AGGRESSION, VIOLENCE AND RESILIENCE IN OFFENDER HEALTHCARE SERVICES

SARAH HODGKINSON, B.Sc., M.Sc.

Thesis submitted to the University of Nottingham for the degree of Doctor in Forensic Psychology

June 2019

Research Supervisor Verification Form

The Centre for Forensic & Family Psychology

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Professional Doctorate in Forensic Psychology (D.Foren.Psy.)

Name of Trainee:	*Sarah Hodgkinson*
Name of Primary Supervisor:	**Shihning Chou**
Thesis Title:	*Aggression, Violence and Resilience in Offender Healthcare Services*

This thesis contains a CD-ROM containing the raw data in an SPSS or Excel format used for this research, along with the relevant SPSS command and output files (or equivalent data for qualitative research), an electronic copy of the thesis, and a copy of the thesis without the references or appendices section.

Turnitin report enclosed. ✓

This thesis has been reviewed before submission by the Primary Supervisor with the following comments:

Signed (Trainee): SEHodgkinson

Date: 20/06/2019

Signed (Primary Supervisor): .....Shon.....

Date: .....20.6.2019.....

Please return to the DForenPsy Admin Office, B22 YANG Fujia Building.

Abstract

Service user to staff violence is well documented in healthcare service literature. However, there appears to be little consensus on the definition of this type of violence. This in turn limits ways of measuring different types of service-user aggression as experienced by staff. Nevertheless, healthcare workers in general are particularly at risk of experiencing workplace violence. Previous research would indicate that staff working in forensic-based services, although still experience aggression and violence, may have mechanisms in place that serve a protective function. Further investigation of such phenomena as resilience is warranted.

The research project followed a four stage mixed design. A systematic review explored definitions and prevalence of service user to staff violence in forensic healthcare services. The second stage comprised a critique of The Perceptions of the Prevalence of Aggression Scale (POPAS) following the systematic review highlighting conflicting conceptualisations of aggression and violence; this required exploration before subsequent project stages. The third stage investigated the negative impact of patient aggression and violence for forensic healthcare staff; resilience and perceived stress was examined in affecting this experience. Finally, a factor analysis explored the existing factor structure of the Connor-Davidson Resilience Scale (CD-RISC) with forensic healthcare staff.

The systematic review found conflicting definitions of violence were utilised across the literature. An inconsistent pattern of prevalence was found across included studies which was 15 - 91.6%. Critique of the POPAS revealed the scale has good internal consistency (Cronbach's alpha above 0.8) across several studies. The scale appeared to have strength as a basis for the development of other scales, which could demonstrate its flexibility. Findings of the third stage of the project indicated that staff working in forensic healthcare services (N=93) experienced a moderate level of stress and were significantly negatively impacted when exposed to aggression and

violence. Participants had a moderate-high level of resilience. Resilience, perceived stress and the experience of aggression and violence were significant predictors of the negative impact of aggression and violence. Such findings were in support of principles highlighted by the Resilience Portfolio Model. Following factor analysis of the CD-RISC seven factors emerged from the data; Factor 1 (adaptability, personal strength) was the strongest to emerge.

It is believed the systematic review is the first attempt to synthesise existing data and serves to provide a point of reference for further exploration. Although reliability and internal consistency of the POPAS was well-established it is recommended that further exploration is needed with respect to exploring the scale's validity in more depth. The POPAS appeared to be a strong measure of aggression and violence in workplace contexts. In support of existing literature healthcare staff working with offenders reported experiencing a high number of aggressive and violent incidents. The sample had a high level of resilience which affected the negative impact after experiencing aggression and violence; the higher the scores of resilience and perceived stress, the lower the negative impact of experiencing aggression and violence. This was in support of theoretical principles of the Resilience Portfolio Model which guided this thesis. Comparison of current factor loadings on the CD-RISC with existing findings would indicate that resilience is complex. Findings may indicate that healthcare staff working with offenders may differ in how resilience operates with reference to experiencing aggression and violence in the workplace.

Keywords: Aggression, Violence, Resilience, Forensic, Healthcare Staff

Authorship Declaration

I declare that this thesis has been composed solely by myself and is the result of my own work, except were explicitly stated otherwise by reference or acknowledgement. It has not been submitted, in whole or in part, in any previous application for a degree or other professional qualification.

Acknowledgements

I would like to thank Humber Teaching NHS Foundation Trust and Nottinghamshire Healthcare NHS Foundation Trust for allowing me to carry out my research at their trust sites. I would also like to thank all of the staff members who took part in my research and for taking the time from their challenging roles to contribute to the project.

I would particularly like to thank my research supervisors for their support and guidance throughout this journey: Dr Shihning Chou, Dr Jen Yates and Dr Kathleen Green. Thank you for giving your time and encouragement so generously.

Finally, I would like to thank my partner, Pete, my family, close friends and colleagues, whose support I would not have been able to achieve this piece of work without. Thank you.

Table of Contents

Title page	i
Research Supervisor Verification Form	ii
Abstract	iii
Keywords	iv
Authorship Declaration	v
Acknowledgements	vi
Table of Contents	vii
List of Tables and Figures	viii
List of Appendices	xi
Thesis overview	viii
Introduction	1
Chapter One: **Systematic Review** A systematic review of the definition and prevalence of service user to staff violence in forensic healthcare services.	**11**
Chapter Two: **Critique** A critique of the Perceptions of the Prevalence of Aggression Scale (POPAS)	**42**
Chapter Three: **Primary Study I** The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress	**58**
Chapter Four: **Primary Study II** An Exploration of the Five-Factor Weight Structure of the CD-RISC Scale with Healthcare Staff Working with Offenders	**92**
Discussion	124
References	134
Appendix	146

List of Tables and figures

Chapter One: Systematic review	Tables	*Table 1: Table of inclusion/exclusion criteria*
		Table 2: Table of risk of bias for included and excluded studies
		Table 3: Table of study characteristics of included studies, study results and calculated prevalence rates
		Table 4: Table of summary of definitions used in each study
	Figures	*Figure 1: Study selection process in the review*
		Figure 2: "Clusters" of prevalence reported in studies
		Figure 3: Codes extracted from definitions and descriptive themes drawn
		Figure 4: Connections between descriptive themes and summary of results
Chapter Two: Critique	Tables	*Table 1: Comparison of the full POPAS scale vs. the abbreviated POPAS*
		Table 2: Comparison of the available psychometric properties of the POPAS with alternative
Chapter Three: Primary Study I	Tables	*Table 1: Summary of participant demographic characteristics* *Table 2: Type of service participants worked in*
		Table 3: Summary of participants' job roles

		Table 4: Summary of participants' mean scores for each scale
		Table 5: Summary of correlations between impact of aggressive and violent incidents, experience of aggression and violence, resilience and perceived stress
		Table 6: Summary of correlations between impact of aggressive and violent incidents, age, gender, years working with offenders and years working in the NHS
		Table 7: Model summary showing fit of linear models to the data
		Table 8: Summary statistics showing quality of the model in predicting the outcome
		Table 9: Linear model of predictors of the impact of aggression and violence experienced by healthcare staff working with offenders.
	Figure	*Figure 1: Flowchart of study procedure*
Chapter Four: Primary Study II	Tables	*Table 1: Breakdown of resilience scores across the sample*
		Table 2: Summary of factor loadings after rotation
		Table 3: Summary and interpretation of item descriptions and item factor loadings
		Table 4: Comparison of Connor and Davidson's (2003) factor and item loadings, and current study factor and item loadings.
		Table 5: Comparison of Connor and Davidson's (2003) and current study item loadings item loadings alongside given factor descriptors.

		Table 6: Comparison of Connor and Davidson's (2003) item structure and current study item structure
	Figure	*Figure 1: Scree plot showing points of inflexion on factors within the model*

List of Appendices

Please note, SPSS datasets can be found on the enclosed CD-ROM.

Letter	Title
Appendix A	Systematic Review Protocol
Appendix B	Quality Assessment tool
Appendix C	Completed quality assessment table of included studies
Appendix D	Second researcher quality assessment table
Appendix E	Table of level of agreement between quality assessors
Appendix F	Data Extraction tool
Appendix G	Completed data extraction table of included studies
Appendix H	Thematic synthesis methods: coding of themes and descriptive groupings
Appendix I	Study I and II Ethical approval documentation (HRA, University of Nottingham and Sponsor approval)
Appendix J	Study I and II Global email and intranet advert for participant recruitment
Appendix K	Study I and II Participant Information Sheet
Appendix L	Study I and II Participant Consent form
Appendix M	Study I and II Participant Debrief Sheet
Appendix N	Evidence of conference presentation

Appendix O Presentations at Wathwood and Arnold Lodge sites

Appendix P End of Study report

Thesis Overview

Aggression and violence has been highlighted across a number of domains as a serious public health concern. Aggression and violence in high risk environments such as offender healthcare services are not well understood. Consequently, it has been difficult to establish more accurate prevalence rates. This is related to a lack of consensus in the literature about what aggression and violence is in this context. In chapter one of this thesis a systematic review was conducted in order to explore definitions of aggression and violence within forensic healthcare contexts and to explore prevalence rates.

In chapter two of this thesis a critique was conducted in order to explore the Perceptions of the Prevalence of Aggression Scale (POPAS; Oud, 2001) as a tool developed to measure the range and types of aggression and violence that staff experience in psychiatric care facilities. It was evident following the systematic review that problems exist in defining aggression and violence, and that methodological issues thus exist in measuring these constructs. Further exploration of tools measuring aggression and violence was therefore warranted to address these concerns.

The impact on staff experiencing aggression and violence is similarly not well understood, particularly in consideration of what helps them to keep working in high risk situations. This may be particularly pertinent for those working in healthcare environments with offenders. The Resilience Portfolio Model was developed to understand the protective factors and processes that promote resilience in victims of violence. This model discusses how resilience and factors such as low levels of perceived stress help individuals protect themselves and even thrive following exposure to violence. In the third chapter of this thesis this model was applied in considering how staff in forensic healthcare services are affected by aggression and violence and how resilience and perceived stress help to lessen the overall negative impact. In thinking more about the Resilience Portfolio it appears unclear how resilience is organised in different

groups of individuals; a limitation of the original model was highlighted as a lack of attention to situational and cultural contexts, such as how resilience is organised within specific victim groups. This was further explored and addressed in the second primary study in chapter four of this thesis. A factor analysis of the CD-RISC was used to help explore and understand the components of resilience in healthcare staff working with offenders in order to address some of the situational limitations of the Resilience Portfolio.

INTRODUCTION

Aggression and violence in society has many impacts at different levels. Workplace aggression and violence in particular may take a number of forms and consequences may vary across a number of distinctive contexts. Aggression and violence experienced by staff in the healthcare sector is an area of study which appears to have been well documented in discussing forms and consequences of staff experiencing such events. McPhaul and Lipscomb (2004) describe how workplace violence is "one of the most complex and dangerous occupational hazards facing nurses working in today's health care environment" and warrants thorough investigation in order to consider means of mitigating such risks. This may be pertinent when workplace aggression and violence is perpetrated by service users whom healthcare staff are attempting to provide care for (particularly in consideration of ethical issues around prosecution for those requiring care in hospitals or secure services).

Boyle and Wallis (2016) presented a set of definitions that attempted to overcome issues with differing conceptualisations of workplace aggression and violence to serve as a starting point for defining these constructs:

- "Verbal Abuse: a person's perception of being professional and personally attacked, devalued or humiliated via the spoken word."
- "Threat: a person's perception of an intention to inflict personal pain, harm, damage, disadvantage, or psychological harm."
- "Physical Abuse: a person's perception of an unwelcome or uninvited action that involves physical contact with a person with the intent of causing physiological, emotional and bodily harm."
- "Sexual Harassment: a person's perception of sexual propositioning or unwelcome sexual attention. This can include behaviours such as humiliating, offensive jokes, stories,

remarks or voyeurism with sexual overtones, suggestive looks or physical gestures, exposed genitalia, gifts of a sexual connotation or requests for inappropriate physical examinations, pressure for dates."

- "Sexual Abuse: a person's perception of an unwelcome or uninvited action that involves physical contact of a sexual nature."

Rippon (2000) distinguished that "Aggression is the destructive behavioural expression of anger and hostility and, as such, is the manifestation of the state of emotion and the trait or attitude of hostility". However, it is considered that anger as a construct may not be entirely associated with aggression, and aggression may be present without anger. Rippon (2000) also observed that like aggression, violence is synonymous with aggression, but violence is reserved for those actions of aggression that are "particularly intense, and are more heinous, infamous or reprehensible."

According to Howells, Daffern and Day (2008) within institutions such as hospitals and prisons aside from causing physical and psychological harm and stress in patients and staff, violence can also contribute to poor morale, job dissatisfaction, staff turnover and the elimination of a therapeutic environment where patients or prisoners can be supported to change and improve their wellbeing. Similarly, McPhaul and Lipscomb (2004) note how the complexities of workplace aggression and violence arise, in part, from a healthcare culture resistant to the notion that healthcare providers are at risk of violence perpetrated by patients or service users combined with the view that violence "is part of the job." However, despite awareness of the range of consequences of workplace aggression and violence in healthcare services, there is mixed consensus with respect to formulating a definition and conceptualising aggression and violence within such contexts (Lanctôt and Guay, 2014).

In spite of efforts to put forth a consistent conceptualisation of aggression and violence disagreement appears to remain. Nolan et al

(1999) discussed how issues with inconsistent reporting of incidents and methodological issues are related to the comparison of mixed concepts and constructs. This appears to have led to further problems with determining prevalence rates within different populations of individuals experiencing workplace aggression and violence (Lanctôt & Guay, 2014). Thus, it appears that a review of existing definitions of violence within the literature is warranted in order to work towards an empirical consensus.

Linked to the above issue is a clear gap of knowledge about what prevalence rates currently exist with respect to staff experiencing aggression and violence in forensic healthcare services; as a group which appears vulnerable in a two-fold fashion with respect to high rates of violence exposure within healthcare settings, whilst also working with known offenders. Thus, due to the lack of an operational definition of violence and a lack of prevalence data of violence perpetrated in forensic healthcare services, an identified systematic review research question is identified as: what definitions and prevalence data exist with respect to violence perpetrated towards healthcare staff by service users in forensic healthcare services? This research question was explored in the first chapter (using a systematic review methodology) by addressing the following objectives:

• To determine if a comprehensive definition of violence exists in forensic healthcare service literature

• To explore the prevalence of violence perpetrated by service users towards healthcare staff in forensic healthcare services.

According to existing guidelines (NICE; 2015) a number of risk assessment tools are currently available and some are in general use in specific clinical settings. These include tools assess overall perpetrator risk of violence, such as the Brøset Violence Checklist (BVC; Woods & Almvik, 2002), the Historical Clinical and Risk Management – version 3 (HCR-20 V3; Douglas et al., 2013) and the Violence Risk Appraisal Guide (VRAG; Harris et al, 1993). However,

few tools appear available to provide thorough assessment of the range and types of violence that victims may experience, which appear in part to be linked to the aforementioned lack of theoretical consensus in conceptualising aggression and violence. However, in spite of such difficulties a number of measures have been developed in order to tackle this issue in apparent efforts to provide data to support theoretical opinions about what aggression and violence comprises.

One such tool is the Perceptions of the Prevalence of Aggression Scale (POPAS) developed by Nico Oud (2001) to assess the range and frequency of aggression and violence that healthcare staff experience in the course of their professional work. This appears to have been utilised and modified for use across a number of contexts, providing hope that victim experiences can be captured accordingly. In spite of this the POPAS does not appear to have been examined in more depth to determine if it is a valid and reliable tool for assessing the range of aggressive and violent behaviour which staff may experience. Thus, it appears that further exploration of the POPAS is warranted in this respect, and hence the second chapter in this thesis examines the POPAS scale as a psychometric measure developed by Oud (2001), with consideration given to potential uses, alternative measures and psychometric properties.

Ramacciati et al (2018) highlighted that the complexity of violence is emphasised by the extensive amount of theory attempting to explain the problem in the field of workplace violence in healthcare services. In their review Ramacciati et al (2018) found 15 different theoretical frameworks to explain workplace violence in emergency care services alone. Aside from such theoretical and conceptual difficulties it is evident that aggression and violence in the workplace remains problematic.

According to NICE guidelines (2015) the prevention and management of violence and aggression are also complex tasks, as their manifestation will depend upon a combination of intrinsic and

extrinsic factors, as well as the setting and context in which it happens. According to this set of guidance intrinsic factors may include a combination of personality characteristics, mental illness or distress, and problems in dealing with anger in the perpetrator. With respect to extrinsic factors, these may be more varied and include the setting in which violence occurs, the attitude of the perpetrator, victim characteristics, the experience and training of health and social professionals, and the perceived risk of danger to others.

With respect to the incidence of staff experiencing workplace aggression and violence Lanctôt and Guay (2014) point out that despite existing study in this area, little is known about the impact and consequences of being a victim of workplace violence. Such an observation appears particularly relevant when considering specific populations of healthcare staff, such as those working with offenders in healthcare settings. Following Lanctôt and Guay's (2014) distinction of the seven different categories of the consequences of workplace violence, it appears that an amount of attention has been paid to the psychological consequences of experiencing workplace aggression and violence. Such studies have considered factors such as Post-Traumatic Stress Disorder (PTSD; e.g. Laurud, Nonstad & Palmstierna, 2009; Richter & Berger, 2006), and overall stress (e.g. Søndenaa et al, 2015). Studies such as Søndenaa et al (2015) have found differences in stress levels between community and forensic inpatient staff working with intellectual disabilities, with this latter group showing fewer symptoms of stress. This would indicate that staff working with offenders may have some mechanisms in place which serve a protective function which mitigates the psychological effects of workplace aggression and violence. However, it appears unclear how other protective factors may serve to function in forensic healthcare staff. For example, it appears unclear how aggression and violence is perceived or understood by this group and how such factors may interact with other individual characteristics or factors.

With respect to protective factors, resilience appears to have become an important construct in understanding why some individuals thrive

and others fail in times of adversity. Connor and Davidson (2003) describe how "resilience embodies the personal qualities that enable one to thrive in the face of adversity"; Agaibi and Wilson (2005) also note that "as an independent variable, resilience has been conceptualized as a personality characteristic (e.g. hardiness, locus of control) and in terms of ego processes".

In order to further understand the role of resilience following exposure to violence Grych, Hamby and Banyard (2015) proposed the Resilience Portfolio Model. This model is conceptualised as a strengths-based framework designed to provide a holistic understanding of the protective factors and processes which promote resilience in those exposed to violence. These authors describe that the range of resources a person has (their 'Resilience Portfolio') shapes their responses to violence. The model draws on theory and research from a number of areas, such as resilience, coping, positive psychology and post-traumatic growth to understand how individuals live fulfilling lives despite experiencing violent and traumatic events. The model includes protective factors at a number of levels and proposes processes through which resilience is fostered in victims of violence. Grych, Hamby and Banyard (2015) use the term 'assets' to describe characteristics a person has that promote healthy functioning, and 'resources' to refer to sources outside of the person, indicating the importance of both internal and external processes. The model organise these internal 'assets' into categories representing functions proposed to be important to healthy adaptation. These categories are identified by the model as: regulating emotions and behaviour, building interpersonal relationships and fostering meaning making. This would indicate that resilience is complex and reflects not only external factors, but also a range of internal factors or 'assets' that a person has. This would indicate that tools such as the CD-RISC may offer useful insights into how these internal factors, or 'assets', present.

According to Grych, Hamby and Banyard (2015) within existing literature resilience is conceptualised as maintaining psychological

health despite exposure to violence, and in developing the Resilience Portfolio considered models of coping by influential authors, such as Lazarus and Folkman (1984). Grych, Hamby and Banyard (2015) in particular highlighted that Lazarus and Folkman (1984) proposed behavioural responses to stressful events, such as exposure to violence, are guided by individual's appraisals of the event. This involves perceptions of how threatening or stressful the event is and beliefs about the ability of victims in how to cope effectively. Thus, in incorporating such theories into the Resilience Portfolio it appears apparent that the way stressful events are perceived may be a key component in how victims' Resilience Portfolios are organised. The Resilience Portfolio Model may therefore be a useful tool in understanding and explaining how both resilience and perceived stress may affect the overall impact of victims' experience of aggression and violence.

This would indicate that victim characteristics and perceptions may play a key role in determining the impact of aggression and violence on those targeted by perpetrators. In consideration of this, the first primary study of this thesis aimed to explore the level of negative impact in healthcare staff members after experiencing patient aggression and violence in working with offenders; and, to explore the role of resilience and perceived stress in the association between experience of inpatient aggression and impact in staff members working with offenders. With these aims in mind the following research questions were formulated as part of the third chapter of this thesis:

1. Are healthcare staff members working with offenders negatively impacted when experiencing aggression and violence in the workplace?

2. What is the role of resilience in this relationship?

3. What is the role of perceived stress as a factor in this relationship?

In Connor and Davidson's (2003) initial paper outlining the development of their measure of resilience, (the CD-RISC) found that from existing research their scale reflected five different factors that embody resilience. However, there appears to be a significant gap in the literature in exploring the Resilience Portfolio in more depth with samples of healthcare staff working with offenders. It appears unclear if tools such as the CD-RISC measure resilience in the same way as it has with other populations (such as those whom Connor and Davidson (2003) initially developed it with) and what characteristics of resilience (the Resilience Portfolio) this population expresses.

Clearly, those who work with offenders are a unique population in their choice of workplace but are likely to be distinctive in how resilience manifests. This may be particularly pertinent following incidents of adversity in the workplace which supports them to continue working with high risk groups over a prolonged period of time. Thus, it would appear unclear how resilience is organised and constructed within this group of individuals which sustains their continued service in high risk professional environments. In light of this the aims of the second primary study was to explore potential differences in the factors comprising resilience in the CD-RISC in the sample of healthcare staff working with offenders. With this aim in mind a research question was identified, which asked: what are the differences in the weighting of the factors of resilience in healthcare staff experiencing aggression and violence in working with offenders?

It is evident from the literature that with respect to workplace aggression and violence in healthcare services there are a number of issues which need to be addressed in relation to:

a) How aggression and violence is defined and conceptualised (addressed in chapter one of this thesis);
b) How prevalent workplace aggression and violence is in forensic healthcare services with staff victims (also addressed in chapter one of this thesis);

c) How aggression and violence is measured and captured by tools attempting to assess the range and types of such events in healthcare services (addressed in chapter two of this thesis);
d) What factors affect the impact of aggression and violence in the workplace, and how does resilience and perceived stress (as highlighted by the Resilience Portfolio Model) help protect healthcare staff members as victims following exposure to workplace violence (addressed in chapter three of this thesis);
e) How resilience is constructed within staff members working with offenders and if in this respect they are distinct from other samples (as addressed in chapter four of this thesis).

The implications and consequences of providing some clarity around the above issues may serve to not only provide contribution to reaching a theoretical consensus but also help to better understand the experiences of healthcare staff exposed to workplace aggression and violence. In learning more about the nature of aggression and violence we may also consider more targeted areas of violence management, as well as developing means of better supporting victims with respect to more accurately capturing the range of types of aggressive and violent incidents. In gaining a better understanding of staff experiences we may also consider how best to support those who have been affected and consider programs for supporting staff to develop specific elements of resilience which appear to be the most prominent in those already working in forensic healthcare services. However, before such steps can be undertaken it is important to consider the above factors and work towards a level of empirical clarity about: how aggression and violence is conceptualised in forensic healthcare literature and what its prevalence is (as considered in the systematic review in chapter one); how it is captured by tools such as the POPAS and if it is a valid and reliable measure (as discussed within the methodological critique in chapter two); how forensic healthcare staff experience aggression and violence, and what factors are associated with its impact (as addressed in the first primary study in chapter three); and how

resilience is constructed within forensic healthcare staff and if they are unique in this respect from other populations (as explored in the second primary study in chapter four).

SYSTEMATIC REVIEW

A systematic review of the definition and prevalence of service user to staff physical violence in forensic healthcare services.

Abstract

Existing literature appears to suggest that service user to staff violence is a common phenomenon within healthcare services. This systematic review sought to examine the existing definitions and prevalence of service user to staff violence within forensic healthcare services. Previous studies appear to utilise conflicting conceptualisations of service user to staff violence, creating issues with accurately assessing prevalence within this population of victims. Application of the search criteria within the current review yielded 21,832 papers identified by electronic and hand searching; 9 studies met inclusion criteria and quality assessment standards. These studies progressed for further analysis. Conflicting definitions and conceptualisations of violence were utilised across included studies. A similarly inconsistent pattern of prevalence was also reported across included studies as the range of prevalence reported was 15% and 91.6%; methodological issues and limitations are discussed in light of this. It is believed this review is the first attempt to systematically synthesise existing data in this area and serves to provide a point of reference for further reviews in this field.

1. Background

Violence as a concept is one which is known and has some level of meaning to most human beings at some point in their lives. Rippon (2000) considered violence synonymous with aggression, but violence is reserved for those actions of aggression that are "particularly intense, and are more heinous, infamous or reprehensible."

Service user to staff violence is an international phenomenon which appears to be well documented in healthcare service literature.

However, in their systematic review Lanctôt and Guay (2014) highlighted that there appears to be little consensus in formulating a definition of this type of violence within existing research literature. This is despite the fact that the number of violent and aggressive incidents perpetrated in the workplace has apparently increased in the last 20 years (Martinko & Zellars, 1998). In their study Lanctôt and Guay (2014) were able to identify four types of workplace violence:

"1) Violent acts by criminals who have no other connection with the workplace;

2) Violence directed at employees by customers, clients, patients, students, or any others for whom an organization provides services;

3) Violence against co-workers, supervisors, or managers by a present or former employee;

4) Violence committed in the workplace by someone who does not work there but has a personal relationship with an employee."

This difficulty in reaching a consensus within the literature appears due to a lack of agreement not only in formulating an operational definition, but also with issues in inconsistent reporting of incidents and methodological issues related to the comparison of mixed concepts and constructs (Nolan et al, 1999). It appears that a consistent, operational definition for the occurrence of service user to staff violence does not currently exist within the literature. Similarly, it is not clear how high overall prevalence rates of violence are, which is also linked to the lack of consensus on what conceptualises service user to staff violence. It appears that problems both in calculating prevalence and in formulating a definition further perpetuate a lack of understanding in a cyclical fashion. Therefore, in order to gain a better idea of the prevalence of service user violence perpetrated towards staff it is important to explore the range of definitions which exist within this niche of the literature exploring the incidence of violence.

Despite such conceptual difficulties it is clear that service user to staff violence is a considerable health concern, and many researchers have attempted to calculate rates of incidence in order to better understand it. Much of the research investigating violence has focused on violence in the healthcare sector directed at employees by service users, called "Type II" violence, according to Lanctôt and Guay's (2014) definitions. These researchers also note there is mixed consensus with respect to prevalence rates (Lanctôt & Guay, 2014). On a national level between 2013 and 2014 Renwick et al (2016) found that in the UK National Health Service (NHS) workers were subject to 68,683 physical assaults. Winstanley and Whittington (2004) found that as high as 27% of the health care staff (all staff grades involved in direct service user contact at a general hospital) of their survey were assaulted, 23% experienced threatening behaviour from service users and 15.5% experienced threatening behaviour from visitors, although data were collected from only one setting and their generalisability beyond this is not known.

When looking at exiting literature more carefully it is evident there are clear professional and cross-cultural differences, as well as clear variation across different service types and service levels. For example, there appears to have been significant attention paid to healthcare workers in emergency departments (for example, Fernandes et al, 1999) as an area of work, but also nursing staff as a group of workers (for example, Cashmore, Indig, Hampton, Hegney & Jalaludin, 2012) who found that 90% of the victims of workplace violence were nurses. Research indicates that mental health service staff as a staff group are exposed to high levels of physical aggression as working with a high risk client group. For example, in their study Renwick et al (2016) found that almost 70% of physical assaults occur in the mental health sector specifically. Foster and Nijman, (2007) found that during a 10 month period in an acute mental health inpatient service there were 254 incidents of aggression recorded; staff were most commonly targeted and were involved in 57.1% of incidents. Similarly, groups such as prison officers are also exposed

to a population who may display higher than average levels of aggression and violence, although it appears this is an area of study which has been somewhat overlooked (Lahm, 2009).

When considering service users with more complex needs such as offenders with mental health conditions, research suggests that an even higher level of risk is present in cases of dual diagnosis. For example, Hill et al (2012) cite a prevalence rate of staff being assaulted by patients at 91% within their study of adolescents with dual forensic and mental health concerns. In a three year study period Cashmore et al (2012) found that in a New South Wales correctional health service 208 incidents of violence were recorded. Verbal abuse (71%) was more common than physical abuse (29%), and the most (44%) incidents of violence (including both verbal and physical abuse) occurred in adult male prisons. The highest proportion (50%) of incidents of physical abuse occurred in a forensic hospital. Cashmore et al (2012) also reported that (93%) of the incidents of violence were initiated by a prisoner/patient.

However, little research has been conducted which has systematically calculated the overall prevalence of staff assaults within this environment. It is unclear whether prevalence rates overall are in fact higher than in other services or not, or if there are other mechanisms in place specifically in forensic healthcare services which mean staff assaults by service users may be higher than average. Therefore, it is evident that further work is needed to establish if working with offenders in health services puts staff at a greater risk of violence or not.

1.1 Research question and objectives

Due to the lack of an operational definition of violence and a lack of prevalence data of violence perpetrated in forensic healthcare services, the research question addressed in this review was: what definitions and prevalence data exist with respect to violence perpetrated towards healthcare staff by service users in forensic

healthcare services? This research question was explored by addressing the following objectives:

- To determine if a comprehensive definition of violence exists in forensic healthcare service literature
- To determine the prevalence of violence perpetrated by service users towards healthcare staff in forensic healthcare services.

2. Method

2.1 Search process, strategy and information sources

The search process and strategy which was identified for the current review was developed primarily from identifying a number of key search terms, namely: **workplace** (workplace, work-related, work, organisation), **violence** (assault, attack, physical aggression, physical violence, patient violence), **forensic** (forensic, offenders, prisoners, criminal), **healthcare** (medical, healthcare, primary care), **staff** (staff, personnel, nursing staff, doctors, medical, therapist, psychiatrist, practitioner, support worker, healthcare assistant, psychologist, health worker, health personnel). From this a number of Medical Subject Headings (MeSH) terms were identified from the key search terms and a secondary search of the existing background literature. These terms were identified as: Criminals; Aggression; Workplace; Physical Abuse; Workplace Violence; Prisoners; Allied Health Personnel; Nursing Staff; Psychiatry; Primary Health Care; Prevalence; Health Care Sector (resource used: https://meshb.nlm.nih.gov/MeSHonDemand). From combining existing search term and identified MeSH terms a search strategy was developed with guidance obtained from the University of Nottingham's library services. The search strategy was then run through a number of databases to ensure that relevant literature papers were being identified and the search strategy was comprehensive. The final search strategy which was developed can be found in Appendix A.

The sources which were searched in the final database search were identified as being from a number of different areas in order to ensure of comprehensive identification of relevant papers. This included both published, unpublished and 'grey' literature. The sources which were searched were: ProQuest Dissertations and Theses, The Home Office UK, The US National Criminal Justice Association, The US National Criminal Justice References Service (NCJRS) abstracts database, CINAHL, Cochrane Library, Medline, Prospero, PubMed, PsycINFO, Campbell Collaboration Library of Systematic Reviews, CORDIS, SocINDEX, Web of Science, Embase, Scopus, Google and Google Scholar search engines (to identify grey literature and sources such as independent reports).

2.2 Eligibility: Inclusion/exclusion

In order to meet the aims and objectives of the review, a number of inclusion and exclusion criteria were identified. For clarity, this was formulated using the Population, Intervention, Comparator and Outcome ('PICO') framework. The final eligibility criteria that were identified can be found in Table One:

Table 1: Table of inclusion/exclusion criteria

	Include	Exclude
Population	Adult healthcare staff (all grades and levels) delivering face to face care to service users	Staff not delivering face to face care (e.g. administration staff, porters, maintenance, and domestic staff)
Intervention/Exposure	Physical violence in forensic services only	Violence in general healthcare services and wards (e.g. A&E departments and non-forensic psychiatric services); verbal aggression
Comparator	None	None
Outcome	Data detailing service user/patient physical violence perpetrated towards staff	Visitor-staff, staff-staff violence; excluding verbal aggression and psychological aggression*
Study and publication type	Full text primary quantitative observational (such as cohort, case control, case series, cross-sectional) research literature. Publications such as government and independent body reports, grey and unpublished literature. Worldwide data were also included, incorporating those of non-English speaking publications. No specific date range restriction was placed on the search strategy; hence data from all publication dates were included	Citations and/or secondary prevalence data
Setting	Forensic-based healthcare setting (services such as secure hospital inpatient, community, and rehabilitation services, whose primary aim is in the provision of healthcare services for offenders)	Non-forensic services

*The rationale for including data on physical violence only was that processes and systems for reporting physical violence is established; systems for reporting instances such as verbal aggression are less clear and may be biased by individual staff experiences and factors such as personal resilience. It is believed that this is something that would need to be explored further in a separate project. Studies which measured physical violence only were included, as were studies involving physical violence and other types of violence. In these latter studies data pertaining to physical violence was isolated and extracted.

2.3 Searches, selection of studies and initial data extraction

The final searches which were undertaken between 19th August 2017 and 30th September 2017 identified 21,832 references. 19,917 abstracts were exported and managed via Endnote and the remaining 1915 references were managed by hand as citations could not be exported to Endnote. The citations which could not be managed by Endnote originated from the gov.uk website, NCJRS, CORDIS and Google. 8270 references were de-duplicated, and 11,912 were excluded from initial screening of reference titles, based on eligibility criteria. Having applied inclusion criteria to the remaining abstracts, a further 1,577 references were excluded for not meeting inclusion criteria. Based on eligibility criteria 73 full text papers were sought. Further application of eligibility criteria then excluded a further 59 references meaning that 14 references were quality assessed.

2.4 Assessment of risk of bias

Fourteen references were assessed for research quality. The assessment tool was adapted from the Critical Appraisal Skills Programme (CASP; 2018) checklists. This was chosen for consistency of quality assessment across a range of types of study, such as qualitative and quantitative based data. It was hoped that in using the same quality assessment tool that bias was reduced in using different types and styles of tool. An example of the quality assessment tool can be found in Appendix B. The final quality assessment table of included references can be found in Appendix C.

A second reviewer outside of the research team independently quality assessed of a random selection of the included papers (20%) to ensure validity. The table of second reviewer quality assessment can be found in Appendix D. Overall, second reviewer comments and quality assessment of the papers appeared consistent with the outcome of the initial quality assessment. A calculation of the level of agreement between individual responses on each criteria was completed to explore potential differences further, which revealed over 70% agreement in responses for each study assessed. This prompted further discussion of differences between reviewers, the overall outcome of which did not alter original decisions to include or exclude respective studies. The table of the level of agreement between the two reviewers is in Appendix E.

Having completed the quality assessment, 5 papers were excluded due to not meeting the quality threshold, as ultimately the review question could not be answered by the paper. The rationale for the papers not meeting quality assessment standards were: insufficient detail of data reporting in reference to type of aggression and victim characteristics; small numbers of participants recruited to establish a clear effect; and were at an increased risk of bias. Risk of bias was further explored and assessed in the domains of sampling and selection, measurement of violence, attrition, analysis and reporting of results. The overall strength of each study across the five assessed

domains was assessed and an overall of risk of bias presented. A table of the results of the assessed levels of bias is shown in Table 2. Studies found to be of a low risk of bias were included.

Table 2: Table of risk of bias for included and excluded studies

		Area of bias*					
	Study	*Sampling and selection*	*Measurement of violence*	*Attrition*	*Analysis*	*Reporting of results*	*Overall risk of bias*
Included studies	Broderick et al (2015)			n/a			
	Cashmore et al (2012) (1)			n/a			
	Cashmore et al (2012) (2)						
	Daffern et al (2003)			n/a			
	Gudjonsson et al (2000)			n/a			
	Hill et al (2012)			n/a			
	Kelly et al (2015)			n/a			
	March (2009)			n/a			
	Nicholls et al (2009)			n/a			
Excluded studies	Brendzal (2001)						
	Carmel & Hunter (1989)						
	Daffern et al (2006)			n/a			
	Lauvrud et al (2009)						
	Uppal & McMurran (2009)						

Low risk of bias Medium risk of bias High risk of bias

*Please refer to Appendix C for completed quality assessment table of included studies where each area of bias for each criteria has been identified. The presented outcomes for each study are based on Cochrane's Handbook and guidance (version 5.1) (2011).

This left nine studies to progress to the data extraction phase of the review. Three of the five excluded papers were followed up with the authors due to the insufficient detail of data reporting in the paper (the remaining two papers were excluded due to low participant numbers). However, none of the three authors followed up with were reachable due to lack of current contact information and loss of contact between authors to access the original data. The three studies were all excluded from the review due to unavailable further detail of the data in order to be able to establish a service user-perpetrated rate of staff assaults.

2.5 'Snowballing'

The reference lists of the nine included studies were scanned for additional references. There were three citations which had not been previously identified by the current review which were followed up. On following these citations up these were screened out as not meeting inclusion criteria at the abstract screen stage of the review.

Figure 1 shown below provides a summary of the outcome of the methodological process as described above.

