of the dependent variable for each predictor; all were satisfactory. Correlations, tolerance and VIF statistics indicated that there was no multicollinearity and the assumption of independent errors was met. No cases had missing data ($N = 187$).

Two other independent variables were correlated with the dependent variable, 'dysfunctional control behaviours'. The first was marital status, and mean ranks indicated that people in a cohabiting relationship tended to endorse more dysfunctional behaviours. It was not included in the main analysis because the relationship was not in the expected direction and could not be meaningfully accounted for. The remaining covariate, 'upset caused by the incident', was included in the analysis, and no univariate outliers were identified on this variable.

Sequential multiple regression analysis investigated whether the significant relationship between appraisals of both the incident and consequences, and dysfunctional behaviours remained after upset caused by the incident was statistically controlled. This variable was forced into the equation before appraisals. The results of the regression analysis are

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[5] $N \geq = (8/f^2) + (m - 1)$ where f^2 is the effect size and m is the number of predictors (Green, 1991, cited in Tabachnik & Fidell, 1996).

summarised in Table 19. Appraisals produced a significant increase in R^2 over and above upset caused by the incident. Knowing scores on these independent variables predicted 28% (27% adjusted) of the variability in dysfunctional control behaviours. Further analysis revealed that upset caused by incident ($t(187) = 3.897, p<.001$) and negative appraisal of consequences ($t(187) = 4.585, p<.001$) were significant predictors of behaviour. Although the correlation between negative appraisals of the incident and dysfunctional behaviour was $r = .29$, these appraisals did not contribute significantly to the regression.

Table 20: Summary of hierarchical regression analysis for variables predicting dysfunctional control strategies ($N = 187$)

Variable	*B*	*SE B*	β
Step 1			
Upset caused by incident	0.06	0.01	.42**
Step 2			
Upset caused by incident	0.04	0.01	.27**
Negative appraisal of the incident	0.04	0.05	.06
Negative appraisal of consequences	1.01	0.22	.33**

Note. $R^2 = .18$ for Step1; $\Delta R^2 = .11$ for Step 2 ($ps < .001$).

* $p < .01$. ** $p < .001$.

The regression analysis was re-run with marital status as a predictor. Its inclusion in the first step of the regression, entered simultaneously with upset caused by the incident, did not influence the pattern of results and it was not a significant predictor of behaviour ($t(187) = -.1.53$, *ns*).

DISCUSSION: STUDY 2

This section provides a summary of the main results from Study 2, followed by a discussion of the strengths and weaknesses associated with the experimental analogue design that was employed. While this offered advantages for addressing the current research question, there are limitations associated with analogue studies in general, and specific aspects of this study, which are highlighted, must be taken into consideration when interpreting the findings.

Summary of Findings

The central aim of this study was to investigate whether the context of violence and aggression experienced by healthcare workers influenced the type of appraisals endorsed and perceived distress. An analogue design was used to allow manipulation of incident context and also to experimentally control for other characteristics such as the perpetrator's gender. Analysis revealed that there were no statistically significant differences between the experimental groups in the extent to which they endorsed negative appraisals of the incident or its sequelae. That is to say, participants exposed to the work or illness scenarios did not endorse more negative appraisals compared with those exposed to non-work and non-illness scenarios.

Ehlers and Clark (2000) suggest that such negative appraisals are associated with persistent symptoms of PTSD because they lead to a sense of current threat. As highlighted in the literature review, consistent evidence has been found for this relationship following different types of trauma (e.g. Dunmore *et al.*, 2001). In the present study it was hypothesised that the context of workplace violence and aggression might not lead to such maladaptive appraisals because incidents occur within the confinements of a work environment, and are perpetrated by someone who is unwell. Contrary to this, the findings suggest that student nurses would be no less likely to endorse negative beliefs following violence and aggression in a work setting, or perpetrated by someone with illness compared to other settings. According to the model they would therefore be no less likely to develop persistent symptoms of PTSD than individuals exposed to other traumas.

In line with the results concerning appraisals, the scenarios were not perceived as differentially distressing. Hypothesis 3, which proposed that incidents at work or where aggression was attributable to the perpetrator's illness would be perceived as less distressing relative to those outside work or attributed to the perpetrator's deliberate choice, was therefore unsupported. However, ratings of imagined upset in the situation were significantly correlated with endorsement of negative appraisals and dysfunctional control strategies. While this measure of distress is a proxy indicator and does not represent actual symptoms of psychological distress, the findings provide some indication of a relationship between the way individuals respond to a situation cognitively and behaviourally, and general psychological

distress, irrespective of the healthcare context. It does not, however, provide any evidence for a causal relationship between appraisals or behavioural responses and distress.

In summary, if it were assumed that this study provided a reliable representation of the nursing population, and that there were minimal methodological limitations, the findings would not support the idea that nurses as a group are less likely to develop problematic cognitions, behaviours and subsequent psychological distress in response to traumas occurring within the workplace compared with those outside this setting. These findings suggest that the low response rate achieved in Study 1 should not be attributed to incidents of violence and aggression having a minimal impact on staff. It therefore appears likely that another factor, or combination of factors, were important in the low uptake of the research. These have been highlighted previously, and relate to experience of severe PTSD symptoms, organisational issues, and methodology. It remains difficult to draw conclusions about the relative contribution of these factors. However, a major distinction with a similar research project that achieved a better response rate (Salter, 2003) concerns the methodology. Salter (2003) was working with a single department who were dedicated to managing incidents within their trust. Furthermore, ethical approval was granted for the researcher to make the initial contact with potential participants to discuss the purpose of the study and obtain consent to send the first questionnaire pack. In contrast, the present study had greater 'distance' between the lead researcher and potential participants, and more staff involved in recruitment; only Site 3 involved staff with a dedicated role for managing incidents within their trust. Owing to these issues, resources such as time were more diluted in the current study, and will have impacted on the working relationships with all those involved. Furthermore, concurrent research at the sites, 'patchy' support, and experience of repeated incidents with a perception that there was no or limited action in response, may have influenced participation. Despite significant efforts to ensure awareness of the research, receipt of a questionnaire pack may have been with limited, or indeed no prior knowledge. Although Site 2 had an 'opt in' system similar to that employed by Salter (2003), the initial contact was made by a third party within the trust, rather than the researcher. It seems likely that these factors in combination will have greatly reduced the response rate.

A further aim of Study 2 was to investigate an important element of the Ehlers and Clark (2000) model of PTSD and establish whether variability in dysfunctional control strategies could be explained by differences in appraisal of the incident and its sequelae. Both types of appraisal were significantly related to control strategies, however, only appraisals of the sequelae significantly predicted behaviour after controlling for perceived distress. Ehlers and Clark's (2000) model suggests that individuals who interpret their symptoms as signaling inadequacy or mental instability will be more likely to engage in strategies to control these symptoms. The findings here therefore suggest that people who interpret their reactions to an event negatively have a tendency to endorse unhelpful behaviours such as cognitive and

behavioural avoidance strategies. As Dunmore *et al.* (2001) suggest, it is logical that negative appraisals motivate coherent dysfunctional strategies. There is evidence from cross-sectional research to support this relationship. For example, correlations have been established between the dysfunctional meaning of intrusive memories and the use of strategies intended to control intrusions such as thought suppression and rumination (Clohessy & Ehlers, 1999; Laposa & Alden, 2003). In a sample of individuals involved in MVAs, Steil and Ehlers (2000) also found that negative interpretations of intrusions explained 23% to 29% of the variance in a range of coping strategies intended to reduce intrusive memories. Although cross-sectional, this study involved a relatively large sample of individuals exposed to MVAs ($N = 138$). However, prospective studies investigating the role of cognitive factors in PTSD do not appear to explicitly investigate or report evidence for the relationship between appraisals and strategies (e.g. Dunmore *et al.*, 2001), indicating a need for further research involving larger sample sizes to generate additional evidence. The significance of this relationship is that such maladaptive strategies are thought to be central to the maintenance of PTSD symptoms (Ehlers & Clark, 2000). A growing body of evidence supports the role of a range of different dysfunctional control strategies in PTSD symptom severity. Furthermore, findings from retrospective studies have been replicated in prospective research. For example, a relationship has been established between avoidance and persistent symptoms of PTSD in individuals exposed to assault (Dunmore *et al.*, 2001; Salter, 2003). While these studies are limited by small sample size, the findings appear to be consistent and have been replicated with different populations.

It is important to consider why negative appraisals of the incident, which concerned the world (e.g. *'I can't rely on other people'*), the self (e.g. *'I am inadequate'*) and self-blame (e.g. *'Somebody else would have stopped the event from happening'*) did not predict variability in dysfunctional control strategies over and above perceived distress. It is likely that appraisals of the incident shared variance with appraisals of sequelae; both were correlated with the dependent variable and with one another. The results do not therefore suggest that this variable is unimportant. Indeed, methodological issues could have limited the predictive utility of incident appraisals, as the measure may not have been valid; selecting a few items to minimise questionnaire length necessarily resulted in other types of appraisals being excluded. It is also possible that there were less coherent links between the items concerning certain appraisals and subsequent behaviours. For example, strategies relating to avoidance of thoughts or reminders of the incident (e.g. *'Try to push thoughts about the incident to the back of your mind'*) are more closely related to appraisals of the incident sequelae and trying to control unpleasant symptoms (e.g. *'Something terrible will happen if I do not try to control my thoughts about the assault'*) than to appraisals of the incident. The latter were more closely related to global negative beliefs about the world and the self as incompetent (e.g. *'The world is a dangerous place'*), which may be considered as higher-order cognitions. Furthermore, the reliability of this scale is

questionable as it only reached a moderate level of internal consistency ($\alpha = .68$). This nonsignificant finding should therefore be interpreted with caution.

