School of Psychology
Ysgol Seicoleg

A Systematic Review of the Effectiveness of The Safewards Model and an Empirical Study of the Relationships between Adverse Childhood Experiences, Attachment, Resilience, Psychological Distress and Trauma in Forensic Mental Health Populations

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Preface

This thesis is formed of two papers; a systematic review and an empirical study. The systematic review aimed to explore the effectiveness of the Safewards Model, which intends to reduce levels of conflict (such as violence and aggression) and containment (e.g. restraint or seclusion) in psychiatric inpatient settings through the use of ten interventions. The interventions are designed to enhance the ways in which staff actions can reduce the likelihood of conflict events (and subsequent containment) occurring.

Conflict and containment have a range of negative outcomes for both staff and service users, however Safewards has shown promise in reducing the incidence of these events, is implemented widely and recommended in best-practice guidelines. Despite this, a review of its effectiveness is lacking. The systematic review aimed to evaluate the effectiveness of Safewards with regards to reduction in conflict and containment and other key outcomes. Searches were conducted using databases Psych Info, PubMed, Web of Science and Cochrane library, alongside additional generic searches, citation searches and reviewing reference lists. Articles were screened independently by two reviewers and quality assessed.

Twelve studies were included; only one was a randomised control trial with the remaining studies utilising quasi-experimental designs, non-randomised with control design, cross-sectional designs and repeated measures designs. All but one of the studies implemented all ten interventions. The results of the study demonstrated that Safewards generally has a positive effect and can help reduce conflict and containment in ward settings. The quality of literature however remains inadequate in order to ascertain effectiveness conclusively. The review synthesises the current evidence-base for the Safewards model and highlights its clinical potential, nonetheless recommendations for more robust research in future are made in order to establish more conclusive evidence.

The empirical paper is a quantitative study that aimed to explore predictive relationships between adverse childhood experiences (ACEs), attachment style and resilience with psychological distress and trauma in forensic mental health populations. Previous research has found an association between ACEs and attachment style with later life psychological distress, with further studies reporting a mediating effect of attachment on this association. Additionally, it has also been demonstrated that psychiatric inpatients and prison populations often experience greater number of ACEs and higher levels of poor mental health. Despite this, little research has examined these associations within a forensic mental health subpopulation; individuals often presenting with histories of offending and acute, chronic mental health difficulties.

The study originally aimed to only recruit a current forensic mental health inpatient sample, however the COVID19 pandemic limited the ability to do so, causing a substantial delay to ethics approval, alongside lower staff levels, lack of staff presence on the wards and restricted access to visitors. As a result, recruitment was amended to be conducted remotely and participants were also sought online utilising website Prolific.co, allowing individuals in the community who had both forensic histories and mental health diagnoses to participate. A total of 128 participants were recruited to complete six digitised questionnaires measuring ACEs, attachment, child and adult resilience, psychological distress and trauma.

Statistical analysis of the data showed that ACEs, attachment style and adult resilience were the most significant predictors of psychological distress and trauma. This meant individuals with higher numbers of ACEs and insecure attachment style were significantly more likely to experience greater levels of distress. Higher ACEs and insecure attachment also increased the likelihood of reaching diagnostic threshold for both post-traumatic stress disorder (PTSD) and complex post-traumatic stress disorder (CPTSD). Greater adult resilience meanwhile significantly predicted lower rates of psychological distress, and individuals with higher adult resilience scores were less likely to reach the diagnostic threshold for PTSD and CPTSD. Attachment was also found to mediate the

relationship between ACEs and psychological distress and trauma, suggesting greater ACEs may result in insecure attachment which then leads to greater levels of psychological distress.

A striking finding of the study was that 95% of the sample had experienced high levels of childhood adversity (defined as four or more ACEs) compared to rates in the general population. Given such results, one main conclusion of the study was that considering childhood adversity is essential within clinical practice and forensic mental health settings specifically. It was also concluded that in order to support individuals in the most effective and appropriate way, factors such as sources of resilience and ability to form and maintain meaningful relationships should be considered and incorporated into existing practice. The study adds to the growing literature surrounding trauma-informed care, in that approaches such as this may be beneficial in forensic mental health settings in reducing the potential lifelong impact of childhood adversity.