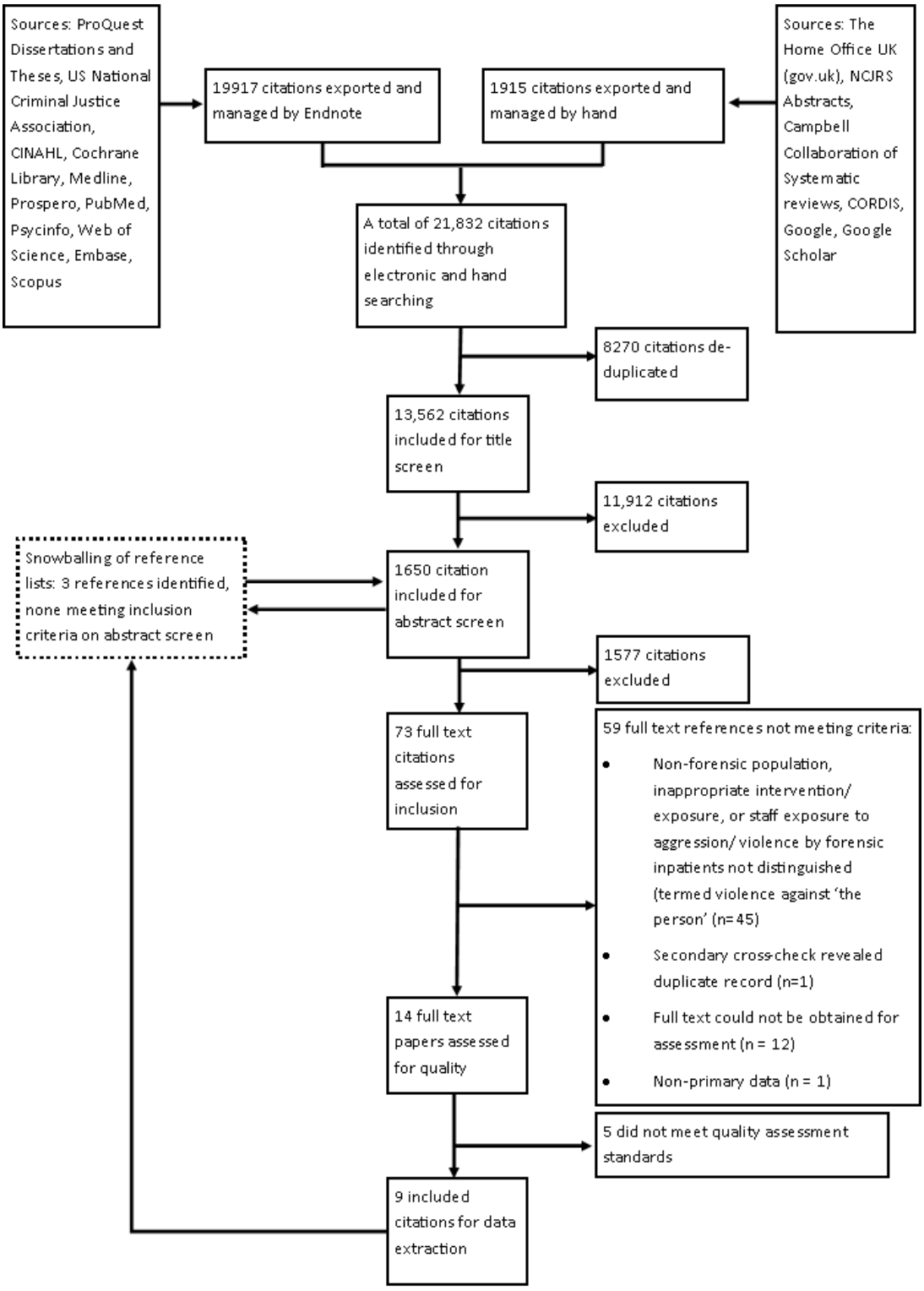


Figure 1: Study selection process in the review

3. Results

3.1 Data extraction

Data of nine included studies were extracted. The data extraction tool was formulated and revised based on whether data extracted helped to answer the review question. The tool was built and piloted on the included studies and revised accordingly. The data extraction tool can be found in Appendix F.

The data which were extracted from the included studies included:

- Study citation
- Study setting
- Population used
- Type of exposure
- The journal the paper was published in
- The type of paper
- How the paper was located
- Language of the report/country of origin
- Type of study
- Short description of the intervention used/ how and when the data were collected
- Methods and analysis used
- Definition of violence used
- Reported number of violent incidents that the victim population (healthcare staff in forensic services) had experienced (what the results were).

The data extracted from the studies were collated and summarised. The completed data extraction table can be found in Appendix G.

The nine studies were published between 2000 and 2015; data within the studies were extracted/collected between 1980 and 2013. The included studies took place in the US (three studies), the United Kingdom (UK) (two studies), Canada (one study) and Australia (three studies). All studies took place within forensic healthcare services – two studies took place in a justice health corporation delivering offender healthcare services and the remaining studies all took place within forensic psychiatric hospitals (see Table 3 for a summary of study characteristics).

Table 3: Table of study characteristics of included studies, study results and calculated prevalence rates.

Study	When conducted/ study period	Country	Participants	Setting	Study type	Summary of findings/ percentage of staff assaulted by service users	Prevalence of staff assaults
Broderick et al (2015)	2011 - 2013	US (California)	Adult, mixed (male and female) psychiatric inpatient population → perpetrators	Multi-state forensic psychiatric hospitals	Observational, retrospective study of patient data	Staff assaults → n=2504 prevalence of 16.04% of sample; total sample (n=15,615)	$\frac{2504}{15{,}615}$ = 16.04%
Cashmore et al (2012) (1)	July 2007 - June 2010	Australia (New South Wales)	Justice Health employees → victims	Justice health corporation	Observational retrospective study of incident data	Staff assaults → n=60 (29%) (pooled physical and sexual assault data) of sample*; total sample (n=208)	$\frac{60}{208}$ = 29%
Cashmore et al (2012) (2)	April 2010	Australia (New South Wales)	Justice Health employees → victims	Justice health corporation	Observational staff survey (online and paper-based)	Staff assaults/ physical aggression → n=45* staff reported service user physical abuse (15%) of sample; total sample (n=299)	$\frac{45}{299}$ = 15%

Daffern et al (2003)	April 2000 - April 2001	Australia	Adult psychiatric inpatient population → perpetrators	Forensic psychiatric hospital	Observational, retrospective study of incident data	Staff assaults/ physical aggression (nurses) → n=30 incidents (15%)* of sample; total sample (n=197)	$\frac{30}{197}$ = 15%
Gudjonsson et al (2000)	1980 - 1996	UK	Adult, mixed (male and female) psychiatric inpatient population → perpetrators	Hospital medium secure psychiatric unit	Observational retrospective study of incident data	Staff assaults/ physical aggression (nurses) → n=412* 18.9% of sample; total sample (n=2180)	$\frac{412}{2180}$ = 18.9%
Study	**When conducted/ study period**	**Country**	**Participants**	**Setting**	**Study type**	**Summary of findings/ percentage of staff assaulted by service users**	**Prevalence of staff assaults**
Hill et al (2012)	February 2008 – January 2011	UK	Adolescent, mixed (male and female) psychiatric inpatient population → perpetrators	Adolescent forensic (medium secure) inpatient unit	Observational, retrospective study of incident data	Staff assaults → n=2,145* (91%) of sample; total sample (n=2357)	$\frac{2,145}{2357}$ = 91%

Kelly et al (2015)	November – December 2011	US (California)	Forensic psychiatric hospital employees → victims	Forensic psychiatric hospital (mixed gender)	Cross-sectional online staff survey	Staff assaults → n=348 (70%) of sample; total sample (n=497)	$\frac{348}{497}$ = 70%
Marth (2009)	1997-2007	US Midwestern	Forensic psychiatric hospital employees → victims	Forensic hospital	Observational record review of staff responses to patient behaviour	Staff assaults → n=396 (49%)* of sample; total sample (n=805)	$\frac{396}{805}$ = 49%
Nicholls et al (2009)	January - December 2004	Canada	Adult psychiatric inpatient population → perpetrators	Forensic psychiatric hospital	Observational, retrospective study of patient data	Staff victims → n=266* (50.5%) of sample; total sample (n=527)	$\frac{266}{527}$ = 50.5%

*Current researcher calculations based on available data (for the purposes of formulating comparable data)

With respect to summary of findings prevalence data for some studies had to be calculated by the current reviewer in order to extract comparable data against what were reported in the study. All source data was based on data reported and/or recorded by staff. Hence, all data captured was from a staff perspective and therefore captured the same phenomena. As can be seen from Table 2 prevalence of staff victims of assault/physical aggression ranged between 15% and 91.6%. All studies except one involved adult inpatient populations; the remaining study was of an adolescent inpatient population. Four studies were from the perspective of staff as victims; five studies were from the perpetrator perspective. All but one were observational studies; the one remaining study was of a cross-sectional observational design. Two studies collected survey data, whereas the remaining seven studies were retrospective analyses of service user or incident data.

Table 4 depicts the summary of the definitions of physical violence used in the context of violence perpetrated towards staff. The definitions ranged from being conceptualised as "aggressive act to staff-physical", "workplace violence", "physical abuse", "assault" and "physical aggression against other people". Four of the included studies did not provide an explicit definition or conceptualise the construct investigated in their study. The remaining five studies which provided a definition used in the study were used in the qualitative data analysis phase of the review.

Table 4: Table of summary of definitions used in each study

Study	Definition/term used
Broderick et al (2015)	Aggressive Act to Staff–Physical: "Hitting, pushing, kicking, or similar acts directed against a staff person that could cause potential or actual injury"
Cashmore et al (2012) (1)	Workplace violence: "Incidents where staff 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"
Cashmore et al (2012) (2)	Physical abuse: defined as "any incident where a person experiences physical assault (e.g. being spat on, bitten, pushed, scratched or hit and so on) or sexual assault (defined as any forced physical sexual contact including forcible touching and fondling, any forced sexual acts including sexual intercourse)."
Daffern et al (2003)	No definition provided.
Gudjonsson et al (2000)	No formal definition provided, but violence as a construct was explored in describing an interaction between individual, structural and situational factors. Construct of violence inferred from background.
Hill et al (2012)	No definition provided but specific types of incidents explored. Construct of violence inferred from methodology.
Kelly et al (2015)	No definition provided but number of physical assaults used as a form of measurement of violence. Hence, construct of violence inferred from methodology.

Marth (2009)	Assault: "An assault is an intentional infliction of any injury upon another person. It includes serious physical injury requiring immediate medical attention or hospitalization; minor injury requiring routine minor first aid (such as disinfection and bandage); or physical contact such as pushing, hair pulling, pinching or slapping not resulting in injury. The standard is whether the assault was intentional or not."
Nicholls et al (2009)	Conceptualised physical aggression against others using the Overt Aggression Scale (OAS) (Silver and Yodofsky (1991)): Physical aggression against other people: "Makes threatening gestures, swings at people, grabs at clothes, strikes, kicks, pushes, pulls hair (without injury to them), attacks others causing mild-moderate physical injury (bruises, sprain, welts), attacks others causing severe physical injury (broken bones, deep lacerations, internal injury)."

3.2 Data synthesis

The data which were gathered from the nine included studies were synthesised. The data were synthesised with respect to the quantitative aspects of determining prevalence of staff assaults by service users in the services, as well as the qualitative definitions used. Each of these processes will be discussed in turn.

3.2.1 Quantitative synthesis of prevalence data

The prevalence of staff assaults was calculated for each study with the number of staff assaults perpetrated by service users in the sample as the numerator and the total sample of staff/incidents as the denominator:

$$\frac{\text{Staff assaulted by patients}}{\text{Total sample}}$$

As shown in Table 2, all prevalence rates were calculated as the rate of staff assaults as a percentage with the total sample percentage being the summation of staff assaulted in the sample. Across all nine studies prevalence ranged from 15% to 91%. It was initially intended that a meta-analysis would be run on the data. Due to the nature of the presented data, a meta-analysis was not considered appropriate due to the lack of data reporting of standard deviations of included studies, meaning that effect sizes could not be calculated for each study. Alternative methods for conducting a meta-analysis (using data transformation methodology) were not considered appropriate due to the large range of prevalence rates reported, small number of included studies, different methods used and means of conceptualising violence within included studies.

In considering the data in more depth without formal analyses, it appeared that that there were differences observed. For example, within the adult service data prevalence of staff assaults ranged from 15-70%, whereas the clear outlier in the data was the prevalence of

staff assaults in adolescent services at a rate of 91%. Controlling for the variable of service type may have provided a more accurate prevalence rate of staff assault in adult services when removing outliers which could skew the data somewhat considerably.

In considering the data in more depth there appeared to be two "clusters" of prevalence data. To expand, the studies by Broderick et al (2015), Cashmore et al (2012) (1), Cashmore et al (2012) (2), Daffern et al (2003) and Gudjonsson et al (2000) all ranged within a window of 15%-29% reported prevalence. Thus reporting a difference of 14% between the upper prevalence and lower prevalence reported rates between these studies. These studies ranged in publication date between 2000 and 2015. The remaining studies ranged between 49%-70% for adult forensic services, with a difference between upper and lower reported prevalence rate of 21% (see Figure 2). These studies ranged in publication date between 2009 and 2015. Again, Hill et al (2012) remained as the clear outlier at 91% reported prevalence for adolescent services In considering the rationale for the appearance of the two "clusters" of data a number of factors were considered.

With respect to publication date overall there appeared to be no pattern to link date of publication and prevalence rates; although in the UK it is of note that the NHS adopted a 'zero tolerance' to violence against staff under the Management of Health and Safety at Work Regulations (1999). In consideration of the dates when the studies were conducted (as shown in Table 3) there appears to be a wide range of time scales. These range from being conducted 1980-1996 (Gudjonsson et al, 2000) to 2011-2013 (as conducted in Broderick et al's, 2015 study). It is evident from the data therefore that the studies refer to very different periods of time. In this respect it is possible that there may be very different reporting standards of staff assault data, although there appear to be no patterns in the data when accounting for other variables in addition to this. For example, there appears to be no pattern when considering study period and country, or study period and setting, or study period and prevalence. It is of

note that between the earliest study commencing and the latest study ending there is a time frame of 33 years. It is possible that guidelines pertaining to reporting staff assaults have changed in this time period or indeed tolerance to staff assaults have changed. For example, in 2015 NICE released guidance on the management of aggression and violence in mental health settings, thus predating all studies but Kelly et al (2015) and Broderick et al (2015). However, this policy was one which was an update of a previous policy released in 2005, which would cover all but Daffern et al's (2003) study and Gudjonsson et al's (2000) study. This could account for why these two studies have not provided formal definitions of aggression and/or violence, although there appears to be no pattern evident in the data in support of this hypothesis. It is of note however, that the paper by Gudjonsson et al (2000), which is the earliest study to commence, was also the study examining data over the longest period of time, as examining data over a period of 16 years. The advantages of such a study lie in the richness of the data gathered, allowing for observation of the many types of violence displayed over time. This is in contrast to studies which are shorter in duration which may not fully capture the range of violent incidents which occur in specific services. The most recent study by Broderick et al (2015) captured data over a period of two years, although this is not the study with the shortest duration. The study with the shortest duration was by Cashmore et al (2010) (2) who reported a similar prevalence rate to the most recent study to be conducted and published (Broderick et al, 2015); these were 15% and 16.04% respectively. Despite this, a pattern beyond that which is shown by these two publications does not appear evident.

A similar lack of pattern was observed for country of publication, as Cluster 1 publication locations included the US, UK and Australia, whereas Cluster 2 publication locations included the US, UK and Canada. A lack of pattern between the two clusters was also found in consideration of setting where the studies took place, as these were a Justice Health corporation and secure/forensic psychiatric hospital

settings. All studies were observational studies, except Kelly et al (2015) which was the only cross-sectional study. With respect to study type in Cluster 1 there were four out of five retrospective studies of incident data, and one staff survey; in Cluster 2 there were three studies which were retrospective studies and one which was a staff survey study. Therefore, no pattern in study type was found between the two clusters of reported prevalence rates. There were also no patterns observed between the two clusters with respect to definitions provided and/or constructs measured. In consideration of the above factors it was unclear why the two clusters of studies presented themselves, as there appeared to be no clear pattern with respect to publication date, country of publication, study setting and study type.

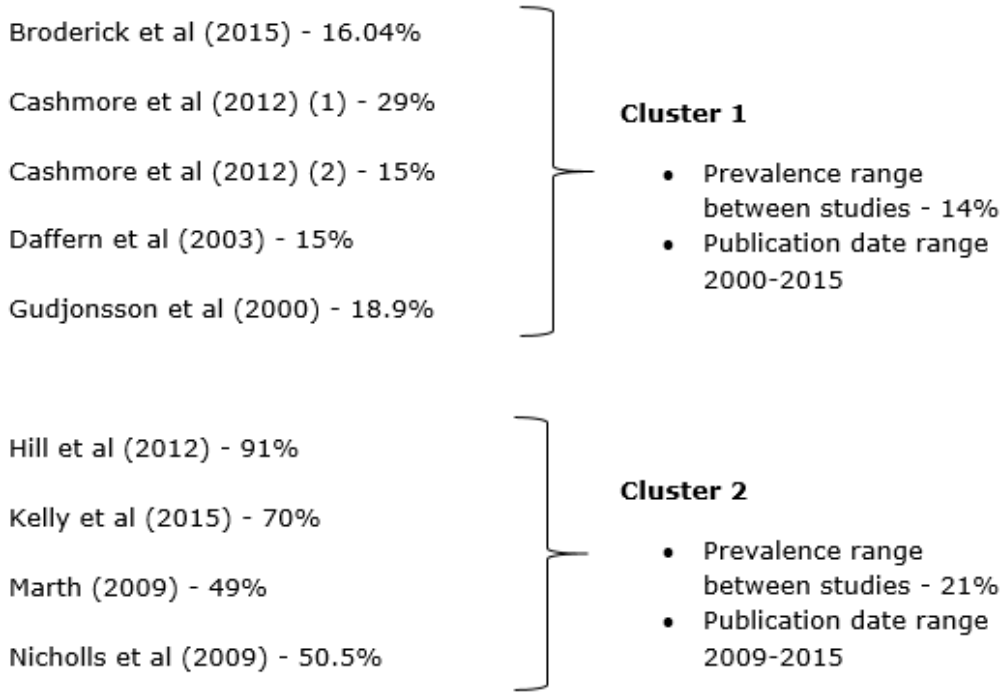


Figure 2: "Clusters" of prevalence reported in studies

3.2.2 Qualitative thematic analysis of study definitions

As can be seen in Table 4, only five studies provided a definition to conceptualise themes explore in their investigations (Broderick et al (2015), Cashmore et al (2012) (1), Cashmore et al (2012) (2), Marth

(2009) and Nicholls et al (2009)). These definitions are shown in Table 4.

Each of the above definitions were qualitatively analysed using thematic synthesis techniques as outlined by Thomas and Harden (2008). These authors outline that "thematic synthesis has three stages: the coding of text 'line-by-line'; the development of 'descriptive themes'; and the generation of 'analytical themes'" (Thomas & Harden, 2008). As described by these authors the current study drew the definitions together as shown in Table 4. The text was coded line by line and descriptive themes drawn together (see Appendix H). Figure 3 below shows how each coded items were categorised into descriptive groupings.

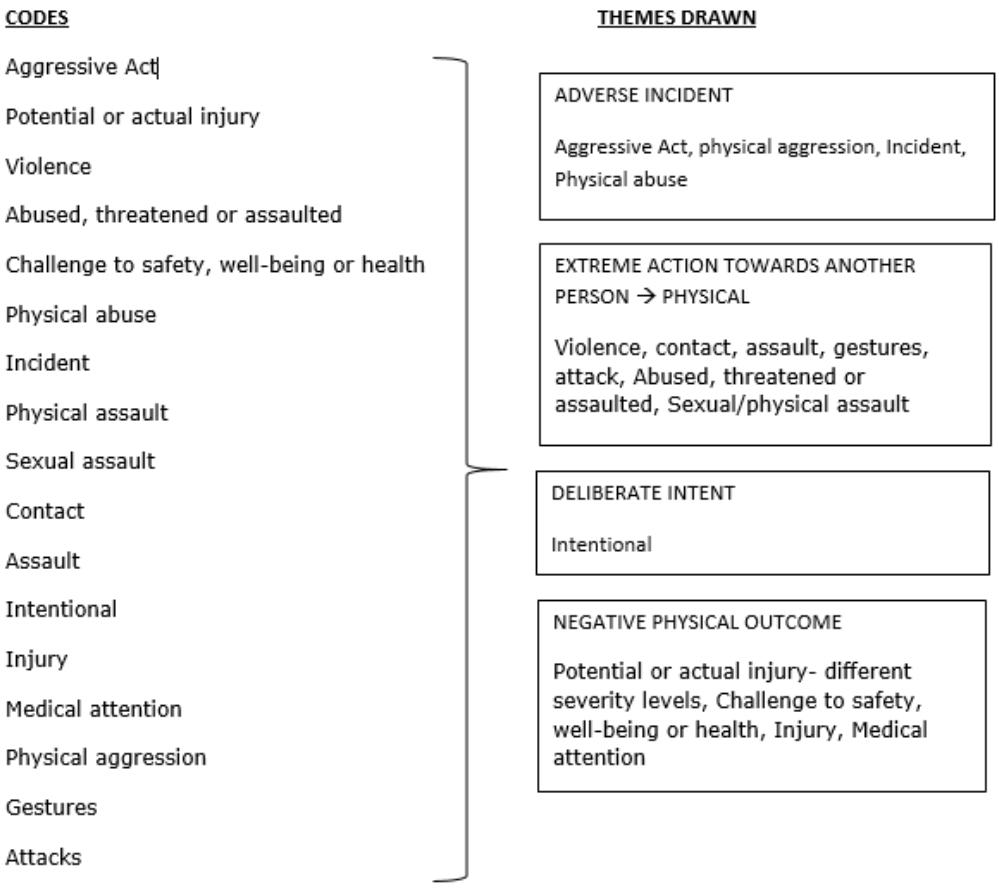


Figure 3: Codes extracted from definitions and descriptive themes drawn

The rationale for the codes drawn from the original text was based on their apparent emphasis and focus within each description, and also the frequency of which the phrase or word was used. The rationale for the groupings of descriptive themes was based on their conceptual familiarity and links with one another. These groups were then labelled with the four following headings:

Adverse incident

Extreme action (perpetrated) towards another person → physical

Deliberate intent

Negative physical outcome (towards victim).

These headings were formulated as being the best conceptualisation or summary of each of the descriptive groupings.

Upon examining the categories further it appeared that there were connections and links between them. To expand, the category of "adverse incident" appeared to be an overarching theme which also encapsulated the other three themes. The theme of "extreme action (perpetrated) towards another person → physical" appeared to be strongly linked with the concept of "intent" and the aggressive action or adverse incident being a deliberate act which may be perpetrated or directed towards another individual. As a result, this appeared to follow and lead to the "negative physical outcome" category as a consequence of the intentional action or event. Figure 4 is a

diagrammatical summary of this hypothetical formulation:

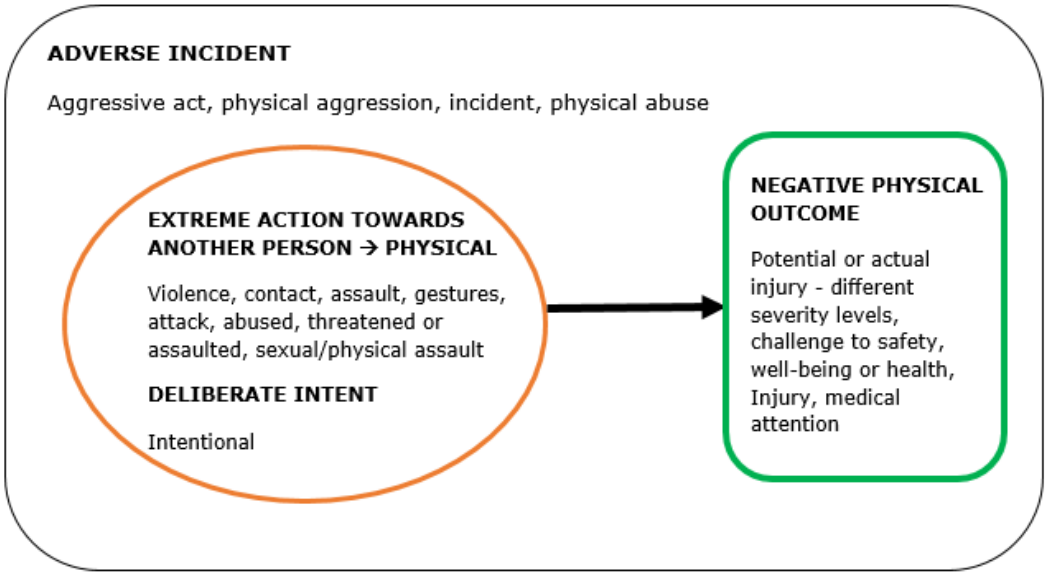


Figure 4: Connections between descriptive themes and summary of results

4. Discussion

Application of the inclusion criteria to the results of the applied search strategy identified 14 papers; nine of these papers met quality assessment standards and were included in the overall review. Prevalence rates of violence perpetrated towards healthcare staff by service users in forensic services ranged between 15-70% in adult services, whereas the clear outlier in the data was the prevalence of staff assaults in adolescent services at a rate of 91%. An overall prevalence rate of violence perpetrated towards staff by service users in forensic healthcare services could not be determined. In line with existing research it was found that a comprehensive definition of violence currently does not exist.

All studies reporting a prevalence of staff physical assault by service users in forensic services were included in this review. Definitions of described violence were successfully extracted from the studies, but a comprehensive definition of violence could not be established. Efforts to synthesise the definitions used to formulate a conceptualisation of violence was made. An overall prevalence rate

across identified forensic services could not be established. Prevalence rates for the nine included studies were successfully extracted but meta-analysis could not be undertaken due to limitations of included studies.

In support of previous research by Lanctôt and Guay (2014) it is evident that a consistent definition of violence does not exist within the literature. Previous research has not yet attempted to quantitatively synthesise existing research with respect to prevalence rates, and hence comparison may not be made with other systematic reviews.

In view of the limitations of this review, it is important to evaluate the strengths and limitations of the included studies. Firstly, as an overall prevalence figure of included studies could not be calculated it must be taken into account that this study has been limited by the lack of reporting of the standard deviations in included studies. Thus, the current review is limited by the analytical detail reported in the studies. Secondly, it was considered that a number of the included studies were of prevalence data studies gathered by file review or review of incident reports. An issue with this which was considered was that the quality of the file review and subsequent outcome would be dependent on the initial quality of the incident reports submitted by staff within the services. Although this was a significant limitation of the current review, it was considered that this was something which could not be controlled for by the current review.

In contrast, other studies using staff self-report data were counteracted by such limitations as it was considered that some staff may respond with more detail to staff surveys. Similarly, it may also be more likely that those assaulted respond more readily to such a survey asking about their experiences at work, which may also have created a response bias. However, the current review was unable to control for this also. It was felt that such design flaws in included studies could not be quality assessed for and excluded as a result, as is a common flaw of such studies. Therefore, it was felt appropriate

to include these studies in the review. The main strength of the included studies was that they clearly reported differences between verbal and physical aggression, which meant that data about physical violence perpetrated towards staff could clearly be extracted for inclusion in this review.

A further strength of the included studies was that each study met the 20% or below criteria for risk of bias, indicating that included studies were at a low risk of bias in the domains of sampling and selection; measurement of violence, attrition, analysis and reporting of results. To expand, all included studies met the maximum assessed quality criteria in the domain of sampling and selection, indicating that the studies were assessed as being subject to a lower risk of bias in areas such as allocation and selection bias. Similarly, all included studies scored well in the domain of measurement of violence, indicating that bias such as detection bias, performance bias and conceptual differences were kept to a minimum. With respect to attrition bias for a number of studies this was not applicable as many of the included studies were retrospective, although the one study which this did effect mitigated for potential effects of this bias. In reference to analytical bias, all included studies met this criteria, indicating that bias such as observer bias and exclusion bias was kept to a minimum. Finally, with respect to reporting of results of included studies bias in this domain and the influence of confounding variable also appeared to be kept to a minimum. Therefore, a strength of the current study was a robust assessment of quality and effects of potential bias in included studies. Assessing for such effects provides confidence that potential sources of bias in included studies has been well controlled for and as a result means in turn potential sources of bias in the current study are controlled for respectively.

In view of the limitations of the review process it was considered that the nine included studies were all of English-speaking regions of origin and thus limited to very specific regions (UK, US and Australia). This consideration has limited the current review as although the aim was to gather worldwide data, worldwide data could not be gathered as

forensic healthcare services appear to be a "Western-specific" phenomena, as suggested by the results of this review. In order for the study to have truly been worldwide then the concept of forensic healthcare services may not have been an exclusion criteria, rather all types of offender services may have been included (such as including prison services, for example) which would possibly transcend cross-cultural differences.

As the studies were similar in their design, type of setting, data gathered and service user populations there is confidence in concluding that outcomes may be generalizable across populations. However, results may only be generalizable with respect to data within adult forensic services, as a clear outlier was found within the one study which reported data from adolescent services. Therefore, it is concluded that results found with respect to child and adolescent forensic services are not generalizable and must be considered separately. Piloting of the search strategy and systematic application of the strategy to the papers identified by electronic and hand searching of the available literature allows confidence in the conclusion that all relevant papers and research were included in the current review. This allows conclusions to be drawn that the findings of this review are based on a full synthesis of all available evidence at the time of data collation.

5. Conclusions and recommendations

In summation of this review, it is evident that findings within this study are in support of Lanctôt and Guay's (2014) original concerns of the limited consensus in formulating a definition of violence within existing research literature. The current review has also found little consensus across studies in the types of definitions and conceptualisations of violence used. However, the current review has attempted to make the first steps in thematically synthesising existing definitions, as summarised in Figure 4. It is also evident as demonstrated in this review that due to a number of limitations a lack of a clear picture in overall prevalence rates of violence in forensic

services also exists. However, it is believed this review is the first attempt to systematically synthesise existing data in this field and serves to provide a point of reference for further reviews in this area of research.

As a result of conducting this review it is evident that further work needs to be completed firstly in conceptualising and defining violence. The current study has aimed to highlight theoretical and conceptual limitations of this field of research so that steps may be made to address violence in clinical settings. As highlighted in the current review violence in forensic healthcare services may vary dramatically with respect to prevalence, and it is suggested that there may be differences between different services, such as the differences shown between adult and adolescent services. Clearly, further research needs to be established in this area so that service providers may adapt accordingly to addressing violence with current legislation and healthcare policies in mind.

It is recommended that once a theoretical accord has been established and there is a consensus in the literature that a 'benchmark' of prevalence may be established, so that this can then be comparable with other services and victim populations. Once theoretical and methodological issues have been addressed in this manner, it is recommended that future research is then dedicated to consider strategies to reduce the overall impact of violence on victims in the clinical field. It is also recommended that future research also considers any mediating factors considering the impact of the violence on victims and protective mechanisms which can be cultivated to lessen the impact on staff.

CRITIQUE

A critique of the Perceptions of the Prevalence of Aggression Scale (POPAS)

Abstract

The Perceptions of the Prevalence of Aggression Scale (POPAS) (Oud, 2001) was developed for staff members in psychiatric services to identify a range of types of aggression and violence that they may experience from service users in the course of their work. Findings from the systematic review chapter of this thesis indicated that there are clear issues in defining and measuring aggression and violence, an area which requires further empirical attention. In this critique the POPAS has been compared with alternative measures and has been evaluated with respect to its psychometric properties. The scale has been found to have good internal consistency (Cronbach's alpha above 0.8) by a number of studies. Further work is recommended to explore different types of validity of the measure and for appropriate norms to be established to consider other potential uses in the future.

1. Introduction

Aggression and violence perpetrated towards staff members in psychiatric care settings is reported to be a significant clinical problem (Barlow, Grenyer & Ilkiw-Lavalle, 2000). However, Owen and colleagues (1998) report that violence is complex, and conceptual difficulties remain in clarifying what constitutes aggression and violence. Similarly, other authors report conceptual issues related to the comparison of mixed concepts and constructs (e.g. Nolan et al, 1999). Lanctôt and Guay (2014) drew attention to the fact that there appears to be little consensus in formulating a definition of violence within existing research literature, making further exploration of types of workplace aggression and violence difficult. Despite conceptual difficulties a number of measures have been developed to tackle this issue, in efforts to suggest a framework of gathering data

to support theoretical opinions about what aggression and violence comprises.

The Perceptions of the Prevalence of Aggression Scale (POPAS) is one such measure and was developed by Nico Oud (2001) to assist staff members to identify the frequency of aggressive or violent behaviour they have experienced in the course of their professional work in the last year. As Oud (2001) specified, the scale focuses on those who experience aggression and violence in the domain of psychiatric healthcare specifically. Nijman, Bowers, Oud and Jansen (2005) report that Oud (2001) assembled the descriptions of the items on the POPAS on the basis of a combination of existing measures (namely the Overt Aggression Scale, OAS; Silver & Yudofsky, 1991) and the Modified Version of the Overt Aggression Scale (MOAS; Kay, Wolkenfield & Murrill, 1988). Such scales were originally developed by psychiatric staff members' structured observation of aggressive and violent incidents which were grouped into categories of aggressive behaviour to comprise a behavioural checklist (Kay, Wolkenfield & Murrill, 1988). In combining such scale data with "other information on definitions of aggression" the items on the POPAS were developed (e.g. Nijman et al, 1999).

As discussed by Nijman, Bowers, Oud and Jansen (2005) many of the existing staff observation scales concerned 'incident-based' measurements to record episodes of behaviour, rather than capturing a reliable picture over prolonged periods of time of the prevalence of behaviour. In order to gain insight into staff members' daily experiences more quickly, it is reported Oud (2001) developed the POPAS in order to gather and manage information in a short period of time (Nijman, Bowers, Oud & Jansen, 2005).

This review examines the POPAS scale as a psychometric measure developed by Oud (2001). This will be achieved in consideration of potential uses, alternative measures and psychometric properties, with respect to its applicability to staff members working in psychiatric healthcare settings.

1.1 Outline of the measure

The original version of the POPAS consists of 18 items, 17 of which consist of two parts. Items one to 16 provide a description of a type of aggression or violence and asks the respondent to rate the extent to which they have been confronted with that particular type of behaviour in the last year over the course of their work. Respondents are asked to rate their experience using one of the following 'Likert-style' criteria: 'never', 'occasionally', 'sometimes', 'often', or 'frequently'. The second part of these items provides a 'free text' response and asks respondents to estimate the number of times they have been confronted with that particular type of aggression in the past year. For example:

> "1. *Verbal aggression*
>
> For example: patients making loud noises, shouting, cursing, yelling personal insults, however, not being perceived as a clear threat by you.
>
> To what extend have you been confronted with *ordinary verbal aggression* during the last year in the course of your work?
>
> () never
>
> () occasionally
>
> () sometimes
>
> () often
>
> () frequently
>
> What will be the estimate number of times in the past year?
>
> ……times." *(Oud, 2001)*

Each item presented asks respondents about their experiences of a range of specific types of aggression or violence that they have encountered in the last year, which are addressed as follows:

Item 1: Verbal aggression (as above)

Item 2: Threatening verbal aggression

Item 3: Humiliating aggressive behaviour

Item 4: Provocative aggressive behaviour

Item 5: Passive aggressive behaviour

Item 6: Aggressive splitting behaviour

Item 7: Threatening physical aggression

Item 8: Destructive aggressive behaviour

Item 9: Mild physical violence

Item 10: Severe physical violence

Item 11: Mild violence against self

Item 12: Severe violence against self

Item 13: Suicide attempts

Item 14: Successful suicides

Item 15: Sexual intimidation/harassment

Item 16: Sexual assault/rape

Item 17 asks respondents "Have you been on sick-leave in the course of your work?". Respondents are asked to provide a yes/no response, and are asked to estimate the number of times/days off due to sick leave in the last year. The final item, Item 18, asks respondents to indicate what the estimated number of times/days off were due specifically to aggression or violence in the last year.

1.2 Potential uses

The POPAS was originally developed by Oud (2009) for use within the field of psychiatric healthcare. Some authors have sought to use the scale across contexts. For example, Ryan and Maguire (2006) utilised a modification of the measure within their study of accident and emergency departments. Geoffrion, Lanctôt, Marchand, Boyer and

Guay (2015) utilised a version of the scale with a population of healthcare workers and law enforcement officers. Thus, it would appear that there is some potential to extend the scope of the original intended purpose of the scale with other populations of potential victims. However, due to the apparent paucity of research in this area this may be a topic of future investigation.

2 Alternative measures

2.1 Jonker, Goossens, Steenhuis and Oud (2008)

In their study Jonker, Goossens, Steenhuis and Oud (2008) were able to collapse the full POPAS into an abbreviated version of the scale following pre-testing. This resulted in collapsing certain items on the scale, such as collapsing "mild physical violence" and "severe physical violence" into one item which constituted "physical violence". These adaptations resulted in a 12-item version of the scale. The abbreviated version of the POPAS (Jonker et al, 2008) contains the following items:

Abbreviated POPAS:

1. Non-threatening verbal aggression

2. Threatening verbal aggression

3. Humiliating aggressive behaviour

4. Provocative aggressive behaviour

5. Passive aggressive behaviour

6. Aggressive splitting behaviour

7. Threatening physical aggression

8. Destructive aggressive behaviour

9. Physical violence

10. Violence against self

11. Suicide attempts

12. Sexual intimidation/harassment

The specific categories chosen by the authors were combined as it was expected that the interpretation of ‘mild’ vs ‘severe’ would not be greatly different from one another. Items pertaining to sexual assault and rape were excluded altogether due to their sporadic occurrence in the service where the study was conducted. Despite collapsing certain forms of aggression into a single category, these authors reported “good internal consistency” of the abbreviated version and reported a Cronbach’s alpha of 0.80. Table 1 shows a comparison of the original 18 item POPAS vs. the abbreviated version of the scale.

Table 1: Comparison of the full POPAS scale (Oud, 2001) vs. the abbreviated POPAS (Jonker et al, 2008)

Full POPAS (Oud, 2001)	***Abbreviated POPAS (Jonker et al, 2008)***
Item 1: Verbal aggression	Item 1: Non-threatening verbal aggression
Item 2: Threatening verbal aggression	Item 2: Threatening verbal aggression
Item 3: Humiliating aggressive behaviour	Item 3: Humiliating aggressive behaviour
Item 4: Provocative aggressive behaviour	Item 4: Provocative aggressive behaviour
Item 5: Passive aggressive behaviour	Item 5: Passive aggressive behaviour
Item 6: Aggressive splitting behaviour	Item 6: Aggressive splitting behaviour
Item 7: Threatening physical aggression	Item 7: Threatening physical aggression
Item 8: Destructive aggressive behaviour	Item 8: Destructive aggressive behaviour
Item 9: Mild physical violence	Item 9: Physical violence
Item 10: Severe physical violence	
Item 11: Mild violence against self	Item 10: Violence against self
Item 12: Severe violence against self	
Item 13: Suicide attempts	Item 11: Suicide attempts

Item 14: Successful suicides	
Item 15: Sexual intimidation/harassment	Item 12: Sexual intimidation/harassment
Item 16: Sexual assault/rape	
Item 17: Sick-leave	
Item 18: Estimated number of times/days off due specifically to aggression or violence in the last year	

2.2 Perceptions of the Prevalence of Aggression Scale – New Zealand (POPAS-NZ)

Another modification of the original POPAS scale is the POPAS-NZ, developed for use with a New Zealand population by Gale, Hannah, Swain, Gray, Coverdale and Oud (2009). Swain, Gale and Greenwood (2014) highlighted that the main modification to the original POPAS scale was an extension of the types of violence experienced to include stalking and "vexatious litigation". Gale et al (2009) also highlighted the additional purpose aside from adding in two such events was to modify the language for the New Zealand reader. The scale consists of 12 questions about experiences of aggression and violence and, like the POPAS, asks respondents to rate how often each event occurred in the past year. Response classifications range from 1 (never) to 5 (frequently) (Swain, Gale & Greenwood, 2014).