Strengths and Limitations

The use of an experimental analogue design enabled the research question to be addressed, which would have presented ethical and practical difficulties for a real-world study. A primary strength was that a good sample size was achieved, with approximately equal numbers in each experimental group. Internal validity of the study was maximised through the following:

- random assignment to experimental groups;
- minimising demand characteristics by using a between-groups design and careful presentation of information when introducing the study; and
- minimising effects of evaluation apprehension through anonymity of questionnaires.

Furthermore, the majority of participants did not find the scenarios difficult to imagine (n = 163) and there were no differences between the four experimental groups in this respect. However, it is important to note that it may have been difficult for participants to respond to some of the questions if they had not experienced an incident similar to that detailed in the vignette. Indeed, only 34% (n = 64) reported having a prior comparable experience.

As with all analogue research, the main limitations concern threats to external validity (Cook & Campbell, 1979). The generalisability of findings from this study to real-life is limited in several ways. First, while the sample comprised a large group of healthcare workers who are frequently exposed to violence and aggression, this represents only one professional group. Participants were also students, and are likely to differ from the general healthcare population in terms of important sociodemographic variables such as age and educational level. Of particular relevance, these factors are associated with greater risk for PTSD in certain populations (Brewin *et al.*, 2000). In the current study, factors such as age may be important moderators because they could be associated with the amount of experience of working in healthcare or exposure to workplace violence and aggression. For example, previous experience of incidents was related to scores on a validated measure of PTSD and general psychological distress in psychiatric staff exposed to violence (Wildgoose *et al.*, 2003). In the current study, it was not possible to explore this relationship as only four participants had experienced more than three similar incidents. However, the heterogeneity of evidence concerning risk factors converges on the importance of individual responses to trauma exposure (Brewin *et al.*, 2000), such as the psychological processes proposed by Ehlers and Clark (2000). Together with the findings from this analogue study, it therefore seems important not to make generalised assumptions that healthcare professionals are protected from developing psychological distress in response to workplace violence and aggression.

Second, self-reported distress from a hypothetical situation does not represent actual distress or indeed PTSD symptoms. Experimental realism was therefore limited owing to the lack of a behavioural dependent variable, such as symptoms. It is acknowledged that people can react in unexpected ways. However, a study of healthcare workers in similar situations found that a proportion of participants were surprised by the strength of their reactions (Walsh & Clarke, 2003), which suggests that the levels of distress reported in this study may be an underestimate of reactions to real-life situations.

Furthermore, although an adequate sample size was achieved, the response rate (40%) indicates a potential for responding bias. Perhaps those who were more concerned about, or were more affected by this issue, took part. It is not possible to qualify such explanations, however, it is likely that some non-response can be attributed to methodology. Students were asked to return the questionnaires in their own time, and some lecturers would not allow questionnaires to be handed out at the beginning of teaching, so students had to initiate collecting these themselves at the end; both will have considerably reduced the response rate.

It is also important to acknowledge that the amount of variance in behavioural responses explained by appraisals was relatively small (28%). This could reflect a number of factors such as the limited predictive utility of the items included in the measures or the role of other potentially important variables that were not assessed. However, the findings appear to be of a reasonable magnitude given the analogue nature of the study. For example, the scenarios and measures relied heavily on participants being able to imagine themselves in the situation. Although the majority did not indicate any difficulties with doing this, it is only an analogue for real-life and participants may have been somewhat removed from their emotional responses owing to the distance from real-life. It is also conceivable that some participants were less likely to endorse extreme responses to items in an analogue situation (e.g. *'I am inadequate'*), which may have led to an underrepresentation of the relationship between negative appraisals and dysfunctional control strategies.

Finally, the present study does not investigate other theories that may be important in understanding how health professionals respond to incidents of violence and aggression. For example, it is possible that habituation or stress inoculation may occur in response to repeated exposure to incidents. There is some evidence to support this theory with ongoing traumatic stressors such as terrorism (e.g. Bleich, Gelkopf & Solomon, 2003), although it is unclear how these concepts relate to existing models of PTSD. Habituation is not necessarily inconsistent with Ehlers and Clark's (2000) cognitive model. For example, in spite of perceiving an ongoing threat of incidents, individuals may learn to utilise functional control strategies that preclude distressing symptoms. However, previous experience of incidents has been related to greater psychopathology in healthcare workers (Wildgoose *et al.*, 2003), highlighting the need for further research to understand the effects of repeated exposure in this population.

Summary and Conclusions

The current analogue study enabled preliminary investigation of one of the hypotheses emerging from Study 1 that healthcare professionals are minimally affected by incidents of violence and aggression within the workplace. The sample comprised student nurses, who represent a large group of professionals frequently exposed to such incidents. Findings suggest that student nurses would be no less likely to endorse negative appraisals following exposure to workplace violence and aggression than following other incidents occurring outside the workplace. They would also be no less likely to endorse negative appraisals following violence and aggression perpetrated by someone with an illness, than following incidents perpetrated by someone without. According to Ehlers and Clark (2000) this indicates that they could potentially develop persistent symptoms of PTSD, as negative appraisals lead to a sense of current threat. These results also suggest that healthcare workers being minimally affected by incidents is unlikely to be a valid explanation for the non-response observed in Study 1.

In line with the model, appraisals of the incident sequelae predicted the level of dysfunctional cognitive and behavioural responses endorsed, including avoidance and rumination. However, the nonsignificant finding concerning incident appraisals is likely to reflect methodological issues, and should therefore be viewed with caution. There are limitations associated with generalisability of these findings to the real world, and further support for external validity would be provided by replication in similar, and different, samples of healthcare professionals.

SYNTHESIS OF STUDIES 1 AND 2

This final section considers the findings from Studies 1 and 2 together, and highlights the main implications. Having established that replication of Study 1 would be warranted, the strengths and limitations of the original design are then discussed, and recommendations are made for the conduct of future attempts at successful replication, based on this appraisal. Based on the present findings, preliminary service oriented conclusions are put forward to facilitate the provision of support to staff who are exposed to incidents of violence and aggression in the course of their work. Finally, ideas for further research concerning PTSD and workplace violence and aggression within the NHS are then outlined.

Summary and Implications of Findings

Although the low response rate makes it difficult to estimate prevalence of PTSD in the sampling population, Study 1 identified individuals with symptoms; a small proportion were experiencing these to a moderate or severe degree. This is in line with the available literature, which suggests that such symptoms are a potential consequence of workplace violence and aggression in healthcare workers, in addition to other psychological effects (Needham *et al.*, 2005).

Although the present analogue study (Study 2) has limitations concerning generalisability, there was no evidence that incidents occurring within the workplace or perpetrated by someone with an illness were appraised differently to those outside work or perpetrated by someone without an illness; nor were the former perceived as less distressing. In light of preliminary findings concerning presence of symptoms in Study 1 and elsewhere, and the limited available research concerning the impacts of repeated exposure, it would seem important not to make assumptions that healthcare workers are minimally affected by these incidents. Furthermore, Ehlers and Clark's (2000) cognitive model, which emphasises the role of appraisals and processing styles in the development of persistent symptoms of PTSD, would also suggest that individual responses are implicated in the development and persistence of PTSD symptoms.

As with any trauma, early identification of those with demonstrable need can enable targeted early intervention. There is a pressing need for the development of reliable ways of achieving this (Brewin, 2005; Ehlers & Clark, 2003), and Study 1 represented an important opportunity to generate and refine a predictive tool for use within the healthcare worker population. While screening tools based on symptoms are promising (Brewin, 2005), preliminary evidence suggests that cognitive factors can significantly increase the accuracy of predictions (Salter, 2003). Furthermore, the latter are not limited by the need to delay assessment. The first study therefore continues to represent a timely and valuable piece of

research, and so it seems relevant to consider the strengths and weaknesses of the original design, and to consider the implications of these if it were to be replicated in the future.

Prediction Research Implications

With regards to strengths, a prospective design was used to overcome interpretive difficulties associated with retrospective studies. Although this can create difficulties with dropout at follow up, it seems essential when seeking to establish whether cognitive variables are genuine predictors of PTSD. Furthermore, many of the measures rely on memory for specific aspects of the event such as peritraumatic processing, which would be less valid over time. A cautionary note here is that such measures will inevitably be completed retrospectively, for example within 10 days of the incident. Emotional state, including PTSD symptoms, could potentially influence perceptions of the event. However, this is less of an issue when the primary aim is to develop a predictive tool, in contrast with exclusively seeking to validate the model and its underlying mechanisms. With the latter, inflated correlations between cognitive factors and PTSD symptoms would lead to overrepresentation of the role of the cognitive variables.

Second, there were advantages of including a range of cognitive variables within one study. This was partly necessary owing to the limited research to indicate the relative importance of variables. However, the associated cost was to extend questionnaire completion time, which almost certainly deterred some potential participants. To address this, the number of items in the nonstandardised predictor measures could be reduced, and similar adaptations have been made for use in studies with children (Ehlers *et al.*, 2003). However, other research would be needed to establish which factors are important and should therefore be included. An obvious alternative would be to include fewer variables, or split these between groups of participants. As research continues to be generated, the relative importance of some variables may become apparent and inform future development of predictive tools based on Ehlers and Clark's (2000) model.