The Effectiveness of Safewards: A Systematic Review

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This systematic review has been prepared for submission to *Clinical Psychology Review* (author guidelines can be found in Appendix 1).[1]

[1] Tables/Figures have been placed within the text for the purpose of academic examination.

Abstract

The Safewards model is intended to be an evidence-based approach to reduce levels of conflict and containment in psychiatric inpatient settings. A systematic review was carried out to examine whether Safewards is effective in reducing conflict and containment events; improving ward climate; and its acceptability to staff and service-users. Searches for articles evaluating the implementation of Safewards was conducted using Psych Info, PubMed, Web of Science and Cochrane Library from October 2019 until 31st May 2020. Twelve studies were included for review after applying inclusion and exclusion criteria. The Quality Assessment Tool for Studies with Diverse Designs (QATSDD) was used to assess study quality and the majority of studies (N = 7) were rated as "moderate" quality. Whilst there is a range of evidence to suggest Safewards may be effective in reducing conflict and containment, there is insufficient high-quality empirical evidence to state this conclusively. Further research utilising robust methodological designs with larger, more representative samples is required in order for the effectiveness of The Safewards Model to be established.

Keywords: Safewards, Effectiveness, Outcomes, Review

The term “conflict” describes behaviours that may pose risk, such as aggression, absconding and self-harm (Bowers, 2014). Prevalence of conflict events, e.g. violence or aggression, is high within health and social care settings, with 200 reported physical assaults estimated on National Health Service (NHS) staff daily in England (Royal College of Nursing, 2018). Mental health services (alongside learning disability services) often report more heightened violence than other care settings, with inpatient mental health services particularly higher risk environments for such behaviours (Cornaggia, Beghi, Pavone, & Barale, 2011; National Institute for Health and Care Excellence, 2015; Royal College of Nursing, 2018) Conflict within UK inpatient facilities are higher than other European and international studies (Bowers et al., 2011) with assault likelihood towards mental health nurses ten times greater than general nurses (Parish, 2014).

Conflict places staff and patients of services at risk of serious harm- for example by leading to physical injury (Langsrud, Linaker, & Morken, 2007) . For staff, frequent exposure to violent incidents can precipitate post-traumatic stress symptoms, poorer psychological wellbeing, increased anxiety and reduced job satisfaction (Needham et al., 2005; Renwick et al., 2016; Wildgoose, Briscoe, & Lloyd, 2003). Impact on service-users can be severe, with conflict behaviours associated with higher suicide risk (Appleby et al., 2006). In addition, conflict/violence and aggression disrupt the therapeutic environment, potentially retraumatising other individuals causing shock, fear, anxiety and sleep problems with negative consequences for therapeutic relationships (Budd, 1999).

Conflict often drives a need for “containment”; methods by which staff manage conflict behaviours, including increased observation, seclusion, security policies and “coercive measures” (Bowers et al., 2011). Ample evidence demonstrates negative physical and psychological effects of containment methods such as restraint, including staff and service-users feeling distressed, recalling previous trauma and feeling fearful and angry; it can damage service-user relationships with staff and services and is incompatible with the basic values of healthcare (Kontio, Nen, Joffe, & Katajisto, 2014; Steinert, Bergbauer, Schmid, & Gebhardt, 2007; Steinert et al., 2010; Strout, 2010; Stubbs, 2008). Best-practice guidelines state that this approach to managing service users should only be

considered as a last resort (Department of Health, 2014), instead suggesting that evidence-based ways of reducing the need for restrictive practices should be implemented. Thus, several models and programmes have been developed to meet this need and continue to be refined.