Prior to utilising the POPAS-NZ in their study Swain and Gale (2014) tested the psychometric properties of the measure; a Spearman's Rank Order correlation was run to determine the relationship between two repeated tests of the scale on two separate occasions. Swain and Gale (2014) reported a strong, positive correlation between each test of the scale at each time period. These authors report that this correlation was statistically significant at $p<0.05$. Gale et al (2009) reported that the scale was internally reliable with a Cronbach alpha

of 0.91 (also cited in Swain, Gale & Greenwood, 2014). In support of this, Baby, Swain and Gale (2016) found a Cronbach's Alpha of 0.927 of this version of the POPAS.

2.3 Scale of Aggressive and Violent Experiences (SAVE)

The SAVE questionnaire was developed for the purposes of a study by Ryan and Maguire (2006) who modified the original POPAS scale. These authors highlighted that the modifications to the POPAS which formulated the SAVE questionnaire were driven by limitations of the POPAS with respect to the periods of time on which respondents were asked to reflect, the frequency of exposure and the range of sources of aggression or violence. Similarly, Ryan and Maguire (2006) note that for the purposes of their study with Irish Accident and Emergency staff that the POPAS was unsuitable for its exclusive focus on experiences from patients. Ryan and Maguire (2006) point out that they felt there was clear evidence that where staff encounter aggression and violence the sources of that aggression are likely to include a number of categories of people aside from patients, such as relatives, visitors and other staff (as cited in Jackson et al, 2002). These authors also highlight that individuals may not only encounter multiple sources of aggression but also multiple incidents of aggression or violence (as cited in Jackson et al, 2002).

In contrast to the POPAS, the SAVE asks participants about their experiences of aggression and violence in the "previous month" (rather than "in the past year"); the rationale for this being to "minimise reporting errors that may have occurred due to recall difficulties relating to the passage of time" (Ryan & Maguire, 2006, page 109). The authors of the SAVE made additional changes to the POPAS by expanding the range of sources of aggression and violence to include "family/concerned persons; colleagues; visitors and members of the public" as well as patients (Ryan & Maguire, 2006). Ryan and Maguire (2006) did not alter the categories and definitions of aggressive and violent experiences as used in the original POPAS questionnaire. The authors' reported rationale for this decision was based on the hope of standardising comparison of experiences across

studies, although categories of aggression and violence towards staff also included vicarious exposure to these experiences. Categories of aggression and violence in the SAVE instrument were identified by Ryan and Maguire (2006) as: Non-threatening verbal aggression; Threatening verbal aggression; Humiliating aggressive behaviour; Proactive aggressive behaviour; Passive aggressive behaviour; Aggressive 'splitting' behaviour; Threatening physical aggression; Destructive aggressive behaviour; Mild physical violence; Severe physical violence; Mild violence against self; Severe violence against self; Suicide attempts; Completed suicide attempts; Sexual intimidation/harassment; Sexual assault/rape. Unfortunately, due to the small number of participants in the original study by Ryan and Maguire (2006) (n=37) the authors appeared to have been unable to provide further information about the reliability or validity of the scale.

3 Evaluation of the POPAS

3.1 Psychometric properties

3.1.1 Reliability

According to Field (2009) reliability refers to "the ability of a measure to produce consistent results when the same entities are measured under different conditions". With respect to the POPAS, it would appear that this has been investigated by a number of authors. For example, Swain and Gale (2014) reported that the POPAS scale has high internal consistency, with a reported Cronbach's alpha of 0.89. Similarly, Geoffrion et al (2015) have reported that the POPAS has a Cronbach's Alpha ranging between 0.70 and 0.91. In support of this Lee, Daffern, Ogloff and Martin (2015) reported a Cronbach's alpha of 0.86, which they confirm indicates that the POPAS demonstrates good internal consistency. Nijman et al (2005) also explored internal consistency using Cronbach's Alpha, which was reported to be 0.86. This latter figure has also been found by Jalil, Huber, Sixsmith and Dickens (2017); a Cronbach's Alpha of 0.85 was also found by Geoffrion (2015). It would appear that a number of studies have found similar outcomes in calculation of Cronbach's Alpha, indicating

that the POPAS is considered to have good internal consistency, as being above the acceptable value of 0.7 to 0.8 as cited by Field (2009).

With respect to other forms of reliability, such as test-retest, there appears to be limited evidence available within current literature to allow for further exploration at the time of writing.

3.1.2 Validity

Field (2009) outlined that validity pertains to evidence that a test measures what it set out to measure conceptually. With respect to the POPAS this has been explored in the following ways:

Secolsky (1987) defined face validity as the suitability of the test or item(s) content for an intended purpose as perceived by test participants. In other words, face validity is concerned with whether a tool actually measures what it claims to. Lee et al (2015) reported that the POPAS demonstrates satisfactory face validity (with "findings of higher levels of severe physical violence when working with involuntary-admitted patients and higher levels of sexual harassment reported by female mental health nursing staff" - Lee et al, 2015). However, Lee et al (2015) highlighted that this requires further validation (as cited in Nijman et al, 2005), an issue which is supported by current researchers.

With respect to the POPAS Jalil et al (2017) highlighted the a degree of convergent validity may be inferred from correlations between reported exposure to severe physical violence and number of days sick leave reported (as cited in Nijman et al, 2005). Jalil et al (2017) highlighted that to the best of their knowledge the POPAS has not been subject to factor analysis. However, Loughland et al (2009) completed a factor analysis of 15 items (excluding the item regarding 'sick leave') using an oblique rotation. Loughland et al (2009) reported that four factors with eigenvalues greater than 1.0 were identified, which explained 66.8% of the total variance. These authors reported that on the basis of this analysis, items were allocated to one of the four identified factors, which were: verbal – 5 items;

physical – 4 items; self-directed – 4 items; and sexual aggression – 2 items. The item 'threatening verbal aggression' loaded on both the verbal and physical items (as covering a range of incidents involving verbal threats about future physical aggression), and was assigned to the verbal aggression factor. Loughland et al (2009) calculated individual scores for these factors by adding the raw item scores and dividing by the number of items. It was reported that binary categorical scores were calculated for each factor into 'non/mild aggression' and 'moderate/severe aggression' (the latter was scored if respondents reported that aggression occurred more frequently than 'never'; except on verbal aggression where this was classified as 'moderate/severe' if it occurred 'sometimes' or more frequently). This indicates that in this respect the POPAS has acceptable convergent validity as factors appear to load onto four factors which explain over 50% of the total variance (as an acceptable level of variance, as cited by Chin, 1998).

Predictive validity has not been considered relevant to the measure as POPAS is not predicting future behaviour and is not designed as a screening device for future behaviour. In its design it simply explores the experience of staff from the perspective of the past year.

3.1.3 Appropriate norms

To the best of current knowledge, appropriate norms (within group norms, such as standard scores, percentiles and so forth) for the POPAS do not appear to have been established.

3.2 Problems with and criticisms of the POPAS

Although a number of studies report the POPAS to have good internal consistency (see Section 3.1.1) there remains limited information for different types of validity. For example, content validity of the POPAS does not appear to have been explored but it could be argued this is difficult to determine aside from expert opinion. Other such forms of validity, such as content, predictive, criterion-related, construct, and congruent validity do not appear to have been explored with respect to the POPAS.

Another limitation of the POPAS is that no appropriate within group norms (within the target population and also general population) appear to have been established (as discussed in Section 3.1.3). This may reflect conceptual issues related to the comparison of mixed concepts and constructs in defining aggression and violence (Nolan et al, 1999), as found in the systematic review comprising the first chapter of this thesis. This issue serves to highlight the question of how one can develop a scale to measure a construct if little consensus in the literature exists in conceptualising it in the first place? However this could be argued of any scale attempting to measure aggression and violence, and emphasises the need to work towards a theoretical consensus within the literature. In order to do this a consistent and agreed set of definitions of forms of aggression and violence is needed to be established so that consistency in measurement may be also established. Thus, data may be gathered about an agreed construct.

A final issue with the POPAS is the unclear conceptual or theoretical framework that was used to develop the measure. As described in Section 1, the items and descriptors of the POPAS were developed from existing scales, which in turn were developed from structured observation of aggressive and violent incidents. It appears unclear if other guiding theoretical principles were considered in developing the scale and the impact of this on further scale development.

3.3 Comparison with alternative measures

POPAS appears to have the ability to be flexible with respect to the development of different versions of the scale, as demonstrated by the development of Jonker et al's (2008) version of the scale, the POPAS-NZ and the SAVE. Providing a comprehensive comparison of the original POPAS with these scales appears somewhat difficult due to paucity of available evidence and validation of these scales, although some available evidence allows for basic comparison.

In considering internal consistency of Jonker et al's (2008) scale these authors reported "good" internal consistency (Cronbach's alpha above 0.80) which appears of a comparable standard with the original

POPAS (as discussed in Section 3.1.1). Other forms of reliability and validity of Jonker's scale do not appear to have been explored in depth rendering further comparison a challenge.

In comparing the original POPAS with the POPAS-NZ the authors of the POPAS-NZ reported a Cronbach's Alpha of 0.91, which was also supported by Baby, Swain and Gale (2016). This would indicate that when comparing this with the POPAS that the POPAS-NZ has a higher level of internal consistency than the POPAS, whose Cronbach's Alpha levels appear to fall between 0.7 and 0.91 (Geoffrion et al, 2015 - please refer to Section 3.1.1). Due to the paucity of available evidence further comparison between the two scales appears problematic. However, future consideration of further comparison must also account for the context in which the POPAS-NZ was created, which is culturally specific to New Zealand, unlike the POPAS which does not appear to have been developed with such cultural implications in mind.

When considering the SAVE there appears to be a paucity of information pertaining to reliability or reliability of the scale, indicating that comparing this with the POPAS is not currently possible. Therefore, overall the original version of the POPAS appears to have strength in its reported psychometric properties in comparison with other measures or modified versions of the POPAS. Table 2 shows a comparison of the psychometric properties of the POPAS with alternative measures, as discussed above. With respect to test re-test reliability, face validity and appropriate norms, this information was unavailable at the time of writing to allow for further comparison.

Table 2: Comparison of the available psychometric properties of the POPAS with alternative measures

	POPAS (Oud, 2001)	**POPAS (Jonker et al, 2008)**	**POPAS-NZ (Gale et al, 2009)**	**SAVE (Ryan & Maguire, 2006)**
Internal consistency (Cronbach's Alpha)	0.70-0.91	0.80	0.91	Data unavailable

4 Conclusions and recommendations

In developing this scale it appears Oud (2001) has attempted to provide a standardised way of measuring subjective experiences such as different types of verbal and physical aggression by providing distinct definitions of different experiences for respondents to clearly identify. Despite limitations of the POPAS Oud has attempted to overcome some of the conceptual difficulties in formulating aggression and violence by separating out such experiences using existing definitions and measures of these constructs, as discussed in Section 1. There appears to be strength in the POPAS in that it has provided a basis for the development of other scales, which could serve to demonstrate its flexibility as a measure. Therefore, this scale highlights the complexity of aggression and violence and suggests that such constructs comprise of a range of victim experiences, as emphasised by the POPAS. Clearly, aggression and violence reflect a range of types of behaviour, which may be classified very broadly by commonly held understanding of the terms 'aggression' and 'violence', but may also be conceptualised more specifically by the range of experiences captured by the POPAS.

Although reliability through internal consistency has been well-established it is recommended that further exploration is needed with

respect to exploring the scale's validity in more depth. Although preliminary explorations indicate the POPAS is a valid measure this needs further clarification across different populations, such as with different types of psychiatric care services. It is also recommended that in doing this future research consider the exploration and development of appropriate norms of the scale in order to provide further clarity about the POPAS's potential and future use.

PRIMARY STUDY I

The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress

Abstract

Workplace violence in healthcare services is a complex phenomenon, as are the experiences of those who are exposed to it. Past evidence indicates that healthcare staff are at particular risk of experiencing aggression and violence, an experience which may be compounded for those working with offenders in forensic healthcare services. 93 Participants from a range of forensic healthcare services took part in this study investigating the impact of experiencing aggression and violence, and the role of perceived stress and resilience in this experience. Findings indicated that those working in forensic healthcare services experience a moderate level of stress when exposed to aggression and violence and were significantly negatively impacted when experiencing aggression and violence in the workplace. Such individuals were found to have a moderate-high level of resilience and that Post-traumatic Stress Disorder (PTSD) was not a clinical concern for this sample. Resilience was found to negatively related to the impact of aggression and violence (the lower the resilience score, the higher the overall impact); perceived stress was also found to be significantly and positively related to these findings. Resilience, perceived stress and the experience of aggression and violence were all found to be significant predictors of the negative impact of aggression and violence. Implications of this research are linked to the development of future strategies in supporting those who have been effected by aggression and violence in the workplace, and in the development of strategies to lessen the impact in the future.

1. Introduction

Aggression and violence in the workplace is a field of study which has significantly captured the interest of the academic community in the

past few decades. In their narrative review Ramacciati et al (2018) highlighted that the complexity of violence is emphasised by the extensive amount of theory attempting to explain the problem in the field of workplace violence in healthcare services. These authors report that some theories of workplace violence focus on a single element (with one or two features), whilst others are based on multiple dimensions (with many factors). Ramacciati et al (2018) found 15 different theoretical frameworks to explain workplace violence in emergency care services alone. These frameworks ranged from more general theories applied to the field, such as 'Broken Windows' theory, to more specific theories such as the Haddon Matrix. However, in recent years attention has been redirected from perpetration of violence to experiences of being a victim of violence. This appears to be in an effort to explore the range of experiences and consequences of workplace violence.

In consideration of specific approaches regarding victim characteristics Grych, Hamby and Banyard (2015) propose a model called the Resilience Portfolio Model. These authors describe this as a strengths-based framework designed to provide a holistic understanding of the protective factors and processes which promote resilience in those exposed to violence. Grych, Hamby and Banyard (2015) explain that the range of resources a person has (their 'resilience portfolio') shapes their responses to violence. These authors describe resilience as a dynamic process which depend on the combination of stressors, risk and protective factors which the person has at a particular point in time. The Resilience Portfolio Model includes protective factors at a number of levels, such as individual, family, peer and community levels. Grych, Hamby and Banyard (2015) use the term 'assets' to describe characteristics a person has that promote healthy functioning, and 'resources' to refer to sources outside of the person. The model organise these 'assets' into categories representing functions proposed to be important to healthy adaptation. These categories are identified by the model as: regulating emotions and behaviour, building interpersonal

relationships and fostering meaning making. This would indicate that victim characteristics may play a role in determining the impact of aggression and violence on those targeted by perpetrators. For example, the Resilience Portfolio Model may indicate that healthcare staff working with offenders may have a higher level of resilience in dealing with violent incidents in the workplace, which allows them to continue working in such environments. This may indicate that such individuals have a number of tools or characteristics which make up their 'resilience portfolio'. Their 'resilience portfolio' may not only include a higher level of overall resilience, but also factors which influence how they perceive stressful situations. Such features or characteristics may thus have the potential to lessen the overall impact of experiencing stressful or potentially traumatic situations, such as the experience of aggression and violence in the workplace.

Despite Ramacciati et al's (2018) extensive review, the focus of the study was limited to emergency department staff and violence perpetrated by service users toward staff (known as 'Type II' violence). It is evident that workplace violence occurs across a number of different contexts, not only limited between different types of service, but also within different types of healthcare services. For example, few studies appear to address and apply theories of workplace violence specifically in forensic healthcare services. This is despite some suggestion that forensic mental health professionals can offer support and advice to others by providing assessment of elements such as personality characteristics, coping strategies, frustration tolerance and so forth (e.g. Flether, Brakel & Cavanaugh, 2000). This latter point of consideration suggests that forensic healthcare professionals can offer some specific understanding and insight into the phenomena of workplace violence, although it is unclear what and how their skills may be applied across other contexts. For example, it is unclear how elements of factors such as resilience and perceived stress may be captured and used as a point of reference for training to help others increase their own resilience or improve their perceptions of stress. This may be particularly

difficult when applying skills which reflect such complex constructs to the range of different aggressive and violent situations that healthcare staff may find themselves in.

In spite of the complexity of the problem of workplace violence, particularly in reaching a theoretical consensus, Lanctôt and Guay (2014) highlight that workplace violence perpetrated by clients in such services is still an important health and safety issue. Lanctôt and Guay (2014) emphasise that in spite of the lack of consensus in definition and theoretical underpinnings it is well documented that healthcare workers in general are particularly at risk of experiencing workplace violence. Winstanley and Whittington (2004) found that as high as 27% of the health care staff (of all staff grades involved in direct patient contact at a general hospital) of their survey were assaulted, 23% experienced threatening behaviour from patients and 15.5% experienced threatening behaviour from visitors. Over 68% reported verbal aggression, 25.7% experiencing it more regularly than monthly.

Some evidence suggests nurses as a separate discipline face a high level of risk compared with all workers. The data suggested that 9.5% of general nurses working in general hospitals were assaulted (with or without injury) in a 1 year period (Wells & Bowers, 2002). Winstanley and Whittington (2004) also found that by profession, staff nurses and enrolled nurses reported the most assaults (43.4%) and doctors, the fewest (13.8%). It is evident within existing literature that differences exist across type of healthcare services and across profession. As McPhaul and Lipscomb (2004) state "workplace violence is a concept with ambiguous boundaries". Similarly, Lanctôt and Guay (2014) point out that despite the existing evidence conducted in this area, little is known about the impact and consequences of being a victim of violence in the workplace; this appears particularly pertinent when applied to forensic healthcare sectors. In their review of the literature these authors were able to identify seven distinct categories of the consequences of workplace violence: (1) physical effects (2) psychological effects (3) emotional

effects (4) work functioning (5) relationship with patients/quality of care (6) social/general and (7) financial consequences. Psychological (such as posttraumatic stress and depression) and emotional (such as anger and fear) consequences and impact on work functioning (e.g., sick leave, job satisfaction) were reported to be the most frequent and important effects of workplace violence (Lanctôt & Guay, 2014).

Much of the existing research literature appears to have focused on the psychological effects of staff experiencing aggression and violence, with particular attention paid to the domains of Post-Traumatic Stress Disorder (PTSD), and overall stress. For example, Richter and Berger (2006) found that a small minority of assaulted employees suffered from PTSD for several months after a patient assault. Laurud, Nonstad and Palmstierna (2009) found that although high violence frequency was found, a low rate of post-traumatic stress symptoms and low compassion satisfaction scores was also found in a nursing sample working in a forensic psychiatric setting. However, it is unclear if such findings are applicable to a range of types of forensic staff, not just samples of nurses. Søndenaa et al (2015) compared levels of traumatic stress and resilience amongst nursing care staff working with challenging behaviour in two intellectual disability (ID) services. They found that nursing staff in the community ID caring services had significantly more signs of stress compared to a staff group working in the forensic ID services. The impact of serious events resulted in a higher level of stress symptoms; however the community carers showed more compassion to their work. This would indicate that staff working in forensic-based services, although still experience aggression and violence, may have some mechanisms in place that serve a protective function. However, it is evident that further investigation of such phenomena is warranted.

1.1 Research questions, aims and hypotheses

The overall aims of the study were: to explore the negative impact of experiencing patient aggression and violence in healthcare staff

members working with offenders; and, to explore the presence of resilience and perceived stress in the relationship between experience of inpatient aggression and trauma in staff members working with offenders.

With these aims in mind the following research questions were formulated:

1. Are healthcare staff members working with offenders negatively impacted when experiencing aggression and violence in the workplace?
2. Does resilience feature in this relationship?
3. Does perceived stress feature in the relationship between the impact of experiencing workplace aggression and violence and overall resilience?

It was hypothesised that:

1. Healthcare staff members who are directly exposed to experiencing aggression and violence in the workplace would report experiencing a negative impact of the event in working with offenders (i.e. it was hypothesised they will display trauma symptomology).
2. When staff report experiencing aggression and violence in working with offenders there will be high staff scores of resilience and perceived stress.

2. Method

2.1 Participants

Participants were recruited from a pool of National Health Service (NHS) employees working in forensic services across two NHS trusts in the UK. These NHS trusts were based in the Yorkshire and Nottinghamshire regions of the UK, and provide inpatient and community services to individuals with a range of mental and physical health needs. Both trust offers specialist forensic support and offender health to service users across both localities, including both secure and community forensic services across five main sites.

Table 1: Summary of participant demographic characteristics

	Range	Minimum	Maximum	Mean	Std. Deviation
Age	42	20	62	40.26	10.40
Years working with offenders	42.90	.10	43.00	10.73	8.20
Years working in the NHS	43.00	.00	43.00	11.78	9.07

N=93

A total of 99 participants across both NHS trusts took part in the survey and comprised a mix of males and females of working age (aged 18-65). Table 1 shows a summary of participant demographic characteristics. Of this sample 64 females (68.8%) participated, whilst 29 males (31.2%) took part in the study. The mean age of the sample was 40 years old, with an age range of the whole sample between 20 and 62 years. The mean number of years working with offenders was 10.7 years, with a range between .10 and 43 years. The mean number of years working in the NHS overall was 11.7 years, with the range of the whole sample between less than one year (as above) and 43 years.

As the advertisement for study participation was visible on global communication systems across the two trusts staff working across a number of different services were asked to complete the survey. This included those working in: secure inpatient services (low, medium, high security, assessment and treatment services, locked rehabilitation, Psychiatric Intensive Care Units), prison in-reach services, community services, and any other services where staff may

come into contact with individuals who have committed offences. Table 2 shows a summary of the types of services staff were from. As can be seen from the table, the majority of participants worked in medium secure services, which represented 48.4% of the sample.

Table 2: Type of service participants worked in

Service type	**Number of participants**	**Percentage of sample**
High secure	16	17.2
Medium secure	45	48.4
Medium secure and community	1	1.1
Medium secure and low secure	1	1.1
Low secure	4	4.3
Low secure and Psychiatric Intensive Care unit	1	1.1
Low secure and prison	1	1.1
Community	12	12.9
Assessment and Treatment	1	1.1
Psychiatric Intensive Care unit	1	1.1
Prison	1	1.1
Rehabilitation	2	2.2
Secure service (type not disclosed)	6	6.5
Secure service (type not disclosed) and Community	1	1.1

Specific inclusion criteria detailed that staff members must be front-line staff members delivering healthcare services to forensic populations. Therefore, participants meeting inclusion criteria would be healthcare assistants, nursing staff, social workers, medical and psychiatric team members, and those offering therapeutic services, such as occupational therapists, speech and language therapists and psychologists (including respective team members across different levels of qualification and tier groups). As shown in Table 3 qualified nursing staff made up the majority of the sample (28%), followed by healthcare assistants (22.6%).

Table 3: Summary of participants' job roles

Job role	**Number of participants**	**Percentage of sample**
Psychiatrist	7	7.5
Medical Doctor	1	1.1
Nursing	26	28.0
Healthcare assistant (including support workers, associate practitioners and other unqualified nursing staff)	21	22.6
Psychologist	10	10.8
Trainee Psychologist	2	2.2
Assistant Psychologist	6	6.5
Occupational Therapist	6	6.5
Psychological Wellbeing Practitioner (PWP)	1	1.1
Social Worker	6	6.5
Manager	3	3.2
Other supportive role (such as education, horticultural instructor, wellbeing facilitator)	4	4.3

Those who did not meet inclusion criteria included individuals such as administrative support, domestic based staff and other supportive roles (such as porters and maintenance). The rationale for excluding this latter group of individuals was based on the premise that such supportive roles are distinct, for example in their role and manner of communication, from those delivering face-to-face services to

offenders and hence may be exposed to aggression and violence in different ways. This would potentially introduce other forms of bias which the current study would not be able to control for. It is believed that in order to include this group further exploration would be needed having established a separate and distinct baseline of experiences between the two groups to draw further comparison.

Advertisements containing study information and an online link were posted on global emails for participants to opt-in to participate in the online survey. Although 99 participants across both sites completed the survey, six participants' data could not be used and were screened out due to not meeting inclusion criteria or providing inappropriate response data (such as failing to provide a numerical response when asked). This left 93 viable data sets. To avoid further risk of bias responses on the online form were made mandatory before participants could proceed to submit their responses. Therefore, all response field were made compulsory, although no further controls could be exercised over participants failing to interpret explicit instructions regarding inclusion criteria.

2.2 Measures

Perception of Prevalence of Aggression Scale (POPAS-abbreviated version; Jonker, et al 2008)

Jonker et al (2008) condensed the original 18-item POPAS into an abbreviated version of the scale. This involved collapsing certain items on the scale, such as collapsing "mild physical violence" and "severe physical violence" into one item which constituted "physical violence". These adaptations resulted in a 12-item version of the scale. The abbreviated version of the POPAS (Jonker et al, 2008) contains descriptions of the following types of aggression and violence:

1. Non-threatening verbal aggression

2. Threatening verbal aggression

3. Humiliating aggressive behaviour

4. Provocative aggressive behaviour

5. Passive aggressive behaviour

6. Splitting aggressive behaviour

7. Threatening physical aggression

8. Destructive aggressive behaviour

9. Physical violence

10. Violence against self

11. Suicide attempts

12. Sexual intimidation/harassment

Participants were asked to rate their experience using one of the following 'Likert-style' criteria: 'never', 'occasionally', 'sometimes', 'often', or 'frequently' to determine how frequently they experienced the above types of aggression and violence in the past year. The second part of each item asked respondents to estimate the number of times they have been confronted with that particular type of aggression in the past year. Jonker et al (2008) reported "good internal consistency" of the abbreviated version and reported a Cronbach's alpha of 0.80. The POPAS was used in the current study to provide detailed and standardised definitions of a range of types of aggressive and violent experiences. This abbreviated version of the original POPAS (Oud, 2001) was used as containing the most relevant items with respect to the aims of the current study.

Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1996)

The IES-R (Weiss & Marmar, 1996) comprises of 22 statements which describe a range of difficulties people may present with after a stressful life event. This event based tool was used in order for participants think about a specific event, as opposed to general ongoing experiences, which was felt would be easier for participants to consider their experiences from a more concrete point of reference.

Participants were asked to consider each item in turn and indicate how distressing each difficulty has been for them during the past seven days with respect to a specific problem (in the case of this study, aggression and violence was indicated as the stressful event participants should have in mind). Participants rated their experiences over the past seven days (participant self-assessed time frame) against the following criteria: 0=not at all (bothered by the described difficulty), 1= a little bit (bothered by the described difficulty), 2=moderately (bothered by the described difficulty), 3=quite a bit (bothered by the described difficulty), 4=extremely (bothered by the described difficulty). Examples of difficulties presented were: Item 1 "Any reminder brought back feelings about it"' Item 8 "I stayed away from reminders of it"; Item 13 "My feelings about it were kind of numb". Over the 22 items, there are three subscales comprising of Intrusion, Avoidance, and Hyperarousal, of which scores in these domains can range from zero to four (the higher the score the more dominant the problems in the respective subscale). Studies exploring psychometric properties of the scale report a high internal consistency, with a Cronbach's alpha of 0.96 (Creamer, Bell & Failla, 2003)

Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003)

The CD-RISC (Connor & Davidson, 2003) is a 25-item scale which assesses resilience based on a five point Likert-style scale. Participants are presented with 25 statements and they must indicate how much they agree with each statement as they apply to them over the past month. Responses range from 'not true at all (0)' to 'true nearly all the time (4)'. Higher scores on the scale reflect a greater level of self-reported resilience. According to Connor and Davidson (2003) the scale exhibits validity relative to other measures of stress and hardiness, as well as reflecting different levels of resilience in populations thought to be distinct from one another in their levels of resilience. Factor analysis of the CD-RISC, as highlighted by Connor and Davidson (2003), revealed a five factor structure as follows:

- Factor 1: personal competence, high standards and tenacity
- Factor 2: trust in one's instincts, tolerance of negative affect, strengthening effects of stress
- Factor 3: positive acceptance of change, secure relationships
- Factor 4: personal control
- Factor 5: spiritual influences

Connor and Davidson (2003) report a Cronbach's alpha of 0.89 and also a high level of test-retest reliability. Similarly, Davidson and Connor (2016, unpublished) cite a number of studies detailing adequate reliability and validity of the scale. For example, in two samples Ito et al (2009) found good test-retest reliability of 0.94 and 0.83 and good internal consistency (Cronbach's alpha reported at 0.94 and 0.90).

PSS-10 (Perceived Stress Scale-10 item version; Cohen, 1983)

The PSS-10 (Cohen, 1983) is a 10 item self-report scale designed to measure the degree to which situations in a person's life are appraised as stressful. According to Cohen (1983) the scale items were designed to consider how unpredictable, uncontrollable and overloaded participants find their lives. Items in the PPS-10 ask general, non-content specific and easy to understand questions about thoughts and feelings over the past month. Responses were presented in the following Likert-style manner for each of the 10 items: 0=never, 1=almost never, 2=sometimes, 3=fairly often, 4=very often. Lee (2012) reports the PSS-10 has established psychometric properties; Cronbach's alpha of the PSS-10 was calculated at >.70 in all 12 studies included in their review.

2.3 Procedure

Data were collected by means of an online survey. The rationale for using online methods of data collection were in efforts to reduce bias

as a result of research influences (to reduce issues associated with social desirability response bias, and time pressures, for example), and to maintain participant's condition of interest. These advantages were considered to outweigh disadvantages of online studies, such as lack of direct oversight of participant wellbeing and engagement, and implementing robust levels of control around factors such as physical environment and study conditions (as discussed in guidance provided by the British Psychological Society (BPS; 2017)).

A global email and intranet advert gave participants the opportunity to follow an online link to the survey within the advertisement (see Appendix J). After participants followed the online link, they were redirected to the study. Figure 1 depicts the stages participants completed as they navigated the online survey.

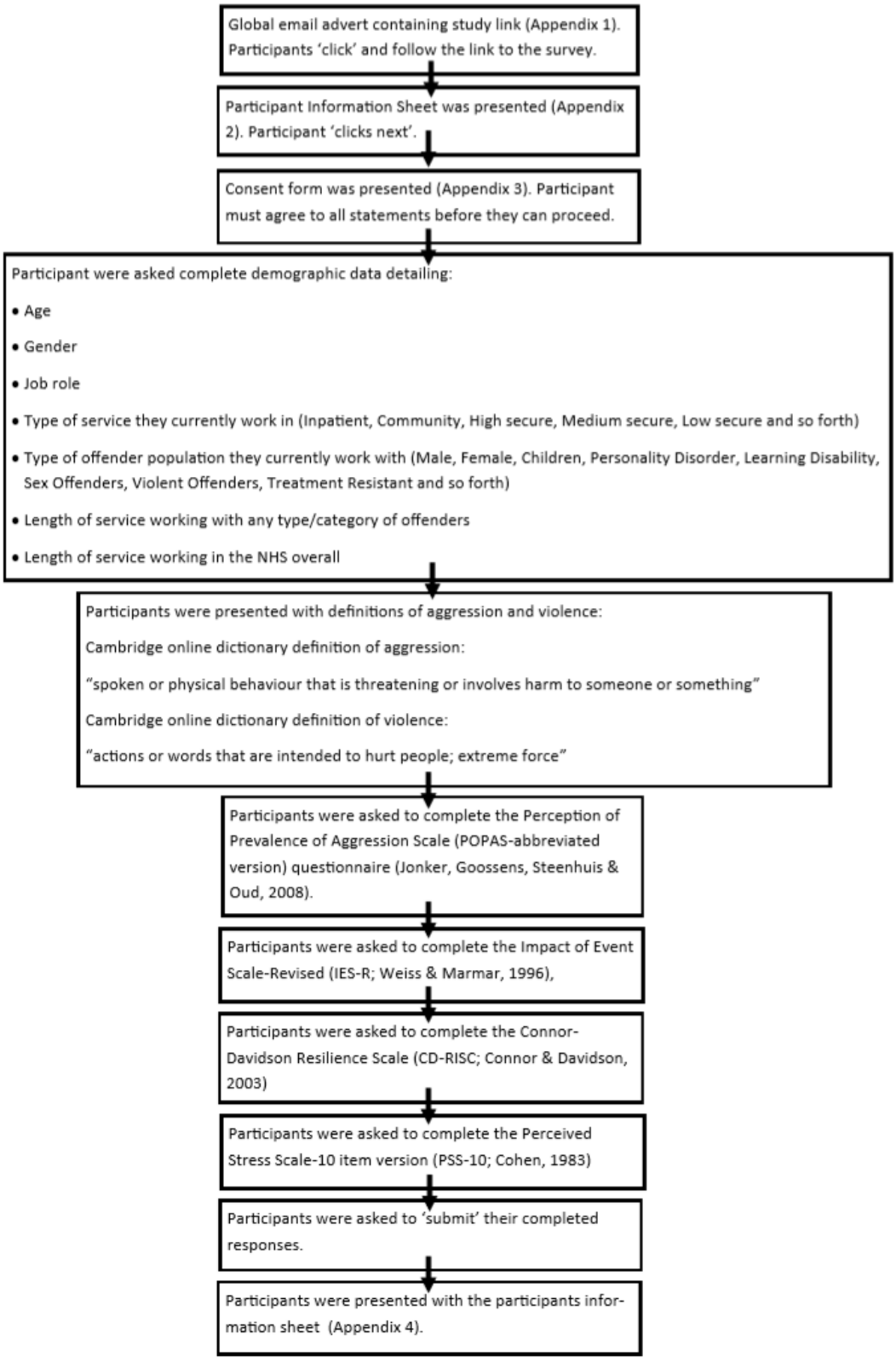


Figure 1: Flowchart of study procedure

2.4 Ethics

This study was sponsored by the University of Nottingham (Sponsor protocol reference: 17062); ethical approval was sought and granted by the University of Nottingham School of Medicine ethics committee (Ethics committee reference: 112-1709). Approval was also granted by the Health Research Authority (HRA) following submission through the Integrated Research Application System (IRAS; IRAS Project reference: 224887), as was local trust research departmental approval. After such approvals were granted the study commenced.

As this was an 'opt-in' approach to recruitment this demonstrated proof that participants had the condition of interest, and which also reduced any risk of researcher bias and eliminate risk of coercion (as ensured by use of an online survey tool). Participants were asked to complete questionnaires about their experiences of aggression and violence in the context of the workplace. This could potentially be sensitive in reference to previous serious and/or traumatic experiences. However, participants were not asked to directly discuss or recall their own specific experiences (as outlined in the Participant Information Sheet – see Appendix K) as Likert-style responses on the questionnaire were fixed; free-text responses were also limited. Also, as staff were already working in services, it was expected that they would already be exposed to aggression and violence due to the client group they have chosen to work with (offenders) and therefore the study did not expose individuals to situations other than what they would experience whilst at work or in everyday life.

In the case of any adverse events, a participant debrief sheet was provided if participants wished to seek further advice or assistance. The researcher's own contact details were also provided with additional contact details for seeking further support of local services (two debrief sheets were provided detailing specific services in each locality). Personal or sensitive information was not expected to be disclosed due to the lack of opportunity participants were presented with, as responses were fixed and a pre-defined range of responses

was specified. Hence, it was not possible for participants to disclose personal or sensitive information.

Anonymity and confidentiality of participants was maintained as no personal information or data was collected which could potentially identify an individual.

3. Results

The data were checked for discrepancies, missing values and anomalous data. This was completed upon importing the data from the online study platform, and each case was checked in the SPSS data file. This process revealed that a number of respondents did not fit inclusion criteria as they were not healthcare members of staff. Discrepancies were also highlighted by ensuring data fitted numerical parameters with values not exceeding a certain length, which revealed one participant had provided non-numerical responses when asked. Six cases in total were screened out (as discussed in Section 2.1) and the remaining 93 cases proceeded for further analysis. Table 4 shows a summary of the mean scores the sample attained on each of the given scales.

Table 4: Summary of participants' mean scores for each scale

Scale	Mean sample score	Explanation	Percentage of sample indicating clinical concerns
PSS-10	17.1	Participants overall experienced a moderate level of stress (individual scores on the PSS-10 range from 0-40, with higher scores indicating higher perceived stress; Cohen, 1983).	3.75% scored above 30* indicating a high level perceived stress
IES-R	13.1	Participants were negatively impacted by their experiences, but Post-traumatic Stress Disorder (PTSD) was not a clinical concern overall (individual scores on the scale range from 0-88; scores that exceed 24 can be indicative that PTSD is a clinical concern and individuals may experience at least some symptomology; Weiss, 2007)	19.9% scored above 24 indicating a clinical concern for PTSD
CD-RISC	68.5	The sample had a moderate-high level of resilience (individual scores on the CD-RISC range from 0-100, with higher scores reflecting greater resilience; Davidson and Connor, 2016).	0% scored below 25** indicating a low resilience score

*Indicative of the upper quartile of total scores

**Indicative of the lower quartile of total scores

The mean number of violent incidents each person experienced in the population over the past year was 37.4, but the average total number of violent incidents experienced by each person in the whole population over the last year was 448.9.

Exploration of the reliability of the PSS-10, IES-R, CD-RISC and POPAS was undertaken. Cronbach's Alpha for the each of the scales were:

- PSS-10 = .860
- IES-R = .969
- CD-RISC = .897
- POPAS Mean Number of Violent Incidents = .911

Such results indicate that each of the measures used had good to excellent internal consistency and adequate reliability (consistent with recommendations, for example as cited by Tavakol & Dennick, 2011).

Assumptions of linearity were explored which revealed that the data met this assumption. Further exploration of assumptions revealed that: PSS-10 scores did not significantly deviate from a normal distribution, $D(93)=.064$, $p=.200$; IES-R scores significantly deviated from a normal distribution, $D(93)=.229$, $p=.000$; CD-RISC scores did not significantly deviate from a normal distribution, $D(93)=.073$, $p=.200$; and the Mean Number of Violent Incidents significantly deviated from a normal distribution, $D(92)=.284$, $p=.000$ (this was completed with the Kruskal-Wallis test). The assumption of independence of residuals was also explored which revealed a Durbin-Watson score of 1.923, indicating the residuals are uncorrelated and the assumption of independence was met. Field (2018) indicates that as a rule of thumb a value of 2 means residuals are uncorrelated. Further exploration of homogeneity of variance using the Levene's Test was not considered appropriate as group sizes on each of the variables were equal, making tests of this assumption redundant (as cited in Field, 2018, p259). Test assumptions were further explored with revealed that the PSS and CD-RISC scores for the sample were

normally distributed but IES-R scores and Mean Number of Violent Incidents were not normally distributed (both of which were positively skewed and platykurtic).

As two out of the four variables were significantly skewed, the IES-R and mean number of violent incidents, a robust method of analysis was used. Transformation of data was not considered appropriate due to potential loss of data in applying a constant to the data and potential changes to the hypotheses and constructs being tested (as discussed in Field, 2018). Other alternative methods such as data trimming and winsorizing are also not suitable due to potential loss valuable data which could affect potential relationships. Therefore, a bootstrapped (confident intervals) multiple regression was considered to be the most appropriate method in preventing loss of data and in being robust to violations of normality, as this does not rely on the assumption of normally distributed data (all other assumptions were met).