As with many other studies associated with Ehlers and Clark's model (e.g. Dunmore *et al.*, 2001), the present design relies heavily on self-report measures. This offers the most practical format for screening tools (Brewin, 2005), but there are potential criticisms for self-assessment of PTSD symptoms, as opposed to interview-based measurement, in the development of such a tool. In particular, self-report may lead to inflated correlations between PTSD symptoms and cognitive variables, which are also self-assessed. However, Foa *et al.* (1997) established that the PDS, which was used to assess symptoms in the present study, has good psychometric properties and a good relationship with PTSD diagnosis using the SCID (Spitzer *et al.*, 1990).

Although a general item related to adverse trauma in adulthood, the design did not specifically assess prior experience of similar workplace incidents or posttrauma exposure to

traumatic incidents or stressful life events. Such factors could be important predictors of long-term outcome (e.g. Blanchard *et al.*, 1997). Alternatively, failing to assess their presence could lead to misleading results. For example, cognitive factors in relation to subsequent incidents may influence psychopathology, and would not have been measured. Indeed, it is not unusual for healthcare professionals to experience repeated incidents (e.g. Upson, 2004), although often at a low level of severity.

The original design of Study 1 intended to use a cut-off of 11 on the symptom scale of the PDS, for prediction of cases with at least moderate PTSD symptomatology. This was informed by a previous study (Salter, 2003), which selected this cut-off on the basis of scores from a clinical population. Future attempts to predict PTSD outcomes could review this cut-off. It is possible that this would be over-inclusive, and identify a proportion of people who were not experiencing sufficiently severe or persistent symptoms to warrant intervention.

The central limitation of this study concerned recruitment. Potential reasons for this and strategies implemented in response have been explored previously. However, it is also possible to identify improvements for the design. It would be useful to monitor uptake of questionnaire packs more closely, by labelling the source location. While in the present study it was possible to identify the participant's site, how they had obtained the pack was unknown. Labelling would also enable problem areas to be identified and interventions to maximise recruitment targeted in these parts of the research site.

Exclusive reliance on staff within the trusts for initial recruitment is a certain limitation of the present methodology, regardless of the quality of working relationships, or strategies such as training and problem shooting. Alternative methods for inviting staff to participate and complete questionnaires have yielded good response rates elsewhere and could also be considered. For example, intranet email could be used independently or in combination with paper-based methods. Nevertheless, it would seem important for ethical judgements concerning this type of research conducted by psychologists in clinical training to carefully consider the costs associated with poor quality research owing to small sample sizes that limit the generalisability of results, or indeed prevent analysis. A case for allowing the lead researcher closer involvement in the recruitment could be made on this basis when seeking ethical approval.

Summary

A number of factors may have influenced the outcome of Study 1, some of which could be related to design and methodological details. However, there were also many strengths, which, had an adequate sample been achieved, suggest that the findings could have made an important contribution. Based on experience from Study 1, a number of recommendations can be made for future attempts at successfully conducting such a study. Firstly, a prospective design should be used to maximise the potential validity of interpretations based on the findings.

Large sample sizes are required to achieve the necessary statistical power, and it would seem essential to review ways of maximising sample size, through: (a) negotiating closer involvement with recruitment and targeting trusts where there are efficient methods for responding to incidents; (b) considering alternative or additional methods for recruitment and questionnaire completion; and (c) exploring ways of limiting demands on completion time. Whilst the content of questionnaires should be minimised, other data could be explored as potentially important predictors, such as the number of previous incidents at work and subsequent life events following trauma. It would be desirable to follow-up participants to assess symptom severity at least six months post-incident, owing to the natural course of PTSD. This would also facilitate comparison with other studies, which often re-assess symptoms at six and nine months post-trauma (e.g. Dunmore *et al.*, 2001).

Service-related Recommendations

Based on findings from the present study and available literature, the following recommendations can be made. Firstly, PTSD should be recognised by healthcare organisations as a potential outcome following exposure to workplace violence and aggression. Those in all levels of management should be aware that staff may develop anxiety-related symptoms, and that objectively minor incidents can also have psychological impacts. Given that other peoples' responses can influence how individuals appraise incidents (e.g. Dunmore *et al.*, 2001), colleagues and managers can play an important role in staff responses to incidents of violence and aggression. The organisations involved in this research did not have systematic ways of identifying need for support or intervention following incidents. It is acknowledged that this would have significant implications for resources and could present difficulties given external pressures such as workload; more time would obviously allow greater attention to be given to these support issues. Consequently, the responsibility is often upon individuals to take a proactive role in seeking support. A further suggestion is therefore that information should be provided to staff concerning formal support that is available both within and outside the organisation. Finally, a logical suggestion is that staff that should be provided with information that normalises PTSD symptoms as a response to these incidents and informs them about their normal course. Although there is limited research that systematically appraises the effectiveness of information provision, preliminary studies with general A&E populations following injury have not found support for such an intervention (Scholes, 2004; Turpin, Downs & Mason, 2003). However, it could play a role in directing individuals to seek help when experiencing persistent symptoms (Turpin *et al.*, 2003). It therefore seems important to establish the effectiveness of information provision within the context of healthcare workers exposed to violence and aggression, or other traumatic events, before dismissing such an intervention.

Future Research

Research concerning PTSD and healthcare workers is in the initial stages (Richter & Berger, 2006). There is clearly scope for further studies to establish both incidence and prevalence of PTSD following workplace violence and aggression in the NHS, preferably involving larger sample sizes and prospective designs. It would be important to index different healthcare settings, and to develop understanding of the effects of repeated exposure to incidents. Although Study 2 did not find an effect of workplace context, future research should assess features of the work environment that could influence, and be potentially detrimental, to the recovery of individuals. This could help inform employers about the best way to support staff following traumatic incidents.

As already noted, replication of Study 1 would be warranted, with careful consideration of the aforementioned actions to improve the design and maximise successful recruitment. The resulting predictive tool would require cross-validation in different healthcare settings to assess external validity. An alternative would be to focus the development of a predictive tool on clinical populations; this could then be validated with healthcare workers. Such an approach could potentially overcome certain difficulties with response rates.

Building on this research, it would be important to investigate the effectiveness of various interventions, which could be offered to staff following exposure to violence and aggression, or indeed other traumas.

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APPENDIXES

Appendix A

Ethical Approval Letters[6]

MREC approval following site-specific approval.

Leeds (East) Research Ethics Committee
Room 5.2, Clinical Sciences Building
St James's University Hospital
Beckett Street
Leeds
LS9 7TF
0113 2065652

12 May 2005

Mrs Emma Bishop

Dear Mrs Bishop

Study title:	*Cognitive factors in persistent posttraumatic stress disorder in NHS staff following exposure to violence and aggression. Study 1: Generation, refinement and validation of a predictive tool. Study 2: An investigation into the mechanisms in the Ehlers-Clark Cognitive Model of PTSD.*
REC reference:	*05/Q1206/44*

The REC gave a favourable ethical opinion to this study on 29 April 2005.

Further notification(s) have been received from local site assessor(s), following site-specific assessment. On behalf of the Committee, I am pleased to confirm the extension of the favourable opinion to the new site(s). I attach an updated version of the site approval form, listing all sites with a favourable ethical opinion to conduct the research.

Management approval

The Chief Investigator or sponsor should inform the local Principal Investigator at each site of the favourable opinion by sending a copy of this letter and the attached form. The research should not commence at any NHS site until management approval from the relevant NHS care organisation has been confirmed.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

MREC approval (continued).

REC reference number: 05/Q1206/44 Please quote this number on all correspondence

Yours sincerely,

Ann Prothero

Mrs Ann Prothero
Administrator

Enclosure: Site approval form (SF1)

Copy: Clare Skinner, University of Leeds

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[6] Identifying details have been removed were necessary to maintain anonymity of the research sites.

Site-specific approval list.

Leeds (East) Research Ethics Committee

LIST OF SITES WITH A FAVOURABLE ETHICAL OPINION

For all studies requiring site-specific assessment, this form is issued by the main REC to the Chief Investigator and sponsor with the favourable opinion letter and following subsequent notifications from site assessors. For issue 2 onwards, all sites with a favourable opinion are listed, adding the new sites approved.

REC reference number:	05/Q1206/44	**Issue number:**	2	**Date of issue:**	12 May 2005
Chief Investigator:	Mrs Emma Bishop				
Full title of study:	Cognitive factors in persistent posttraumatic stress disorder in NHS staff following exposure to violence and aggression. Study 1: Generation, refinement and validation of a predictive tool. Study 2: An investigation into the mechanisms in the Ehlers-Clark Cognitive Model of PTSD				

This study was given a favourable ethical opinion by Leeds (East) Research Ethics Committee on 01 January 0001. The favourable opinion is extended to each of the sites listed below. The research may commence at each NHS site when management approval from the relevant NHS care organisation has been confirmed.

Principal Investigator	Post	Research site	Site assessor	Date of favourable opinion for this site	Notes [1]
Mrs Emma Bishop	Psychologist in Clinical Training		Research Ethics Committee	12/05/2005	
Miss Annie Moreland	Psychologist in Clinical Training		Research Ethics Committee	29/04/2005	

Approved by the Chair on behalf of the REC:

Ann Prothero ..... **(Signature of Chair/Administrator*)**
(*delete as applicable)

ANN PROTHERO ..... **(Name)**

[1] *The notes column may be used by the main REC to record the early closure or withdrawal of a site (where notified by the Chief Investigator or sponsor), the suspension of termination of the favourable opinion for an individual site, or any other relevant development. The date should be recorded.*

R&D approval Site 1.