The Safewards Model (Bowers, 2014) aims to explain conflict and containment behaviours comprehensively, highlighting the bidirectional link between the two and identifying interventions to promote safety in a widely systemic way. The model was developed in 2014, following extensive research into conflict and containment behaviours over a number of years by Bowers and colleagues. From this research, the variable rates of conflict and containment rates across wards was noted, alongside differing containment methods and commonalities underlying specific behaviours; for example, links between high absconding rates and high levels of aggression and between high rates of coerced medication and use of special observations (Bowers et al., 2009). The degree of variability in incident rates across wards was found to be marked, with some wards reporting rates ten times that of others (Bowers, 1998) and this variability was present internationally also (Bowers et al., 2005). The Safewards model attempts to explain these differences and summarise factors that influence conflict and containment rates, as well delineate the commonalities underpinning different events and actions.

Through synthesising findings, six domains were identified that are key in influencing rates of conflict and containment: *The patient community*; *patient characteristics*; *the staff team*; *the regulatory framework*; *the physical environment*; and *outside hospital*. Each domain has its own empirical underpinning, for example, “the staff team” emerged from evidence including a meta-analysis suggesting that patient-staff interactions influence 39% of patient violence (Bowers et al., 2011). “Physical environment” (such as locked wards) has been associated with reduced absconding but increased aggression (Bowers et al., 2009). “Patient community” pertains to suggestions that patient-patient interactions precede 25% of violent events (Bowers et al., 2011) or fear of other patients may trigger absconding (Bowers, Jarrett, Clark, Kiyimba, & McFarlane, 1999), and the “regulatory framework” domain transpires from systematic reviews demonstrating statistical

associations between formal detainment and conflict events (Bowers et al., 2014). By illustrating links between each domain and potential *flashpoints*- situations where conflict might arise- Safewards suggests that modifiers can be implemented to reduce or better manage incidents. Examples of such are provided in Table 1 (retrieved from www.safewards.net/model/easy).

Table 1

Summary of Links Between Domains, Flashpoints and Example Modifiers.

Domain/originating factors	Flashpoints	Staff modifiers
Staff team or Internal Structure: Rules; Routines; Efficiency, Clean/tidy; Ideology, custom & practice	Denial of request; Staff demand; Limit setting; Bad news; Ignoring	Staff anxiety & frustration; Moral commitments; Psychological understanding; Teamwork & consistency; Technical mastery; Positive appreciation
Physical environment: Door locked; Quality; Availability of seclusion; Rooms; PICU or comfort/chill/sensory rooms	Complexity of layout; Hidden areas; Private areas	Caringly vigilant & inquisitive; Checking routines
Outside hospital: Visitors; Relatives & family tensions; Prospective negative move; Dependency & Institutionalisation; Demands & home	Bad news; Home crisis; Loss of relationship or accommodation; Argument	Carer/relative involvement; Family therapy; Active patient support
The patient community or patient-patient interaction: Contagion & discord	Assembly/crowding/activity; Queuing/waiting/noise; Staff/pt turnover/change; Bullying/stealing/property damage	Explanation/information; Role modelling; Patient education; Removal of means; Presence & presence+
Patient characteristics, symptoms & demography: Paranoia, PD traits; Irritability/disinhibition; Abused; Male; Alcohol/drugs;	Exacerbations; Independence/identity; Acuity/severity	Pharmacotherapy; Psychotherapy; Nursing support & intervention

Depression; Insight; Delusions; Hallucinations; Young		
Regulatory framework or external structure: Legal framework; National policy; Complaints; Appeals; Prosecutions; Hospital policy	Compulsory detention; Appeal refusal; Complaint denied; Enforced treatment	Due process; justice; respect for rights; Information giving; Support to appeal; Legitimacy