A bootstrapped multiple regression was conducted to address the aims, research questions and hypotheses outlined above. This method was used to predict the impact of experiencing aggression and violence (IES-R), using the predictors of resilience (CD-RISC), perceived stress (PSS-10) and the experience of aggression and violence (using the POPAS). Demographic variables such as participant age, gender, length of NHS service, and length of time working with offenders/in forensic services were controlled for as being entered into the first stage of the model. The three independent variables (resilience, perceived stress and experience of aggression and violent) were entered into the main analysis. The forced entry method of data entry was used to enter all predictors into the model simultaneously. The rationale for this was to avoid bias as a result of assigning importance to one variable over another in a hierarchical manner. Bootstrap sample specifications were set at a number of 5000, based on recommendations by Hayes (2009), and Preacher and Hayes (2008). Similarly, Efron (1984) calculated that a rough minimum of 1000 should be used to compute the necessary intervals.

As two of the variables violated assumptions of normality, it was felt 5000 iterations would be adequate to compute necessary intervals with the current dataset to minimise sample variance in the estimates.

Multicollinearity was not considered a cause for concern as none of the predictors appeared to correlate too highly with one another (as Field, 2018, recommends $r<0.9$). Similarly, all VIF values fell below 10 and the average VIF score for the second model containing all predictors was 2.27 (as recommended by Field, 2018).

Interpretation of the data revealed that the impact of the event and the experience of aggression and violence were significantly correlated ($r=.560$, $p=.000$), indicating the higher the mean number of aggressive and violence incidents experienced the higher the overall impact. Impact of the event and resilience were found to be negatively related, but the relationship was not significant ($r=-.113$, $p=.141$), indicating resilience and impact of the experience of aggression and violence were not related. With respect to impact of the event and perceived stress, these factors were found to be positively and significantly related ($r=.611$, $p=.000$), indicating the higher the overall impact, the higher the overall perceived stress. Data indicated that perceived stress and impact of the event were the most strongly related of all factors. Table 5 summarises these correlations.

Table 6 shows correlations between the impact of aggressive and violent incidents, age, gender, years working with offenders and years working in the NHS. As can be seen in Table 6 impact of event was not significantly correlated to any of these variables, although some of the variables did significantly correlate with each other, such as age and years working with offenders ($r=.622$, $p=.000$), and age and years working in the NHS ($r=.663$, $p=.000$).

Table 5: Summary of correlations between impact of aggressive and violent incidents, experience of aggression and violence, resilience and perceived stress (N=93)

		Impact of Event (IES score)	Experience of aggression and violence (POPAS score)	Resilience (CD-RISC score)	Perceived Stress (PSS score)
Impact of Event (IES score)	Pearson Correlation	1.00	.560	-.113	.611
	Sig. (1-tailed)	-	.000	.141	.000
Experience of aggression and violence (POPAS score)	Pearson Correlation	.560	1.00	-.226	.531
	Sig. (1-tailed)	.000	-	.015	.000
Resilience (CD-RISC score)	Pearson Correlation	-.113	-.226	1.00	-.412
	Sig. (1-tailed)	.141	.015	-	.000
Perceived Stress (PSS score)	Pearson Correlation	.611	.531	-.412	1.00
	Sig. (1-tailed)	.000	.000	.000	-

Table 6: Summary of correlations between impact of aggressive and violent incidents, age, gender, years working with offenders and years working in the NHS (N=93)

		Impact of Event (IES score)	Age	Gender	Years working with offenders	Years working in the NHS
Impact of Event (IES score)	Pearson Correlation	1.00	.084	-.225	-.155	-.125
	Sig. (1-tailed)	-	.211	.015	.068	.116
Age	Pearson Correlation	.084	1.00	-.300	.622	.663
	Sig. (1-tailed)	.221	-	.002	.000	.000
Gender	Pearson Correlation	-.225	-.300	1.00	-.230	-.176
	Sig. (1-tailed)	.015	.002	-	.013	.045
Years working with offenders	Pearson Correlation	-.155	.622	-.230	1.00	.848
	Sig. (1-tailed)	.068	.000	.013	-	.000
Years working in the NHS	Pearson Correlation	-.125	.663	-.176	.848	1.00
	Sig. (1-tailed)	.116	.000	.045	.000	-

A bootstrapped Durbin-Watson score of 1.906 was found, indicating that the residual terms were uncorrelated and the assumption of independent errors was not violated (Field, 2018, notes as "as a conservative rule of thumb, values less than 1 or greater than 3 are cause for concern" page 387).

With respect to the model summary, the first model applied (containing demographic variables only) accounted for 13% of the variability in the outcome of the impact of aggression and violence (R^2 = .130). In the second model (containing demographic variables, perceived stress, resilience and the experience of aggression and violence) R^2 = .598, indicating that all predictors combined explained 59% of proportion of variance explained by the model on the impact of aggression and violence. The R^2 change statistic in the second model (containing all predictor variables) gave rise to a significant F change statistic of 32.957 (p=.000), which was an increase from the first model (F change score of 3.298, p=0.14) indicating that the model fit improved as predictors were added to the second model. The model summary of both models is shown in Table 7.

Table 7: Model summary showing fit of linear models to the data

Model*	R	R^2	Adjusted R^2	Standard error of the estimate	R^2 change	F change	Significance of F change
1**	.361	.130	.091	16.881	.130	3.298	.014
2***	.773	.598	.565	11.679	.468	32.857	.000

* Dependant variable: Impact of experiencing aggression and violence

** Predictors: Age, Gender, Years working in the NHS, Years working with offenders (demographic variables)

*** Predictors: demographic variables (as above), Perceived stress (PPS), Resilience (CD-RISC), Experience of violence (mean number of violent incidents, as measured by the POPAS)

Results of the analysis found that in the first model F=3.298, p=.014, compared to the second model where F=18.062, p=.000. This indicated that both models containing all predictors significantly improved the ability to predict the outcome variable compared to not fitting the model (p<.05). Results of the second model indicate that as a result of applying these three predictors to the model this significantly improved the ability to predict the impact of aggression and violence. The F-test in both models therefore informs us that the model was a significant fit to the data overall, but this fit improved in the second model. These results are shown in Table 8.

Table 8: Summary statistics showing quality of the model in predicting the outcome

Model*		Sum of Squares	Df	Mean Square	F	Sig.
1**	Regression	3760.085	4	940.021	3.298	.014
	Residual	25079.097	88	284.990		
	Total	28839.183	92			
2***	Regression	17245.514	7	2463.645	18.062	.000
	Residual	11593.669	85	136.396		
	Total	28839.183	92			

* Dependant variable: Impact of experiencing aggression and violence

** Predictors: Age, Gender, Years working in the NHS, Years working with offenders (demographic variables)

*** Predictors: demographic variables (as above), Perceived stress (PPS), Resilience (CD-RISC), Experience of violence (mean number of violent incidents, as measured by the POPAS)

Interpretation of the model parameters indicated that the coefficients in the second model (in which all predictors were included) found that of all predictors perceived stress was found to be the best predictor

of the impact of aggression and violence (b=1.531). The experience of aggression and violence (as depicted by the mean number of incidents experienced) was found to affect the outcome, but to a lesser degree (b=.067). Correlational data (as shown in Table 5) also indicated that the more aggressive and violent incidents experienced, the higher the impact. Resilience was found to affect the outcome of the impact of aggression and violence (b=.356); correlational data (as shown in Table 5) shows that the lower the resilience the higher the overall impact of aggression and violence.

Overall results indicate that for this model perceived stress, $t(85)=6.423$, $p<.05$, resilience $t(85)=2.952$, $p<.05$ and the experience of aggression and violence (as shown by mean number of incidents) $t(85)=3.008$, $p<.05$, were all significant predictors of the (negative) impact of aggression and violence. From this data it is evident that perceived stress was the biggest predictor, followed by experience of aggression and violence and resilience to a similar degree. This data has been summarised in Table 9 below.

Table 9: Linear model of predictors of the impact of aggression and violence experienced by healthcare staff working with offenders.

				95% confidence interval for B	
Model*	Standardised Beta coefficient	t	Sig	Lower bound	Upper bound
Perceived stress (PSS scores)	.576	6.423	.000	1.057	2.005
Resilience (CD-RISC scores)	.232	2.952	.004	.116	.596
Experience of aggression and violence (mean POPAS score)	.259	3.008	.003	.023	.111

*Predictors: demographic variables (as above), Perceived stress (PPS), Resilience (CD-RISC), Experience of violence (mean number of violent incidents, as measured by the POPAS)

Finally, residuals were checked for evidence of bias. Casewise diagnostic statistics revealed that standard residuals were not considered a cause for concern. Four cases were identified which may have been problematic but additional analysis of cases revealed that none of the cases had a Cook's distance greater than 1 which all fell within expected limits (within parameters as noted in Field, 2018). Thus, post hoc tests revealed that none of the potentially problematic cases had an undue influence on the model.

4. Discussion

In consideration of the initial aims of the study, the overall aim to explore the negative impact in healthcare staff members after experiencing patient aggression and violence in working with offenders was addressed. Similarly, the second aim to explore the presence of resilience and perceived stress in the relationship between experience of inpatient aggression and trauma in staff members working with offenders was also met.

To explore the relationships between the four variables further the results of analysis found that:

1. Healthcare staff members working with offenders were significantly negatively impacted when experiencing aggression and violence in the workplace. It was found that the more aggression and violence experienced, the higher the negative impact on staff. The experience of aggression and violence was found to be a significant predictor of the negative impact of aggression and violence.
2. Resilience was found to have a significant negative impact on scores of aggression and violence; the lower the resilience score the larger the negative impact. Resilience was also found to be a significant predictor of the negative impact of experiencing aggression and violence.
3. The role of perceived stress was significantly and positively related to these findings. In other words, the higher the perceived stress, the higher the negative impact on staff and the more aggression and violence experienced. Perceived stress was the biggest predictor of the negative impact of aggression and violence.

The hypotheses initially put forth were also addressed. The first hypothesis was accepted, as it was hypothesised that healthcare staff members who are directly exposed to experiencing aggression and violence in the workplace would report experiencing a negative impact in working with offenders. The second hypothesis was also

accepted. It was hypothesised that when staff report experiencing aggression and violence in working with offenders there would be a significant difference in staff scores of resilience and perceived stress compared with those not reporting experiencing aggression and violence. Both of these hypotheses were accepted based on the above findings.

In linking these findings to past evidence there appears to be an interesting picture. For example, in support of previous research indicating that healthcare staff experience a high number of aggressive and violent incidents (such as discussed by Winstanley & Whittington, 2004), the current study supported these findings, as the average number of violent incidents each person experienced in the population over the past year was 37. The average total number of violent incidents experienced by individuals in the whole population over the last year was 448.9, which can be perceived to be a high number. Richter and Berger's (2006) findings indicated that a small minority of assaulted employees suffered from PTSD for several months after a patient assault. In this study, results indicated that this was not the case as scores on the IES-R indicated that overall PTSD was not a clinical concern in this population, although participants in the current study were significantly negatively impacted when experiencing aggression and violence. Overall, the sample had a moderate-high level of resilience, as measured by the CD-RISC, supporting hypotheses that this population could be considered particularly resilient, when experiencing a reported moderate level of stress, as reported by participants.

As shown in Table 5, resilience was negatively related to the impact of the aggression and violence, indicating that the higher the resilience the lower the impact of aggression and violence. This is in support of approaches such as the Resilience Portfolio Model proposed by Grych, Hamby and Banyard (2015) which indicate a relationship between the promotion of protective factors, such as resilience, in response to violence (the higher the resilience, the lower the impact). Findings in the current study would appear to support this in being a

significant predictor of the impact of aggression and violence on victims. Factors such as perceived stress were also found to play an expected role (the higher the perceived stress, the higher the impact). This is in similar support of as studies such as Connor and Davidson's (2003) who found that higher levels of resilience corresponded to lower levels of perceived stress vulnerability. Results found within the current study supported these reported findings also. Therefore, it is evident from current analysis that when considering those working in forensic services who are exposed to a high level of aggression and violence, they also have high levels of resilience and perceived stress. Such constructs may hence constitute part of their 'resilience portfolio' which supports them to continue working in high risk environments following periods of adversity.

In consideration of the strengths and limitations of this paper, it is of note that subgroups such as gender, age, type of offender population and length of NHS service were also considered as part of the analysis. Such subgroup data could have the potential to confound results by introduction of subgroup bias, but as a result of including these in the analysis such factors were controlled for. Hence, potential effects and bias within the model were accounted for as much as possible.

A possible limitation of the study was that the study design adopted an opt-in method of participation. It is considered that as participants opted in to participate that self-selection may have created bias, in that those experiencing violence could have been more likely to complete the survey. This may create problems in generalising prevalence estimates within this population. However, in balancing this risk of bias against ethical considerations of active participate recruitment the overall risk of bias was considered to outweigh potential ethical risks. To expand, it was considered that the presence of the researcher in actively recruiting participants may have led to potential participants feeling pressured to complete the survey; this was considered to be problematic particularly in consideration of the potentially sensitive nature of research topic.

Despite this, the aims and research questions set out at the beginning of the study were each addressed, in spite of the fact that further questions remain about the in-depth nature of the relationships explored. Similarly, a strength of the study was that a range of types of participants took part in the study, ensuring generalisability of findings to a range of forensic service professionals. For example, data were collected from staff members from a wide age range, and a range of job roles and service types. Hence, a rich pool of staff data was gathered, which is in contrast to a number of studies which have been limited to data gathered solely from one group, for example such as nursing or emergency department staff (for instance as observed in Ramacciati et al's, 2018, study). A further point of consideration is that clear descriptions of a range of examples of violence and aggression were provided by the POPAS (Jonker et al, 2008). This has the potential to reduce problems and bias introduced by individualised and different conceptualisations of aggression and violence. Hence, a clear point of reference for participants to base their own experiences was provided.

With respect to the measures used, in line with past research as discussed in Section 2.2, the current study found that each tool had good to excellent internal consistency and adequate reliability (consistent with recommendations, for example as cited by Tavakol & Dennick, 2011). Similarly, CD-RISC scale has previously been cross-validated with the PSS and other measures of stress vulnerability (Connor, Davidson & Lee, 2003; Agaibi & Wilson, 2005), indicating the compatibility of these measures with each other in measuring similar yet distinct constructs. Such factors reflect further strengths of the study. However, it is unclear if these measures have been rigorously validated previously with similar groups of staff working with offenders, although the POPAS was developed with psychiatric healthcare staff in mind. It is considered that the CD-RISC in particular requires further exploration with respect to how resilience is constructed within healthcare staff working with

offenders, particularly in relation to its factor structure. Thus, this is an area that the second primary study aims to address.

It is considered that the main implications of such research lie in the application of findings to improvements in staff health and wellbeing. It is evident that further research is needed in this field, but such understanding allows contribution to the development of tools, strategies and frameworks in which to support those effected and to manage the impact of such adverse experiences in the working environment. Such findings related to staff experiences and characteristics have the potential to aid understanding of those outside the field of forensic healthcare services, as well as increasing our understanding of how services can support those who have already been victims of assault.

With respect to the future, it is evident that resilience is a complex phenomenon and that further research is needed, particularly with regard to those who work in roles with a potentially higher than average risk of exposure to aggression and violence. Similarly, it is considered that it may be pertinent to explore subgroup differences pertaining to type of aggression and violence experienced by staff, as well as further exploration of other individual differences and personality characteristics which may influence the impact of experiencing aggression and violence. It is recommended that as well as exploring subgroup data pertaining to differences in staff characteristics (such as age and gender), as well as service types, it may be of academic interest to explore differences between those delivering direct patient care and other staff groups. For example, it may be pertinent to explore service user relationships between those directly delivering patient care, and those delivering indirect services within this context, such as domestic staff, porters, administration and maintenance staff. Past research in this area appears limited, particularly when considering those working in forensic services.

Despite steps made by the current paper to shed light on the multifaceted phenomena of aggression and violence in forensic

healthcare services, questions remain about the nature of this group of this particular group of participants. For example, what characteristics make those working in forensic services more able to tolerate working in such a high risk field? What helps them cope in times of adversity? How do they recover from serious assault? What can we learn from this group of individuals with respect to resilience? Clearly, further research is needed to address such questions in order to enrich our understanding of aggression and violence, so that we may consider ways to lessen the impact of such experiences to the unique group of individuals who support the delivery of complex healthcare services.

PRIMARY STUDY II

An Exploration of the Five-Factor Weight Structure of the CD-RISC Scale with Healthcare Staff Working with Offenders

Abstract

Resilience has become an important construct for understanding why some individuals thrive and others fail in times of adversity. The Resilience Portfolio Model has been used to attempt to explain how victims of violence cope with their experiences; this is the range of facets which comprise an individual's 'Resilience Portfolio' which allows them to thrive in times of adversity. By developing the CD-RISC, Connor and Davidson (2003) proposed a five factor scale of measuring resilience. The current study aimed to explore the factors comprising the CD-RISC with a population of male and female healthcare staff working with offenders. This was in efforts to identify factors comprising their 'Resilience Portfolio'. Following an exploratory factor analysis results indicated that the scale had good internal consistency (Cronbach's Alpha of .897); a total of seven factors were found in the model, which explained 66.57% of the variance in the data, with Factor 1 being the strongest to emerge. The factors reflected constructs comprising resilience in the following manner: Factor 1 (adaptability, personal strength), Factor 2 (belief system), Factor 3 (secure relationships, positive support network), Factor 4 (strong work ethic, persistence, goal attainment), Factor 5 (leadership, humour, clear thinking), Factor 6 (failure resistance), and Factor 7 (control, purpose). Such findings were in contrast to Connor and Davidson's (2003) results and factor structure. Despite methodological concerns and limitations with this study, it is believed that the CD-RISC has not been previously explored with this population. Implications may serve to inform future directions in understanding resilience with similar populations and may help develop strategies for staff to improve their resilience when working with high risk client groups.

1. Introduction

Winstanley and Whittington (2004) highlight that aggression towards healthcare staff is an increasing problem, but as highlighted in the first chapter of this thesis prevalence rates in forensic healthcare services show mixed results. Morrison et al (2002) found that incidents of aggression and violence in a maximum security psychiatric facility were increasing considerably, resulting in serious staff injuries. Such findings appear to be one of many examples of what Meehan, McIntosh and Bergen (2006) describe as a commonly encountered phenomenon in healthcare settings.

Qualitative investigation of forensic healthcare staff experiences of aggression and violence in the course of their work has yielded some interesting findings. For example, Kurtz and Jeffcote (2011) found that staff saw themselves as having a human focus and emphasised the clinical aspects of their role in helping patients. These authors found that healthcare staff working in forensic services were strongly invested in bringing about positive changes in patients' lives and saw the development of relationships with patients, even in the face of difficulty, as "pivotal". Interesting Kurtz and Jeffcote (2011) also found that occasions when staff succeeded in building rapport with patients who were initially hostile were described with pride. Such findings would indicate that this population of healthcare staff have some clear internal mechanisms in place which allow them to successfully work with forensic populations. Taubman-Ben-Ari and Weintroub (2008) highlighted that those who choose to work in an environment in which they consistently encounter stressful situations probably have appropriate coping skills and they perceive their work as less stressful. Such findings would indicate that those working in environments whereby they are exposed to aggression and violence have mechanisms in place which allow them to thrive in times of adversity. In support of such findings Itzhaki et al (2015) found that mental health nurses developed resilience when exposed to violence in the workplace, but noted that resilience of mental health nurses has rarely been investigated. Similarly, as highlighted in the previous chapter of this thesis questions remain about what makes this

population in particular resilient to experiences of aggression and violence.

According to Ledesma (2014) "resilience is defined as the ability to bounce back from adversity, frustration, and misfortune and is essential for the effective leader". Similarly, Connor and Davidson (2003) describe how "resilience embodies the personal qualities that enable one to thrive in the face of adversity". Survival, recovery, and thriving are concepts associated with resilience and describe the stage at which a person may be during or after facing adversity (Ledesma, 2014).

The Resilience Portfolio is one such model which is used to reference the range of factors of resilience which victims of violence use to cope with their experiences. Grych, Hamby and Banyard (2015) reportedly developed this conceptual framework which integrated ideas from theory and research to provide a holistic understanding of the protective factors that promote resilience in those exposed to violence. The Resilience Portfolio Model was described by these authors as a strengths-based framework which proposes that the diversity and density of resources and assets available to individuals (their 'resilience portfolio') shapes their responses to violence. Thus, the Resilience Portfolio Model may help us to understand and explain how some individuals cope better when exposed to aggression and violence. This model may therefore explain how some individuals who are more vulnerable to exposure to aggression and violence, such as healthcare staff working with offenders, may cope with their experiences. However, with this population there appears to be little research to explain why some staff are more resilient than others, and what characteristics comprise the 'resilience portfolio' of such individuals. It is therefore unclear what specific components of resilience make up a potentially more robust 'resilience portfolio' that allows such individuals to continue working in high risk environments.

Ledesma (2014) discussed that existing literature suggests a number of variables characterize resilience and thriving, including: hardiness,

positive self-esteem, perseverance, strong coping skills, adaptability, risk-taking, a sense of coherence, self-efficacy, optimism, strong social resources, low fear of failure, determination, and a high tolerance of uncertainty. Similarly, Agaibi and Wilson (2005) summarised that "post-traumatic resilience refers to a complex repertoire of behavioural tendencies (and is) associated with a cluster of personality traits linked to extraversion, high self-esteem, assertiveness, hardiness, internal locus of control, and cognitive feedback." They also note that "as an independent variable, resilience has been conceptualized as a personality characteristic (e.g. hardiness, locus of control) and in terms of ego processes" and that "posttraumatic resilience is a form of behavioural adaptation to situational stress and a style of personality functioning". In Connor and Davidson's (2003) initial paper outlining the development of their measure of resilience, the CD-RISC, they found that from existing research their scale reflected five different factors that embody resilience:

- Factor 1: personal competence, high standards and tenacity
- Factor 2: trust in one's instincts, tolerance of negative affect, strengthening effects of stress
- Factor 3: positive acceptance of change, secure relationships
- Factor 4: control
- Factor 5: spiritual influences

Connor and Davidson (2003) describe how the scale was developed using content from a number of sources. This appears largely to be the work of Kobasa (1979) exploring hardiness, including items reflecting control, commitment, and change viewed as challenge; and the work of Rutter (1985) exploring facets such as action orientation, strong self-esteem/confidence, and strengthening effects of stress. Such a range of facets indicates that resilience is complex. Previous research has indicated the role of resilience appears to be a mediating factor on the impact of traumatic events, such as aggression and violent events in the workplace. For example, Klinoff (2017) found that resilience significantly affects the relationship between hope,

optimism, and social support and job burnout in correctional officers, a previously neglected population with respect to existing literature. Klinoff (2017) highlighted that past studies have demonstrated a positive relationship between these personal strengths and resilience, and the mediating role of resilience in reducing burnout. Klinoff (2017) highlighted that their findings were consistent with a growing body of research demonstrating the role of resilience as a mediating mechanism for protecting individuals against burnout and promoting positive psychological outcomes.

In developing the scale Connor and Davidson (2003) explored six separate groups of individuals: a general population sample, primary care outpatients, psychiatric outpatients in private practice, subjects with generalised anxiety disorder (GAD), and subjects in two clinical trials of PTSD. Connor and Davidson (2003) found that the strongest of the five factors which emerged from the data appeared to be the aspects of persistence/tenacity and a strong sense of self-efficacy. Yu et al (2011) were able to replicate the five factor structure of the Chinese version of the CD-RISC in a sample of Chinese students. However, in other factor analyses of these five factors on the CD-RISC there appears to be mixed results. For example, in their factor analysis of the CD-RISC Lamond et al (2008) found only four factors to emerge from their data exploring resilience in community-dwelling older women. Similarly, Karaırmak's (2010) exploratory factor analysis yielded a three-factor solution for Turkish disaster survivors; the factors were labelled as tenacity and personal competence, tolerance of negative affect and tendency toward spirituality. In a sample of South African adolescents Jorgensen and Seedat (2011) failed to verify the original five factor model of Connor & Davidson, and suggested a possible three or two factor model in their sample. Khoshouei (2009) found a four factor model structure using the Persian version of the CD-RISC with a sample of Iranian students. Similarly, Green et al (2014) describe how their findings derived from exploratory factor analysis did not support the five-factor analytic structure. Green et al (2014) discussed how parallel analyses

indicated a two-factor structural model, composed of adaptability and self-efficacy-themed items. However, only the adaptability-themed factor was found to be consistent with Green et al's (2014) view of resilience - a factor of protection against the development of mental health problems following trauma exposure (Green et al, 2014). Such evidence would indicate possible differences between populations with distinct characteristics, and the possible presence of other mediating factors.

Notably, CD-RISC scale was also cross-validated in a study by Connor, Davidson and Lee (2003) with the Perceived Stress Scale (measuring the degree to which situations in one's life appear stressful, Cohen, Kamarck, and Mermelstein, 1994) and other measures of stress vulnerability and another hardiness measure (Agaibi & Wilson, 2005). This suggests that the perception of stress may also play a mediating role in the psychological effects of trauma as an individual characteristic. This is supported by studies such as Søndenaa et al (2015) who highlight that the role of stress appears to have a mediating role in this relationship, in that the impact of serious events resulted in a higher level of stress and burnout symptoms in staff working in a care setting. However, it is apparent that further exploration of the components of this resilience scale is needed. It is unclear if the previously identified factors by the CD-RISC are also apparent within a population of healthcare staff working with offenders, as to the best of our knowledge the CD-RISC has not been comprehensively explored with this group.

1.1 Aims and objectives

In light of existing research literature the aim of the study was to explore potential differences in the factors comprising resilience in the CD-RISC in the sample of healthcare staff working with offenders. With this aim in mind a research question was identified, which asked: what are the differences in the weighting of the factors of resilience in healthcare staff experiencing aggression and violence in working with offenders? It was hypothesised that there would be a significant

difference in the weighting of the resilience factors in the sample of healthcare staff working with offenders. This was based on research by Connor and Davidson (2003) who highlighted in their existing study that the strongest of their five factors appeared to be the aspects of persistence/tenacity and a strong sense of self-efficacy, in a general population sample. This was alongside the premise that healthcare staff working with offenders could differ in their levels of resilience in being exposed to aggression and violence in the workplace.

2. Method

2.1 Participants, Procedure and Ethics

For a discussion of the participants and procedure used in this study, and a discussion of the ethical considerations, please refer to Section 2 of Chapter Three (Primary Study I) of this thesis.

2.2 Measure

CD-RISC (Connor-Davidson Resilience Scale; Connor & Davidson, 2003)

The CD-RISC (Connor & Davidson, 2003) is a 25-item scale which assesses resilience based on a five point Likert-style scale. Higher scores on the scale reflect a greater level of self-reported resilience. Factor analysis of the CD-RISC, as highlighted by Connor and Davidson (2003), revealed a five factor structure in a general population sample as follows:

- Factor 1: personal competence, high standards and tenacity
- Factor 2: trust in one's instincts, tolerance of negative affect, strengthening effects of stress
- Factor 3: positive acceptance of change, secure relationships
- Factor 4: personal control
- Factor 5: spiritual influences

According to Connor and Davidson (2003) the scale exhibits validity comparative to other measures of stress and hardiness, and reflects different levels of resilience in populations thought to be distinct from one another in their levels of resilience.

Connor and Davidson (2003) reported a high level of test-retest reliability and a Cronbach's alpha of 0.89. Davidson and Connor (2016, unpublished) also cited a number of studies detailing similar levels of reliability and validity of the scale. For example, in two samples Ito et al (2009) found good internal consistency (Cronbach's alpha reported at 0.94 and 0.90) and a good level of test-retest reliability of 0.94 and 0.83 in a sample of Japanese students. Notario-Pacheco et al, 2014) also found a Cronbach's alpha of 0.88 in a sample of Spanish patients with fibromyalgia. Similar results have been found with Indian students (e.g. Singh and Yu, 2010; Cronbach's alpha of 0.89) and Chinese adolescents (e.g. Yu et al, 2011; Cronbach's alpha of 0.89). With respect to validation of the CD-RISC with mental health care staff Itzhaki et al (2015) found a Cronbach's alpha of 0.89 also indicating adequate internal consistency with the population. However, to the best of current knowledge the CD-RISC does not appear to have been validated specifically with forensic healthcare staff.

3. Results

Following the collection of data, the data were checked for any anomalous results and missing values. As a result of data screening six cases were removed as not meeting inclusion criteria (only complete numerical data sets could be included) and 93 cases were able to proceed for further analysis.

Descriptive analysis of data highlighted that the mean age of the sample was 40 years of age, with a total sample age range of 20 to 62 years. The mean number of years working in the NHS was 11.7 years, but the range was less than one year (.10) to 43 years (please see the Chapter Three Section 2 of this thesis for a tabular breakdown of these scores).

The mean number of years working with offenders was reported at 10.7 years, with a range of .10 and 43 years. However, the most common number of years working with offenders was found to be 8 years. Eight participants (8.6% of the sample) had worked with offenders in services for a year or less. 43 participants had worked with offenders between two and ten years (46.2% of the sample); 29 participants had worked with offenders between 11 and 20 years (31.2% of the sample); 11 participants had worked with offenders between 21 and 30 years (11.8% of the sample); and two participants had worked with offenders for 30 years or more.

64 females took part in the study which comprised 68.8% of the sample; 29 males took part comprising 31.2% of the sample. Please see Section 2 of Chapter Three of this thesis for a summary of participant demographic characteristics, a breakdown of the type of service participants worked in, and a summary of participants' job roles.

The mean CD-RISC score for the sample was found to be 68.5, indicating that overall the sample had a moderate-high level of resilience (individual scores on the CD-RISC range from 0-100, with higher scores reflecting greater resilience; Davidson & Connor, 2016). Self-reported scores of resilience across the sample ranged from 41 to 100; the most common resilience score was 73. Table 1 shows a breakdown of resilience scores across the sample.

Table 1: Breakdown of resilience scores across the sample

		Frequency	Percent	Cumulative Percent
Resilience score	41.00	1	1.1	1.1
	42.00	1	1.1	2.2
	44.00	1	1.1	3.2
	46.00	2	2.2	5.4
	49.00	1	1.1	6.5
	53.00	4	4.3	10.8
	54.00	2	2.2	12.9
	55.00	1	1.1	14.0
	57.00	3	3.2	17.2
	58.00	2	2.2	19.4
	59.00	1	1.1	20.4
	60.00	1	1.1	21.5
	61.00	3	3.2	24.7
	62.00	4	4.3	29.0
	63.00	2	2.2	31.2
	64.00	1	1.1	32.3
	65.00	4	4.3	36.6
	66.00	2	2.2	38.7
	67.00	4	4.3	43.0
	68.00	5	5.4	48.4

	69.00	4	4.3	52.7
	70.00	2	2.2	54.8
	71.00	4	4.3	59.1
	72.00	1	1.1	60.2
	73.00	9	9.7	69.9
	74.00	2	2.2	72.0
	75.00	6	6.5	78.5
	77.00	3	3.2	81.7
	78.00	1	1.1	82.8
	79.00	3	3.2	86.0
	81.00	2	2.2	88.2
	82.00	1	1.1	89.2
	83.00	2	2.2	91.4
	85.00	1	1.1	92.5
	87.00	1	1.1	93.5
	88.00	1	1.1	94.6
	89.00	3	3.2	97.8
	94.00	1	1.1	98.9
	100.00	1	1.1	100.0
	Total	93	100.0	100.0

Exploration of the reported average number of violent incidents each person experienced revealed a mean of 37 incidents over the past

year. However, the total number of violent incidents experienced by individuals across the whole sample over the past year was 448.9.

Reliability of the CD-RISC overall was also explored within the sample which revealed a Cronbach's Alpha of .897. This indicated that the CD-RISC had a good to excellent internal consistency and adequate reliability, consistent with recommendations provided by Tavakol and Dennick (2011), and comparable with other populations (as discussed in Section 2.2).

In order to explore the presence of latent variables an Exploratory Factor Analysis (EFA) was conducted. Despite the presence of a specific hypothesis the rationale for this was based on the apparent lack of previous exploration of the CD-RISC with this particular population, hence Confirmatory Factor Analysis (CFA) was not considered the most appropriate method in this study. The presence of a specific hypothesis would indicate that a CFA would need to be completed but it was considered that exploratory analyses would be more appropriate as CD-RISC factor weightings do not appear to have been established with this population. It was considered that a CFA could follow the EFA to confirm initial findings; however, DeCoster (1998) notes that undertaking both CFA and EFA requires use of separate data sets. This was not considered viable in the current study due to issues with the small sample size, as discussed below.

It is of note that the final viable sample size used in this study was deemed to be small (N = 93). This was a particular concern as a number of cases were screened out from the original sample (N = 99) for not being complete and not meeting inclusion criteria. Careful consideration was given to this as correlation coefficients may fluctuate from sample to sample, much more so in small samples, thus creating potential problems with reliability (as discussed by Field, 2018). Existing evidence indicates that a larger sample should be used, although this could not be achieved in the current study having reached saturation point in data collection. This highlighted problems with poor response rates associated with online studies, as

discussed by Fan and Yan (2010). Comrey and Lee (1992) proposed that 100 participants was poor, 200 was considered fair, 300 was good, 500 was very good, and 1000 or more participants was excellent. However, conflicting evidence was found indicating that the current sample would be adequate (although studies found were acknowledged to be much older than those recommending use of large groups). For example, Gorsuch (1983) recommended a sample of 100 participants, and Kline (1979) recommended a ratio of 2 (twice as many subjects as variables; in the case of this study this ratio was 3.72) with a minimum of 100 participants. Similarly, De Winter, Dodou and Wieringa (2009) found from their exploration that EFA can yield reliable results when sample sizes are well below 50 even in the presence of small distortions. Jung and Lee (2011) discussed a third alternative to conduct a factor analysis when sample sizes are small, namely Regularized Exploratory Factor Analysis (REFA). These authors found that REFA may be recommended particularly when sample sizes are small (below 50 cases). However, REFA was not considered appropriate in the current study as the sample (N=93) was above 50 and considered to be substantially closer to the minimum recommended number of cases (of 100) as discussed above.

In light of these issues it was considered appropriate to conduct the EFA with the current dataset and number of cases in order to address the study aims and research questions. An Oblique rotation (direct oblimin) was used in order to rotate the 25 factors whilst keeping them correlated, as it was assumed based on previous research as discussed in Section 1, that items on the scale would be related as components of resilience. Similarly, according to Gerbing and Hamilton (1996) oblique is generally considered more sophisticated.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was found to be .814 providing a good indication that patterns of correlations were relatively compact so the factor analysis would yield distinct and reliable factors (according to guidance by Field, 2018). Bartlett's Test was significant (.000) indicating that the correlation

matrix was significantly different from zero. With respect to multicollinearity the correlation matrix was inspected to detect any variables that correlated highly; none were found indicating that multicollinearity was not a concern. However, on inspection of the determinant value this was found to be 3.919E-6 (0.000003919) which is less than the necessary value of 0.00001 (Field, 2018). If below this necessary value then Field (2018) highlights that items may be too unrelated. Despite this it was not considered appropriate to actively eliminate variables in order to correct for this, based on Connor and Davidson's (2003) inclusion of all items comprising the CD-RISC. As can be seen in Table 2 below, Item 7 does not appear to load onto any factor and hence appears to have been indirectly removed by the model, indicating that this may be the item causing issues with the determinant.

Following analysis a total of seven factors were found in the model, which explained 66.57% of the variance in the data. The scree plot appeared ambiguous and showed inflexions that would justify retaining both seven and three factors (see Figure 1). Seven factors were retained because of Kaiser's criterion on this value (being above 1) and the variable loadings on this number of factors. The seven factors had eigenvalues over Kaiser's criterion of 1; factors below 1 were not extracted. Factor 1 appeared to be the strongest factor with an eigenvalue of 8.11, which explained 32.44% of the cumulative variance whilst the other six factors explained the remaining variance. Factor 2 had an eigenvalue of 1.88; factor 3 was 1.67; factor 4 was 1.44; factor 5 was 1.29; factor 6 was 1.14; and factor 7 was 1.12). Table 2 shows a summary of the factor loadings after rotation.

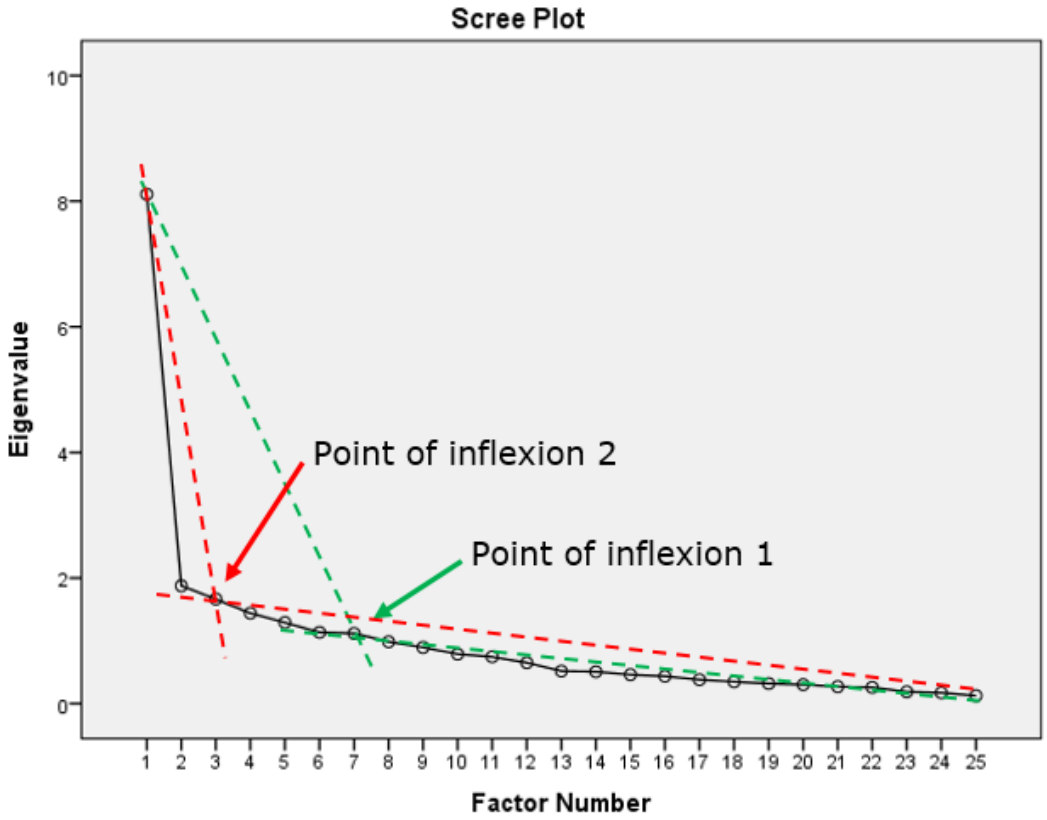


Figure 1: Scree plot showing points of inflexion on factors within the model

Table 2: Summary of factor loadings after rotation

	Factor (Eigenvalue)						
	1 (8.11)	**2** (1.88)	**3** (1.67)	**4** (1.44)	**5** (1.29)	**6** (1.14)	**7** (1.12)
% of variance	*32.44*	*7.51*	*6.67*	*5.76*	*5.17*	*4.55*	*4.48*
Item							
1	**.595**	-.009	.057	.018	-.031	-.042	.021
4	**.583**	.027	.142	.072	.087	-.115	-.228
17	**.507**	.172	-.074	**-.473**	.063	.001	.048
5	**.441**	-.090	.039	-.220	.210	-.020	.005
19	**.386**	.072	.180	.069	.168	-.137	-.257
7	.292	.209	.006	-.085	.228	.233	-.251
9	-.005	**.753**	-.060	-.135	-.088	-.034	.106
3	-.241	**.523**	.094	.167	.103	-.159	-.082
20	.098	**.377**	.040	-.010	-.007	.077	-.012
8	**.303**	**.319**	.121	-.134	.034	-.013	-.185
2	.005	.117	**.827**	.044	-.031	.217	-.098
13	.126	-.012	**.651**	-.132	.016	**-.321**	.003
24	.012	.100	-.006	**-.737**	.037	-.211	-.042
10	-.133	.090	.289	**-.586**	.133	.036	.138
23	.083	-.056	-.048	**-.543**	.124	.012	-.106
25	.038	-.023	.206	**-.484**	-.277	.105	**-.354**

12	.060	.122	-.030	**-.463**	.112	**-.308**	-.101
11	.162	.232	-.040	**-.432**	.198	.178	-.211
15	-.066	.047	-.092	-.060	**.744**	-.080	-.040
18	.043	.008	.098	-.147	**.496**	-.179	-.034
6	.182	-.105	.272	-.006	**.447**	.159	.015
14	**.363**	.010	.016	-.032	**.420**	.106	-.153
16	.289	.088	-.054	-.132	.165	-**.658**	-.132
22	.105	-.064	.066	.031	-.135	-.162	**-.810**
21	-.117	.043	-.006	-.062	.181	.071	**-.639**

Note: factor loadings over 0.3 have been highlighted in bold. Clusters on each factor have been shaded. Item 7 did not appear to load onto any factor.