NHS

20 June 2005

Emma Bishop
Psychologist in Clinical Training
University of Leeds
15 Hyde Terrace
LEEDS
LS2 9LT

Tel
Fax
Website

Dear Emma,

Re: Cognitive factors in symptoms of persistent posttraumatic stress disorder in NHS staff following exposure to violence and aggression

Your Ref: 05/Q1206/44

Thank you for submitting your proposal for research governance approval. I am writing to confirm that your proposal has now been approved.

Please note however, that this approval is conditional on compliance with the following requirements:

- You adhere to the responsibilities of sponsor, employing organisation and chief investigator as defined in the Research Governance Framework. This includes being responsible for ensuring that informed consent and other procedures in the protocol are being adhered to *(I will assume you are responsible unless you return the attached slip).*
- You have read and understood the information provided in the Research and Development Handbook.
- If you have not already done so, forward a copy of the relevant ethics committees' approval letter before starting your research project.
- You do not deviate from, or make changes to the proposal without prior written approval from the Research and Development Coordinator, except where this is necessary to eliminate immediate hazards to research participants. In such cases the Research and Development Coordinator should be informed as soon as possible.
- In the event of and any adverse events arising during research you must follow the Trust Incident Reporting Information System.
- Report any concerns regarding research fraud and misconduct that arise during research in line with the policy and procedure for 'hearing the concerns of workers'.
- You must report back to research subjects on outcomes of the research.
- The consent to project monitoring and audit.

manages all research in accordance with the Research Governance Framework[1]. As sponsor, employing organisation and chief investigator, you are responsible for the conduct of the research at the Trust and are responsible for ensuring that Health and Safety and Data Protection policies are adhered to where appropriate.

I hope all goes well with the study and look forward to hearing about your progress.

Yours sincerely,

pp Medical Director

1 Research Governance Framework for Health and Social Care, DHO, March 2001.

Substantial amendment – addition of Site 3.

Leeds (East) Research Ethics Committee
Room 5.2, Clinical Sciences Building
St James's University Hospital
Beckett Street
Leeds
LS9 7TF

Telephone: 0113 2065652

21 September 2005

Ms Emma Bishop

Dear Ms Bishop

Study title: **Cognitive factors in symptoms of persistent posttraumatic stress disorder in NHS staff following exposure to violence and aggression. Study 1: Generation, refinement and validation of a predictive tool. Study 2: An investigation into the mechanisms in the Ehlers-Clark model of PTSD.**
REC reference: **05/Q1206/44**

Amendment number: 5
Amendment date: 07/09/2005

The above amendment was reviewed at the meeting of the Sub-Committee of the Research Ethics Committee held on 20/09/2005.

Ethical opinion

The members of the Committee present gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Notice of substantial amendment dated 16/09/2005
Participant information sheet for site 3, version 1 dated 7/09/2005.
Consent form for site 3, version 1 dated 7/09/2005.
Revised protocol, version 4, dated 7/09/2005.
Summary protocol, version 4 dated 7/09/2005.
Flier, version 1 dated 07/09/2005
Cover letter 1, (Site 3), version 1 dated 07/09/2005
Cover letter 2 (Site 3), version 1 dated 07/09/2005.

Substantial amendment – addition of Site 3 (continued).

Cover letter 3 (Site 3) version 1 dated 07/09/2005.
Cover letter 4 (Site 3) version 1 dated 07/09/2005.
Follow up letter (Site 3) version 1 dated 07/09/2005
Additional incident letter (Site 3) version 1 dated 07/09/2005.
Information sheet for managers, version 1 dated 07/09/2005

Membership of the Committee

The members of the Ethics Committee who were present at the meeting are listed on the attached sheet.

Research governance approval

All investigators and research collaborators in the NHS should notify the R&D Department for the relevant NHS care organisation of this amendment and check whether it affects research governance approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

REC reference number: 05/Q1206/44 **Please quote this number on all correspondence**

Yours sincerely

Dr M O'Meara
Vice Chair

E-mail: Elaine.hazel@leedsth.nhs.uk

Copy to: R&D Department LTHT

List of names and professions of members who were present at the meeting:

Dr M O'Meara, Consultant Anaesthetist
Dr M Kellett, Consultant Dental Surgeon

Amended site-specific approval list.

Leeds (East) Research Ethics Committee

LIST OF SITES WITH A FAVOURABLE ETHICAL OPINION

For all studies requiring site-specific assessment, this form is issued by the main REC to the Chief Investigator and sponsor with the favourable opinion letter and following subsequent notifications from site assessors. For issue 2 onwards, all sites with a favourable opinion are listed, adding the new sites approved.

REC reference number:	05/Q1206/44	**Issue number:**	2	**Date of issue:**	04 October 2005
Chief Investigator:	Mrs Emma Bishop				
Full title of study:	Cognitive factors in persistent posttraumatic stress disorder in NHS staff following exposure to violence and aggression Study 1: Generation, refinement and validation of a predictive tool Study 2: An investigation into the mechanisms in the Ehlers-Clark Cognitive Model of PTSD				

This study was given a favourable ethical opinion by Leeds (East) Research Ethics Committee on 29 April 2005. The favourable opinion is extended to each of the sites listed below. The research may commence at each NHS site when management approval from the relevant NHS care organisation has been confirmed.

Principal Investigator	*Post*	*Research site*	*Site assessor*	*Date of favourable opinion for this site*	*Notes* [1]
Mrs Emma Bishop	Psychologist in Clinical Training		Research Ethics Committee	12/05/2005	
Miss Annie Moreland	Psychologist in Clinical Training		Research Ethics Committee	29/04/2005	
Mrs Emma Bishop	Psychologist in Clinical Training		Research Ethics Committee	04/10/2005	

Approved by the Chair on behalf of the REC:

Ann Prothero ..... **(Signature of Chair/Administrator*)**

(*delete as applicable)

ANN PROTHERO ..... **(Name)**

R&D approval Site 3.

RESEARCH

Enquiries on this matter should be made to:

Tel: (01274) (36) 6808
Fax: (01274) (38) 2640
E Mail:

Telephone:
Text phone for deaf users:

Our Ref: JW/JED/ELSY 791

From:
Dr
BSc MB ChB MRCP FFPHM
Director of Research & Effectiveness
Email
Tel:

11th October 2005

Mrs Emma Bishop
Psychologist in Clinical Training

Dear Mrs Bishop

Re: *Cognitive factors in persistent posttraumatic stress disorder in NHS staff following exposure to violence and aggression.*
Study 1: Generation, refinement and validation of a predictive tool
Study 2: An investigation into the mechanisms in the Ehlers-Clark Cognitive Model of PTSD
Sponsor: *University of Leeds*

On behalf of Trust, I approve on the terms of this letter the Trust's involvement in this study as Research Site as set out in your R&D Application dated 19th September 2005 and subject to the Trust's standard conditions of R&D Management Approval (attached). Details have been entered onto the Trust's research database (print out attached). Please note the *Start Date*. This is the effective date of R&D Management Approval and is the earliest commencement date for this Trust's participation. The terms referred to are:

- The Trust manages all research in accordance with the Research Governance Framework for England as varied from time to time and compliance by you with this Framework is a requirement of this R&D Management Approval. The Framework sets out the responsibilities and standards that should be applied to work managed within the formal research context. Standards for research governance are available on the Department of Health's website at www.dh.gov.uk/research and are set out under 5 domains of ethics, science, information, health, safety & employment, finance and intellectual property and include legislative requirements, Department of Health requirements and other established standards of good practice from recognised international and national authorities and professional organisations. Professional judgement is necessarily involved in the interpretation of many aspects of the guidance. A direct link to these standards is available on our Research website at

R&D approval Site 3 (continued).

RESEARCH

- As site Principal Investigator, you are responsible for the conduct of the research at the Trust. Unless you inform me otherwise (see attached reply slip), I will assume that you are responsible for ensuring that informed consent and other procedures in the protocol are being adhered to.

- You should notify the Research Office immediately should concerns arise about the safety and welfare of participants in this study at the Trust.

- Complete and return to the Research Office:

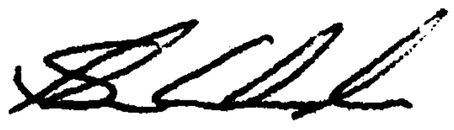
  (i) An Annual Progress Report each year sent to you starting from the first anniversary of the date of this letter (or, in the case of a study which is completed within the year, complete the Annual Progress Report and submit with the end of study declaration, see (iii) below).

  (ii) Copies of any correspondence you receive from the Sponsor or Chief Investigator or Research Ethics Committee with regard to the safety or conduct of the study.

  (iii) A completed End of Study Declaration report (attached).

Please help us to improve our service by completing the feedback form and returning it to the Research Office.

Yours sincerely



Director of Research & Effectiveness

Appendix B

Measures

Data-driven processing: Time 1.

DATA DRIVEN PROCESSING SCALE

In this questionnaire we are interested in WHAT WENT THROUGH YOUR MIND during the traumatic event. Please indicate the extent to which the following statements applied to you DURING THE TRAUMATIC EVENT.