The Safewards model enables potential interventions to be identified that can reduce conflict and containment rates by enhancing staff modifiers as above. The research team scored potential interventions based on feasibility and impact, with a final list of 30 taken to consultation with a panel of expert nurses, service-users and carers. The 16 interventions chosen by the panel were then used within a pilot study allowing them to be consolidated and developed (Bowers et al., 2015). Ten key interventions (described in Table 2) were identified that were most impactful and easy to implement, resulting in a package of interventions suitable to be evaluated within a randomised control trial (Bowers et al., 2015). The initial RCT of the model showed promise, with overall rates of containment (coerced medication, seclusion, restraint, special observation etc.) and conflict (i.e. verbal aggression, suicide attempts, alcohol use or attempted absconding) reducing over 31 psychiatric inpatient wards following implementation (Bowers et al., 2015). The model has been recognised within UK guidelines for reducing restrictive practice (Department of Health, 2014; National Institute for Health and Care Excellence (NICE), 2015) and has been employed by services both nationally and internationally.

Table 2

Ten Interventions to Enhance Staff Modifiers that Impact Rates of Conflict and Containment (from www.safewards.net)

Intervention	Description
Clear mutual expectations	Conflict may arise if service-user and staff expectations lack congruence. Co-producing a list of expectations between staff and service-users creates mutual clarity and consistency.
Soft words	Service-users admitted to inpatient wards are most likely distressed, agitated and in crisis. Staff also have certain requirements of service-users which may lead to conflict (such as not leaving the ward). Soft words is aimed at showing empathy, respect to service-users and colleagues and being polite and kind in requests.
Talk down	Using de-escalation techniques and training staff in advanced techniques to help calm distressed service-users before conflict occurs.
Positive words	Ensuring that during handover, staff verbally provide positive information about service-users, and that information about any incidents includes explanations as to why the individual might have been distressed. This intervention recognises the impact of handover in setting the dynamics of shifts, and that whilst handing over important risk information is vital, so is maintaining a balance of both positive and less positive information.
Bad news mitigation	Reducing the impact of bad news and recognising the level of impact this has on service-users. Actively planning how best to shared bad news to mitigate this impact.
Knowing each other	Sharing interests or appropriate information about each other to engage and build relationships.
Mutual help meeting	Voluntary meetings with both staff and service-users to discuss the week, what has helped and what improvements could be made.
Calm down methods	This intervention aims to reduce or provide alternatives to the use of medication as a method of containment or managing service-user distress. Providing an array of items that may be soothing which can be offered to service-users before restrictive methods are used.
Reassurance	Reassurance is used to reduce anxieties among service-users following incidents, to minimise any further conflict which may be triggered or arise as a reaction to bearing witness to difficulties on the ward.
Discharge messages	Individuals can leave messages prior to their discharge with advice, notes of positivity about the ward or their journey to help reassure others and promote hope.

Systematic reviews of seclusion and restraint reduction programs in mental health settings (Goulet, Larue, & Dumais, 2017; Wilson, Rouse, Rae, & Jones, 2015) describe how numerous interventions have shown promise in reducing restrictive practices, including cognitive-behavioural models, behavioural interventions and post-incident reviews. Yet most studies lack robust methodological design and adequate power to draw meaningful conclusions using inferential statistics. Further reviews of the effects of strategies to prevent seclusion and restraint (Sailas & Fenton, 2000) and of alternatives to coercion in mental health settings (Gooding, Mcsherry, Roper, & Grey, 2018) echo these findings, highlighting the severe lack of controlled studies and inability to generalise findings from current empirical research. Numerous reviews have also collated literature describing prevalence or incidence, impact, and staff and service-user experiences of violence and aggression, conflict, containment or restraint and other behaviour management interventions within mental health services (Bowers et al., 2011; Wright, 1999; Iozzino, Ferrari, Large, Nielssen, & De, 2015; Cornaggia et al., 2011; Steinert et al., 2010; Strout, 2010; Woods & Ashley, 2007).

The use of The Safewards model is growing rapidly as government drivers push for more compassionate and less restrictive ways of working within mental health care. Despite this, no review has comprehensively examined research into the effectiveness of implementing The Safewards Model. As such, the need for a systematic review of the effectiveness and impact of the model was identified, given the importance of providing evidence-based care that promotes safety and reduces both high-risk conflict and containment behaviour.