Further exploration of the item loadings on each factor was undertaken based on the CD-RISC item descriptions and Connor and Davidson's (2003) abbreviated item descriptions. Table 3 shows how each item in the CD-RISC loaded onto each factor, and using Connor and Davidson's (2003) item descriptions, how each factor has been interpreted.

Table 3: Summary and interpretation of item descriptions and item factor loadings

Factor	Collated item descriptions*	Factor summary/ interpretation
1	1. Able to adapt to change 4. Can deal with whatever comes 17. Think of self as strong person 5. Past success gives confidence for new challenge 19. Can handle unpleasant feelings	Adaptability, personal strength
2	9. Things happen for a reason 3. Sometimes fate or God can help 20. Have to act on a hunch 8. Tend to bounce back after illness or hardship	Belief system
3	2. Close and secure relationships 13. Know where to turn for help	Secure relationships, positive support network
4	24. You work to attain your goals 10. Best effort no matter what 23. I like challenges 25. Pride in your achievements 12. When things look hopeless, I don't give up 11. You can achieve your goals	Strong work ethic, persistence, goal attainment

5	15. Prefer to take the lead in problem solving 18. Make unpopular or difficult decisions 6. See the humorous side of things 14. Under pressure, focus and think clearly	Leadership, humour, clear thinking
6	16. Not easily discouraged by failure	Failure resistance
7	22. In control of your life 21. Strong sense of purpose	Control, purpose

*Based on Connor & Davidson's (2003) descriptors

As can be seen in Table 3, five items loaded onto Factor 1. Further inspection of each item description indicated that this factor appeared to reflect adaptability and personal strength in dealing with whatever comes and being able to handle unpleasant feelings. Four items loaded onto Factor 2 which appeared to reflect a belief system in how individuals understand, explain and cope with the things that happen. Factor 2 could be considered similar to Connor and Davidson's (2003) Factor 5 indicating 'spiritual influences'. Factor 3 comprised of two items that appeared to represent secure relationships and a positive support network. Six items loaded onto Factor 4, which appeared to reflect having a strong work ethic and a level of persistence in achieving personal goals. Factor 5 comprised of four items which appeared to reflect leadership (related to a sense of control), humour and clear thinking with respect to how things are perceived and dealt with. Factor 6 comprised of only one item which appeared to represent a resistance to failure and a sense of 'not giving up'. Finally, Factor 7 included two items which appeared to reflect having a sense of control over one's life alongside a sense of purpose.

Following this, comparison between Connor and Davidson's (2003) item structure was undertaken. Table 4 shows a comparison of

Connor and Davidson's (2003) findings in their sample of six groups of participants (a general population sample, primary care outpatients, psychiatric outpatients in private practice, subjects with generalised anxiety disorder (GAD), subjects in two clinical trials of PTSD) compared to findings in the current study with a sample of healthcare staff working with offenders. A detailed breakdown of the comparisons between the current study and Connor and Davidson's (2003) factor loadings and each item is shown in Table 5.

Table 4: Comparison of Connor and *Davidson's (2003) factor and item loadings, and current study factor and item loadings.*

Connor & Davidson's (2003) item description	**Items**	**Current study item description**	**Items**
Factor 1: personal competence, high standards and tenacity	24, 12, 11, 25, 10, 23, 17, 16	Factor 1: Adaptability, personal strength	1, 4, 17, 5, 19*
Factor 2: trust in one's instincts, tolerance of negative affect, strengthening effects of stress	20, 18, 15, 6, 7, 19, 14	Factor 2: Belief system	9, 3, 20, 8
Factor 3: positive acceptance of change, secure relationships	1, 4, 5, 2, 8	Factor 3: Secure relationships, positive support network	2, 13
Factor 4: control	22, 13, 21	Factor 4: Strong work ethic, persistence, goal attainment	24, 10, 23, 25, 12, 11
Factor 5: spiritual influences	3, 9	Factor 5: Leadership, humour, clear thinking	15, 18, 6, 14
		Factor 6: Failure resistance	16
		Factor 7: Control, purpose	22, 21

*item 7 did not load onto any factor to the threshold of 0.3 so was omitted by the model; if included it would have loaded onto Factor 1

Table 5: Comparison of Connor and *Davidson's (2003) and current study item loadings item loadings alongside given factor descriptors.*

Item number	**Scale item**	**Connor & Davidson's (2003) item description**	**Connor & Davidson's (2003) Factor**	***Current study Factor***
1	I am able to adapt when changes occur.	Able to adapt to change	3	*1*
2	I have at least one close and secure relationship that helps me when I am stressed.	Close and secure relationships	3	*3*
3	When there are no clear solutions to my problems, sometimes fate or God can help.	Sometimes fate or God can help	5	*2*
4	I can deal with whatever comes my way.	Can deal with whatever comes	3	*1*
5	Past successes give me confidence in dealing with new challenges and difficulties.	Past success gives confidence for new challenge	3	*1*
6	I try to see the humorous side of things when I am faced with problems.	See the humorous side of things	2	*5*

7	Having to cope with stress can make me stronger.	Coping with stress strengthens	2	-
8	I tend to bounce back after illness, injury, or other hardships.	Tend to bounce back after illness or hardship	3	*2*
9	Good or bad, I believe that most things happen for a reason.	Things happen for a reason	5	*2*
10	I give my best effort no matter what the outcome may be.	Best effort no matter what	1	*4*
11	I believe I can achieve my goals, even if there are obstacles.	You can achieve your goals	1	*4*

Table 5 continued: Comparison of Connor and Davidson's (2003) and current study item loadings item loadings alongside given factor descriptors.

Item number	**Scale item**	**Connor & Davidson's (2003) item description**	**Connor & Davidson's (2003) Factor**	***Current study Factor***
12	Even when things look hopeless, I don't give up.	When things look hopeless, I don't give up	1	*4*
13	During times of stress/crisis, I know where to turn for help.	Know where to turn for help	4	*3*
14	Under pressure, I stay focused and think clearly.	Under pressure, focus and think clearly	2	*5*
15	I prefer to take the lead in solving problems rather than letting others make all the decisions.	Prefer to take the lead in problem solving	2	*5*
16	I am not easily discouraged by failure.	Not easily discouraged by failure	1	*6*

17	I think of myself as a strong person when dealing with life's challenges and difficulties.	Think of self as strong person	1	*1*
18	I can make unpopular or difficult decisions that affect other people, if it is necessary.	Make unpopular or difficult decisions	2	*5*
19	I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	Can handle unpleasant feelings	2	*1*
20	In dealing with life's problems, sometimes you have to act on a hunch without knowing why.	Have to act on a hunch	2	*2*
21	I have a strong sense of purpose in life.	Strong sense of purpose	4	*7*
22	I feel in control of my life.	In control of your life	4	*7*
23	I like challenges.	I like challenges	1	*4*
24	I work to attain my goals no matter what roadblocks I encounter along the way.	You work to attain your goals	1	*4*
25	I take pride in my achievements.	Pride in your achievements	1	*4*

4. Discussion

With respect to the original aim of the study to explore differences in the factors comprising resilience in the CD-RISC in the sample of healthcare staff working with offenders, this was achieved. The research question asked, what are the differences in the weighting of the factors of resilience in healthcare staff experiencing aggression and violence in working with offenders? The question was addressed as it was found that Factor 1 was the strongest of the seven factors found following analysis. The original hypothesis was also explored as it was hypothesised that there would be a difference in the weighting of the original five factor structure as proposed by Connor and Davidson (2003). As seven factors were found in the current study, with considerably different factor loadings compared with Connor and Davidson's (2003) original findings, this hypothesis was proven. Further analysis shows how differently the factor structure may be interpreted. A summary of these differences is shown in Table 6 below.

Table 6: Comparison of Connor and Davidson's (2003) item structure and current study item structure

Connor and Davidson's (2003) factors	**Current study factors**
Factor 1: personal competence, high standards and tenacity	Factor 1: Adaptability, personal strength
Factor 2: trust in one's instincts, tolerance of negative affect, strengthening effects of stress	Factor 2: Belief system
Factor 3: positive acceptance of change, secure relationships	Factor 3: Secure relationships, positive support network
Factor 4: control	Factor 4: Strong work ethic, persistence, goal attainment
Factor 5: spiritual influences	Factor 5: Leadership, humour, clear thinking
	Factor 6: Failure resistance
	Factor 7: Control, purpose

In linking these findings to past evidence, there appear to be clear similarities and differences between Connor and Davidson's (2003) original factor structure and the current study (as shown in Table 3).

To expand, with respect to Factor 1 there appeared to be some similarities in reference to how the factor can be described; 'personal competence', 'high standards' and' tenacity' vs. 'adaptability' and 'personal strength'. However, there appeared to be few similarities with respect to the items which load onto each factor (except item 17

which loaded across both factor structures). This would indicate that the items in Factor 1 across both studies reflected similar constructs but comprising different items. It would appear that many of the items on Connor and Davidson's Factor 1 also load onto Factor 4 of the current study; items 24, 12, 11, 25, 10, and 23 all load across both factors. This would suggest that Factor 1 of the CD-RISC and Factor 4 of the current study may more accurately reflect similar constructs.

With respect to Factor 2 of the CD-RISC (reflecting 'trust in one's instincts', 'tolerance of negative affect', 'strengthening effects of stress') there appeared to be few similarities across the Factor 2 constructs of both studies. Similarly, only item 20 was found across both the current study factor structure and Connor and Davidson's (2003) factor structure. However, items 15, 18, 6 and 14 load across Factor 2 of the CD-RISC and Factor 5 in the current study (with Factor 5 reflecting 'leadership', 'humour', 'clear thinking'). This would suggest that these item loadings could reflect similar constructs across the factors as found in both studies.

In Factor 3 of the CD-RISC (reflecting 'positive acceptance of change', 'secure relationships') there appeared to be some similarities in that both studies found secure relationships to be reflected within this construct, but with item 2 only appearing across both factor structures. However, it appears that items 1, 4 and 5 map across two different factors, namely Factor 3 of the CD-RISC but Factor 1 in the current study. This may suggest that 'positive acceptance of change' may reflect similar elements as those found in 'adaptability' and 'personal strength'.

In reference to Factor 4 of the CD-RISC (reflecting 'control') there appeared to be few similarities compared with Factor 4 of the current study, in having no common items across both studies. In the current study Factor 4 appeared to reflect a 'strong work ethic', 'persistence' and 'goal attainment'. In contrast Connor and Davidson (2003) found this factor to reflect 'control', although item loadings across other

factors appear better able to map onto Factor 7 in the current study (reflecting 'control' and 'purpose'). It appears that items 21 and 22 both map onto Factor 4 (CD-RISC) and Factor 7 (current study) respectively.

Again, across both studies Factor 5 appeared to reflect different constructs, with no items in common for this factor. However, it is of note that items 3 and 9 of Factor 5 of the CD-RISC were also found in Factor 2 of the current study. These factors may be similar in the constructs which they represent, namely 'spiritual influences' vs. a 'belief system'. However, in the current study the remaining items on Factor 2, namely, 20 and 8, mapped onto different factors in the CD-RISC.

Factors 6 and 7 in the current study did not appear in Connor and Davidson's (2003) study, but Factor 7 may be seen to map onto Connor and Davidson's (2003) Factor 4 comprising of 'control' (as discussed above). Similarly, in the current study item 16 appeared to map onto Factor 6 separately as a single item and single factor, but in Connor and Davidson's (2003) study this item mapped onto Factor 1. In looking more closely at Factor 6 of the current study (reflecting 'failure control') this may be considered comparable to the element of 'tenacity', as found comprising Factor 1 of the CD-RISC.

These findings would indicate clear differences in how resilience is comprised in healthcare staff working with offenders compared to a mixed sample as seen in Connor and Davidson's (2003) study. In consideration of the development of the CD-RISC as described in Connor and Davidson's (2003) paper and in subsequent exploration of the theoretical basis of the aforementioned constructs, Connor and Davidson (2003) highlight an important limitation. The authors note that a main limitation of their paper in assessing characteristics of resilience is that they do not assess the resiliency process or provide information about the theory of resilience. In comparing the factors between the current study and those extracted by Connor and Davidson (2003) as above, the current study has not been able to

compare and contrast the factors in more depth with respect to their definitional and theoretical underpinnings. If such knowledge were made available then further efforts could be made to offer insight into why the factor structure and factor labels appear to present themselves as found in the current study (in other words, an explanation could have been offered as to why some factors appear to reflect similar constructs but comprise different items). Thus, further exploration and comparison between the current study and that of Connor and Davidson (2003) has not been possible. This is therefore a limitation of the current study, in addition to the limitations as discussed below.

The findings as found in the current study are consistent with studies detailing an alternative factor structure of the CD-RISC, such as Lamond et al (2008), Green et al (2014), Jorgensen and Seedat (2008) and Karaırmak (2010). Despite differences with Connor and Davidson's (2003) study, findings may also be compared with Ledesma's (2014) conceptualisation and discussion of the characterisation of resilience, as comprising common facets such as perseverance/persistence, adaptability and strong social resources/positive support network. Hence, the factors of resilience which have been identified following factor analysis within the current study are hypothesised to make up the 'Resilience Portfolio' of this population of healthcare staff working with offenders. By examining the CD-RISC it was identified that the 'Resilience Portfolio' of this population may be made up of distinct factors to general population samples (as used in Connor & Davidson's, 2003, original sample). These differences are clearly highlighted in Table 6. Therefore, findings indicate that healthcare staff groups working with offenders have a distinct 'Resilience Portfolio' compared with other populations.

In consideration of the strengths and limitations of this study a significant weakness was the small sample size. As discussed in Section 3 above, a great deal of deliberation was given to whether a factor analysis could be performed with the sample size following data cleaning. It was thought that a factor analysis would be appropriate

with current sample but was acknowledged that as a result there may be an increased likelihood of the presence of problems with fluctuating correlation coefficients and hence introducing potential issues with reliability of the factor analysis (Field, 2018). Therefore, the results of the factor analysis may not be as reliable as would be hoped for, although internal consistency of the measure was found to be good. It was also considered that this may be a rationale for the different factor loadings compared to Connor and Davidson (2003), although it was felt this remains a contentious issue due to the conflicting evidence as presented in Section 3 above.

Despite differences in factor loadings between the current study and Connor and Davidson's (2003) study, on further exploration of the qualitative themes, as shown in Table 6, it is evident there are some similarities as to the overall constitution of resilience. For example, although loaded on different factors common themes across both analyses include secure relationships, control, presence of a belief system/spiritual influences, persistence/tenacity. This indicated that resilience as a construct within this population may be similar but distinct from other populations of individuals. However, it was felt that further exploration of this is warranted in order to strengthen findings, ideally with a larger sample size.

Despite methodological concerns and limitations with this study, it is believed that the CD-RISC has not been previously explored in depth with a population of healthcare staff working with offenders. Hence, this study may add a new perspective and contribute in a unique way to existing literature in this field. Implications of such a piece of research may serve to inform future directions in understanding resilience with this population and may help develop strategies for staff to improve their resilience when working with high risk client groups. With respect to the future results from this study may indicate that individuals who work with offenders may be unique in a number of ways with respect to their overall levels of resilience. There may be other unexplored areas and features to discover about this population, and hence is an early starting point for future research.

However, appreciation and consideration must be given to those members of staff who not only work in forensic services, but those who are exposed to aggression and violence in other contexts, such as populations of clients with learning disabilities who present with different types of challenging behaviours. Therefore, questions remain about how research can move forward with this and translate some of the features of resilience and associated skills learned beyond the forensic context and into other areas of clinical practice. Healthcare staff working with offenders face unique demands, and can contribute significantly to helping others across other contexts to develop their skills in resilience, not only with coping with aggression and violence, but also with other adverse incidents.

It is hoped that this study will draw attention to the work demands and characteristics of this distinctive group of individuals so that we may better understand how their skills can be used to help others in times of adversity.

DISCUSSION

The main questions overarching this thesis explored how healthcare staff are impacted when working with offenders and if protective characteristics, such as resilience, have a role in lessening this impact. Initial questions which arose from these ideas centred around considering how common violence in healthcare services is and what definitions exist that help ensure researchers are measuring the same construct. The first chapter of this thesis comprising the systematic review was designed to explore this further. Findings of the systematic review lead to further questions about the quality of existing tools developed to measure aggression and violence; this was explored further in completing a critique of an existing measure of aggression and violence. Information gathered following systematic review and critique was then applied to consider how these factors present for staff working in forensic healthcare services. The negative impact of experiencing patient aggression and violence in healthcare staff members working with offenders was explored in the first primary study. The role of resilience and perceived stress in the association between experience of inpatient aggression and trauma in staff members working with offenders was also explored. Findings from the first primary study revealed interesting findings about the construct of resilience, which led to further exploration in the second primary study about how resilience is organised in healthcare staff working with offenders.

Following systematic review addressing definitions and prevalence of violence towards staff in forensic healthcare services, it was found that conflicting definitions and conceptualisations of violence are used within existing literature. An inconsistent pattern of prevalence of violence across included studies was reported, which ranged from 15% and 91%, and fell into two 'clusters'. Cluster 1 found prevalence rates between 15% and 29%, and Cluster 2 reported prevalence rates between 49% and 91%. Qualitative synthesis of definitions of violence following thematic synthesis drew out the following themes: Adverse incident, Extreme action (perpetrated) towards another

person → physical, Deliberate intent, and Negative physical outcome (towards victim). The emergence of such themes were following failure to find a comprehensive and consistently used definition of violence; in support of previous findings by Lanctôt and Guay (2014) who described that a consistent definition of violence does not currently exist within the literature. Connections and links were made between these themes and a hypothetical conceptualisation of violence was formulated. The category of "adverse incident" appeared to be an overarching theme which also encapsulated the other three themes. The theme of "extreme action (perpetrated) towards another person → physical" appeared to be strongly linked with the concept of "intent" and the aggressive action or adverse incident being a deliberate act which may be perpetrated or directed towards another individual. As a result, this appeared to follow and lead to the "negative physical outcome" category as a consequence of the intentional action or event.

Following the systematic review it was evident that conceptual difficulties would also potentially reflect and cause serious issues with measurement of aggression and violence. For example, Cashmore et al (2012; 1) refer to 'workplace violence', whereas Cashmore et al (2012; 2) refer specifically to 'physical abuse' in measuring the same construct. Similarly, Marth (2009) refers to the term 'assault' whereas Nicholls et al (2009) conceptualised a similar construct using the OAS (Silver and Yodofsky, 1991). Such conceptual difficulties were felt to be reflected in the wide range of prevalence rates of aggression and violence found in the systematic review. However, in thematically exploring the range of definitions a number of common themes were found in the definitions used, which were identified as Adverse incident, Extreme action (perpetrated) towards another person → physical, Deliberate intent, and Negative physical outcome (towards victim). Such findings demonstrate that clearly there are some commonalities in definitions used which would impact how aggression and violence is measured and the type of tools which could be used.

As a result of the above issues it was therefore considered important to critique existing measures conceptualising aggression and violence. The Perceptions of the Prevalence of Aggression Scale (POPAS; Oud, 2001) was chosen as a tool which attempts to comprehensively capture a range of aggressive and violent incidents that healthcare staff experience. The measure was compared with alternative measures and was evaluated with respect to its psychometric properties and potential uses. The critique identified that the POPAS was developed for staff members in psychiatric services to identify a range of types of aggression and violence that they may experience from service users in the course of their work. However, other authors have modified the scale for use across other contexts, and researchers such as Jonker, Goossens, Steenhuis and Oud (2008) have been able to collapse the full POPAS tool into an abbreviated version, whilst others have developed an alternative modified tool (such as the Scale of Aggressive and Violent Experiences (SAVE); Ryan & Maguire, 2006). Other researchers have used the POPAS to develop alternative measures for specific populations, such as for use with a New Zealand population (POPAS-NZ; Gale, Hannah, Swain, Gray, Coverdale & Oud, 2009).

With respect to psychometric properties of the POPAS the critique found that a number of studies have found similar outcomes to authors such as Geoffrion (2015) who found a Cronbach's Alpha of 0.85, indicating that the POPAS has a good level of internal consistency. Limited evidence appeared available with respect to other forms of reliability. Within existing literature the POPAS was found to demonstrate good face validity and an acceptable level of convergent validity, although predictive validity was not considered relevant to the measure as not predicting future behaviour. With respect to appropriate norms, these do not appear to have been established.

Following exploration of the POPAS in more depth, it appeared that healthcare staff have been identified as experiencing a range of types of aggressive and violent incidents in the course of their work,

indicating that workplace violence remains a complex phenomenon. Past evidence indicated that healthcare staff are at particular risk of experiencing aggression and violence, an experience which may be compounded for those working with offenders in forensic healthcare services. However, Søndenaa et al's (2015) findings indicated that staff working in forensic-based services may have some mechanisms in place that serve a protective function.

The Resilience Portfolio Model is a framework which has been used in this thesis to explain why forensic healthcare staff working with offenders continue to work in such environments after experiencing aggression and violence. This model suggests that the 'resilience portfolio' of this population may comprise of a number of factors which help them to cope in times of adversity. The term 'assets' is used to describe the characteristics a person has that promote healthy functioning, and 'resources' to refer to sources outside of the person, indicating the importance of both internal and external processes. The model organises 'assets' into categories representing functions proposed to be important to healthy adaptation, which are identified by the model as: regulating emotions and behaviour, building interpersonal relationships and fostering meaning making. This would indicate that resilience is complex and reflects not only external factors, but also a range of internal factors or 'assets' that a person has. The hypothesis that resilience is comprised of factors would indicate that tools such as the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) may help to better conceptualise these 'assets', specifically in identifying what characteristics these factors or 'assets' comprise. Thus, use of the CD-RISC may provide insights and useful data about the specific characteristics of the factors or 'assets' comprising resilience.

Findings of the first primary study indicated that those working in forensic healthcare services experienced a moderate level of stress when exposed to aggression and violence and were significantly negatively impacted when experiencing aggression and violence in the workplace. These individuals were found to have a moderate-high

level of resilience and that Post-traumatic Stress Disorder (PTSD) was not a clinical concern for this sample. Overall, resilience was significantly and negatively related to the overall negative impact of experiencing aggression and violence but perceived stress was found to be significantly and positively related to these findings. This would indicate that both resilience and perceived stress comprise the 'resilience portfolio' of staff members working with offenders, indicating there may be further mechanisms in place which support staff to thrive in times of adversity.

In consideration of these findings, questions remained about how resilience as a construct is comprised and structured within healthcare staff working with offenders, as a potentially unique group of resilient individuals. In light of existing literature it was highlighted that like aggression and violence, resilience is considered a complex phenomenon, but measures such as the CD-RISC have identified five factors that embody resilience. The Resilience Portfolio Model does not appear to specifically define resilience, but recognises groups of factors which comprise resilience (as the CD-RISC does). This would indicate that tools such as the CD-RISC may better define resilience, whilst aligning themselves well with the Resilience Portfolio Model by recognising resilience as a complex and multi-faceted construct. The CD-RISC may therefore offer useful insights into how these internal factors, or 'assets', present. However, it was unclear whether resilience of forensic healthcare staff is constructed in the same way as other populations. Following factor analysis, the second primary study found that seven factors comprising resilience emerged from the data. These seven factors were: Factor 1: Adaptability, personal strength, Factor 2: Belief system, Factor 3: Secure relationships, positive support network, Factor 4: Strong work ethic, persistence, goal attainment, Factor 5: Leadership, humour, clear thinking, Factor 6: Failure resistance, Factor 7: Control, purpose. Such factors were in contrast to Connor and Davidson's (2003) original findings, indicating that resilience in forensic healthcare staff may be structured in a different way to other population groups. Hence, in

linking back to the Resilience Portfolio Model, the 'resilience portfolio' of this group of individuals may be distinct, which allows them to continue working in environments exposed to aggression and violence.

Limitations of the systematic review were related to the restrictions of included studies. For example, an overall prevalence figure could not be calculated due to the lack of reporting of the standard deviations of included studies. Hence, the review was limited by the lack of analytical detail reported in the studies. Secondly, the review was also limited by quality of included studies with respect to the sources of information from which data was gathered, as this was gathered by file review or incident reports. It was considered that such data would depend upon the initial quality of the reports submitted by individual staff on site, although it was acknowledged this could not be controlled for by the review. It was felt that such design flaws in included studies could not be quality assessed for and excluded as a result, as is a common flaw of such studies. A final issue was that the included studies were all conducted in English-speaking regions of origin which did not allow for the capture of potential cross-cultural data; although the studies were similar in their design, type of setting, data gathered and service user populations there is confidence in concluding that outcomes may be generalizable across Western forensic populations. The main strength of the included studies was that they clearly reported differences between verbal and physical aggression, which meant that data about physical violence perpetrated towards staff could clearly be extracted for inclusion in this review. A further strength of the review was that all included studies met the maximum assessed quality criteria, and hence risk of bias across a number of domains was low and the review included a robust assessment of study quality.

In spite of limitations, it is believed the systematic review conducted is the first attempt to systematically synthesise existing data in the field of forensic healthcare services and serves to provide a point of reference for further reviews in this field. It appears evident that

further work is needed in conceptualising and defining violence. The current study has aimed to highlight theoretical and conceptual limitations of this field of research so that steps may be made to address violence in clinical settings. As found in the review, prevalence of violence within forensic healthcare services may vary dramatically and confusion is evident with respect to defining violence. It is recommended that once a theoretical accord has been established that a 'benchmark' of prevalence may be established, so that this can then be comparable with other services and victim populations.

In consideration of the critique of the POPAS with respect to other forms of reliability, such as test-retest, there appears to be limited evidence available within current literature to allow for further exploration. There also appeared to be limited information with respect to other forms of validity. Other such forms of validity, such as content, predictive, criterion-related, construct, and congruent validity do not appear to have been explored with respect to the POPAS. Similarly, the critique appeared unable to establish appropriate within group norm data, which was discussed as potentially reflecting conceptual difficulties with mixed concepts and constructs, as discussed in the systematic review. In spite of limitations, the POPAS appears to demonstrate flexibility, as other measures have been developed from the original version of the scale, some of which have shown good internal consistency (such as Jonker et al's (2008) scale which is reported to have "good" internal consistency).

With respect to the first primary study it was of note that potentially confounding subgroup data pertaining to demographic variables was accounted for, which attempted to reduce the overall risk of bias linked to the presence of these variables. A further strength of the study was that a range of types of participants took part in the study, ensuring generalisability of findings to a range of forensic service professionals. Hence, a rich pool of staff data was gathered, which is in contrast to a number of studies which have been limited to data

gathered solely from one group. A further point of consideration is that clear descriptions of a range of examples of violence and aggression were provided by the POPAS (Jonker et al, 2008). This has the potential to reduce problems and bias introduced by individualised and different conceptualisations of aggression and violence.

In consideration of the second primary study a significant weakness was the small sample size in conducting the factor analysis. This was discussed in depth and it was concluded that with the sample used a factor analysis would be appropriate, but it was acknowledged that as a result there may be an increased likelihood of the presence of problems with the reliability of the factor analysis. However, internal consistency of the measure was found to be good. Despite differences in factor loadings between the current study and Connor and Davidson's (2003) study, on further exploration of the qualitative themes, it was evident there were some similarities as to the overall constitution of resilience. This indicated that resilience as a construct within forensic healthcare staff may be similar but also distinct from other populations of individuals. However, it was felt that further exploration of this is warranted in order to strengthen findings, ideally with a larger sample size.

As a result of conducting the systematic review it was evident that further work needs to be completed in conceptualising and defining violence. Implications of the review highlighted theoretical and conceptual issues, leading to potential confusion as to establishing an accurate prevalence of aggression and violence, particularly in forensic healthcare services. Clearly, further research needs to be established in this area so that service providers may adapt accordingly to addressing violence with current legislation and healthcare policies in mind. It was recommended that once a theoretical consensus can be established a 'benchmark' of prevalence may be established, so that this can then be comparable with other services and victim populations.

Following critique the POPAS has been identified as a reliable measure, although further work is needed with respect to exploring the scale's validity in more depth. Although preliminary explorations indicate the POPAS is a valid measure this needs further clarification across different populations, such as with different types of psychiatric care services, so that findings may be applied across different contexts in a valid and reliable manner. It is also recommended that in doing this future research consider the exploration and development of appropriate norms of the scale in order to provide further clarity about the POPAS's potential and future use.

Implications of the first primary study appear to lie in the application of findings to improvements in managing the effects of experiencing aggression and violence in staff health and wellbeing. As has been discussed the 'resilience portfolio' of healthcare staff working with offenders may be unique and comprise of factors other than resilience; perceptions of stress also appear to play a role. Hence, implications lie in discovering how these traits can be honed, developed and applied to other populations vulnerable to experiences such as aggression and violence. It is evident that further research is needed in this field, but such understanding allows contribution to the development of tools, strategies and frameworks in which to support those affected and to manage the impact of such adverse experiences in the working environment. This may have the potential to aid understanding of those outside the field of forensic healthcare services to other contexts, such as prison environments, as well as increasing our understanding of how services can support those who have already been victims of assault. In considering findings of the second primary study it is evident that resilience is a complex phenomenon and that further research is needed, particularly with regard to those who work in roles with a potentially higher than average risk of exposure to aggression and violence. It is considered pertinent to explore subgroup differences pertaining to type of aggression and violence experienced by staff, as well as further

exploration of other individual differences and personality characteristics which may be considered relevant to develop in order to minimise the impact of experiencing aggression and violence.

Such study of aggression, violence and resilience may add a new perspective and contribute in a unique way to existing literature in this field by highlighting the role and characteristics of existing groups of individuals in engaging with aggression and violence in the workplace. Implications of such a piece of research may serve to inform future directions in understanding resilience with those working in high risk contexts and may help provide opportunities for development strategies for staff to improve their resilience when working with high risk client groups. With respect to the future results from this thesis indicate that individuals who work with offenders may be characteristically unique with respect to their experiences and levels of resilience. Thus, this thesis has provided some insights into the 'resilience portfolio' of this group of individuals. Findings from this thesis overall indicate that there may be other unexplored areas and features to discover about this population, and hence may be an early starting point for future research. However, questions remain about how research can be directive and translate some of the features of resilience and associated skills learned beyond the forensic context and into other areas of clinical practice. It is considered that forensic healthcare staff can contribute significantly to helping others across different contexts to develop their skills in resilience, not only with coping with aggression and violence, but also with other adverse incidents. It is hoped that this thesis will provide useful insights into the concepts of resilience, aggression and violence so that we may better understand how these constructs can be applied accordingly to support those in times of adversity.

References

Agaibi, C. E., & Wilson, J. P. (2005). Trauma, PTSD, and resilience a review of the literature. *Trauma, Violence, & Abuse*, *6*(3), 195-216

Baby, M., Swain, N., & Gale, C. (2016). Healthcare managers' perceptions of patient perpetrated aggression and prevention strategies: A cross sectional survey. *Issues in mental health nursing*, *37*(7), 507-516.

Barlow, K., Grenyer, B., & Ilkiw-Lavalle, O. (2000). Prevalence and precipitants of aggression in psychiatric inpatient units. *Australian and New Zealand Journal of Psychiatry*, *34*(6), 967-974.

Boyle, M. J., & Wallis, J. (2016). Working towards a definition for workplace violence actions in the health sector. Safety in Health, 2(1), 1.

British Psychological Society (2017). Ethics Guidelines for Internet-mediated Research. INF206/04.2017. Leicester: Author. Available from: www.bps.org.uk/publications/policy-and-guidelines/research-guidelines-policy-documents/researchguidelines-poli

Broderick, C., Azizian, A., Kornbluh, R., & Warburton, K. (2015). Prevalence of physical violence in a forensic psychiatric hospital system during 2011–2013: Patient assaults, staff assaults, and repeatedly violent patients. *CNS spectrums*, *20*(3), 319-330

Cambridge Dictionary, dictionary.cambrdige.org, 2017, retrieved 10/01/17, from http://dictionary.cambridge.org/dictionary/english/aggression

Cambridge Dictionary, dictionary.cambrdige.org, 2017, retrieved 10/01/17, from http://dictionary.cambridge.org/dictionary/english/violence

(1) Cashmore, A. W., Indig, D., Hampton, S. E., Hegney, D. G., & Jalaludin, B. B. (2012). Workplace violence in a large correctional

health service in New South Wales, Australia: a retrospective review of incident management records. *BMC health services research*, *12*(1), 245.

(2) Cashmore, A. W., Indig, D., Hampton, S. E., Hegney, D. G., & Jalaludin, B. (2012). Workplace abuse among correctional health professionals in New South Wales, Australia. *Australian Health Review*, *36*(2), 184-190

Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling.

The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24,* 386-396.

Cohen, S., Kamarck, T., & Mermelstein, R. (1994). Perceived stress scale. Measuring stress: A guide for health and social scientists.

Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.

Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and anxiety*, *18*(2), 76-82.

Connor, K. M., Davidson, J. R., & Lee, L. C. (2003). Spirituality, resilience, and anger in survivors of violent trauma: A community survey. *Journal of traumatic stress*, *16*(5), 487-494.

Creamer, M., Bell, R., & Failla, S. (2003). Psychometric properties of the impact of event scale—revised. *Behaviour research and therapy*, *41*(12), 1489-1496.Davidson, J.T.R., and Connor, K.M. (2016). Connor-Davidson Resilience Scale (CD-RISC) Manual. *Unpublished. 10-01-2016 and partly accessible at* [*www.cd-risc.com*](http://www.cd-risc.com) *(current manual obtained directly from study authors).*

Critical Appraisal Skills Programme (2018). CASP [online] Available at: https://casp-uk.net/casp-tools-checklists/

Daffern, M., Mayer, M. M., & Martin, T. (2003). A preliminary investigation into patterns of aggression in an Australian forensic psychiatric hospital. *The Journal of Forensic Psychiatry & Psychology*, *14*(1), 67-84.

Davidson, J.T.R., and Connor, K.M. (2016). Connor-Davidson Resilience Scale (CD-RISC) Manual. *Unpublished. 10-01-2016 and partly accessible at www.cd-risc.com (current manual obtained directly from study authors).*

DeCoster, J. (1998). Overview of factor analysis.

De Winter*, J. D., Dodou*, D. I. M. I. T. R. A., & Wieringa, P. A. (2009). Exploratory factor analysis with small sample sizes. *Multivariate behavioral research*, *44*(2), 147-181.

Douglas, K. S., Hart, S. D., Webster, C. D., & Belfrage, H. (2013). *HCR-20V3: Assessing risk for violence: User guide*. Mental Health, Law, and Policy Institute, Simon Fraser University.

Efron, B. (1984). Better bootstrap confidence intervals. *Journal of the American statistical Association*, *82*(397), 171-185.

Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic review. *Computers in human behavior*, *26*(2), 132-139.

Fernandes, C. M., Bouthillette, F., Raboud, J. M., Bullock, L., Moore, C. F., Christenson, J. M., ... & Way, M. (1999). Violence in the emergency department: a survey of health care workers. *Canadian medical association journal*, *161*(10), 1245-1248.

Field, A. (2009). *Discovering statistics using SPSS*. Sage publications.

Field, A. (2018). *Discovering statistics using SPSS – Fifth Edition*. Sage publications.

Fletcher, T. A., Brakel, S. J., & Cavanaugh, J. L. (2000). Violence in the workplace: new perspectives in forensic mental health services in the USA. *The British Journal of Psychiatry*, *176*(4), 339-344.

Foster, C., Bowers, L., & Nijman, H. (2007). Aggressive behaviour on acute psychiatric wards: prevalence, severity and management. Journal of advanced nursing, 58(2), 140-149.

Gale, C., Hannah, A., Swain, N., Gray, A., Coverdale, J., & Oud, N. (2009). Patient aggression perceived by community support workers. *Australasian Psychiatry*, *17*(6), 497-501.

Gates, D., Gillespie, G., Smith, C., Rode, J., Kowalenko, T., & Smith, B. (2011). Using action research to plan a violence prevention program for emergency departments. *Journal of Emergency Nursing*, *37*(1), 32-39.

Geoffrion, S., Lanctôt, N., Marchand, A., Boyer, R., & Guay, S. (2015). Predictors of trivialization of workplace violence among healthcare workers and law enforcers. *Journal of Threat Assessment and Management*, *2*(3-4), 195.

Geoffrion, S. (2015). Aggression and accountability: how caregivers and law enforcers cope.

Gerbing, D. W., & Hamilton, J. G. (1996). Viability of exploratory factor analysis as a precursor to confirmatory factor analysis. *Structural Equation Modeling: A Multidisciplinary Journal*, *3*(1), 62-72.

Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Erlbaum. Cited in Field, A. (2018). *Discovering statistics using SPSS – Fifth Edition*. Sage publications.

Green, K. T., Hayward, L. C., Williams, A. M., Dennis, P. A., Bryan, B. C., Taber, K. H., ... & Calhoun, P. S. (2014). Examining the factor structure of the Connor–Davidson Resilience Scale (CD-RISC) in a post-9/11 US military veteran sample. *Assessment*, *21*(4), 443-451.

Grych, J., Hamby, S., & Banyard, V. (2015). The resilience portfolio model: Understanding healthy adaptation in victims of violence. *Psychology of Violence*, *5*(4), 343.

Gudjonsson, G. H., Rabe-Hesketh, S., & Wilson, C. (2000). Violent incidents on a medium secure unit: the target of assault and the management of incidents. *The Journal of Forensic Psychiatry*, *11*(1), 105-118

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication monographs*, 76(4), 408-420.

Harris, G. T., Rice, M. E., & Quinsey, V. L. (1993). Violent recidivism of mentally disordered offenders: The development of a statistical prediction instrument. *Criminal justice and behavior*, *20*(4), 315-335.

Hesketh, K. L., Duncan, S. M., Estabrooks, C. A., Reimer, M. A., Giovannetti, P., Hyndman, K., & Acorn, S. (2003). Workplace violence in Alberta and British Columbia hospitals. *Health policy (Amsterdam, Netherlands)*, *63*(3), 311.

Higgins JPT, Green S (editors). *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from http://handbook.cochrane.org.

Hill, S. A., White, O., Lolley, J., Sidki-Gomez, A., & Williams, H. (2012). Incidents in an adolescent forensic secure inpatient service. *Medicine, Science and the Law*, *52*(1), 27-31.

Howells, K., Daffern, M., & Day, A. (2008). Aggression and violence. *Handbook of forensic mental health*, 351-374.

Ito, M., Nakajima, S., Shirai, A., & Kim, Y. (2009, November). Cross-cultural validity of the Connor-Davidson Scale: Data from Japanese population. In *Poster presented at the 25th annual meeting of the International Society of Traumatic Stress Studies,*

Atlanta, GA. Cited in Davidson, J.T.R., and Connor, K.M. (2016). Connor-Davidson Resilience Scale (CD-RISC) Manual. *Unpublished. 10-01-2016 and partly accessible at* www.cd-risc.com

Itzhaki, M., Peles-Bortz, A., Kostistky, H., Barnoy, D., Filshtinsky, V., & Bluvstein, I. (2015). Exposure of mental health nurses to violence associated with job stress, life satisfaction, staff resilience, and post-traumatic growth. *International journal of mental health nursing*, *24*(5), 403-412.

Jackson D., Clare J. & Mannix J. (2002). Who would want to be a nurse? Violence in the workplace – a factor in recruitment and retention. *Journal of Nursing Management 10, 13–20.*

Jalil, R., Huber, J. W., Sixsmith, J., & Dickens, G. L. (2017). Mental health nurses' emotions, exposure to patient aggression, attitudes to and use of coercive measures: Cross sectional questionnaire survey. *International journal of nursing studies*, *75*, 130-138.

Jonker, E. J., Goossens, P. J. J., Steenhuis, I. H. M., & Oud, N. E. (2008). Patient aggression in clinical psychiatry: perceptions of mental health nurses. *Journal of Psychiatric and Mental Health Nursing*, *15*(6), 492-499.

Jorgensen, I. E., & Seedat, S. (2008). Factor structure of the Connor-Davidson resilience scale in South African adolescents.

Jung, S., & Lee, S. (2011). Exploratory factor analysis for small samples. *Behavior research methods*, *43*(3), 701-709.

Karaırmak, Ö. (2010). Establishing the psychometric qualities of the Connor–Davidson Resilience Scale (CD-RISC) using exploratory and confirmatory factor analysis in a trauma survivor sample. *Psychiatry research*, *179*(3), 350-356.

Kay, S. R., Wolkenfeld, F., & Murrill, L. M. (1988). Profiles of aggression among psychiatric patients: I. Nature and prevalence. *Journal of Nervous and Mental Disease*.

Kelly, E. L., Subica, A. M., Fulginiti, A., Brekke, J. S., & Novaco, R. W. (2015). A cross-sectional survey of factors related to inpatient assault of staff in a forensic psychiatric hospital. *Journal of advanced nursing*, *71*(5), 1110-1122.

Khoshouei, M. S. (2009). Psychometric evaluation of the Connor-Davidson resilience scale (CD-RISC) using Iranian students. *International Journal of Testing*, *9*(1), 60-66.

Kline, P. (1979). *Psychometrics and psychology*. London: Acaderric Press.

Klinoff, V. A. (2017). The Assessment of Burnout and Resilience in Correctional Officers.

Kobasa, S. C. (1979). Stressful life events, personality, and health: an inquiry into hardiness. *Journal of personality and social psychology*, *37*(1), 1.

Kurtz, A., & Jeffcote, N. (2011). 'Everything contradicts in your mind': A qualitative study of experiences of forensic mental health staff in two contrasting services. *Criminal Behaviour and Mental Health*, *21*(4), 245-258.

Lamond, A. J., Depp, C. A., Allison, M., Langer, R., Reichstadt, J., Moore, D. J., & Jeste, D. V. (200). Measurement and predictors of resilience among community-dwelling older women. *Journal of psychiatric research*, *43*(2), 148-154.

Lahm, K. F. (2009). Inmate assaults on prison staff: A multilevel examination of an overlooked form of prison violence. *The Prison Journal*, *89*(2), 131-150.

Lanctôt, N., & Guay, S. (2014). The aftermath of workplace violence among healthcare workers: A systematic literature review of the consequences. *Aggression and violent behavior, 19(5), 492-501.*

Lauvrud, C., Nonstad, K., & Palmstierna, T. (2009). Occurrence of post-traumatic stress symptoms and their relationship to professional

quality of life (ProQoL) in nursing staff at a forensic psychiatric security unit: a cross-sectional study. Health and quality of life outcomes, 7(1), 1.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer publishing company.

Ledesma, J. (2014). Conceptual frameworks and research models on resilience in leadership. *Sage Open*, *4*(3), 2158244014545464.

Lee, E. H. (2012). Review of the psychometric evidence of the perceived stress scale. *Asian nursing research*, *6*(4), 121-127.

Lee, J., Daffern, M., Ogloff, J. R., & Martin, T. (2015). Towards a model for understanding the development of post-traumatic stress and general distress in mental health nurses. *International journal of mental health nursing*, *24*(1), 49-58.

Loughland, C. M., Lawrence, G., Allen, J., Hunter, M., Lewin, T. J., Oud, N. E., & Carr, V. J. (2009). Aggression and trauma experiences among carer-relatives of people with psychosis. *Social psychiatry and psychiatric epidemiology*, *44*(12), 1031-1040.

Management of Health and Safety at Work (1999). *Management of Health and Safety at Work Regulations 1999. Approved Code of Practice and Guidance L21 (second edition).* Retrieved from: http//legislation.gov.uk; accessed on 17/04/2018

Marth, D. (2009). *A longitudinal study of differences in staff assaults by responses to residents in a forensic hospital*. University of Missouri-Columbia.

Martinko, M. J., & Zellars, K. L. (1998). Toward a theory of workplace violence and aggression: A cognitive appraisal perspective. In R. W. Griffin, A. O'Leary-Kelly, & J. M. Collins (Eds.), *Monographs in organizational behavior and industrial relations, Vol. 23, Parts A & B. Dysfunctional behavior in organizations: Violent and deviant behavior* (pp. 1-42). Elsevier Science/JAI Press.

McPhaul, K. M., & Lipscomb, J. A. (2004). Workplace violence in health care: recognized but not regulated. *Online Journal of Issues in Nursing*, *9*(3), 7.

Meehan, T., McIntosh, W., & Bergen, H. (2006). Aggressive behaviour in the high-secure forensic setting: the perceptions of patients. *Journal of Psychiatric and Mental Health Nursing*, *13*(1), 19-25.

Morrison, E., Morman, G., Bonner, G., Taylor, C., Abraham, I., & Lathan, L. (2002). Reducing staff injuries and violence in a forensic psychiatric setting. *Archives of Psychiatric Nursing*, *16*(3), 108-117.

NICE (guideline ng10). (2015). *Violence and Aggression: Short-term management in mental health, health and community settings*. (Updated edition) UK: The British Psychological Society and The Royal College of Psychiatrists

Nicholls, T. L., Brink, J., Greaves, C., Lussier, P., & Verdun-Jones, S. (2009). Forensic psychiatric inpatients and aggression: An exploration of incidence, prevalence, severity, and interventions by gender. *International journal of law and psychiatry*, *32*(1), 23-30.

Nijman, H. L., Muris, P., Merckelbach, H. L., Palmstierna, T., Wistedt, B., Vos, A. M., ... & Allertz, W. (1999). The staff observation aggression scale–revised (SOAS-R). *Aggressive Behavior: Official Journal of the International Society for Research on Aggression*, *25*(3), 197-209.

Nijman, H., Bowers, L., Oud, N., & Jansen, G. (2005). Psychiatric nurses' experiences with inpatient aggression. *Aggressive behavior*, *31*(3), 217-227.

Nolan P., Dallender J., Soares J., Thomsen S. & Arnetz B. (1999) Violence in mental health care: the experiences of mental health nurses and psychiatrists, *Journal of Advanced Nursing 30(4), 934-941*

Notario-Pacheco, B., Martínez-Vizcaíno, V., Trillo-Calvo, E., Pérez-Yus, M. C., Serrano-Parra, D., & García-Campayo, J. (2014). Validity and reliability of the Spanish version of the 10-item CD-RISC in patients with fibromyalgia. *Health and quality of life outcomes*, *12*(1), 14.

Oud, N. 2001. The Perceptions of Prevalence Of Aggression Scale (POPAS).

Owen, C., Tarantello, C., Jones, M., & Tennant, C. (1998). Violence and aggression in psychiatric units. *Psychiatric Services*, *49*(11), 1452-1457.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods*, 40(3), 879-891.

Ramacciati, N., Ceccagnoli, A., Addey, B., Lumini, E., & Rasero, L. (2018). Violence towards emergency nurses: A narrative review of theories and frameworks. *International emergency nursing*, *39*, 2-12.

Renwick, L., Lavelle, M., Brennan, G., Stewart, D., James, K., Richardson, M., ... & Bowers, L. (2016). Physical injury and workplace assault in UK mental health trusts: an analysis of formal reports. *International journal of mental health nursing*, *25*(4), 355-366.

Richter, D., & Berger, K. (2006). Post-traumatic stress disorder following patient assaults among staff members of mental health hospitals: a prospective longitudinal study. *BMC psychiatry*, *6*(1), 15.

Rippon, T. J. (2000). Aggression and violence in health care professions. Journal of advanced nursing, 31(2), 452-460.

Rutter, M. (1985). Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. *The British Journal of Psychiatry*, *147*(6), 598-611.

Ryan D. & Maguire J. (2006). Aggression and violence – a problem in Irish Accident and Emergency departments. *Journal of Nursing Management 14, 106–115*

Secolsky, C. (1987). On the direct measurement of face validity: A comment on Nevo. *Journal of Educational Measurement*, *24*(1), 82-83.

Silver, J. M., & Yudofsky, S. C. (1991). The Overt Aggression Scale: overview and guiding principles. *J Neuropsychiatry Clin Neurosci*, *3*(2), S22-S29.

Singh, K., & Yu, X. N. (2010). Psychometric evaluation of the Connor-Davidson Resilience Scale (CD-RISC) in a sample of Indian students. *Journal of Psychology*, *1*(1), 23-30.

Søndenaa, E., Whittington, R., Lauvrud, C., & Nonstad, K. (2015). Job stress, burnout and job satisfaction in staff working with people with intellectual disabilities: community and criminal justice care. *Journal of Intellectual Disabilities and Offending Behaviour*, *6*(1), 44-52.

Swain, N., & Gale, C. (2014). A communication skills intervention for community healthcare workers reduces perceived patient aggression: A pretest-postest study. *International Journal of Nursing Studies*, *51*(9), 1241-1245.

Swain, N., Gale, C., & Greenwood, R. (2014). Patient aggression experienced by staff in a New Zealand public hospital setting. *The New Zealand Medical Journal (Online)*, *127*(1394).

Taubman-Ben-Ari, O. & Weintroub, A. (2008). Meaning in life and personal growth among pediatric physicians and nurses. *Death Studies*, *32*, 621–645.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, *2*, 53.

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC medical research methodology*, *8*(1), 45.

Weiss, D. S., & Marmar, C. R. (1996). The Impact of Event Scale - Revised. In J. Wilson & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 399-411). New York: Guilford

Weiss, D. S. (2007). The Impact of Event Scale – Revised. In J. Wilson & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD: a practitioners handbook* (2nd edition, pp. 168-189). New York: Guilford

Wells, J., & Bowers, L. (2002). How prevalent is violence towards nurses working in general hospitals in the UK?. Journal of advanced nursing, 39(3), 230-240.

Winstanley, S., & Whittington, R. (2004). Aggression towards health care staff in a UK general hospital: variation among professions and departments. *Journal of clinical nursing,* 13(1), 3-10.

Woods, P., & Almvik, R. (2002). The Brøset violence checklist (BVC). *Acta Psychiatrica Scandinavica*, *106*, 103-105.

Yu, X. N., Lau, J. T., Mak, W. W., Zhang, J., & Lui, W. W. (2011). Factor structure and psychometric properties of the Connor-Davidson Resilience Scale among Chinese adolescents. *Comprehensive psychiatry*, *52*(2), 218-224.

Appendix

Appendix A: Systematic Review Protocol

Systematic Review Protocol

Title

A systematic review of the definition and prevalence of violence perpetrated towards healthcare staff in forensic healthcare services.

Background

Scoping of the literature revealed that healthcare staff of all grades and levels experience different types of violence whilst at work. Those providing face-to-face care to service users appear at particular risk and literature suggests that those working in forensic-based services experience a high level of violence at work. Definitions and conceptualisations of violence appears to vary, with some literature including verbal aggression as part of violence experienced by staff. Nursing staff appear to be at a higher risk, but this is possibly due to the higher number of papers found during scoping on this staff group. There appears to be many papers on violence within general healthcare professions, but some key papers consider those working in forensic-based services. Scoping of the literature suggests that violence within the healthcare sector is not just a Westernised problem, but is also a worldwide phenomenon.

For example, in a three year study period Cashmore, Indig, Hampton, Hegney and Jalaludin (2012) found that in a New South Wales correctional health service 208 incidents of workplace violence were recorded. Verbal abuse (71%) was more common than physical abuse (29%), and the most (44%) incidents of workplace violence (including both verbal and physical abuse) occurred in adult male prisons. However, the most (50%) incidents of physical abuse occurred in a forensic hospital. 90% of the victims were nurses and two-thirds were females; young employees and males were most likely to be victims of physical abuse. Preparing or dispensing medication and attempting to calm and/or restrain an aggressive patient were identified as 'high risk' work duties for verbal abuse and physical abuse, respectively. Most (93%) of the incidents of workplace violence were initiated by a prisoner/ patient.

Summary of existing literature

Aggression and violence experienced by staff in the healthcare sector has been well documented, although there is mixed consensus with respect to prevalence rates (Lanctôt and Guay (2014). In their

systematic review of the literature Lanctôt and Guay (2014) highlighted that this appears to be due to little consensus in formulating a definition of violence within existing research literature. However, in the study they were able to outline four types of workplace violence:

1) Violent acts by criminals who have no other connection with the workplace

2) Violence directed at employees by customers, clients, patients, students, or any others for whom an organization provides services

3) Violence against co-workers, supervisors, or managers by a present or former employee

4) Violence committed in the workplace by someone who does not work there but has a personal relationship with an employee.

Rippon (2000) notes that like aggression, violence is synonymous with aggression, but violence is reserved for those actions of aggression that are "particularly intense, and are more heinous, infamous or reprehensible."

This difficulty in reaching a consensus within the literature appears due to a lack of agreement not only in formulating an operational definition, but also with issues in inconsistent reporting of incidents and methodological issues related to the comparison of mixed concepts and constructs (Nolan et al, 1999). Winstanley and Whittington (2004) found that as high as 27% of the health care staff (all staff grades involved in direct service user contact at a general hospital) of their survey were assaulted, 23% experienced threatening behaviour from patients and 15.5% experienced threatening behaviour from visitors.

Therefore, it appears that an operational definition for the (reportedly common) occurrence of violence does not currently exist within the literature. Similarly, although it is reported that violence perpetrated towards staff is common it is not clear how high overall prevalence rates of violence are, which is also linked to the lack of consensus on what conceptualises violence. Therefore, in order to gain a better idea of the prevalence of violence perpetrated towards staff it is important to explore the range of definitions which exist within the literature.

Research question and aims

Research questions

What definitions and prevalence data exist with respect to violence perpetrated towards healthcare staff by service users in forensic healthcare services?

Aims

To explore definitions of violence perpetrated towards staff by service users in forensic healthcare services.

To explore prevalence rates of violence perpetrated towards forensic healthcare staff by service users.

PICO

Population: adult male and female healthcare staff of all grades, disciplines and levels working with forensic service users; staff delivering face-to-face care

Exposure (Experience): direct physical violence at work – perpetrated by forensic service users

Comparator: different levels of exposure

Outcomes: a) qualitative definitions of violence, b) quantitative data on prevalence of violence perpetrated towards healthcare staff by forensic service users.

Setting: Any forensic-based healthcare setting, inpatient, community, rehabilitation, prison etc. whose primary aim is in caring for offenders.

Study design: quantitative and qualitative observational studies

Methods

Search strategy

Key search terms to be used: **workplace** (workplace, work-related, work, organisation), **violence** (assault, attack, physical aggression, physical violence, patient violence), **forensic** (forensic, offenders, prisoners, criminal), **healthcare** (medical, healthcare, primary care), **staff** (staff, personnel, nursing staff, doctors, medical, therapist, psychiatrist, practitioner, support worker, healthcare assistant, psychologist, health worker, health personnel)

MeSH terms identified from background and key search terms: Criminals; Aggression; Workplace; Physical Abuse; Workplace Violence; Prisoners; Allied Health Personnel; Nursing Staff;

Psychiatry; Primary Health Care; Prevalence; Health Care Sector (resource used: https://meshb.nlm.nih.gov/MeSHonDemand)

Final search strategy developed

1. (healthcare worker* or health person* or health staff)
2. "workplace violence"
3. (patient agg* or patient viol*)
4. (forensic psy* or criminal* or offender*)
5. 1 and 2
6. 1 and 3
7. 1 and 4
8. 2 and 3
9. 2 and 4
10. 3 and 4
11. 1 and 2 and 3
12. 1 and 2 and 3 and 4
13. 1 and 2 and 4
14. 3 and 4

Databases to be searched: ProQuest Dissertations and Theses, The Home Office UK, National Criminal Justice, The US National Criminal Justice, References Service (NCJRS) abstracts database, CINAHL, Cochrane Library, Medline, Prospero, PubMed, PsycINFO, Campbell Collaboration Library of Systematic Reviews, CORDIS, SocINDEX, Google and Google Scholar search engines (to identify grey literature and sources such as independent reports. The method of 'snowballing' shall be also used to explore the reference section of included papers for further citations.

Type of data/studies to be included: full text primary research literature/data, government and independent body reports, grey/unpublished literature; worldwide data, no date restriction to be placed on the search.

Screening and selecting

Inclusion/exclusion

- Adult healthcare staff (all grades/levels) delivering face to face care to service users only – exclude staff not delivering face to face care, such as admin, porters, maintenance, domestic staff
- Violence in forensic services only – exclude studies in general healthcare services, such as A&E departments, non-forensic psychiatric services etc.
- Service user/patient violence towards staff only – exclude visitor-staff, staff-staff violence, exclude verbal aggression/psychological aggression – physical violence only (the rationale for this is that systems for reporting physical violence is more clear cut; systems for reporting instances such as verbal aggression are less clear and are biased by individual staff experiences. I believe this is something that would need to be addressed in a separate study and is a larger project)
- Primary data only – exclude citations/secondary prevalence data (to follow up with citations to find data from original studies in order to include these)
- Include citations for definitions of violence – can determine most commonly used definition as well as identifying the definitions that exist
- Worldwide data

Quality assessment

The assessment tool will be adapted from the CASP checklist set of quality assessment tools. This was chosen for consistency of quality assessment across a range of types of study, such as qualitative and quantitative based data. It is hoped in using the same quality assessment tool that bias will be reduced in using different types and styles of tool.

Data extraction

The data which will be extracted from each paper will include:

- Title, abstract (brief summary) and author of the paper ***→ include/exclude***
- Setting ***→ include/exclude***

- Population used → ***include/exclude***
- The journal the paper was published in
- The type of paper – review paper, case study etc. published, unpublished, in press etc.
- How the paper was located
- The language of the report
- The type of study – cohort, case control etc.
- A short description of the intervention used/how data was collected
- Methods and analysis used
- The definition of violence used
- The reported number of violence incidents that the population (staff in forensic services) had experienced
- The outcome of the quality assessment → ***include/exclude***

Data analysis

- A **narrative synthesis** of definitions of violence used in the forensic health sector. The first step in this would be to develop a preliminary synthesis by extracting the definitions used in the included studies. Thematic analysis will then be conducted on these definitions. The common themes will be extracted by coding text, developing descriptive themes and generating analytical themes, as proposed by Thomas and Harden (2008). The relationships within and between the studies will be explored using qualitative case descriptions. The robustness of the synthesis will be assessed using critical reflection on the synthesis process. The final synthesis will be addressed by drawing together conclusions of the synthesis.

- A **meta-analysis** of the prevalence of violence in forensic healthcare settings Meta-analysis will be conducted only if appropriate to do so (if not then a narrative synthesis will be conducted); if the assumption of homogeneity is met, firstly by meeting inclusion criteria, and if the participants are exposed to violence in a similar manner (same exposure, outcomes, effects in the same direction, corresponding confidence intervals overall). A summary statistic will be calculated by calculating the difference in means (as data will be continuous)

for each study. A random effects analysis will be conducted in the form of using inverse variance as the mean difference in studies will be explored (as data is continuous; meta-analysis shall be conducted with continuous data, but categorical data shall be included in the narrative synthesis). Data will be presented in the form of a forest plot; it is anticipated that methodological heterogeneity will be the most likely source of variability in study design and quality. A more formal assessment of heterogeneity will be conducted such as a chi-square test if the number of studies identified and included is substantial enough. If assumptions are met and it is considered appropriate to do so then a meta-regression may be conducted to account for factors that could influence the overall effect. Subgroups will be explored such as type of forensic service that was explored in each study and the type of staff group (such as nursing etc.) that the study centred on.

Time frame

Step 1: Protocol

Step 2: Literature searching

Step 3: Screening

Step 4: Obtaining papers

Step 5: Applying inclusion criteria, selecting full text papers

Step 6: Data extraction

Step 7: Quality assessment

Step 8: Analysis and synthesis

Step 9: Write up

References

Cashmore, A. W., Indig, D., Hampton, S. E., Hegney, D. G., & Jalaludin, B. B. (2012). Workplace violence in a large correctional health service in New South Wales, Australia: a retrospective review of incident management records. *BMC health services research*, *12*(1), 245.

Lanctôt, N., & Guay, S. (2014). The aftermath of workplace violence among healthcare workers: A systematic literature review of the consequences. *Aggression and violent behavior, 19(5), 492-501.*

Nolan P., Dallender J., Soares J., Thomsen S. & Arnetz B. (1999) Violence in mental health care: the experiences of mental health nurses and psychiatrists, *Journal of Advanced Nursing 30(4), 934-941*

Rippon, T. J. (2000). Aggression and violence in health care professions. Journal of advanced nursing, 31(2), 452-460.

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC medical research methodology*, *8*(1), 45.

Winstanley, S., & Whittington, R. (2004). Aggression towards health care staff in a UK general hospital: variation among professions and departments. *Journal of clinical nursing,* 13(1), 3-10.

Appendix B: Quality Assessment tool

Quality assessment

Researcher performing quality assessment:

Date of assessment:

Title and author of the paper	Was there a clear statement of the aims of the research? Did the study address a clear focused issue? [SAMPLING & SELECTION]	Was the methodology appropriate? Were participants recruited in an acceptable way? [SAMPLING & SELECTION]	Was the recruitment strategy appropriate to the aims of the research? Was the outcome accurately measured to minimise bias? [SAMPLING & SELECTION]	Was the research design appropriate to address the aims of the research? [MEASUREMENT OF VIOLENCE/ DESIGN]	Was the data collected in a way that addressed the research issue? Was violence defined? [MEASUREMENT OF VIOLENCE/ DESIGN]	Has the relationship between researcher and participants been adequately considered? Was the follow up of subjects complete/long enough? Was missing data accounted for/followed up? [ATTRITION]	Was the data analysis sufficiently rigorous? [ANALYSIS]	Have the authors identified all important confounding variables? Have they taken account of the confounding factors in the design and/or analysis? [REPORTING OF RESULTS]	Is there a clear statement of findings? Was reporting of results clear? [REPORTING OF RESULTS]	What are the implications of this study for practice? Include/ exclude?

Appendix C: Completed quality assessment table of included studies

Quality assessment

Researcher performing quality assessment: Sarah Hodgkinson

Date of assessment: 01.01.2018

Title and author of the paper	Was there a clear statement of the aims of the research? Did the study address a clear focused issue? [SAMPLING & SELECTION]	Was the methodology appropriate? Were participants recruited in an acceptable way? [SAMPLING & SELECTION]	Was the recruitment strategy appropriate to the aims of the research? Was the outcome accurately measured to minimise bias? [SAMPLING & SELECTION]	Was the research design appropriate to address the aims of the research? [MEASUREMENT OF VIOLENCE/ DESIGN]	Was the data collected in a way that addressed the research issue? Was violence defined? [MEASUREMENT OF VIOLENCE/ DESIGN]	Has the relationship between researcher and participants been adequately considered? Was the follow up of subjects complete/long enough? Was missing data accounted for/followed up? [ATTRITION]	Was the data analysis sufficiently rigorous? [ANALYSIS]	Have the authors identified all important confounding variables? Have they taken account of the confounding factors in the design and/or analysis? [REPORTING OF RESULTS]	Is there a clear statement of findings? Was reporting of results clear? [REPORTING OF RESULTS]	What are the implications of this study for practice? Include/ exclude?
Brendzal, M. D. (2001). *Clinician safety: Prevalence and possible impact of client violence on psychologists* (Doctoral dissertation, ProQuest Information & Learning).	Proquest partial full text preview only; unable to determine further information									**EXCLUDE**

Broderick, C., Azizian, A., Kornbluh, R., & Warburton, K. (2015). Prevalence of physical violence in a forensic psychiatric hospital system during 2011–2013: Patient assaults, staff assaults, and repeatedly violent patients. *CNS spectrums*, *20*(3), 319-330.	Yes	Yes as data is retrospective (database study)	Yes	Yes	Yes – clear definitions used as a point of reference.	N/A – retrospective data	Yes	Confounding issues appear to be considered	Yes – study flows well and outcome appear logical	Clear evidential data; meets all quality criteria **INCLUDE**
Carmel, H., & Hunter, M. (1989). Staff injuries from inpatient violence. *Psychiatric Services*, *40*(1), 41-46.	Yes a clear issue but statement a little vague	Yes – database retrospective study	Yes	Unclear how incidents were recorded/ measured	A definition of "injury" was used	No evidence of how this was followed up or how data was verified	Unclear	Some confounding variables accounted for; specific injury data from violence only – did not account for non-injury outcomes	Unsure – prevalence of injury of physical violence only – other outcomes not considered.	Clear gaps in data unaccounted for; unable to determine clear data of attrition, analysis and reporting of results **EXCLUDE**
Cashmore, A. W., Indig, D., Hampton, S. E., Hegney, D. G., & Jalaludin, B. B. (2012). Workplace violence in a large correctional health service in New South Wales, Australia: a retrospective review of incident management records. *BMC*	Yes	Yes – retrospective database data	Yes	Yes – database data	Yes – clear definition used	N/A – retrospective data	Yes	Confounding variables appear to be accounted for	Yes – limitations of the study well accounted for	Appears detailed; meets all quality criteria **INCLUDE**

health services research, *12*(1), 245.										
Cashmore, A. W., Indig, D., Hampton, S. E., Hegney, D. G., & Jalaludin, B. (2012). Workplace abuse among correctional health professionals in New South Wales, Australia. *Australian Health Review*, *36*(2), 184-190.	Yes	Yes – two methods used	Yes – pilot study used, different methods of data collection/recruitment used. Chief executive used to help recruit rather than researcher directly	Yes – pilot study used	Yes – clear definition used	Yes	Yes	Yes	Yes – limitations of the study well accounted for also	Appears to be a detailed rigorous study; meets identified quality criteria **INCLUDE**
Daffern, M., Mayer, M. M., & Martin, T. (2003). A preliminary investigation into patterns of aggression in an Australian forensic psychiatric hospital. *The YesJournal of Forensic Psychiatry & Psychology*, *14*(1), 67-84.	Yes	Yes – recording of incident data	Yes	Yes – retrospective study of incident data	No explicit definition provided but clear topic identified	N/A – retrospective data	Yes	Yes	Yes – limitations considered	Appears comprehensive; meets all quality criteria **INCLUDE**
Daffern, M., Mayer, M., & Martin, T. (2006). Staff gender ratio and aggression in a forensic psychiatric hospital. *International journal of mental*	Yes	Yes – recording of incident data	Yes	Yes – all incidents considered. However, staff victims accounted for but unable to separate out verbal and	No but clear topic identified → literature review comprehensive	N/A – retrospective data	Unclear	No – unable to separate out types of violence	Yes	Staff victims unaccounted for - insufficient evidence available to answer research question; reporting of results and

health nursing, *15*(2), 93-99.				physical aggressive acts						analysis criteria not met **EXCLUDE**
Gudjonsson, G. H., Rabe-Hesketh, S., & Wilson, C. (2000). Violent incidents on a medium secure unit: the target of assault and the management of incidents. *The Journal of Forensic Psychiatry*, *11*(1), 105-118.	Yes	Yes – recording of incident data	Yes	Yes – all incidents considered	No but clear topic identified	N/A – retrospective data	Yes - appear precise and clear	Yes – independent variables and confounding variables appear to be accounted for	Yes	Clear study of reported incidents; meets key quality criteria **INCLUDE**
Hill, S. A., White, O., Lolley, J., Sidki-Gomez, A., & Williams, H. (2012). Incidents in an adolescent forensic secure inpatient service. *Medicine, Science and the Law*, *52*(1), 27-31.	Yes	Yes – recording of incident data	Yes	Yes – all incidents considered	No but topic clearly identified	N/A – retrospective data	Yes appears rigorous	Appears to consider variables	Yes	Implications for forensic adolescent services for comparison against adults; meets key quality criteria **INCLUDE**
Kelly, E. L., Subica, A. M., Fulginiti, A., Brekke, J. S., & Novaco, R. W. (2015). A cross-sectional survey of factors related to inpatient assault of staff in a forensic psychiatric hospital. *Journal of*	Yes	Yes – staff survey	Yes	Yes	No but topic clearly discussed/ identified	N/A	Appears rigorous	Yes - appears to consider variables	Yes	Study taken place from staff survey perspective rather than typical incident reporting data; meets key quality criteria

advanced nursing, *71*(5), 1110-1122.										**INCLUDE**
Lauvrud, C., Nonstad, K., & Palmstierna, T. (2009). Occurrence of post traumatic stress symptoms and their relationship to professional quality of life (ProQoL) in nursing staff at a forensic psychiatric security unit: a cross-sectional study. *Health and quality of life outcomes*, *7*(1), 31.	Yes	Yes	Yes: Staff survey – appears to have used randomisation	Yes: Staff survey – appears to have used randomisation	No – short background to topic	None	Unclear - 100 participants appears low for type of study	Yes - appears to consider variables	Unsure – low participant numbers	No clear evidential data of incidents – only 100 participants; did not meet criteria for analysis and reporting of results **EXCLUDE**
Marth, D. (2009). *A longitudinal study of differences in staff assaults by responses to residents in a forensic hospital*. University of Missouri-Columbia.	Yes	Yes – record review	Lots of staff/incidents included in the review over a longitudinal period of time	Yes - retrospective study of incident data	Yes – clear definition used	N/A	Appears rigorous	Yes - appears to consider variables	Yes	Large dataset used – longitudinal; meets all quality assessment criteria **INCLUDE**
Nicholls, T. L., Brink, J., Greaves, C., Lussier, P., & Verdun-Jones, S. (2009). Forensic psychiatric inpatients and aggression: An exploration of incidence, prevalence,	Yes	Yes – record/file review	Yes	Yes - retrospective study of incident data	Yes – clear definition used	N/A file review data	Appears rigorous	Yes - appears to consider variables	Yes	Good breakdown of incident data; meets all quality criteria **INCLUDE**

severity, and interventions by gender. *International journal of law and psychiatry*, *32*(1), 23-30.										
Uppal, G., & McMurran, M. (2009). Recorded incidents in a high-secure hospital: A descriptive analysis. *Criminal Behaviour and Mental Health*, *19*(4), 265-276.	Yes	Yes	No – not able to separate out number of staff assaults specifically – not able to separate out victim or type of assault	Yes - retrospective study of incident data	No	Unclear	Unclear	No – unable to separate victim or type of assault	Unclear	Insufficient detail to fully assess quality **EXCLUDE**

Appendix D: Second researcher quality assessment table

Quality assessment

Researcher performing quality assessment: Emily Mellor

Date of assessment: 09.01.18

Title and author of the paper	Was there a clear statement of the aims of the research? Did the study address a clear focused issue? [SAMPLING & SELECTION]	Was the methodology appropriate? Were participants recruited in an acceptable way? [SAMPLING & SELECTION]	Was the recruitment strategy appropriate to the aims of the research? Was the outcome accurately measured to minimise bias? [SAMPLING & SELECTION]	Was the research design appropriate to address the aims of the research? [MEASUREMENT OF VIOLENCE/ DESIGN]	Was the data collected in a way that addressed the research issue? Was violence defined? [MEASUREMENT OF VIOLENCE/ DESIGN]	Has the relationship between researcher and participants been adequately considered? Was the follow up of subjects complete/long enough? Was missing data accounted for/followed up? [ATTRITION]	Was the data analysis sufficiently rigorous? [ANALYSIS]	Have the authors identified all important confounding variables? Have they taken account of the confounding factors in the design and/or analysis? [REPORTING OF RESULTS]	Is there a clear statement of findings? Was reporting of results clear? [REPORTING OF RESULTS]	What are the implications of this study for practice? Include/ exclude?
Carmel & Hunter (1989)- Staff injuries from inpatient violence	Yes	Yes as data is retrospective	Yes	Unclear regarding how criteria for violence was measured	No definition provided	No evidence of a follow up	Appear to be precise/ rigorous	Not considered the hours of contact with patients each individual had in total/ their relationship with the patient. No consideration to gender of patient/age etc.	Yes- it makes sense that staff that have more contact with patients e.g. nursing staff are more likely to be a victim of violence.	Increase awareness of violence in such establishments Exclude
Daffern et al (2003) - A preliminary investigation into patterns of	Yes- to explore prevalence and determinants	Yes as data is retrospective	Yes	Yes, used of psychometric to review	Yes, used of psychometric to review	No evidence of a follow up. However, a prospective assessment was	Appear to be precise/ rigorous	Yes	Yes- males responsible for more violence as there are	The cost of such aggressive incidents

aggression in an Australian forensic Psychiatric hospital.	of aggression.			seriousness of incidents.	seriousness of incidents.	undertaken after this paper			more male beds	Include

Appendix E: Table of level of agreement between quality assessors

Level of agreement between researcher and second quality assessment reviewer for assessed studies

	Was there a clear statement of the aims of the research? Did the study address a clear focused issue? [SAMPLING & SELECTION]	Was the methodology appropriate? Were participants recruited in an acceptable way? [SAMPLING & SELECTION]	Was the recruitment strategy appropriate to the aims of the research? Was the outcome accurately measured to minimise bias? [SAMPLING & SELECTION]	Was the research design appropriate to address the aims of the research? [MEASUREMENT OF VIOLENCE/ DESIGN]	Was the data collected in a way that addressed the research issue? Was violence defined? [MEASUREMENT OF VIOLENCE/ DESIGN]	Has the relationship between researcher and participants been adequately considered? Was the follow up of subjects complete/long enough? Was missing data accounted for/followed up? [ATTRITION]	Was the data analysis sufficiently rigorous? [ANALYSIS]	Have the authors identified all important confounding variables? Have they taken account of the confounding factors in the design and/or analysis? [REPORTING OF RESULTS]	Is there a clear statement of findings? Was reporting of results clear? [REPORTING OF RESULTS]	What are the implications of this study for practice? Include/ exclude?
Study: Carmel, H., & Hunter, M. (1989). Staff injuries from inpatient violence. *Psychiatric Services*, *40*(1), 41-46. **Outcome of agreement= 70% agreement; 30% disagreement**										
RESEARCHER	Yes a clear issue but statement a little vague	Yes – database retrospective study	Yes	Unclear how incidents were recorded/ measured	A definition of "injury" was used	No evidence of how this was followed up or how data was verified	Unclear	Some confounding variables accounted for; specific injury data from violence only – did not account for non-injury outcomes	Unsure – prevalence of injury of physical violence only – other outcomes not considered.	Clear gaps in data unaccounted for; unable to determine clear data of attrition, analysis and reporting of results **EXCLUDE**

SECOND QUALITY ASSESSOR	Yes	Yes as data is retrospective	Yes	Unclear regarding how criteria for violence was measured	No definition provided	No evidence of a follow up	Appear to be precise/ rigorous	Not considered the hours of contact with patients each individual had in total/ their relationship with the patient. No consideration to gender of patient/age etc.	Yes- it makes sense that staff that have more contact with patients e.g. nursing staff are more likely to be a victim of violence.	Increase awareness of violence in such establishments Exclude
Level of agreement	Agree	Agree	Agree	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree
Study: Daffern, M., Mayer, M. M., & Martin, T. (2003). A preliminary investigation into patterns of aggression in an Australian forensic psychiatric hospital. *The YesJournal of Forensic Psychiatry & Psychology*, *14*(1), 67-84. **Outcome of agreement= 80% agreement; 20% agreement unclear**										
RESEARCHER	Yes	Yes – recording of incident data	Yes	Yes – retrospective study of incident data	No explicit definition provided but clear topic identified	N/A – retrospective data	Yes	Yes	Yes – limitations considered	Appears comprehensive; meets all quality criteria **INCLUDE**
SECOND QUALITY ASSESSOR	Yes- to explore prevalence and determinants of aggression.	Yes as data is retrospective	Yes	Yes, used of psychometric to review seriousness of incidents.	Yes, used of psychometric to review seriousness of incidents.	No evidence of a follow up. However, a prospective assessment was undertaken after this paper	Appear to be precise/ rigorous	Yes	Yes- males responsible for more violence as there are more male beds	The cost of such aggressive incidents Include
Level of agreement	Agree	Agree	Agree	Agree	Unclear	Unclear	Agree	Agree	Agree	Agree