Please rate whether the following statements applied to you AT ANY TIME during the trauma

	Not at all/never	Very little	Moderately	Strongly	Very strongly
1. I couldn't really take it all in	0	1	2	3	4
2. I did not fully understand what was going on	0	1	2	3	4
3. It was just like a stream of unconnected impressions following each other	0	1	2	3	4
4. I could not think clearly	0	1	2	3	4
5. I was overwhelmed by sensations and couldn't put everything together	0	1	2	3	4
6. I was confused and could not fully make sense of what was happening	0	1	2	3	4
7. My mind was fully occupied with what I saw, heard, smelled and felt	0	1	2	3	4
8. My mind was full of impressions and my reactions to them	0	1	2	3	4

Lack of self-referent processing: Time 1.

SELF-REFERENT PROCESSING SCALE

Listed below are a number of statements that describe thoughts and feelings that people experience during a trauma. Please rate the extent to which these statements apply to your experience DURING THE TRAUMA by circling the appropriate number. There are no right or wrong answers to these questions. Please try to remember how you felt and thought AT THE TIME OF THE TRAUMA, not what you thought afterwards with the benefit of hindsight.

Please rate whether the following statements applied to you AT ANY TIME during the trauma

		Not at all/never	Very little	Moderately	Strongly	Very strongly
1.	I felt as if the assault was happening to someone else	0	1	2	3	4
2.	I felt cut off from my past	0	1	2	3	4
3.	It felt like I was a different person from the person I used to be	0	1	2	3	4
4.	I was aware that the assault was happening, but not so much that it was happening to me	0	1	2	3	4
5.	I felt cut off from my future	0	1	2	3	4
6.	I couldn't imagine anything beyond this experience	0	1	2	3	4
7.	Things that had been important to me before did not matter any longer	0	1	2	3	4
8.	I felt there was no way back to my normal life after this	0	1	2	3	4

State dissociation: Time 1.

STATE DISSOCIATION QUESTIONNAIRE

Listed below are a number of statements that describe thoughts and feelings that people experience during a trauma. Please rate the extent to which these statements apply to your experience DURING THE TRAUMA by circling the appropriate number. There are no right or wrong answers to these questions. Please try to remember how you felt and thought AT THE TIME OF THE TRAUMA, not what you thought afterwards with the benefit of hindsight.

Please rate whether the following statements applied to you AT ANY TIME during the trauma

		Not at all/never	Very little	Moderately	Strongly	Very strongly
1.	I felt dazed, unable to take in what was happening	0	1	2	3	4
2.	The world around me seemed strange or unreal	0	1	2	3	4
3.	My body felt as if it was not really mine	0	1	2	3	4
4.	I felt emotionally numb	0	1	2	3	4
5.	I felt as if I was separate to my body and was watching it from outside	0	1	2	3	4
6.	I felt as if time was going faster or slower than it really was	0	1	2	3	4
7.	I felt as if I was living in a dream or a film, rather than in real life	0	1	2	3	4
8.	Things around me seemed too big or too small, or distorted in shape	0	1	2	3	4
9.	I felt distant from my emotions	0	1	2	3	4

Mental defeat: Time 1.

MODIFIED THOUGHTS AND FEELINGS DURING TRAUMA

Listed below are a number of statements that describe thoughts and feelings that people experience during a trauma. Please rate the extent to which these statements apply to your experience DURING THE TRAUMA by circling the appropriate number. There are no right or wrong answers to these questions. Please try to remember how you felt and thought AT THE TIME OF THE TRAUMA, not what you thought afterwards with the benefit of hindsight.

Please rate whether the following statements applied to you AT ANY TIME during the trauma

		Not at all/never	Very little	Moderately	Strongly	Very strongly
1.	I lost any will-power	0	1	2	3	4
2.	I didn't care what happened to me anymore	0	1	2	3	4
3.	I felt completely defeated	0	1	2	3	4
4.	I no longer felt like a human being	0	1	2	3	4
5.	In my mind, I gave up	0	1	2	3	4
6.	I felt destroyed as a person	0	1	2	3	4
7.	I wanted to die	0	1	2	3	4
8.	I lost any inner resistance	0	1	2	3	4
9.	I felt like an object	0	1	2	3	4
10.	I felt completely at the mercy of other people or the situation	0	1	2	3	4
11.	I felt completely humiliated and lost any sense of human dignity	0	1	2	3	4

Nature of trauma memory: Time 1.

UNPLEASANT MEMORY QUESTIONNAIRE

The following questions relate to the ways in which people sometimes describe their MEMORIES OF AN UNPLEASANT EVENT. Please rate the extent to which these statements apply to YOUR MEMORIES OF THE EVENT by circling the appropriate number. If the statement is not true for you please circle 'not at all'. There are no right and no wrong answers to these questions.

Please rate whether the following statements apply to you AT ANY TIME since the unpleasant event

		Not at all	A little	Moderately	Strongly	Very Strongly
1.	I feel that my memory for the event is incomplete	0	1	2	3	4
2.	There are periods of time during the event that I cannot account for	0	1	2	3	4
3.	I have trouble remembering the order in which thing's happened during the event	0	1	2	3	4
4.	My memory of the event is muddled	0	1	2	3	4
5.	I cannot get what happened during the event straight in my mind	0	1	2	3	4

Response to intrusions: Time 1.

RESPONSE TO INTRUSIONS QUESTIONNAIRE

What do you do when memories of the assault pop into your mind? Please circle the answer that applied best to you DURING THE PAST WEEK.

		Not at all/never	Sometimes	Often	Always
1.	I try to push them out of my mind	0	1	2	3
2.	I try to erase the memory of the event	0	1	2	3
3.	I try hard to control my emotions	0	1	2	3
4.	I distract myself with something else	0	1	2	3
5.	I think of something else	0	1	2	3
6.	I work hard at keeping busy with other things	0	1	2	3
7.	I think about how life would have been different if the assault had not occurred	0	1	2	3
8.	I dwell on how the assault could have been prevented	0	1	2	3
9.	I think about why the assault happened to me	0	1	2	3
10.	I dwell on how I used to be before the assault	0	1	2	3
11.	I dwell on what other people have done to me	0	1	2	3
12.	I dwell on what I should have done differently	0	1	2	3
13.	I go over what happened again and again	0	1	2	3
14.	I detach myself from the memories	0	1	2	3
15.	I drift off into a world of my own	0	1	2	3
16.	I numb my feelings	0	1	2	3
17.	I drink alcohol, take medication or use drugs	0	1	2	3
18.	I put on loud music or TV	0	1	2	3

Post-traumatic cognitions: Time 1.

POSTTRAUMATIC COGNITIONS INVENTORY

This questionnaire lists different thoughts which people may have after a traumatic experience. In this questionnaire we are interested in the way that YOU thought, IN THE LAST MONTH, in regard to the traumatic event that you have experienced.
Please read each statement carefully and decide how much you have AGREED or DISAGREED with each statement during the last month.
For each of the thoughts, please show your answer by choosing the number from the scale below which BEST DESCRIBES HOW MUCH YOU AGREE WITH THE STATEMENT and placing the number next to that statement. People react in many different ways; there are no right or wrong answers to these statements.

		Totally disagree	Disagree very much	Disagree slightly	Neutral	Agree slightly	Agree very much	Agree totally
1.	My reactions since the event mean that I am going crazy	1	2	3	4	5	6	7
2.	Somebody else would have stopped the event from happening	1	2	3	4	5	6	7
3.	I feel like an object, not like a person	1	2	3	4	5	6	7
4.	I have to be on guard all the time	1	2	3	4	5	6	7
5.	Nothing good can happen to me anymore	1	2	3	4	5	6	7
6.	I will not be able to control my anger and will do something terrible	1	2	3	4	5	6	7
7.	The event happened to me because of the sort of person I am	1	2	3	4	5	6	7
8.	The world is a dangerous place	1	2	3	4	5	6	7
9.	I feel like I don't know myself any more	1	2	3	4	5	6	7
10.	If I think about the event, I will not be able to handle it	1	2	3	4	5	6	7
11.	People can't be trusted	1	2	3	4	5	6	7
12.	My life has been destroyed by the event	1	2	3	4	5	6	7
13.	Somebody else would not have gotten into this situation	1	2	3	4	5	6	7
14.	I can't deal with even the slightest upset	1	2	3	4	5	6	7
15.	I feel dead inside	1	2	3	4	5	6	7

Post-traumatic cognitions (continued).

		Totally disagree	Disagree very much	Disagree slightly	Neutral	Agree slightly	Agree very much	Agree totally
16.	People are not what they seem	1	2	3	4	5	6	7
17.	I can't rely on myself	1	2	3	4	5	6	7
18.	There is something wrong with me as a person	1	2	3	4	5	6	7
19.	I will never be able to feel normal emotions again	1	2	3	4	5	6	7
20.	I have to be especially careful because you never know what can happen next	1	2	3	4	5	6	7
21.	My reactions since the event show that I am a lousy coper	1	2	3	4	5	6	7
22.	I am inadequate	1	2	3	4	5	6	7
23.	You can never know who will harm you	1	2	3	4	5	6	7
24.	I feel isolated and set apart from others	1	2	3	4	5	6	7
25.	I have no future	1	2	3	4	5	6	7
26.	There is something about me that made the event happen	1	2	3	4	5	6	7
27.	I have permanently changed for the worse	1	2	3	4	5	6	7
28.	I can't rely on other people	1	2	3	4	5	6	7
29.	I can't trust that I will do the right thing	1	2	3	4	5	6	7
30.	I am a weak person	1	2	3	4	5	6	7
31.	The event happened because of the way I acted	1	2	3	4	5	6	7
32.	I used to be a happy person but now I am always miserable	1	2	3	4	5	6	7
33.	I can't stop bad things from happening to me	1	2	3	4	5	6	7

Incident severity: Time 1.