Aims and Objectives

The aim of this systematic review was to collate and critically examine the literature available to explore the effectiveness of The Safewards Model. As a meta-analysis was not undertaken due to the heterogeneity of the available literature, the review cannot establish effectiveness by providing a single statistical estimation of overall effect of the model. Instead the review presents a narrative synthesis of the data collated systematically, with the aim of minimising bias and improving the reliability of the current evidence base. Whilst the main outcomes of the model are intended to be a reduction in conflict and containment (Bowers et al., 2015), additional outcomes measured within the literature base include impacts on ward climates and staff. Given the negative consequences of conflict and containment on therapeutic environments and interpersonal relationships (Kelly, Fenwick, Brekke, & Novaco, 2015; Renwick et al., 2016; Strout, 2010; Wildgoose et al., 2003) it felt pertinent to include these outcomes in order to evaluate the model holistically.

To fulfil the aims of the review, effectiveness was measured as a mixed-methods approach in respect of the following outcomes:

i. Does implementation of the Safewards model lead to a reduction in conflict incidence?
ii. Does implementation of Safewards lead to a reduction in containment incidence?
iii. Does implementation of Safewards lead to a quantifiable improvement in ward climate?
iv. Do staff and service users find the Safewards model and its interventions acceptable?

Methodology

Search strategy

Databases PsychINFO, Web of Science, Cochrane Library and PubMed were searched for articles from October 2019 until May 31st 2020. The term “safeward*” was used as a keyword and topic for all databases and the only keyword used, due to the specific nature of the review and being a protected term in itself in relation to the model. Reference lists within the studies were screened

and a generic search using Google Scholar was undertaken to ensure completeness. Finally, key authors were contacted to request any further studies that might fit the inclusion criteria.

Table 3

Eligibility Criteria

Inclusion	Exclusion
• The research reported an evaluation of Safewards from which it was possible to extract specific outcomes related to the interventions • The outcomes reported can be used to evaluate the effectiveness of Safewards • Studies were full-text, journal published research articles written in English	• Not possible to distinguish whether outcomes were due to Safewards or additional interventions • Studies that *only* reported adherence were excluded

Study Selection

Titles and abstracts of all records identified were screened for eligibility by the first author then reviewed by the fifth author. Full-text articles were obtained for results that were potentially of interest and screened according to inclusion and exclusion criteria (Table 3). The process of selecting studies is outlined in the Preferred Reporting Items for Systematic Reviews and Meta Analyses flow diagram (PRISMA; (Moher, Liberati, Tetzlaff, & Altman, 2009).

Results

Results of the search are shown in Figure 1. After reviewing a total of 25 papers, 13 were excluded due to not meeting the inclusion criteria. As a result, twelve articles were deemed eligible and therefore included in the review. Reference lists of the included studies were screened and citation searches conducted to ensure relevant articles had not been missed.

Assessment of Quality

A quality assessment tool was used to evaluate the methodological robustness of each study. The studies included utilised a range of research designs, and were both quantitative and qualitative. As a result, it was important that the studies were assessed using a tool designed to evaluate a variety of designs and methods. This would also ensure that each study was assessed to the same standard, allowing direct comparisons of quality.

The Quality Assessment Tool for Studies with Diverse Designs (QATSDD: Sirriyeh, Lawton, Gardner, & Armitage, 2011) was utilised in order to fulfil the assessment. The QATSDD comprises of 16 items using a four-point rating scale: 0 = *Not at all*; 1 =*Very slightly*; 2= *Moderately* and 3 = *Completely* (Appendix 2). Out of the total 16 items, 14 are applicable to quantitative studies and 14 to qualitative; all 16 are applicable to mixed method designs. Scores are used to calculate a percentage, with higher percentages denoting higher quality papers. The QATSDD is shown to have good inter-rater reliability (K =71.5%) and validity for studies with diverse designs (Sirriyeh et al., 2011).