Appendix F: Data Extraction tool

Data extraction – included studies

Researcher performing data extraction:

Date of extraction:

Title, abstract (brief summary) and author of the paper → ***include/exclude***	Setting → ***include/exclude***	Population used → ***include/exclude***	Type of exposure – aggression/ violence → ***include/ exclude***	The journal the paper was published in	type of paper – review paper, case study etc. published, unpublished, in press etc.	How the paper was located	language of the report/ country of origin	type of study – cohort, case control etc.	A short description of the intervention used/how data was collected/when data was collected	Methods and analysis used	definition of workplace violence used	reported number of violence incidents that the population (staff in forensic services) had experienced/ RESULTS

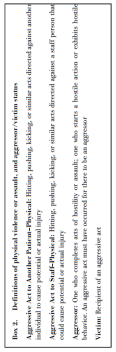
May also extract: individual study characteristics (aims/objectives of the study; study design; study inclusion/exclusion criteria; recruitment procedure used etc), participant characteristics, intervention and setting, outcome data/results

Appendix G: Completed data extraction table of included studies

Data extraction – included studies

Researcher performing data extraction: Sarah Hodgkinson

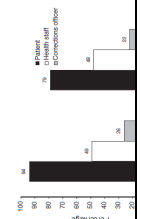
Title, abstract (brief summary) and author of the paper→ ***include/exclude***	Setting→ ***include/ exclude***	Population used→ ***include/exclude***	Type of exposure – aggression / violence→ ***include/ exclude***	The journal the paper was published in	Type of paper – review paper, case study etc. published, unpublished, in press etc.	How the paper was located	Language of the report/ country of origin	Type of study – cohort, case control etc.	A short description of the intervention used/how data was collected/ when data was collected	Methods and analysis used	Definition of violence used	Reported number of violent incidents that the population (staff in forensic services) had experienced/RESULTS
Broderick, C., Azizian, A., Kornbluh, R., & Warburton, K. (2015). Prevalence of physical violence in a forensic psychiatric hospital system during 2011–2013: Patient assaults, staff assaults, and repeatedly	US multi-hospital state forensic psychiatric system	Adult psychiatric inpatient population. N = 15,615; females n = 2161; males n = 13,454. Various ethnicities	Acts of patient violent from patient data files	CNS Spectrums (2015), 20, 319–330.	Published paper	EBCSCO Host – electronic database search	English; US (California)	Observational retrospective study of patient data	Data collected from database incident management module of computerised patient treatment planning databased between 2011-2013	Data collected from database Data files provided by data management office of California DSH for all patients. Data extraction of	Physical violence during the study was defined as assaults directed against either another patient or a staff member, as defined in the California	The number of patients having at least a single staff assault incident was n = 2504, yielding a staff assault prevalence of 16.04 %(95% CI 15.46%–16.62%).

violent patients. *CNS spectrums*, *20*(3), 319-330.										physical assault data → descriptive review of demographic data. Chi square and logistic regression for main effects model	DSH policies (see Box 2). 	A simple tally showed that the top 156 aggressors (1% of the study population) were involved in 28.7% of all these violent assaults. When examining the patients still hospitalized at the conclusion of the study, those remaining (n = 5508) a staff violence prevalence of 22.97% (95% CI 21.86%–24.08%),

Title, abstract (brief summary) and author of the paper→ ***include/exclude***	Setting→ ***include/ exclude***	Population used→ ***include/exclude***	Type of exposure – aggression / violence→ ***include/ exclude***	The journal the paper was published in	Type of paper – review paper, case study etc. published, unpublished, in press etc.	How the paper was located	Language of the report/ country of origin	Type of study – cohort, case control etc.	A short description of the intervention used/how data was collected/ when data was collected	Methods and analysis used	Definition of violence used	Reported number of violent incidents that the population (staff in forensic services) had experienced/RESULTS
Cashmore, A. W., Indig, D., Hampton, S. E., Hegney, D. G., & Jalaludin, B. B. (2012). Workplace violence in a large correctional health service in New South Wales, Australia: a retrospective review of incident management records. *BMC health services research*, *12*(1), 245.	The study setting was Justice Health, a NSW Government funded statutory health corporation established to provide health care to people, including both adults and juveniles, who come into contact with the criminal justice system in NSW.	Justice Health employs over 1,490 people. These employees work in a range of settings, including: police holding cells; adult prisons; periodic detention and transitional centres; a prison hospital; a forensic hospital; juvenile justice centres; a youth drug and alcohol court; adult and children's	Reviewed IIMS (Incident Information Management System) records describing workplace violence perpetrated against Justice Health staff by patients, correctional officers or patients' visitors (208 incidents).	BMC Health Services Research	Published	MEDLINE – electronic database search (OVID)	English; Australia	Observational retrospective study of incident reports	All of the IIMS (Incident Information Management System) records were extracted described an incident of workplace violence and therefore none were excluded from analysis. The three-year study period was from 1 July 2007 to 30 June 2010.	Data collected from database. Data were analysed using SAS version 9.2. Descriptive statistics were calculated to describe and summarise records. Significance testing was conduct	The Joint Programme on Workplace Violence in the Health Sector defines workplace violence as: "Incidents where staff are abused, threatened or assaulted in circumstances related to their work, including commuting to and from work, involving an explicit or implicit challenge to	Incidents of physical abuse were less common (27%, n=56). Only 2% (n=4) of the incidents involved a sexual assault (these were subsequently analysed as "physical abuse"). A significantly higher proportion of males than

		courts; and in the community. The types of health services provided are equally diverse and include: clinical and nursing care; mental health and drug and alcohol services; oral health services; and a range of primary health care services.								ed to determine if experiences of workplace violence varied significantly by victim gender (chi-square test) and victim age (t-test).	their safety, well-being or health" (Citation: International Labour Office: International Council of Nurses, World Health Organization, Public Services International: Framework Guidelines for Addressing Workplace Violence in the Health Sector. Geneva: International Labour Office; 2002.)	females (55% vs. 25%, $X2=16.14$, $p < 0.001$) were the victims of physical abuse. Table 2 Incidents of workplace violence reported by Justice Health employees between 1 July 2007 and 30 June 2010 by victim's profession[1] Workplace violence / Physical abuse / Verbal abuse n / % / n / % / n / % Nurse 187 89.9 57 95.0 130 87.8 Medical doctor 11 5.3 2 3.3 9 6.1 Allied health 5 2.4 1 1.7 4 2.7 Administration 3 1.4 0 0.0 3 2.0 Table 1 Incidents of workplace violence reported by Justice Health employees between 1 July 2007 and 30 June 2010 by Justice Health setting Workplace violence / Physical abuse / Verbal abuse n / % / n / % / n / % Adult male prison 92 44.4 11 18.3 81 55.1 Forensic hospital 40 19.3 30 50.0 10 6.8 Female prison 27 13.0 8 13.3 19 12.9 Prison hospital 17 8.2 8 13.3 9 6.1 Juvenile justice centre 11 5.3 1 1.7 10 6.8 Police holding cell 11 5.3 2 3.3 9 6.1 Other 9 4.4 0 0.0 9 6.1

Title, abstract (brief summary) and author of the paper➔ ***include/ exclude***	Setting➔ ***include/ exclude***	Population used➔ ***include/exclude***	Type of exposure – aggression / violence➔ ***include/ exclude***	The journal the paper was published in	Type of paper – review paper, case study etc. published, unpublished, in press etc.	How the paper was located	Language of the report/ country of origin	Type of study – cohort, case control etc.	A short description of the intervention used/how data was collected/ when data was collected	Methods and analysis used	Definition of violence used	Reported number of violent incidents that the population (staff in forensic services) had experienced/RESULTS
Cashmore, A. W., Indig, D., Hampton, S. E., Hegney, D. G., & Jalaludin, B. (2012). Workplace abuse among correctional health professionals in New South Wales, Australia. *Australian Health Review*, *36*(2), 184-190.	Justice Health: a statutory health corporation established to facilitate the provision of healthcare to people who come into contact with the criminal justice system in New South Wales (NSW).	All employees of Justice Health	The survey included questions relating to participants' experiences of workplace abuse (including both verbal and physical abuse) during a recall period of 3 months.	Australian Health Review	Published	SCOPUS – electronic database search	English; Australia	Observation survey/questionnaire	Self-administered survey of workplace abuse. Of those who were invited to participate in the research, 710 were employed as a health professional: 590 nurses; 85 medical doctors; and 35 allied health professionals. The survey was delivered via the internet and was also made available on the Justice Health intranet site for completion as	Data were analysed using SAS 9.2 (SAS Institute Inc., Cary, NC, USA). Descriptive statistics were calculated to describe and summarise survey responses. The Chi-square test was	No definition used in paper but in survey used – definition of workplace abuse developed by Farrell et al.	A total 299 usable surveys; Only 16% reported physical abuse. Of those who reported physical abuse during the recall period (48 people*), 94% recalled at least one incident of physical abuse where a patient was the perpetrator

									a paper-based survey	used to explore associations among categorical variables. A P-value of <0.05 was considered statistically significant.	**Box 1. Definition of workplace abuse used in the current study** Verbal abuse is defined as a form of mistreatment, spoken or unspoken that leaves you feeling personally or professionally attacked, devalued or humiliated. It is communication – including actions or behaviours – through words, tone or manner that disparages, patronises, threatens, accuses, or is disrespectful towards another. Please note that we are referring to behaviour that includes the suggestion of physical violence via verbal interaction, in person or over the telephone, as well as physical postures that suggest an object or fist might be thrown. However, no physical contact eventuates. An instance where you are deliberately professionally isolated would be considered a form of abuse (e.g. if your manager regularly ignores your emails or often does not return your phone calls). Physical abuse is defined as any incident where a person experiences physical assault (e.g. being spat on, bitten, pushed, scratched or hit and so on) or sexual assault (defined as any forced physical sexual contact including forcible touching and fondling, any forced sexual acts including sexual intercourse). Farrell GA, Bobrowski C, Bobrowski P. Scoping workplace aggression in nursing: findings from an Australian study. *J Adv Nurs* 2006; 55(6): 778–87. doi:10.1111/j.1365-	(45 people*).  *current researcher calculations

											2648.2006.03956.x	
Title, abstract (brief summary) and author of the paper→ ***include/exclude***	Setting→ ***include/ exclude***	Population used→ ***include/exclude***	Type of exposure – aggression / violence→ ***include/ exclude***	The journal the paper was published in	Type of paper – review paper, case study etc. published, unpublished, in press etc.	How the paper was located	Language of the report/ country of origin	Type of study – cohort, case control etc.	A short description of the intervention used/how data was collected/ when data was collected	Methods and analysis used	Definition of violence used	Reported number of violent incidents that the population (staff in forensic services) had experienced/RESULTS
Daffern, M., Mayer, M. M., & Martin, T. (2003). A preliminary investigation into patterns of aggression in an Australian forensic psychiatric hospital. *The Journal of Forensic Psychiatry & Psychology*, *14*(1), 67-84.	Australian forensic psychiatric hospital	Adult psychiatric inpatient population.	Information extracted from these forms included the time of day and the month of the aggression, the ward, the type of aggression (verbal or physical aggression or property damage), characteristics of the aggressive inpatient (gender,	The Journal of Forensic Psychiatry & Psychology	Published	PsycInfo – electronic database search (OVID)	English; Australia	Observational retrospective study of incident reports	Incident forms that reported acts of aggression by inpatients between 27 April 2000, the opening date of the hospital, and 26 April 2001 were reviewed.	?? "Data were analysed using SPSS for Windows version 10.0….. Given the small sample of aggressive patients, only descriptive statistics are	No definition used	During the 12 months under review, 197 incidents of aggression were reported within the hospital. Physical aggression was the most common form of aggression recorded (88 or 44.7% of incidents),

			age), characteristics of the victim (gender, whether staff or patient and the profession if staff victim), and the severity of the aggression.							presented."		followed by property damage (68 or 34.5%), verbal aggression (38 or 19.3%) and sexual aggression (3 or 1.5%). nursing staff (48 incidents) were the most frequent victims of verbal or physical aggression. Physical aggression against staff (30) was more common than verbal aggression (23) or sexual aggression (3).
Title, abstract (brief summary) and author of	Setting→ ***include/ exclude***	Population used→	Type of exposure – aggression /	The journal the paper was	Type of paper – review paper,	How the paper	Language of the report/	Type of study – cohort,	A short description of the intervention	Methods and	Definition of violence used	Reported number of violent incidents

the paper→ ***include/exclude***		***include/exclude***	violence→ ***include/exclude***	published in	case study etc. published, unpublished, in press etc.	was located	country of origin	case control etc.	used/how data was collected/ when data was collected	analysis used		that the population (staff in forensic services) had experienced/RESULTS
Gudjonsson, G. H., Rabe-Hesketh, S., & Wilson, C. (2000). Violent incidents on a medium secure unit: the target of assault and the management of incidents. *The Journal of Forensic Psychiatry*, *11*(1), 105-118.	Medium secure unit	Adult male and female psychiatric patients	'untoward' incident data extracted from a standard hospital incident form → violence only, of 2180 incident forms	The Journal of Forensic Psychiatry	Published	PsycInfo – electronic database search (OVID)	English; UK	Observational retrospective study of incident reports	Incident form data was extracted from existing records; The severity of each incident is classified by a clinical manager shortly after it occurs. All incidents were rated according to the following criteria: • '0' incident: this involves a threat of physical violence without violence being in□ inflicted; the category also includes verbal aggression, damage to property,	Random effects logistic regression was used to model the probability of various characteristics (e.g. that one of the targets of an assault was a nurse) given that a violent incident had occurred. All independent variable	None given; discussed that "In his review of the literature, Davis (1991) concluded that violence is best construed as arising from the interaction between three types of factors: individual (e.g. acute illness, the phase of illness, drug abuse, age, and history of violence); situational (e.g. time of the day, overcrowding, provocation from staff	The most frequent single victims were nurses (assaulted in 18.9% of all incidents), followed by fellow patients (14.5%) and damage to property (13%) Doctors, other clinicians, visitors or the patients themselves were the single targets in only 2.4% of incidents.

									arson, and self-injury; • '1' incident: here violence is inflicted but no injury is detectable on examination by a doctor and there is no significant pain; • '2' incident: there is significant pain, bruising or laceration; • '3' incident: any assault producing an injury that requires further hospital investigation (e.g. X-ray, staff being sent off duty)	s (age, gender, ethnic minority status, diagnosis, legal section, time period, and severity) were initially entered and subsequently removed one by one if they were not significant according to the Wald statistic. All pairwise interactions between the final selected set of independent variable	and patients, and poor management practice); and structural (e.g. changes in mental health policies)."	In 4% of incidents violence was inflicted on a combination of targets. For the purpose of the logistic regression analysis, all 465 (21%) incidents involving nurses (as single targets or in combination with other targets) were counted as assaults on nurses.

										s were also tested. Standardized level 2 residuals		
Title, abstract (brief summary) and author of the paper➔ ***include/exclude***	Setting➔ ***include/ exclude***	Population used➔ ***include/exclude***	Type of exposure – aggression / violence➔ ***include/ exclude***	The journal the paper was published in	Type of paper – review paper, case study etc. published, unpublished, in press etc.	How the paper was located	Language of the report/ country of origin	Type of study – cohort, case control etc.	A short description of the intervention used/how data was collected/ when data was collected	Methods and analysis used	Definition of violence used	Reported number of violent incidents that the population (staff in forensic services) had experienced/RESULTS
Hill, S. A., White, O., Lolley, J., Sidki-Gomez, A., & Williams, H. (2012). Incidents in an adolescent forensic secure inpatient service. *Medicine, Science and the Law*, *52*(1), 27-31.	adolescent forensic secure inpatient service in a medium secure hospital	The 37 discharged patients comprised nine females and 28 males. The mean age at admission was 16 years and nine months with a mean age at discharge of 17 years and three months.	Patient "incident" forms examined	Medicine, Science and the Law	Published	Google Scholar electronic search	English; UK	Observational retrospective study of incident reports	Records of all incidents were collated for the 37 patients who have subsequently been discharged from Bluebird House for the three years from February 2008 to the end of January 2011.	Unknown/not reported but reported that "The 28 male patients accounted for 799 (33%) of the incidents during the 4101	None given	Of the total of 2357 incidents, 992 (42%) were related to violent and threatening behaviour. Seven hundred and sixty-one incidents involved an actual physical

										days that they occupied beds at Bluebird House. These differences are statistically significant at the 5% level (chi-squared test 2461, P, 0.0001, DF – 2)."		assault, of which 64 (8.4%) were patient on patient assaults and the remaining 91.6% were patient on staff assaults.
Title, abstract (brief summary) and author of the paper→ ***include/exclude***	Setting→ ***include/ exclude***	Population used→ ***include/exclude***	Type of exposure – aggression / violence→ ***include/ exclude***	The journal the paper was published in	Type of paper – review paper, case study etc. published, unpublished, in press etc.	How the paper was located	Language of the report/ country of origin	Type of study – cohort, case control etc.	A short description of the intervention used/how data was collected/ when data was collected	Methods and analysis used	Definition of violence used	Reported number of violent incidents that the population (staff in forensic services) had experienced/RESULTS
Kelly, E. L., Subica, A. M., Fulginiti, A., Brekke, J.	forensic psychiatric hospital –	sample of 348 psychiatric staff participated in	Staff workplace experiences – survey	Journal of	Published	MEDLINE – electronic	English; US (California)	Cross-sectional	An online survey about staff workplace experiences,	An online survey was sent	None given	70% reported being assaulted

S., & Novaco, R. W. (2015). A cross-sectional survey of factors related to inpatient assault of staff in a forensic psychiatric hospital. *Journal of advanced nursing*, *71*(5), 1110-1122.	mixed gender	an online survey	(all types of incidents)	Advanced Nursing		database search		online staff survey	psychosocial characteristics and wellbeing. Data were collected from November – December 2011.	through the hospital's internal email system to the hospital's 1794 total clinical staff members. The final sample consisted of 348 clinical staff (71% of those who began the survey, 19% of clinical staff). All data were inspected for outliers and normality of distributions by		during the previous 12 months. In terms of assault severity, 42% of participants reported at least one incident of non-sexual serious assault (e.g. being kicked, punched, slapped, hit in the head, pushed or knocked down) and 64% reported at least one mild assault (e.g. being grabbed, touched or spat on). The average scaled frequencies across assault

										examining skew, kurtosis and Q-Q plots. Need for data transformation was not indicated. Descriptive statistics, Pearson's correlations, one-way analyses of variance and hierarchical linear regression were conducted using SPSS version 18.0 (SPSS Inc. 2009).		types suggested that staff were not often assaulted in multiple forms (scaled M = 037, first interquartile = 000, third interquartile = 057). Twelve percent of respondents reported taking off at least 1 day of work during the previous 6 months due to a patient assault.

Title, abstract (brief summary) and author of the paper➔ ***include/ exclude***	Setting➔ ***include/ exclude***	Population used➔ ***include/exclude***	Type of exposure – aggression / violence➔ ***include/ exclude***	The journal the paper was published in	Type of paper – review paper, case study etc. published, unpublished, in press etc.	How the paper was located	Language of the report/ country of origin	Type of study – cohort, case control etc.	A short description of the intervention used/how data was collected/ when data was collected	Methods and analysis used	Definition of violence used	Reported number of violent incidents that the population (staff in forensic services) had experienced/RESULTS
Marth, D. (2009). *A longitudinal study of differences in staff assaults by responses to residents in a forensic hospital*. University of Missouri-Columbia.	Forensic hospital	805 staff members	Staff surveys/questionnaires: Staff-Resident Interaction Chronograph (SRIC, Paul, 1987) is a standardized, direct observational coding instrument that was used to collect data in this study.	(Unpublished)	Unpublished	ProQuest dissertations and theses – electronic database search	English; US (Midwestern)	Observational: record review of 805 staff member's responses to residents' behavior	sample in this study were 805 staff members whose responses to residents on six social learning program (SLP) wards across three security levels of a Midwestern forensic hospital were observed over a ten-year period of time (1997 to 2007). Various questionnaires administered to staff	Descriptive statistics were reported in terms of mean rate scores and correlations. T-tests were performed to determine if assaulted staff members are more likely than non-assaulte	Assault. An assault is an intentional infliction of any injury upon another person. It includes serious physical injury requiring immediate medical attention or hospitalization; minor injury requiring routine minor first aid (such as disinfection and bandage); or physical	Three hundred and ninety-six staff members were assaulted (N=805). There were 28 cases with missing data, so the sample included 465 females and 312 males.

										d staff members to engage in each nine staff respons e-resident behavior situations. After mean rate scores for the constructs of limit setting, activity demand, and denial of requests were derived from rate scores on the nine staff respons e-resident behavior situations, t-	contact such as pushing, hair pulling, pinching or slapping not resulting in injury. The standard is whether the assault was intentional or not.	

										tests were also performed to determine whether assaulted staff engaged in more limit setting, activity demand, and denial of requests than staff who were not assaulted.		
Title, abstract (brief summary) and author of the paper→ ***include/exclude***	Setting→ ***include/ exclude***	Population used→ ***include/exclude***	Type of exposure – aggression / violence→ ***include/ exclude***	The journal the paper was published in	Type of paper – review paper, case study etc. published, unpublished, in press etc.	How the paper was located	Language of the report/ country of origin	Type of study – cohort, case control etc.	A short description of the intervention used/how data was collected/ when data was collected	Methods and analysis used	Definition of violence used	Reported number of violent incidents that the population (staff in forensic services) had experienced/RESULTS

Nicholls, T. L., Brink, J., Greaves, C., Lussier, P., & Verdun-Jones, S. (2009). Forensic psychiatric inpatients and aggression: An exploration of incidence, prevalence, severity, and interventions by gender. *International journal of law and psychiatry*, *32*(1), 23-30.	forensic psychiatric hospital	In total, 527 patients had complete data and were part of intensive retrospective file reviews; inpatient aggression was evaluated using the Overt Aggression Scale.	Patient data – including aggression and violence/serious incidents	International Journal of Law and Psychiatry	Published	Google Scholar electronic search	English; Canada	Observational retrospective study of patient data	Between January 1st and December 31st 2004, a total of 548 patients were assessed and/or treated at the Forensic Psychiatric Hospital (FPH) in Port Coquitlam, British Columbia. Due to incomplete files and missing data, a total of 527 patients were available for the present study. Socio-demographic, mental health, and criminological patient information was extracted – patient file review questionnaire used, aggression and violent incident coding form used – Overt Aggression Scale (OAS)	Statistical analyses were completed using the Statistical Package for Social Sciences (SPSS-14.0). Categorical data were analyzed using two-way frequency tables with the chi-square test of independence and phi is reported as a measure of the strength of the association between	None used: Overt Aggression Scale (OAS) used to assess aggression. OAS conceptualises physical aggression as: **Physical aggression against other people** Makes threatening gestures, swings at people, grabs at clothes Strikes, kicks, pushes, pulls hair (without injury to them) Attacks others causing mild-moderate physical injury (bruises, sprain, welts) Attacks others causing severe physical injury (broken	There were 310 incidents which involved physical aggression and/ or inappropriate sexual behaviour against others; these constituted our 'serious' incidents which were followed-up through first aid reports, worker's compensation reports, and risk management reports. It is noteworthy that even after removing the relatively innocuous incidents of verbal

									used to assess aggression.-->serious incident forms	categorical variables (i.e., the effect size). Fisher's exact test was completed when more than 25% of the cells had an expected count of less than 5. Two-sample t tests were conducted to compare the means of the men and women for continuous variables. Nonparametric		aggression and property damage, most incidents of 'serious' aggression did not result in any injuries to staff (91.6%) regardless of whether the perpetrator was male (91.9%) or female (88.5%) $\chi 2[2, N=310]=.74$, p=.69, Phi=.05).Of those 212 cases of serious aggression with complete data, most incidents involved a single target (87.5%), and it was equally

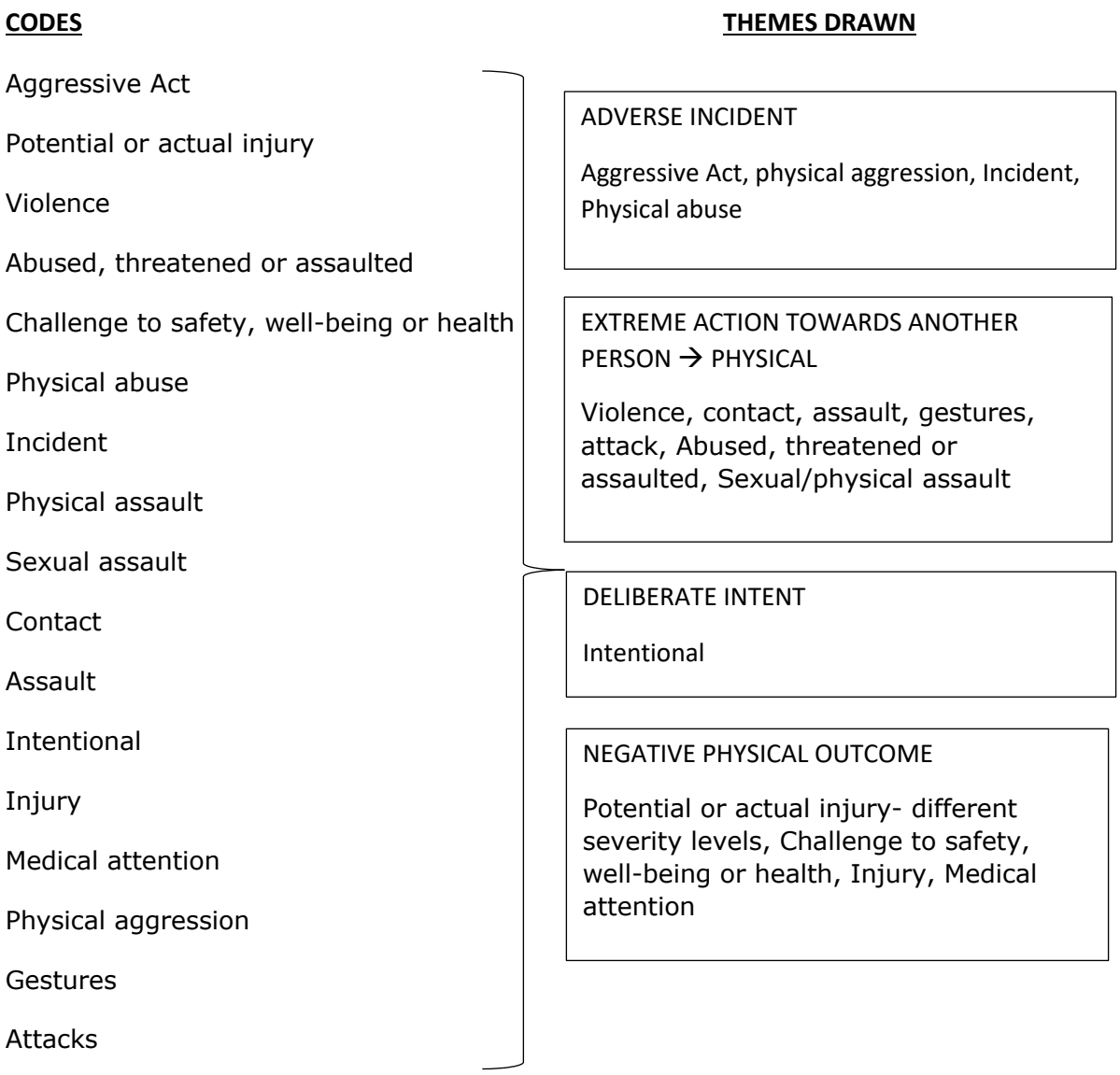
										analyses were conducted on skewed data. Hierarchical logistic regression analysis was used to evaluate the relationship between gender and inpatient aggression after controlling for diagnoses.		likely that Victims were co-patients (49.5%) or staff (50.5%).

Date of extraction: 15/01/2018 – 21/01/2018

Appendix H: Thematic synthesis method: coding of themes and descriptive groupings

Study	Definition/term used
Broderick et al (2015)	Aggressive Act to Staff–Physical: "Hitting, pushing, kicking, or similar acts directed against a staff person that could cause potential or actual injury"
Cashmore et al (2012) (1)	Workplace violence: "Incidents where staff 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"
Cashmore et al (2012) (2)	Physical abuse: defined as "any incident where a person experiences physical assault (e.g. being spat on, bitten, pushed, scratched or hit and so on) or sexual assault (defined as any forced physical sexual contact including forcible touching and fondling, any forced sexual acts including sexual intercourse)."
Marth (2009)	Assault: "An assault is an intentional infliction of any injury upon another person. It includes serious physical injury requiring immediate medical attention or hospitalization; minor injury requiring routine minor first aid (such as disinfection and bandage); or physical contact such as pushing, hair pulling, pinching or slapping

	not resulting in injury. The standard is whether the assault was intentional or not.”
Nicholls et al (2009)	Nicholls et al (2009) conceptualised physical aggression against others using the Overt Aggression Scale (OAS) (Silver and Yodofsky (1991)): Physical aggression against other people: “Makes threatening gestures, swings at people, grabs at clothes, strikes, kicks, pushes, pulls hair (without injury to them), attacks others causing mild-moderate physical injury (bruises, sprain, welts), attacks others causing severe physical injury (broken bones, deep lacerations, internal injury).


CODES
THEMES DRAWN
Aggressive Act
Potential or actual injury
Violence
Abused, threatened or assaulted
Challenge to safety, well-being or health
Physical abuse
Incident
Physical assault
Sexual assault
Contact
Assault
Intentional
Injury
Medical attention
Physical aggression
Gestures
Attacks
ADVERSE INCIDENT
Aggressive Act, physical aggression, Incident, Physical abuse
EXTREME ACTION TOWARDS ANOTHER PERSON → PHYSICAL
Violence, contact, assault, gestures, attack, Abused, threatened or assaulted, Sexual/physical assault
DELIBERATE INTENT
Intentional
NEGATIVE PHYSICAL OUTCOME
Potential or actual injury- different severity levels, Challenge to safety, well-being or health, Injury, Medical attention

Appendix I: Study I and II Ethical approval documentation (HRA, University of Nottingham and Sponsor approval)

NHS
Health Research Authority

Dr Shihning Chou
Room B Floor YANG Fujia Building, Jubilee Campus
Wollaton Road
Nottingham
Nottingham
NG8 1BB

Email: hra.approval@nhs.net

04 September 2017

Dear

Letter of HRA Approval

Study title:	**The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress**
IRAS project ID:	**224887**
Protocol number:	**17062**
REC reference:	**18/HRA/0211**
Sponsor	**University of Nottingham**

I am pleased to confirm that **HRA Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

Participation of NHS Organisations in England

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

Appendix B provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read *Appendix B* carefully**, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities
- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.
- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details and further information about working with the research management function for each organisation can be accessed from www.hra.nhs.uk/hra-approval.

Appendices

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

After HRA Approval

The attached document *"After HRA Approval – guidance for sponsors and investigators"* gives detailed guidance on reporting expectations for studies with HRA Approval, including:

- Working with organisations hosting the research
- Registration of Research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics and is updated in the light of changes in reporting expectations or procedures.

Scope

HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found at http://www.hra.nhs.uk/resources/applying-for-reviews/nhs-hsc-rd-review/.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/.

HRA Training

We are pleased to welcome researchers and research management staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

IRAS project ID	224887

Your IRAS project ID is **224887**. Please quote this on all correspondence.

Yours sincerely

Joanna Ho
Assessor

Email: hra.approval@nhs.net

Copy to: *Ms Angela Shone, Sponsor Representative, University of Nottingham*
Ms Cathryn Hart, Lead NHS R&D Contact, Humber NHS Foundation Trust
Miss Sarah Hodgkinson, Student, University of Nottingham
Participating NHS organisations in England

Appendix A - List of Documents

The final document set assessed and approved by HRA Approval is listed below.

Document	Version	Date
Copies of advertisement materials for research participants [Additional documents]	final version 1.0	24 July 2017
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Sponsor evidence of insurance]	version 1	01 August 2017
IRAS Application Form [IRAS_Form_02082017]		02 August 2017
IRAS Application Form XML file [IRAS_Form_02082017]		02 August 2017
IRAS Checklist XML [Checklist_02082017]		02 August 2017
Letter from sponsor [Sponsor letter]	version 1	01 August 2017
Letters of invitation to participant [Additional documents]	final version 1.0	24 July 2017
Non-validated questionnaire [Additional documents]	final version 1.0	24 July 2017
Other [Statement of Activities]	final version 1.0	24 July 2017
Other [HRA form (SoE)]	final version 1.0	24 July 2017
Participant consent form [Participant consent form]	final version1.0	24 July 2017
Participant information sheet (PIS) [Hull participant information sheet]	final version 1.0	24 July 2017
Participant information sheet (PIS) [Nottingham information sheet]	final version 1.0	24 July 2017
Research protocol or project proposal [Study protocol]	final version 1.0	24 July 2017
Summary CV for Chief Investigator (CI) [Shihning Chou (CI) CV]	final version 1.0	24 July 2017
Summary CV for student		
Summary CV for supervisor (student research) [Dr Shihning Chou CV]	final version 1.0	24 July 2017
Validated questionnaire [Additional documents]	final version 1.0	24 July 2017

IRAS project ID	224887

Appendix B - Summary of HRA Assessment

This appendix provides assurance to you, the sponsor and the NHS in England that the study, as reviewed for HRA Approval, is compliant with relevant standards. It also provides information and clarification, where appropriate, to participating NHS organisations in England to assist in assessing and arranging capacity and capability.

For information on how the sponsor should be working with participating NHS organisations in England, please refer to the, *participating NHS organisations, capacity and capability* and *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* sections in this appendix.

The following person is the sponsor contact for the purpose of addressing participating organisation questions relating to the study:

Name: Dr Shihning Chou
Tel: 0115 846 6623
Email: shihning.chou@nottingham.ac.uk

HRA assessment criteria

Section	HRA Assessment Criteria	Compliant with Standards	Comments
1.1	IRAS application completed correctly	Yes	See 5.1 below
2.1	Participant information/consent documents and consent process	Yes	No comments
3.1	Protocol assessment	Yes	No comments
4.1	Allocation of responsibilities and rights are agreed and documented	Yes	The Statement of Activities will act as agreement of an NHS organisation to participate. No other study agreement is expected. Although formal confirmation of capacity and capability is not expected of all or some organisations participating in this study (see *Confirmation of Capacity and Capability* section for full details), and such

Section	HRA Assessment Criteria	Compliant with Standards	Comments
			organisations would therefore be assumed to have confirmed their capacity and capability should they not respond to the contrary, we would ask that these organisations pro-actively engage with the sponsor in order to confirm at as early a date as possible. Confirmation in such cases should be by email to the CI and Sponsor confirming participation based on the relevant Statement of Activities and information within this Appendix B.
4.2	Insurance/indemnity arrangements assessed	Yes	Sponsor indemnity applies to the management and design of the study. NHS indemnity applies to the conduct of the study. Where applicable, independent contractors (e.g. General Practitioners) should ensure that the professional indemnity provided by their medical defence organisation covers the activities expected of them for this research study
4.3	Financial arrangements assessed	Yes	This is an educational project where no application for external funding was made. No funding will be provided to participating NHS organisations.
5.1	Compliance with the Data Protection Act and data security issues assessed	Yes	The unique identifier assigned to participants will not be as described in IRAS A38. Sponsor has confirmed Personal Data is not collected at any point in the study.
5.2	CTIMPS – Arrangements for compliance with the Clinical Trials Regulations assessed	Not Applicable	No comments
5.3	Compliance with any applicable laws or regulations	Yes	No comments

Section	HRA Assessment Criteria	Compliant with Standards	Comments
6.1	NHS Research Ethics Committee favourable opinion received for applicable studies	Not Applicable	This study is exempt from REC review as the research is limited to the involvement of staff as participants only.
6.2	CTIMPS – Clinical Trials Authorisation (CTA) letter received	Not Applicable	No comments
6.3	Devices – MHRA notice of no objection received	Not Applicable	No comments
6.4	Other regulatory approvals and authorisations received	Not Applicable	No comments

Participating NHS Organisations in England

This provides detail on the types of participating NHS organisations in the study and a statement as to whether the activities at all organisations are the same or different.
This is a non-commercial multicentre study where participating NHS organisations will be undertaking the same research activities. There is therefore only one site type for this study. The Chief Investigator or sponsor should share relevant study documents with participating NHS organisations in England in order to put arrangements in place to deliver the study. The documents should be sent to both the local study team, where applicable, and the office providing the research management function at the participating organisation. For NIHR CRN Portfolio studies, the Local LCRN contact should also be copied into this correspondence. For further guidance on working with participating NHS organisations please see the HRA website. If chief investigators, sponsors or principal investigators are asked to complete site level forms for participating NHS organisations in England which are not provided in IRAS or on the HRA website, the chief investigator, sponsor or principal investigator should notify the HRA immediately at hra.approval@nhs.net. The HRA will work with these organisations to achieve a consistent approach to information provision.

Confirmation of Capacity and Capability

This describes whether formal confirmation of capacity and capability is expected from participating NHS organisations in England.
The HRA has determined that participating NHS organisations in England **are not expected to formally confirm their capacity and capability to host this research,** because this study involves NHS staff as participants only where a questionnaire will be disseminated via email. • Sponsors should now provide a copy of this letter to those NHS organisations in England that it intends to work with. These NHS organisations should have already received the initial

assessment letter from the HRA in order to assess or arrange capacity and capability.

- As stated in the Initial Assessment Letter (dated 17 August 2017), it is expected that these organisations will become participating NHS organisations 35 days after issue of the Initial Assessment Letter (no later than **21 September 2017**):
  - You may not include the NHS organisation if they provide justification to the sponsor and the HRA as to why the organisation cannot participate
  - You may not include the NHS organisation if they request additional time to confirm.
- You may include NHS organisations in this study in advance of the deadline above where the organisation confirms by email to the CI and sponsor that the research may proceed.
- The document "Collaborative working between sponsors and NHS organisations in England for HRA Approval studies, where no formal confirmation of capacity and capability is expected" provides further information for the sponsor and NHS organisations on working with NHS organisations in England where no formal confirmation of capacity and capability is expected, and the processes involved in adding new organisations. Further study specific details are provided the *Participating NHS Organisations* and *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* sections of this Appendix.

Principal Investigator Suitability

This confirms whether the sponsor position on whether a PI, LC or neither should be in place is correct for each type of participating NHS organisation in England and the minimum expectations for education, training and experience that PIs should meet (where applicable).
Sponsor has indicated that neither Principal Investigator nor Local Collaborator is required for each participating NHS organisation. The Chief Investigator (central study team) will be responsible for research activities at site. GCP training is not a generic training expectation, in line with the HRA statement on training expectations.