INCIDENT SEVERITY QUESTIONNAIRE

Time

1. At approximately what time of day did the incident occur?

2. Approximately how long did the incident last?

- 5 minutes or less
- 6 to 10 minutes
- Over 1 hour
- 31 minutes to 1 hour
- 11 to 30 minutes

Incident details

3. ☐ Witnessed ☐ Personally experienced

4. ☐ Verbal aggression ☐ Physical assault ☐ Sexual assault

5. How many people were aggressive towards you or the person involved?

6. Did the aggressor(s) have a weapon or make you think they had a weapon? ☐ Yes ☐ No

7. Did the weapon come into contact with your body? ☐ Yes ☐ No

8. Did the aggressor(s) threaten to harm you in any way? ☐ Yes ☐ No

Personal impact

9. Did you suffer any physical injuries as a result of the assault? What were they?

- ☐ No injuries
- ☐ Minor cuts/bruises
- ☐ Major cuts/bruises
- ☐ Burns
- ☐ Broken bone
- ☐ Head injuries
- ☐ Gun shot/stab wound
- ☐ Other (please state)

10. During the incident, to what extent did you think that you would be killed?
Please put a cross to indicate what you thought **at the time**

Not at all — 100% sure

11. During the incident, to what extent did you think that you would be seriously injured?
Please put a cross to indicate what you thought **at the time**

Not at all — 100% sure

Consequences

12. Were the aggressors arrested after the assault? Did anything happen to them at all? ☐ Yes ☐ No

13. Are you involved in any court proceedings or police investigations following the incident? ☐ Yes ☐ No

14. Are you trying to claim any compensation following the incident? ☐ Yes ☐ No

Background factors: Time 1.

BACKGROUND FACTORS QUESTIONNAIRE

Gender

- ◻ Male
- ◻ Female

Age

Age on day of incident

Current yearly household income

- ◻ Under £10,000
- ◻ £10,000 - £14,999
- ◻ £15,000 – £19,999
- ◻ £20,000 - £24,999
- ◻ £25,000 - £29,999
- ◻ £30,000 - £34,999
- ◻ £35,000 - £39,999
- ◻ £40,000 – £44,999
- ◻ £45,000 - £49,999
- ◻ Over £50,000

Level of educational qualification

- ◻ GCSEs or 'O' levels
- ◻ Degree level
- ◻ HNC or equivalent
- ◻ Post graduate qualification
- ◻ 'A' levels or equivalent
- ◻ None of the above

Ethnicity

- ◻ White British
- ◻ White Irish
- ◻ Other White
- ◻ Asian Bangladeshi
- ◻ Asian Indian
- ◻ Asian Pakistani
- ◻ Black African
- ◻ Black Caribbean
- ◻ Mixed White and Asian
- ◻ Mixed White and Black African
- ◻ Mixed White and Black Caribbean
- ◻ Other Asian
- ◻ Other Black
- ◻ Other Ethnic Chinese
- ◻ Other Mixed
- ◻ Not stated

Other information

Prior to this incident, had you ever receive treatment from a counsellor, clinical psychologist, or a psychiatrist? ◻ Yes ◻ No

If yes, why did you seek the treatment/what was the problem?

Did you experience any physical, sexual or emotional abuse as a child, or any neglect? ◻ Yes ◻ No ◻ Rather not say

Did you experience any other adverse childhood events, not including abuse? ◻ Yes ◻ No

Have you experienced any other traumatic experiences in your life, other than child abuse or the most recent traumatic incident? ◻ Yes ◻ No

Is there a history of psychiatric disorder in your family? ◻ Yes ◻ No

If yes, what was the disorder?

What relationship are/were you to the person with the disorder?

PTSD symptom severity: Times 1 and 2[7].

PDS

Below is a list of problems that people sometimes have after experiencing a traumatic event. Read each one carefully and choose the answer (0-3) that best describes how often that problem has bothered you IN THE PAST MONTH. Rate each problem with respect to the traumatic events that currently bother you most

PART 1	Not at all/ Only one time	Once a week or less/ Once in a while	2 - 4 times a week/ Half the time	5 or more times a week/ Almost always
1. Having upsetting thoughts or images about the traumatic event that came into your head when you didn't want them to	0	1	2	3
2. Having bad dreams or nightmares about the traumatic event	0	1	2	3
3. Reliving the traumatic event, acting or feeling as if it were happening again	0	1	2	3
4. Feeling emotionally upset when you were reminded of the traumatic event (e.g. feeling scared, angry, sad, guilty, etc.)	0	1	2	3
5. Experiencing physical reactions when you were reminded of the traumatic event (e.g. break into a sweat, heart beating fast)	0	1	2	3
6. Trying not to think about, talk about, or have feelings about the traumatic event	0	1	2	3
7. Trying to avoid activities, people or places that remind you of the traumatic event	0	1	2	3
8. Not being able to remember an important part of the traumatic event	0	1	2	3
9. Having much less interest or participating much less often in important activities	0	1	2	3
10. Feeling distant or cut off from people around you	0	1	2	3
11. Feeling emotionally numb (e.g. being unable to cry or unable to have loving feelings)	0	1	2	3
12. Feeling as if your future plans or hopes will not come true (e.g. you will not have a career, marriage, children, or a long life)	0	1	2	3
13. Having trouble falling or staying asleep	0	1	2	3
14. Feeling irritable or having fits of anger	0	1	2	3
15. Having trouble concentrating (e.g. drifting in and out of conversations, losing track of a story on television, forgetting what you read)	0	1	2	3
16. Being overly alert (e.g. checking to see who is around you, being uncomfortable with your back to a door, etc.)	0	1	2	3
17. Being jumpy or easily startled (e.g. when someone walks up behind you)	0	1	2	3

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Anxiety and depression: Times 1 and 2[8].

HOSPITAL ANXIETY AND DEPRESSION SCALE

The following questions are to do with your feelings. Please read each item and tick the reply that comes closest to how you have been feeling **in the past week**. Don't take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought-out response.

1. I feel tense or 'wound up'

- ☐ Most of the time
- ☐ A lot of the time
- ☐ From time to time, occasionally
- ☐ Not at all

2. I still enjoy the things I used to enjoy

- ☐ Definitely as much
- ☐ Not quite so much
- ☐ Only a little
- ☐ Hardly at all

3. I get a sort of frightened feeling as if something awful is about to happen

- ☐ Very definitely and quite badly
- ☐ Yes, but not too badly
- ☐ A little but it doesn't worry me
- ☐ Not at all

4. I can laugh and see the funny side of things

- ☐ As much as I always could
- ☐ Not quite so much now
- ☐ Definitely not so much now
- ☐ Not at all

5. Worrying thoughts go through my mind

- ☐ A great deal of the time
- ☐ A lot of the time
- ☐ From time to time but not too often
- ☐ Only occasionally

6. I feel cheerful

- ☐ Not at all
- ☐ Not often
- ☐ Sometimes
- ☐ Most of the time

7. I can sit at ease and feel relaxed

- ☐ Definitely
- ☐ Usually
- ☐ Not often
- ☐ Not at all

8. I feel as if I am slowed down

- ☐ Nearly all the time
- ☐ Very often
- ☐ Sometimes
- ☐ Not at all

9. I get a sort of frightened feeling like 'butterflies' in the stomach

- ☐ Not at all
- ☐ Occasionally
- ☐ Quite often
- ☐ Very often

10. I have lost interest in my appearance

- ☐ Definitely
- ☐ I don't take as much care as I should
- ☐ I may not take quite as much care
- ☐ I take just as much care as ever

11. I feel restless as if I have to be on the move

- ☐ Very much indeed
- ☐ Quite a lot
- ☐ Not very much
- ☐ Not at all

12. I look forward with enjoyment to things

- ☐ As much as I ever did
- ☐ Rather less than I used to
- ☐ Definitely less than I used to
- ☐ Hardly at all

13. I get sudden feelings of panic

- ☐ Very often indeed
- ☐ Quite often
- ☐ Not very often
- ☐ Not at all

14. I can enjoy a good book or radio or TV programme

- ☐ Often
- ☐ Sometimes
- ☐ Not often
- ☐ Very seldom

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Support: Time 2

PSYCHOLOGICAL SERVICES AND INFORMAL SUPPORT

Formal support

1. Following the traumatic incident you recently experienced, have you received any support from a trained psychological health practitioner? Yes No

2. If yes, what was their profession?

Psychiatrist	Counsellor
Psychologist	Nurse therapist
Psychotherapist	Other (please state)