Assessment of all studies was undertaken by the first author and inter-rater reliability was appraised by a random selection of studies being quality assessed by the second and third authors. Any disagreement of assessment was resolved through discussion and screening of abstracts. The overall quality of each study was used to guide the review, with regards to the implications of each study and to inform conclusions drawn from outcomes. In order to do this, study quality was categorised based on the GRADE approach (GRADE working group 2004). Using this approach, studies scoring between 0-25% were considered *very low* quality; 26-50% *low* quality; 51-75% *moderate* quality and scores of 76-100% were considered to be of *high* quality. This further allowed direct comparison of study quality and utilised a consistent interpretation of QATSDD scores.

Data Extraction

Information from each study was extracted, including: author(s); setting; design; total sample size; sample characteristics; outcomes and outcome measure tool(s); primary findings and quality assessment scores and quality categorisation. The information was then recorded into a standardised table (Table 3) by the first author and reviewed by the second author.

Figure 1

PRISMA Flow Diagram of Study Selection Process

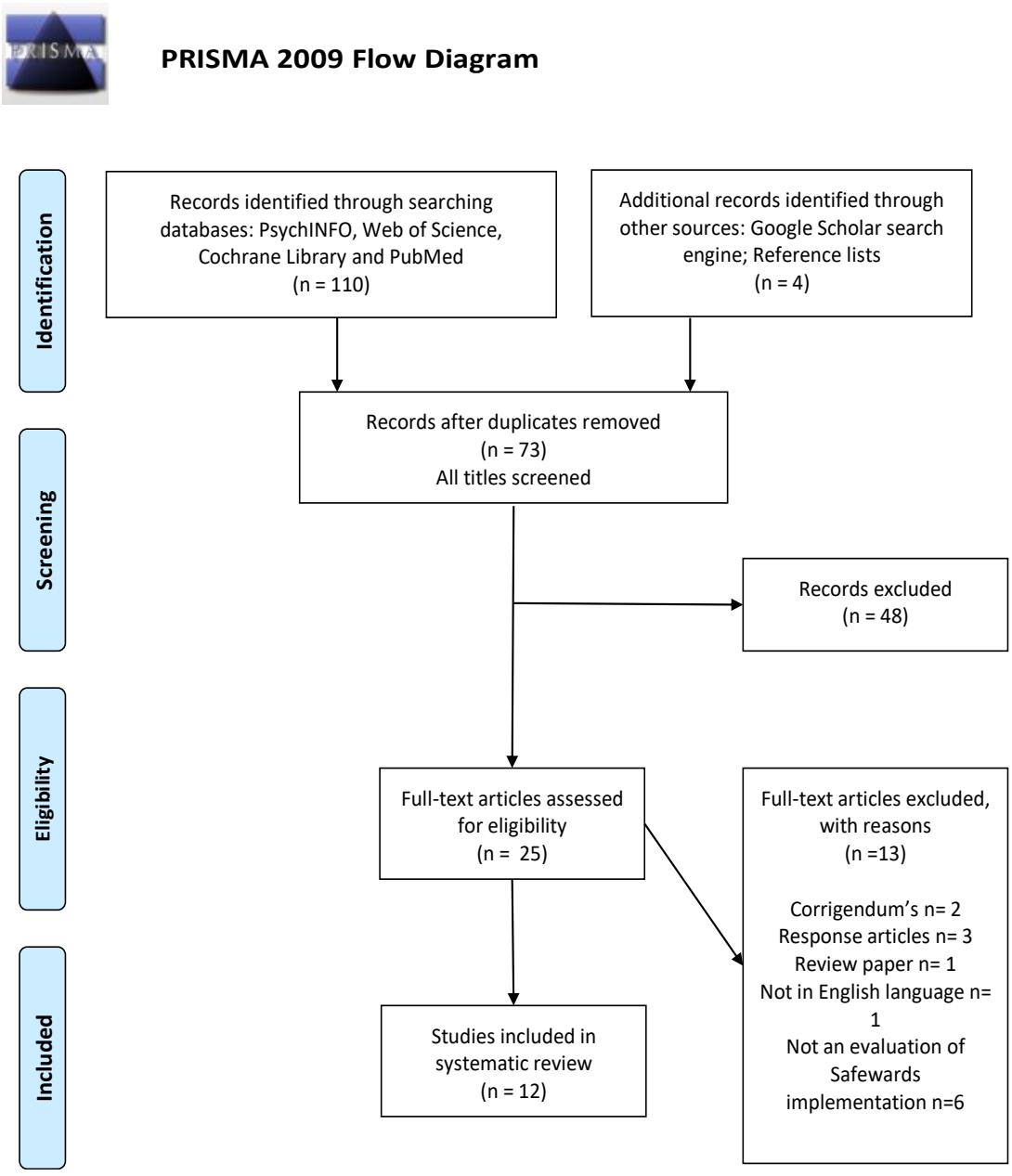

Table 3

Data Extraction Table

Study	Setting: Country	Design	Total sample size (N)	Sample characteristics	Variables measured; outcomes measures; outcome tool	Primary finding (s)	Quality assessment score (%) and categorisation
Baumgardt et al., (2019)	Two secure (locked) psychiatric wards in Berlin, Germany.	Repeated measures within and between group design using pre and post outcomes.	N = 103 (service-users)	Adults (age 17-91) with a range of mental health disorder diagnoses. Majority of wards were mixed-gender (n =16). Ten wards were male only and five female only.	Coercive interventions measured 10 weeks pre and 10 weeks post Safewards implementation using frequency and duration. Organisation Fidelity Checklist.	Exposure to coercive interventions declined in both wards. On one ward this decrease was statistically significant (p= <.01). Duration of coercive measures also reduced significantly on one ward p<.05 with effect size of Cohen's d = .282 (85% CI: -0.787 – 0.222)	62% Moderate