HR Good Practice Resource Pack Expectations

This confirms the HR Good Practice Resource Pack expectations for the study and the pre-engagement checks that should and should not be undertaken
Local staff substantively employed by participating NHS organisations will be invited to be participants of this study via email. No HR access arrangements are therefore expected for this study.

Other Information to Aid Study Set-up

This details any other information that may be helpful to sponsors and participating NHS organisations in England to aid study set-up.
The applicant has indicated that they do not intend to apply for inclusion on the NIHR CRN Portfolio.

University of Nottingham
UK | CHINA | MALAYSIA

Email: FMHS-ResearchEthics@nottingham.ac.uk

Faculty of Medicine & Health Sciences
Research Ethics Committee
c/o Faculty PVC Office
School of Medicine Education Centre
B Floor, Medical School
Queen's Medical Centre Campus
Nottingham University Hospitals
Nottingham, NG7 2UH

25 September 2017

Sarah Hodgkinson
Doctorate in Forensic Psychology Student
c/o **Dr Shihning Chou**
Assistant Professor of Forensic Psychology
Centre for Forensic & Family Psychology
Division of Psychiatry & Applied Psychology
School of Medicine
B Floor, Yang Fujia Building
Jubilee Campus
University of Nottingham

Dear Ms Hodgkinson

Ethics Reference No: 112-1709 **– please always quote** **IRAS ID:** 224887 **Sponsor Ref:** 17062	
Study Title: The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress	
Short Title: Offender Aggression and Violence: Staff Resilience & Perceived Stress	
Chief Investigator/ Supervisor: Dr Shihning Chou, Assistant Professor of Forensic Psychology, Centre for Forensic & Family Psychology, Division of Psychiatry & Applied Psychology.	
Lead Investigators/student: Sarah Hodgkinson, Doctorate in Forensic Psychology Student.	
Other Key Investigators: Dr Jennifer Yates, Research Fellow, Division of Psychiatry & Applied Psychology, School of Medicine.	
Type of Study: PG Student project, qualitative/quantitative	
Proposed Start Date: 09/2017	**Proposed End Date:** 29/10/2018 12 mths
No of Subjects: 300	**Age:** 18+years
School: Medicine	

Thank you for submitting the above application which has been considered by the Committee at its on 11th September 2017 and the following documents were received:

Offender Aggression and Violence: Staff Resilience & Perceived Stress:

- DPAP Research Ethics form and supporting documents version 1.0: 24/07/17
- Protocol final version 1.0 date 06/07/17
- 17062 Sponsor Letter date: 01/08/17
- Evidence of Insurance date: 26/0/17
- IRAS final 02.08.17
- HRA Form Final version 1.0 24/07/17
- SoA, Final version 1.0 24/07/17
- Additional documents - Recruitment material, Questionnaires, debrief version 1.0 24/07/17
- Participant Information Sheet – Hull final version 1.0 24/07/17
- Participant Information Sheet – Nottingham final version 1.0 24/07/17
- Consent Form final version 1.024/07/17
- CV Shihning Chou 2017

These have been reviewed and are satisfactory and the study has been given a favourable opinion.

A favourable opinion is given on the understanding that the conditions set out below are followed:

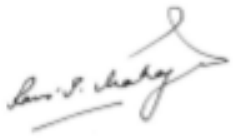
1. You should follow the protocol agreed and inform the Committee of any changes using a notification of amendment form (please request a form).

University of Nottingham
UK | CHINA | MALAYSIA

2. You must notify the Chair of any serious or unexpected event.

3. An End of Project Progress Report is completed and returned when the study has finished (please request a form).

Yours sincerely



Professor Ravi Mahajan
Chair, Faculty of Medicine & Health Sciences Research Ethics Committee

The University of Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

Our reference: RGS 17062

Kim: 0115 84 67105
Sandip: 0115 84 67103
Sponsor@nottingham.ac.uk

Research, Enterprise and Graduate Services
University of Nottingham
King's Meadow Campus
Lenton Lane
Nottingham
NG7 2NR

1st August 2017

Dear Sarah

As you've now submitted for University REC approval and HRA assessment for your study you will be proceeding to NHS Trust R&D approvals, In accordance with the Research Governance Framework 2005, there must be in place research agreements between the Sponsor and the Chief Investigator and the sponsor and host organisation of any participating NHS site.

Please do not send either the sponsor/Chief Investigator agreement or the non-commercial research agreement to the ethics committee.

Enclosed are signed (by the Sponsor) copies of the University's such agreements for you to sign and/or disseminate accordingly:

There are two **Sponsor/ Chief Investigator agreements** – both require signing by the Chief Investigator, once signed please retain one for your Trial Master File and return the other to me at the above address at your earliest convenience. This does not need submitting to R&D as part of your R&D submission.

A **non-commercial research agreement (NCA)** has not been issued for CCGs/PICs (Participant Identification Centres) or Prisons (if applicable) and you are using a Statement of Activities in place of an NCA. Should the R&D department require a copy of the non-commercial research agreement – please do not hesitate to contact me.

Amendments to study documents (before final REC approval, after sponsor sign off):
Please note that if the REC requests any changes to any documents these should also be sent to me, as I need to keep a record of the final REC approved version of your study documents.

Amendments to study documents (after REC approval):
Should there be any subsequent amendment to any of the study documents please refer to SOP TA013 Protocol Amendments, available on the Research Governance Workspace. Copies of amendments should be submitted to sponsor@nottingham.ac.uk for sponsor review and sign off prior to submission to the relevant REC & NHS R&D department(s).

world-changing research
from The University of Nottingham

R&D Approvals:
Please also forward copies of R&D approval letter(s) /confirmation of capacity once received to me for my records and also any fully signed non-commercial research agreements.

Additional Sites:
If a research site is added after sponsor sign off please ensure that the research governance team is notified, So that we may keep our records accurate and up to date for insurance and governance purposes and so that we may issue and additional agreements that are required.
Please contact us for further guidance.

Progress Reports:
It is a condition of your ethical approval that a progress report is submitted to ethics yearly on the anniversary of your ethics approval date (not first participant recruited). Failure to do this, may result in a suspension of your favourable opinion by the ethics committee. Please ensure that you complete your progress report and also send a copy to the sponsor representative (me) and any R&D departments.

Extending the duration of your study:
If you need to extend the duration of your study please ensure that the research governance team are notified of the change, so that we may keep our records accurate and up to date for insurance and governance purposes. It may be necessary to reissue the sponsor/chief investigator agreement for the extended period.

End of the Study:
Once your study is complete you MUST notify the sponsor, ethics committee and R&D department(s). Please do not forget to do this, we require the date the study ended and a copy of the final report for our records.

Sponsor Standard Operating Procedures (SOPs)
There are a set of sponsor SOPs for the conduct of research in the NHS – these may be found at https://workspace.nottingham.ac.uk/display/ResG/Introduction

Any queries then please don't hesitate to contact me.

Yours sincerely

Kimberly Byrne / Sandip Stapleton
Research Governance Officer
University of Nottingham

world-changing research
from The University of Nottingham

Title of research project: **The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress**

Project ID: 17062

SIGNATURES

Signed for and on behalf of the University of Nottingham:

Signature: _____ Date: 1/8 **2017**

Name: **Angela Shone** Position: **Head of Research Governance**

Chief Investigator:

Signature: _____ Date: 7/8/2017

Name: **Dr Shihning Chou** Position: **Assistant Professor of Forensic Psychology**

The University of Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

SPONSORSHIP AGREEMENT

SPONSOR and CHIEF INVESTIGATOR CLINICAL RESEARCH (CLINICAL TRIALS)

Version 1.5, November 2014

This **AGREEMENT** is made between

The University of Nottingham (the Sponsor) of University Park, Nottingham, NG7 2RD,

and **the Chief Investigator** (collectively the **'Parties'**) of the clinical research identified below:

Chief Investigator name:	**Dr Shihning Chou**
University of Nottingham job title:	**Assistant Professor of Forensic Psychology**
Title of research project:	**The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress**
Project ID:	**17062**

With effect from 1st May 2004, Statutory Instrument 2004, no. 1031, *The Medicines for Human Use (Clinical Trials) Regulations 2004* enacting *EU Directive 2001/20/EC*

and

with effect from 29th August 2006, Statutory Instrument 2006, no. 1928, *The Medicines for Human Use (Clinical Trials) Amendment Regulations 2006*

and

with effect from 12th December 2006, Statutory Instrument 2006, no. 2984, *The Medicines for Human Use (Clinical Trials) Amendment (no. 2) Regulations 2006*

hereafter known as the **'Regulations'**, came into effect in the UK governing the conduct of clinical trials involving the use of investigational medicinal products (IMPs) and superseding previous clinical trial legislations.

In addition the Department of Health Research Governance Framework for Health and Social Care, second edition, 2005 (RGF) set out a framework for the conduct of all clinical research within the NHS.

The Regulations define a 'Sponsor' with regard to clinical trials as being the organisation or organisations taking responsibility for the 'initiation, management and financing (or arranging the financing) of that trial'.

Appendix J: Study I and II Global email and intranet advert for participant recruitment

Intranet Advert to participate:

Research survey – participants needed!

If you work with clients who have committed criminal offences and/or who possibly present with behaviours that are considered aggressive and violent then you are invited to take part in a study about your experiences.

The study is being undertaken within the trust as part of a doctorate student research project with the University of Nottingham which invites staff who work with these clients in different services and professions to complete an online survey. Participation is voluntary; you do not need to disclose any information that could possibly identify you and your answers will remain anonymous.

If you wish to find out more please follow the link below:

(a link to the survey inserted)

Many thanks!

Initial global email invitation to participate – integrated into daily staff Trust email updates:

Dear Colleague,

I am emailing you to inform you of and to invite you to participate in a study that I am undertaking within the trust as part of a piece of research that will contribute to the achievement of my doctorate in Forensic Psychology with the University of Nottingham.

The project is an online-based survey about staff perspectives in working with clients who have committed offences and who present with behaviours that are considered aggressive and violent. I will be looking at staff experiences of this client group, experiences of any aggression and violence in the workplace, and participants will be asked to complete three short questionnaires about the impact of your experiences, overall resilience and perceptions of stress.

Hence, I am looking for individuals from different professions who currently work with this client group across different services. If you wish to find out more about the study and to participate please click on the link below to the survey:

(a link to the survey inserted)

Participation is entirely voluntary and if you wish to take part but change your mind about taking part then you may withdraw at any

point in the study. You do not need to disclose any information that could possibly identify you and your answers will remain anonymous.

If you have any questions about the survey or any concerns I may be contacted by the above email address: sarah.hodgkinson1@nhs.net or by contacting me via my university email address:msxsh10@nottingham.ac.uk.

Alternatively if you have any concerns you may also contact my university supervisor Dr. Shihning Chou on: shihning.chou@nottingham.ac.uk.

Many thanks and best wishes,

Sarah Hodgkinson

Appendix K: Study I and II Global email and intranet advert for participant recruitment

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Participant Information Sheet

(Final version 1.0; 24/07/17)

IRAS Project ID: 224887

Title of Study: **The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress**

Name of Researcher(s): *Sarah Hodgkinson*

Dr Shihning Chou

Dr Jennifer Yates

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. Talk to others about the study if you wish. Contact us if there is anything that is not clear.

What is the purpose of the study?

This is an invitation to take part in a doctorate research study about the experiences of healthcare staff when working with offenders who may be aggressive and violent in the workplace. This study is being conducted as part of the completion of my degree for the award of a Doctorate in Forensic Psychology. This information is designed to tell you what it will involve.

The study is an online survey about your experiences of working with those who have committed offences and those that may be considered aggressive and violent. The survey is designed to collect information exploring the impact of your experiences at work when working with this client group, your overall resilience, and perceptions of stress. This is designed to consider the level of impact of aggressive and violent experiences on staff when working with this group, and

to find out more about any mediating factors and the protective mechanisms staff have in place to cope with this environment. Secondary aims of the study involve further exploration of different aspects of resilience that individuals may have.

Why have I been invited?

You have been asked to participate because by following the online link you have identified that you currently work (or have worked in the past) with those who have committed criminal offences, are offenders, or who have a forensic history. Staff members from any discipline, background or age group are welcome to take part in the study, as long as they have experience working with offenders. This is because the study is based specifically on finding out about the experiences of staff who work with this type of service user. We are inviting a minimum of 300 participants like you to take part.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you may copy and paste this information sheet into a Word document and print it to keep and you will be asked to complete the consent form on the next page. If you decide to take part you are free to withdraw at any time and without giving a reason by closing the web browser. However, as this is an anonymous questionnaire, once you have finished and submitted your answers it is not possible to withdraw your responses. This would not affect your legal rights, and a decision to withdraw at any time, or a decision not to take part, will not adversely affect your job or your relationship with your manager.

What will happen to me if I take part?

If you decide to take part in the study you will be asked to fill in an online survey, which consists of a number of questions that relate to your own personal experiences. You will be asked to complete some demographic information and complete four short questionnaires. The survey should take approximately 20 minutes to complete. You will not be identifiable at any point during the survey and you can withdraw at any point. However, once you have submitted your questionnaire you will not be able to withdraw your responses from the study as the researcher is unable to identify you. Your participation is voluntary, and you may change your mind about being involved without giving a reason.

Expenses and payments

Participants will not be paid to participate in the study.

What are the possible disadvantages and risks of taking part?

It is anticipated that there are no overt risks involved in taking part in the study. However, the study is about your experiences of aggression and violence in the context of the workplace. This could potentially be sensitive in reference to previous serious and/or traumatic experiences. However, you are not asked to directly discuss or recall your experiences, rather you will be asked to complete a questionnaire about your experiences. Also, as you are already working in services with offenders, it is expected that you will already be exposed to aggression and violence due to the client group you have chosen to work with and therefore the study is not exposing individuals to situations other than what you would experience whilst at work/in everyday life.

It is possible that some participants may experience inconvenience in taking part in the study, such as some individuals taking longer than others to complete the survey. The content of the study has been carefully considered in its design to minimise risks, discomfort or inconvenience which may be incurred as a result of participating in the study. It is hoped that any inconvenience incurred will be balanced by any scientific value that the study may add to the existing research literature.

What are the possible benefits of taking part?

We cannot promise the study will help you but the information we get from this study may help others in the future. The research may be of personal interest to participants but with reference to personal benefit, there is no financial incentive or otherwise as a result of taking part in the research. However, the research may benefit others in the future in serving to highlight issues for staff in working with offenders and may be helpful in informing possible future research direction.

What happens when the research study stops? What if there is a problem?

If you have a concern about any aspect of this study, you should contact the **researchers** via email who will do their best to answer your questions. The researchers contact details are given at the end of this information sheet.

If this does not resolve the query to your satisfaction, please write to the Head of the School of Medicine, Professor Tony Avery:

School of Medicine

University of Nottingham

Medical School

Nottingham

NG7 2UH

Will my taking part in the study be kept confidential?

We will follow ethical and legal practice and all information about you will be handled in confidence.

All information which is collected about you during the course of the research will be kept **strictly confidential**, stored in a secure and locked office, and on a password protected database. No information which identifies you will be recorded as all responses are anonymous.

Your personal data (address, telephone number) will be not be recorded for any part of this study. All raw data collected for the purposes of this study will be destroyed securely after the study has been completed and during this time all precautions will be taken by all those involved to maintain your confidentiality, only members of the research team will have access to the data. It is possible that relevant sections of the data collected during the study may be looked at by individuals from regulatory authorities, or from The University of Nottingham, to ensure the proper auditing and monitoring of the research

What will happen if I don't want to carry on with the study?

Your participation is voluntary and you are free to withdraw at any time, without giving any reason, and without your legal rights being affected. If you withdraw during the study then the information collected so far will not be recorded and the data will be lost – only after you complete the survey and submit your responses will your data be used in the study. However, once you have submitted your responses these cannot be withdrawn as all data is anonymised and the researchers will not be able to identify you from the responses given.

What will happen to the results of the research study?

Once the data has been collected it will be analysed by the researchers for the purposes of writing a doctorate-level thesis which is expected to be completed in October 2018 at the earliest. It is possible that this piece of work will be also submitted for publication. This is the sole purpose of the research. Participants can learn about the overall results of the study if they wish by sending an expression

of interest to the researchers using the contact details below. Unfortunately as anonymity is maintained throughout the study the researcher is unable to provide individual results to participants.

Who is organising and funding the research?

This research is being organised and funded by the University of Nottingham.

Who has reviewed the study?

This study has been reviewed and given favourable opinion by the University of Nottingham's School of Medicine and the Faculty of Medicine & Health Sciences ethics committee.

Further information and contact details

For further information or if you have any questions or concerns about the study please contact the chief investigators using the following details:

- Sarah Hodgkinson (primary researcher - doctorate candidate):

msxsh10@nottingham.ac.uk

- Dr Shihning Chou (supervisor):

shihning.chou@nottingham.ac.uk

0115 846 6623

- Dr Jennifer Yates (supervisor):

Jennifer.yates@nottingham.ac.uk

Many thanks for taking the time to read this information.

Appendix L: Study I and II Participant Consent form

CONSENT FORM
(Final version 1.0: 24/07/17)

Title of Study: The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress

IRAS Project ID: *224887*

Name of Researcher: Sarah Hodgkinson
Dr Shihning Chou
Dr Jennifer Yates

Please tick box

1. I confirm that I have read and understand the information sheet final version number 1 dated 24/07/17 for the above study and have had the opportunity to ask questions.

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. I understand that should I withdraw during the study (by closing the web browser) then the information collected so far will be not be submitted and that once I submit my responses this information cannot be withdrawn.

3. I understand that the information collected about me may be used to support other research in the future, and my anonymised responses may be shared with other researchers and published as part of an academic publication.

By clicking the button below I indicate that I understand what the study involves and that my answers are anonymous. I agree to take part and I understand that once I click 'submit' at the end of the questionnaire it will not be possible to withdraw the data.

4. I agree to take part in the above study.

For your records you may copy and paste this consent form, or capture a print screen image.

Appendix M: Study I and II Participant Debrief Sheet

<u>Participant Debrief Page (Humber)</u>

Thank you for taking part in this survey – your participation is very much appreciated!

To recap, the survey was about your experiences of working with those who have committed offences and those that are considered aggressive and violent. The survey collected information about your experiences of this and you were asked to complete some questionnaires looking at the impact of your experiences, your overall resilience and perceptions of stress. This was designed to consider the level of impact on staff of working with this high-risk client group and to find out more about the protective mechanisms staff have in place to cope with this environment.

The study was not designed for you to directly recall any traumatic experiences that you may have had at work, but it is possible you may have been reminded of some unpleasant experiences. If you feel you have been affected by any of the questions or wish to talk more about it then you may find out more about different services available by considering the information below:

- The trust Occupational Health Service is an **independent confidential service** that provides an impartial advisory service to both employers and employees, and provides a Staff Counselling Service as well as other services. You can contact Humber NHS Occupational Health on 01482 389335/ 01482 389333 or find out more on the global staff intranet

- Focus Counselling Service – a local Hull based service working to support the mental health of managers, employees and their families. The service may be contacted on 01482 891564 or info@focuscounselling.co.uk

- Survivors – Hull and East Riding: http://www.survivorshull.org.uk/

- The Samaritans - The quickest way to contact and get a response is by phone on 116 123, this number is FREE to call.

- Let's Talk – Depression and Anxiety Service in Hull - http://www.letstalkhull.co.uk/ or: call 01482 335 627 or email pws-letstalk.hull@nhs.net

Once again thank you for taking part in the study. If you have any concerns or questions, or wish to find out more about the overall results of the study then please feel free to contact me on the following email address:

msxsh10@nottingham.ac.uk

Unfortunately, as all responses are anonymous and I cannot identify individuals personally I am unable to provide individual responses to the survey. Alternatively you have contact my university research supervisors on the following email addresses:

Shihning.chou@nottingham.ac.uk

Jennifer.yates@nottingham.ac.uk

Thank you!

……
……

Participant Debrief Page (Nottingham)

Participant Debrief Page

Thank you for taking part in this survey – your participation is very much appreciated!

To recap, the survey was about your experiences of working with those who have committed offences and those that are considered aggressive and violent. The survey collected information about your experiences of this and you were asked to complete some questionnaires looking at the impact of your experiences, your overall resilience and perceptions of stress. This was designed to consider the level of impact on staff of working with this high-risk client group and to find out more about the protective mechanisms staff have in place to cope with this environment.

The study was not designed for you to directly recall any traumatic experiences that you may have had at work, but it is possible you may have been reminded of some unpleasant experiences. If you feel you have been affected by any of the questions or wish to talk more about it then you may find out more about different services available by considering the information below:

- The trust Occupational Health Service is an **independent confidential service** that provides an impartial advisory service to both employers and employees. You can find out more on the global staff intranet.
- The trust also operates the Centre for Trauma, Resilience and Growth which can be found on the trust webpage. For general enquiries, please contact Gemma Page, the Centre Administrator: gemma.page@nottshc.nhs.uk. The Trauma

Service is a small team which generally only operates on Tuesdays, Wednesdays and Thursdays. The direct telephone line is 0115 8542225, which has secure voicemail

- Nottingham Counselling Service – a local Nottingham based service that offers affordable counselling with no GP referral necessary. Please visit the website at https://www.nottinghamcounsellingcentre.org.uk/ or call 0115 950 1743 to find out more.

- The Samaritans - The quickest way to contact and get a response is by phone on 116 123, this number is FREE to call.

- Nottingham Wellness In Mind is a service that provides advice and support for anyone in Nottingham seeking better mental health. To find out more visit https://www.wellnessinmind.org/ or call 0800 561 0073.

Once again thank you for taking part in the study. If you have any concerns or questions, or wish to find out more about the overall results of the study then please feel free to contact me on the following email address:

msxsh10@nottingham.ac.uk

Unfortunately, as all responses are anonymous and I cannot identify individuals personally I am unable to provide individual responses to the survey. Alternatively you have contact my university research supervisors on the following email addresses:

Shihning.chou@nottingham.ac.uk

Jennifer.yates@nottingham.ac.uk

Thank you!

Appendix N: Evidence of conference presentation

Impact Lecture Presentation

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress

Sarah Hodgkinson[1], Shihning Chou[1], Jen Yates[2]

[1]*Centre for Forensic & Family Psychology, Faculty of Medicine & Health Sciences, University of Nottingham*

[2]*Institute of Mental Health, Faculty of Medicine & Health Sciences, University of Nottingham*

resilience
/rɪˈzɪlɪəns/

E-Poster Presentation

The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress

Sarah Hodgkinson[1], Shihning Chou[1], Jen Yates[2]

[1]*Centre for Forensic & Family Psychology, Faculty of Medicine & Health Sciences, University of Nottingham*
[2]*Institute of Mental Health, Faculty of Medicine & Health Sciences, University of Nottingham*

Background

Aggression and violence experienced by staff in the healthcare sector is well documented; disagreement with respect to prevalence rates remains[1].

Research indicates that resilience may be a mediating factor on the impact of such traumatic events. Connor and Davidson's (2003)[2] paper drew from existing research to find five factors that embody resilience:

- personal competence, high standards and tenacity;
- trust in one's instincts, tolerance of negative affect, strengthening effects of stress;
- positive acceptance of change, secure relationships;
- control;
- spiritual influences.

Such a range of facets indicates that resilience is complex.

Connor and Davidson (2003) found that the strongest factors which emerged from the data appeared to be persistence/tenacity and a strong sense of self-efficacy; subsequent factor analyses indicate mixed results[3].

IMPACT

Social, Economic, Academic and Knowledge

Knowledge gained may provide evidence for future investment in increasing staff resilience, resulting in reduced staff sick leave and in preventing psychological harm of such experiences.

Knowledge gained may also help develop better support systems which will improve health outcomes and quality of life for those who have already been affected.

It is hoped that in developing knowledge we may learn more about the culture and challenges of working in the healthcare sector and in considering how staff may adapt to responding to those involved in the criminal justice system.

The research will provide a better understanding of the impact on staff of experiencing aggression and violence in the workplace, and provide knowledge about factors which mediates the impact.

This may inform policy in building mechanisms to develop staff resilience and coping skills in dealing with these experiences.

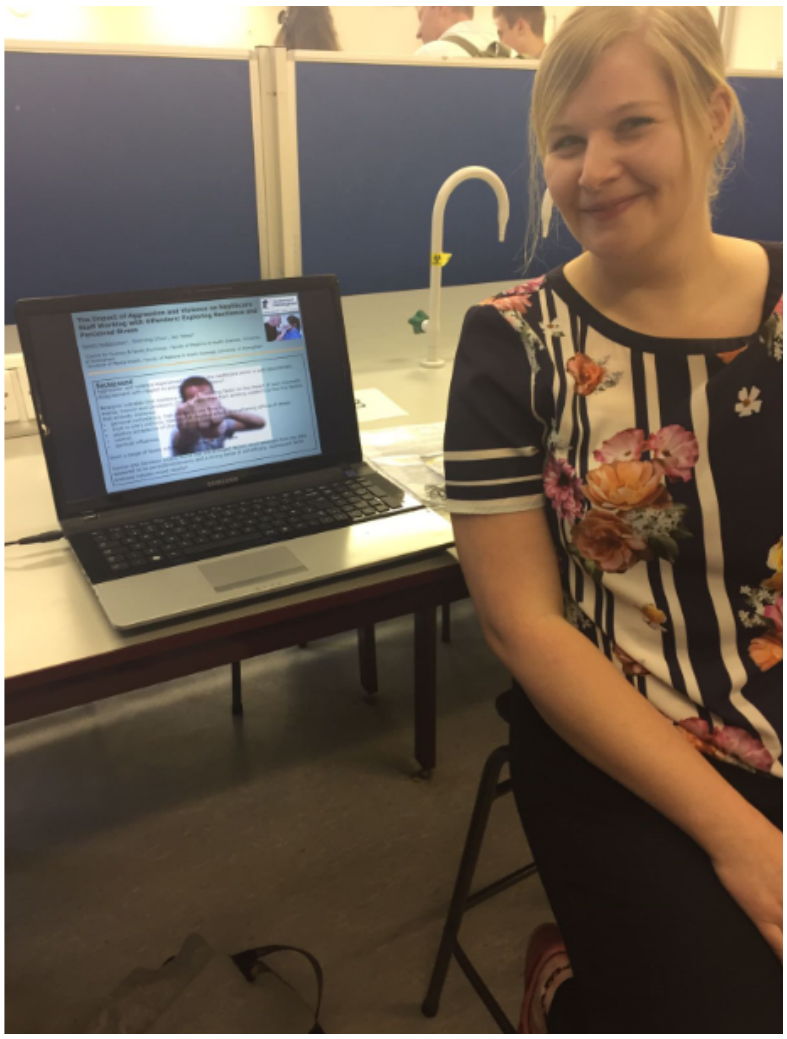
The academic impact of this may be in the development of the CD-RISC resilience scale in establishing the weighting of the factors comprising resilience. This may develop knowledge about resilience as a complex construct and help reach consensus about the personal attributes comprising it. It may add to knowledge about workplace aggression and violence, reach a consensus about their respective definitions, and provide a more established basis for gathering information about prevalence.

References

1.Lanctôt, N., & Guay, S. (2014). The aftermath of workplace violence among healthcare workers: A systematic literature review of the consequences. *Aggression and violent behavior*, 19(5), 492-501.

2.Connor, K. M., & Davidson, J. R. (2003). *Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC).* Depression and anxiety, 18(2), 76-82

3.Lamond, A. J., Depp, C. A., Allison, M., Langer, R., Reichstadt, J., Moore, D. J., & Jeste, D. V. (2008). Measurement and predictors of resilience among community-dwelling older women. *Journal of psychiatric research*, 43(2), 148-154.



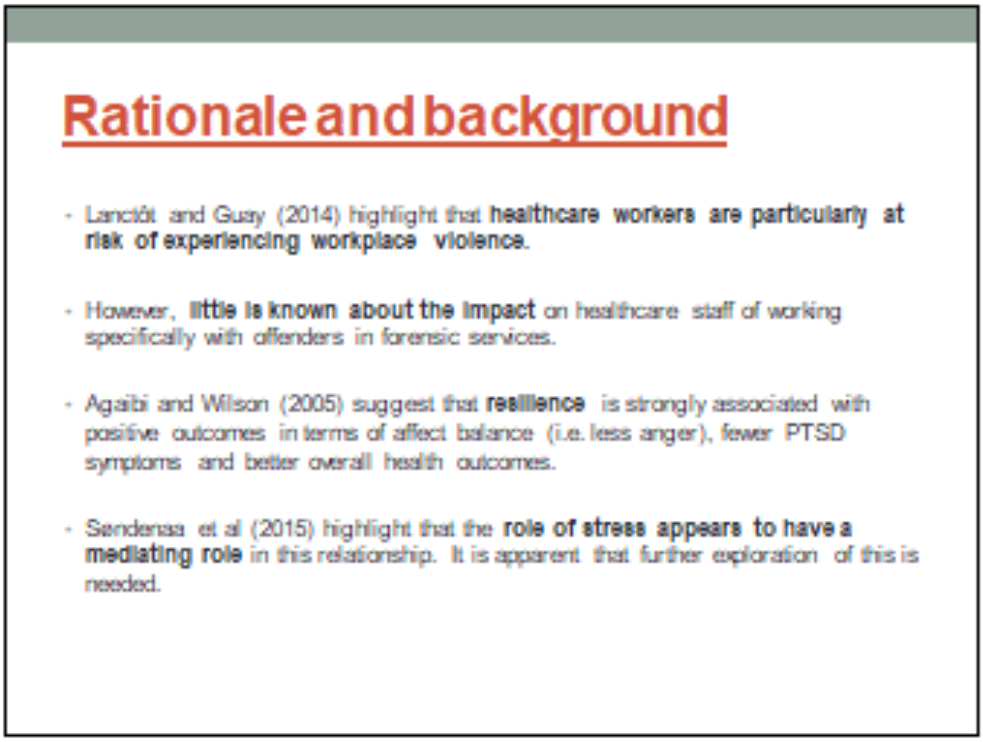
Appendix O: Presentations at Wathwood and Arnold Lodge sites

RESEARCH STUDY

The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress

Sarah Hodgkinson[1], Shihning Chou[1], Jen Yates[2]

[1]Centre for Forensic & Family Psychology, Faculty of Medicine & Health Sciences, University of Nottingham
[2]Institute of Mental Health, Faculty of Medicine & Health Sciences, University of Nottingham



Rationale and background

- Lanctôt and Guay (2014) highlight that **healthcare workers are particularly at risk of experiencing workplace violence.**
- However, **little is known about the impact** on healthcare staff of working specifically with offenders in forensic services.
- Agaibi and Wilson (2005) suggest that **resilience** is strongly associated with positive outcomes in terms of affect balance (i.e. less anger), fewer PTSD symptoms and better overall health outcomes.
- Sendensa et al (2015) highlight that the **role of stress appears to have a mediating role** in this relationship. It is apparent that further exploration of this is needed.

Primary Research Study I

Aims

- To explore the impact of aggressive and violent events and resilience in healthcare staff members working with offenders.
- To explore how the impact of aggressive and violent events and resilience are related to perceived stress in healthcare staff members working with offenders.

Research questions

- Are healthcare staff members working with offenders negatively impacted when experiencing aggression and violence in the workplace?
- What is the role of resilience in this relationship?
- What is the role of perceived stress as a potentially mediating factor in this relationship?

Primary Research Study II

Aim

To explore the differences in the five factors comprising resilience in the CD-RISC in the sample of healthcare staff working with offenders:

- Factor 1: personal competence, high standards and tenacity
- Factor 2: trust in one's instincts, tolerance of negative affect, strengthening effects of stress
- Factor 3: positive acceptance of change, secure relationships
- Factor 4: control
- Factor 5: spiritual influences

Research question

What are the differences in the weighting of the five factors of resilience in healthcare staff experiencing aggression and violence in working with offenders?

Participants

- Participants will be **male and female adults** of working age, who currently work with different groups of offenders within the NHS **(NHS staff)**.
- Staff working across a number of different **forensic services** will be asked to complete the survey, or where they may come into contact with individuals who have committed offences.
- A minimum of 300 participants is proposed (G power; Principle Component Analysis).
- Data will be collected by means of an **online survey**.

How data will be collected

- Participants will be presented with:
  - a **participant information sheet**
  - the opportunity to **consent**
  - asked to complete **demographic data**.
- Participants will also be provided with a **description of aggression and violence** and asked to complete an abbreviated version of the **POPAS** scale (Perception of Prevalence of Aggression Scale; Oud (2001)) to help identify the types of aggression and violence that participants are involved in at work.
- Participants will then be asked to complete:
  - the **IES-R** (Impact of Event Scale; Weiss & Marmar (1996))
  - the **CD-RISC** (Connor-Davidson Resilience Scale; Connor & Davidson, (2003))
  - the **PSS** (Perceived Stress Scale; Cohen, 1983).
- Participants will then be presented with advice and contact information for further support if they wish to seek it in the form of a **debrief sheet**.

Results and data analysis

For the primary research study a **MANOVA analysis** will be used to explore the relationships between the groups on the three variables (IES-R, CD-RISC and PSS-10 scores) between all staff scores (determining the mean number of aggressive and violent incidents experienced).

For the secondary study a **Principle Component Analysis** will be undertaken to explore the differences weightings of the five factors comprising resilience in the CD-RISC in the sample of staff working with offenders (the factors as proposed by Connor and Davidson (2003)):

- Factor 1: personal competence, high standards and tenacity
- Factor 2: trust in one's instincts, tolerance of negative affect, strengthening effects of stress
- Factor 3: positive acceptance of change, secure relationships
- Factor 4: control
- Factor 5: spiritual influences

Implications of research

- Practical implications of the study are related to:
  - **future training and investment** to enhance staff protective mechanisms in the domains of improving resilience and lowering staff perceptions of stress.
  - **staff recruitment and supportive strategies** to help those who have been affected by aggression and violence in the workplace.
  - This may **inform policy** in building mechanisms to develop staff resilience and coping skills
- Academic implications of the research may be in the development of the CD-RISC resilience scale in establishing the weighting of the factors comprising resilience, which in turn may **develop knowledge** about resilience as a construct.

Key references

- Agaibi, C. E., & Wilson, J. P. (2005). Trauma, PTSD, and resilience a review of the literature. *Trauma, Violence, & Abuse*, *6*(3), 195-216.
- Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and anxiety*, *18*(2), 76-82.
- The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 386-396.
- Lanctôt, N., & Guay, S. (2014). The aftermath of workplace violence among healthcare workers: A systematic literature review of the consequences.
- Oud, N. 2001. The Perceptions of Prevalence Of Aggression Scale (POPAS).
- Sandenaa, E., Whittington, R., Lauvrud, C., & Nonstad, K. (2015). Job stress, burnout and job satisfaction in staff working with people with intellectual disabilities: community and criminal justice care. *Journal of Intellectual Disabilities and Offending Behaviour*, *6*(1), 44-52.*Aggression and violent behavior*, *19*(6), 492-501.
- Weiss, D. S., & Marmar, C. R. (1996). The Impact of Event Scale - Revised. In J. Wilson & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 399-411). New York: Guilford

Appendix P: End of Study report

The University of Nottingham

Medical School Research Ethics Committee

Annual/End of Project Progress Reporting Form

(for Research Projects Approved by the University Medical School Research Ethics Committee)

Please complete this form electronically and submit to louise.sabin@nottingham.ac.uk .

1. Details of Research Project

Full Title *(short title in brackets)*:	The Impact of Aggression and Violence on Healthcare Staff Working with Offenders: Exploring Resilience and Perceived Stress (Offender Aggression and Violence: Staff Resilience and Perceived Stress)
Ethics Reference Number *(e.g. A10112011) as detailed on Approval email)*:	112-1709
What is the status of this study?*(please delete as appropriate)*	**Completed** (data collection completed; data analysis to commence)
Start Date:	25th September 2017
End Date: *(If not completed, please put estimate)*	29th May 2018
If the study stopped prematurely please provide details why:	Poor uptake of participants but adequate numbers of participant data collected for analysis. Saturation of participant invites reached.

2. Details of Principal Investigator / Supervisor

Name:	Dr Shihning Chou
School / Department:	Centre for Forensic & Family Psychology, School of Medicine

3. Details of Student Investigator (If applicable)

Name:	Sarah Hodgkinson
School / Department:	Centre for Forensic & Family Psychology, School of Medicine

4. Other members of the Research Team

Please include and identify co-investigators/ Research assistants/ students **if different to those listed in initial application:**	**Name**	**Department**	**Role**
	Dr Jen Yates	Division of Psychiatry and Applied Psychology	Second investigator/supervisor

5. Research Site Information

Please list any research sites which have been added since the initial ethics approval was obtained.	**Humber NHS Foundation Trust (main site)** **Nottingham Healthcare NHS Foundation Trust (additional)**
Are any more sites going to be added? If yes, how many?	**No**

6. Participants / Data / Tissues

	Participants / Data	Tissue samples
Annual number recruited (from date of approval)	99 participants	n/a
Target (for study as a whole) ***IF APPLICABLE***	Minimum 75, maximum 300	n/a
If the project has ended, are you intending to destroy any human tissue obtained as a result of the project?	**n/a**	n/a
If no, **please note you will be required by law to inform the person designate in your department to ensure that you comply with standard operating procedures in your department relating to the Human Tissue Act.**		

7. Adverse events

Have there been any adverse events during the last year? If so, please provide a brief summary:	**No**
Have you notified the Chair of REC & Research Governance Officer of these AEs ?	n/a

8. Please list your main findings from the study (please list any publications):

Main findings not yet established as data has not been formally analysed. However, a range of healthcare staff took part in the study including from nursing, psychiatry and therapeutic-based disciplines. From preliminary consideration of the data most staff members in forensic services reported experiencing some form of aggression and violence in the workplace.

9. Please identify address where study will be archived

Centre for Forensic & Family Psychology, School of Medicine, University of Nottingham

10. Please state who is the custodian of the data:

Name:	Sarah Hodgkinson
School / Department:	Centre for Forensic & Family Psychology, School of Medicine

8. Declaration (for signatures, please type names)

- **Please note that is the responsibility of the Chief/Principal Investigator to ensure that all study data is archived in a secure location with restricted access to authorised personnel only and that data is held in accordance with the Data Protection Act 1998 and where appropriate with the Clinical Trials Regulations 2004. It is not good practice to store data at a personnel address or on a personal computer; it is recommended that all data be stored in a secure environment within an organisational establishment under the care of an appointed custodian.**
- **The information I have provided in this form is accurate to the best of my knowledge.**

Signature of Principal Investigator / Supervisor: *(please delete as appropriate)*	**Shihning Chou:**
Signature of Student Investigator: *(if applicable)*	**Sarah Hodgkinson:** 
Date: 4.6.2018	