3. If yes, how many sessions did you have / have you had? _____

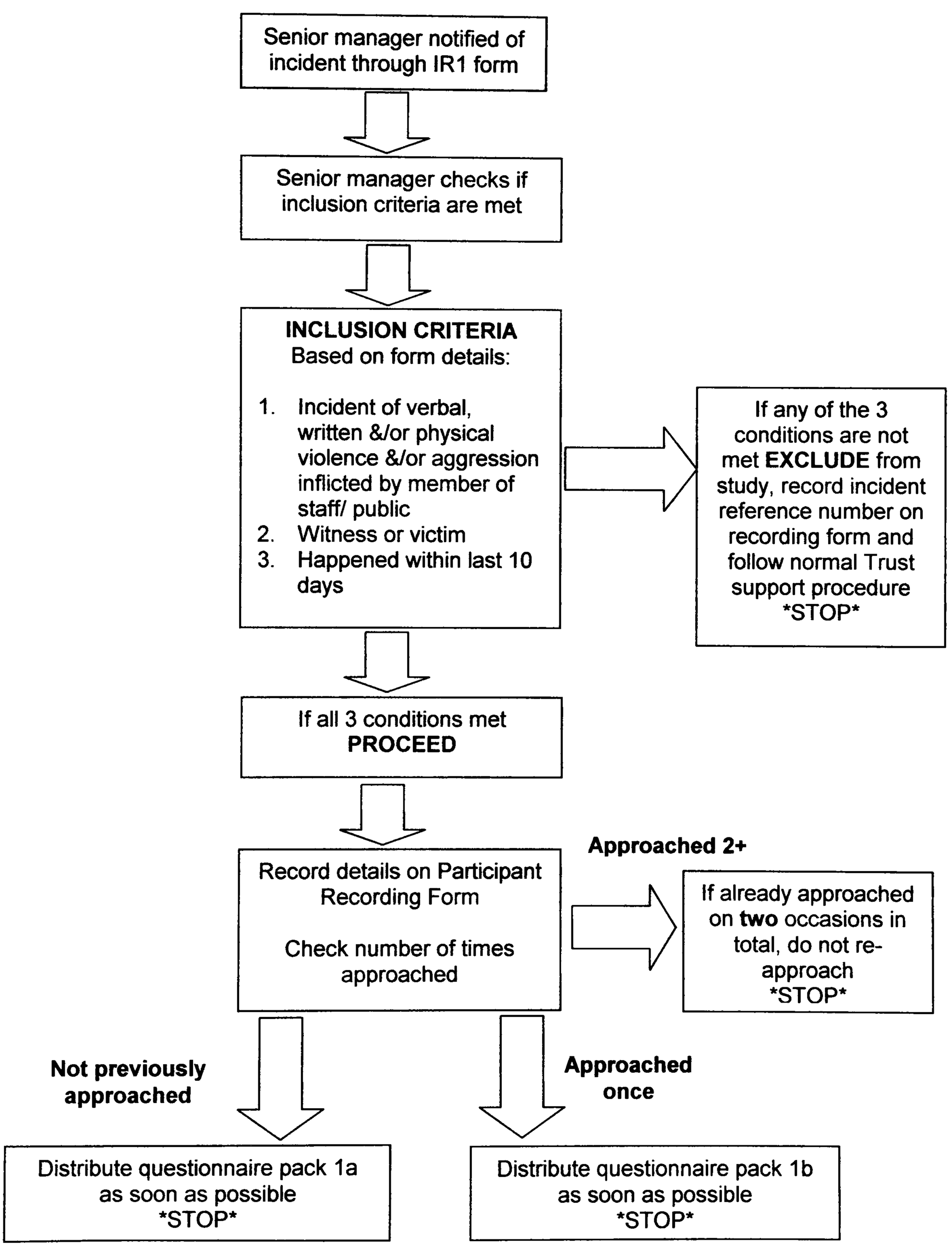
Informal support

4. Following the traumatic incident you recently experienced, have you received any informal support from friends, family or work colleagues? Yes No

Appendix C

Protocol

Example flow diagram from Site 1.



Example written protocol from Site 1.

[SITE 1] PROTOCOL PTSD RESEARCH

BACKGROUND INFORMATION FOR THE RESEARCH

As you may already be aware, NHS staff increasingly experience violence and aggression in the workplace. This can cause physical injuries, but we also know that it can affect people emotionally and some individuals develop symptoms of posttraumatic stress disorder (PTSD). These usually go away naturally in the following weeks or months, but for some people they can persist. For the next few months therefore, we are approaching staff in the Mental Health Directorate Services involved, who experience a violent or aggressive incident at work to take part. It will involve completing questionnaires on 3 occasions over a 6-month period, and requires ticking responses to questions.

This research has two parts: Study 1 aims to create an assessment tool to identify those at risk of persistent PTSD symptoms and ensure that they receive appropriate support as early as possible; Study 2 aims to investigate the mechanisms underlying why and how people develop PTSD symptoms and how they are maintained. The research is being carried out over a 6-month period.

YOUR ROLE

Thank you for being involved in this research project. We are asking you to facilitate the initial recruitment of staff, which is a vital part to the running of this study. In brief this will involve passing a questionnaire pack to members of staff who complete an IR1 form due to being involved in an incident of violence or aggression.

Step 1: Receiving an IR1 form
The criteria for taking part in this research are as follows:

The staff member was involved in or witnessed an act of physical violence, threat of violence or other verbal/written aggression, by a member of the public or a member of staff
The incident occurred 10 days or less from today's date

On receipt of an IR1 form please establish that the incident involved violence or aggression, as stated above. If you are unsure please do not hesitate to contact us. Please do not include staff in the research if it is more than 10 days since the incident, or if you are aware of any injury or issue related to the incident that would prevent them from being able to complete the questionnaires. Proceed to step 2 if the inclusion criteria are met.

Step 2a: Completing the Participant Recording Form
It is possible that a staff member will experience more than one incident during this research. In these cases we are able to invite them to re-start the questionnaires in relation to this incident, if it is more significant to them. Because of this, it is important to complete the recording form first. Please record their name, the number of times they have received a pack and indicate a reason if they have not been able to do so. This will also help us to monitor response rates, which is important information when writing up the research.

Example written protocol from Site 1 (continued).

Step 2b: Giving a pack to the potential participant
If the person has not been approached before, please give them pack 1a. If the person has been approached once before, please give them pack 1b, which contains a different letter explaining why we are inviting them to re-start. If the person has already been re-approached on one occasion, please do not give them any further packs.

It is very important that the potential participant receives the pack as soon as possible. As time passes it will become increasingly difficult for them to accurately remember details of the incident. Therefore it would be ideal if you could ensure that they receive the pack as soon as you become aware of the incident. Please use what you regard as the most efficient way of ensuring that the staff member receives the pack, for example in the internal mail. This pack also contains a detailed information sheet about the research, a written consent form and a freepost envelope. Potential participants will need to provide their contact details in order to be given the further questionnaire packs by the researchers.

This would be your only involvement in recruiting participants. The researchers will be responsible for all further data collection.

OTHER INFORMATION

When discussing this research with staff, it would be important to stress the following:

Two psychologists who are completely independent of the Trust are carrying out this research. All information linked with the research will be kept strictly confidential and will not be shared with other Trust staff such as their line manager. Therefore the identity of those who decide to take part will only be known to the researchers.

Taking part in this research is voluntary. Participants are free to withdraw at anytime without giving a reason.

If you or a potential participant have any questions, please refer to the Information Sheet for more details about the research, or the researchers can be contacted on the details below.

CONTACT DETAILS FOR QUERIES

If you have any questions or require any further information, you can contact the relevant researcher:

Emma Bishop (Bradford)
Tel: 0113 3432732
Email: ugmerb@leeds.ac.uk

Annie Moreland (York)
Tel: 0113 3432732
Email: ugmam@leeds.ac.uk

Thank you for your time and involvement in this research.

Appendix D

Master Template Letters

Cover letter Time 1.

LEEDS UNIVERSITY HEADED PAPER

Dear staff member,

Re: The impact of violence and aggression at work on NHS staff:
Why do some people get symptoms of posttraumatic stress disorder?

We understand that you have recently experienced an incident at work involving violence or aggression. As you may be aware, violent or aggressive attacks on NHS staff have become more and more common in recent years. These can have a number of consequences for both individuals and the organisations in which they work. We are writing to invite you to take part in a study that is currently taking place in [Trust]. An information sheet is enclosed for you to read, outlining the importance of this research and the way you can assist through your participation. Please find enclosed the following items:

- **A questionnaire pack** – the questionnaires are printed on both sides; please complete all sides and return them within 10 days of the incident.
- **Research information sheet** – this provides answers to many of the questions that are typically asked about the research.
- **Research consent form** – the consent form is the first page of the questionnaire pack. Please read and sign this if you would like to take part in the study.
- **Freepost envelope** – please return your completed questionnaires and your Research Consent form in this envelope within 10 days of the incident.

If you decide to take part, we would be grateful if you could complete the initial questionnaire pack as soon after the incident as possible. This is because it relies on your memory of the event and it is known that memory can change with time. However, if more than 10 days has passed since the incident, do still complete and return the questionnaires. While you are free to withdraw from the research, the success of the project requires that as many participants complete all the questionnaires as possible.

If you are experiencing any distress following the incident, we would encourage you to seek the support that you feel you need. There are various confidential sources, including [trust specific services], occupational health and your GP. If you have any further questions, please contact one of us by phone or e-mail (details below). If you are contacting by telephone, please leave a message and we will return your call as soon as possible.

Thank you for your time,

Emma Bishop and Annie Moreland
Researchers
Telephone: 0113 3432732
ugmerb@leeds.ac.uk / ugmam@leeds.ac.uk

Cover letter Time 2.