Bowers et al., (2015)	Acute psychiatric wards within 15 hospitals (chosen at random) in the South East of England.	Cluster randomised control trial	N= 31 (wards)	Modal age group of staff was 40-49 years (33.7%), 59.4% of whom were female and 28.4% white British.	Total rates of conflict and containment, measured by the PSCC. APDQ; SHAS; Ward Atmosphere Scale; SF-36v2 short form health survey. Fidelity checklist.	Relative to control, Safewards reduced rates of conflict events by 15% (95% CI 5.6-23.7%), p= <.01 Containment events reduced by 26.4% (95% CI 9.9-34.3%), p=<.01 No significant different in the rates of zero event shifts for conflict or containment.	83% High

Study	Setting: Country	Design	Total sample size (N)	Sample characteristics	Variables measured; outcomes measures; outcome tool	Primary finding (s)	Quality assessment score (%) and categorisation
Cabral & Carthy., (2017)	Six forensic inpatient wards in West London.	Mixed quantitative and qualitative design. Repeated measure within-subjects design (pre and post). Focus group.	N=125 (pre and post measures) N= 9 (focus group)	Not provided	EssenCES. Organisation fidelity checklist (www.safewards.net). Thematic analysis was used to ascertain main themes emerging from the focus group.	EssenCES mean score improved at follow up across all three sub-scales. Thematic analysis demonstrated overall positive views of Safewards alongside themes of resistance or barrier to change and deficit in Safewards knowledge and skills.	29% Low
Davies et al., (2020)	Acute assessment and treatment unit for people with intellectual disabilities in South Wales, UK.	Mixed methods design: repeated measures (pre and post) and qualitative feedback	N = 15 (service-users)	Not provided	PSCSR.	Significant reductions overall post-intervention for aggression ($z= -6.526$, $p< 0.01$), absconding ($z = -2.171$, $p <0.05$), medication-relation behaviours ($z= -2.085$, $p<0.01$) and containment ($z = -5.618$, $p< 0.01$). Nine out of 31 sub-questions showed significant reductions between time one and time two.	54% Moderate
Hottinen et al., (2019)	Six adolescent psychiatric inpatient wards in the Helsinki and Uusimaa Hospital district of Finland.	Repeated measures within-subject design: pre and post.	N = 330 (service-users)	Adolescents (service-users) defined as between 13-17 years of age.	EssenCES (Finnish translation). Base data was taken over two months, with follow up	Baseline measures indicated that staff ratings of 'patient cohesion' and 'therapeutic hold' significantly higher than patients. Inpatients experience of safety	67% Moderate