LEEDS UNIVERSITY HEADED PAPER

[Date]

[Participant's name]
[Preferred address]

Dear [Participant's name],

Re: The impact of violence and aggression at work on NHS staff:
Why do some people get symptoms of posttraumatic stress disorder?

Thank you for completing and returning the questionnaires. It is now approximately 3 month since the incident. Whether you feel that the incident is behind you or not, your answers are still important and we would be grateful if you could complete the enclosed questionnaires. It really is crucial for the success of this project that participants provide responses to all the questions *at each stage of the study.*

Please find enclosed the following:

- **A questionnaire pack** – please follow the instructions on each set, which are different for each one.
- **Freepost envelope** – please return your completed questionnaire the envelope provided.

If you are continuing to experience distressing symptoms, we would encourage you to contact [trust specific services], occupational health and/or your GP.

Furthermore, if any questions or concerns have occurred to you since the start of this project, please contact one of us using the details below. If you are contacting by telephone, please leave a message and we will return your call as soon as possible.

Thank you again for your time,

Emma Bishop and Annie Moreland
Researchers
Telephone: 0113 3432732
ugmerb@leeds.ac.uk / ugmam@leeds.ac.uk

Additional incident letter.

LEEDS UNIVERSITY HEADED PAPER

Dear staff member,

Re: The impact of violence and aggression at work on NHS staff:
Why do some people get symptoms of posttraumatic stress disorder?

It has come to our attention that you have experienced another incident of violence and aggression at work. If you have already declined to take part in this study and are still not interested in doing so, please ignore this letter.

However, if you have agreed to take part **and** the most recent event is more significant to you, we are writing to ask if you would be willing to repeat the questionnaires in relation to this event.

If you have any further questions, please contact one of us by phone or e-mail (details below). If you are contacting by telephone, please leave a message and we will return your call as soon as possible.

Thank you again for your time,

Emma Bishop and Annie Moreland
Researchers
Telephone: 0113 3432732
ugmerb@leeds.ac.uk / ugmam@leeds.ac.uk

Reminder letter.

LEEDS UNIVERSITY HEADED PAPER

[Date]

[Participant's name]
[Preferred address]

Dear [Participant's name],

Re: The impact of violence and aggression at work on NHS staff:
Why do some people get symptoms of persistent PTSD?

Thank you for completing the last questionnaire and for returning it. We recently sent you the next set of questions but as yet we have not received your responses. As we said in our last communication, this study stands a good chance of identifying some useful results to help those exposed to trauma in the future. However, for this to be the case, it is crucial that as many people as possible respond to all the questionnaires. We would be very grateful, therefore, if you could **please find five or so minutes to complete these questions** and return them in the freepost envelope provided. Thank you in advance for you time.

Please find enclosed the following:

- **A questionnaire pack** – please follow the instructions in each section, which are different for each one.
- **Freepost envelope** – please return your completed questionnaires in the envelope provided.

If you are continuing to experience distressing symptoms, we would encourage you to contact [trust specific services], occupational health and/or your GP.

If any questions or concerns have occurred to you since the start of this project, please contact one of us using the details below. If you are contacting by telephone, please leave a message and we will return your call as soon as possible.

Thank you again for your time,

Emma Bishop and Annie Moreland
Researchers
Telephone: 0113 3432732
ugmerb@leeds.ac.uk / ugmam@leeds.ac.uk

Appendix E

Reminder Sheet

IMPORTANT REMINDER

- We need people to take part even if they do not feel they have been affected by the incident
- This research is confidential – only the researchers know who will take part in the study
- It is crucial to report the incident and fill in the questionnaire within 10 days of it occurring
- The 1st questionnaire pack is the longest - follow up questionnaires will be much shorter
- Please make sure you haven't missed any questions – it is important to answer even if it doesn't seem relevant to you
- Return the questionnaires ASAP in the FREEPOST envelope
- The information you provide will be used to improve the support given to staff in the future

If you want any more information about the study, such as why we are asking particular questions, please contact us by phone or email

Thank you for your time

Appendix F

Study 2 Questionnaire and Scenarios

Violence and aggression questionnaire

Please read this scenario and then answer the questions below.
[Scenario A, B, C or D]

1. Listed here are some thoughts that people might have about this incident. Please rate how much you think you would agree/disagree with these statements if you were in this situation (please circle the relevant number):

	Disagree very much	Disagree moderately	Disagree slightly	Agree slightly	Agree moderately	Agree very much
a. There is something about me that made the event happen	0	1	2	3	4	5
b. The world is a dangerous place	0	1	2	3	4	5
c. I can't rely on other people	0	1	2	3	4	5
d. Somebody else would have stopped the event from happening	0	1	2	3	4	5
e. I am inadequate	0	1	2	3	4	5
f. I can't stop bad things from happening to me	0	1	2	3	4	5

2. Listed here are thoughts that some people have had about their feelings after incidents similar to the scenario you have read. Please rate how much you think you would agree/disagree with these statements if you were in the situation described (please circle the relevant number):

	Disagree very much	Disagree moderately	Disagree slightly	Agree slightly	Agree moderately	Agree very much
a. I will never have normal emotions again	0	1	2	3	4	5
b. I must be losing my mind	0	1	2	3	4	5
c. I will never get over the assault	0	1	2	3	4	5
d. Something is seriously wrong with me	0	1	2	3	4	5
e. I am changed for the worse	0	1	2	3	4	5
f. Something terrible will happen if I do not try to control my thoughts about the assault	0	1	2	3	4	5
g. If I cannot control my thoughts about the assault I will go crazy	0	1	2	3	4	5

Continued ov

Study 2 Questionnaire and Scenarios (continued)

3. What do you think you would do if you were the person involved in this incident? Please circle the answer that best describes how often you think you would do the following:

	Never	Sometimes	Often	Always
a. Avoid going to the area where the incident occurred	0	1	2	3
b. Avoid telling people about the assault	0	1	2	3
c. Try to push thoughts about the incident to the back of your mind	0	1	2	3
d. Make sure that you are not alone	0	1	2	3
e. Overprotect those close to you	0	1	2	3
f. Ruminate about how the event could have been prevented	0	1	2	3

4. How upset do you think you would be about this incident? (Put a mark on the line to indicate your response):

Not at all _____ Extremely

5. Here are some more questions about these scenarios (please circle your answer):

a. How easy was it to imagine this event?	Very easy	Easy	Difficult	Very difficult
b. Has anything like this happened to you before?	Yes	No		
c. If yes, approximately how many times has this happened?	_____			
d. How likely is it that you would be involved in an incident like this in the future?	Very likely	Likely	Unlikely	Not at all likely

6. Finally please could you provide a few bits of information about yourself so that your can be put in greater context? (Please circle):

Year of training	1	2	3			
Course	Advanced Diploma in Nursing			BHSc (Hons) Nursing Adult		
Gender	Male	Female				
Age	18-24	25-34	35-49	50-64		
Marital status	Married	Cohabiting	Single	Separated	Divorced	Widowed

Thank you for taking the time to complete these questions

Scenarios A-D.

		Organisational context	
		Work	Non-work
Cause of behaviour	Illness	A	B
	Non-illness	C	D

A. Assaulted at work by person with a diagnosis of dementia
You are working on a ward for older people at a local community hospital. Peter Young is a 66-year-old man who has sustained a fall and developed a urinary tract infection. He also has a dementia diagnosis and after admission to the ward, he is confused and restless. Towards the end of your shift, you are sitting at the nurses' station writing up notes; your colleagues are busy giving out medication helping other patients with nighttime routine. Peter has been wandering aimlessly around the ward but walks nearer to you and becomes increasingly distressed and angry, shouting, "Get away". As you quickly try to calm the situation, Peter raises his fist unexpectedly and punches you across the face before you can pull away. The incident leaves you with a bruise and scratches on your right cheek. You feel quite on edge following the incident, and have trouble sleeping that night. You are due back at work the following day.

B. Assaulted in the supermarket car park by person with a diagnosis of dementia
You are in the supermarket on your way home from a late shift at work. A man in his 60s is behind you at the checkout and while he doesn't seem drunk, he is seems very restless and confused. You recognise these symptoms as indicative of a stroke or dementia. He starts shouting at you and the shop assistant, and as you try to ignore him he raises his fist unexpectedly and punches you across the face before you can pull away. The incident leaves you with a bruise and scratches on your right cheek. You feel quite on edge following the incident, and have trouble sleeping that night. You are due back at work the following day.

C. Assaulted at work by person under the influence of alcohol
You are doing a shift in A&E on a Friday night. You have been asked to dress a wound for a 66-year-old man, Peter Young, who sustained a fall and lacerated his hand earlier that evening. Your colleague has let you know the man is drunk but hasn't caused any particular bother so far. While attending to Peter he quickly becomes distressed and angry, shouting, "Get away". As you quickly try to calm the situation, Peter raises his fist unexpectedly and punches you across the face before you can pull away. The incident leaves you with a bruise and scratches on your right cheek. You feel quite on edge following the incident, and have trouble sleeping that night. You are due back at work the following day.

D. Assaulted in the supermarket car part by person under the influence of alcohol
You are in the supermarket on your way home from a late shift at work. A man in his 60s approaches the queue and you immediately notice that he is very drunk. He starts shouting at you and the shop assistant, and as you try to ignore him he raises his fist unexpectedly and punches you across the face before you can pull away. The incident leaves you with a bruise and scratches on your right cheek. You feel quite on edge following the incident, and have trouble sleeping that night. You are due back at work the following day.