Study	Setting: Country	Design	Total sample size (N)	Sample characteristics	Variables measured; outcomes measures; outcome tool	Primary finding (s)	Quality assessment score (%) and categorisation
				No data provided on age ranges of participants, including staff.	data recorded in the same two months, one year later.	was rated significantly higher than that of staff. At follow up (post intervention) there were no statistically significant differences in staff ratings of patient cohesion or therapeutic hold. Staff experience of safety improved following Safewards implementation, p = <.05. Patient ratings in patient cohesion and therapeutic hold were significant higher compared to baseline, p= <.05 and p=<.01 respectively.	
Fletcher et al., (2019)	Inpatient mental health wards (adult, adolescent/youth, aged acute and secure extended care); Victoria, Australia.	Cross-sectional postintervention survey design.	N= 103 (staff responses)	Majority female staff (68.4%), mean age of 43 years with each type of service represented. 55% of participants were in nursing in some capacity.	A bespoke online survey with both quantitative and qualitative questions designed to assess staff perceptions of acceptability, applicability and impact, analysed using thematic approach.	Overall quantitative results showed staff felt Safewards positively impacted physical and verbal conflict 'usually' or 'always. Staff 'usually' or 'always' felt safer and more positive on the wards. The number of responses meant no statistical analysis of significant could be conducted. Thematic analysis suggested some staff felt the intervention was incompatible with nursing roles. 'Procedural concerns' related to lack of ownership or responsibility for the intervention.	54% Moderate

Study	Setting: Country	Design	Total sample size (N)	Sample characteristics	Variables measured; outcomes measures; outcome tool	Primary finding (s)	Quality assessment score (%) and categorisation
						Conversely, themes indicated positive views on the interventions themselves and positive impacts on ward culture.	
Fletcher et al., (2019a)	Inpatient mental health wards (adult, adolescent/youth, aged acute an secure extended care units) in Victoria, Australia.	Cross-sectional postintervention survey design.	N= 10 (wards)	Majority consumers were representative of adult inpatient wards, mean age = 40 years (range 18-78). 52% female. Average length of stay ranged from 1-4 weeks.	Bespoke online survey including demographic data followed by both quantitative and qualitative questions regarding the acceptability, applicability and impact of Safewards.	Quantitative results demonstrated that consumers felt Safewards had a positive impact on physical and verbal conflict, 25% of responses answering 'usually' or 'always'. No analysis of significance was conducted. Some responses also indicated feeling safer in the ward, more positive about being in the ward and more connected with staff. Thematic analysis of qualitative data indicated key themes of recognition and respect (improvement, increased hope, improved sense of community and improved sense of safety and calm. It also demonstrated some consumers felt language associated with the interventions were patronising or not suitable for all service-users.	63% Moderate
Fletcher et al., (2017)	Adult and adolescent mental health wards in Victoria, Australia.	Repeated measures between subjects (matched control): baseline, at	N = 44 (wards)	Both trial and control wards included a mix	Client Management Interface (CMI) provided data of seclusion events	Seclusion rates did not differ at post-trial measurement, but then reduced by 36% at 12 month	76% High

Study	Setting: Country	Design	Total sample size (N)	Sample characteristics	Variables measured; outcomes measures; outcome tool	Primary finding (s)	Quality assessment score (%) and categorisation
		intervention, post-trial and follow up.		of both regional and urban wards within small and large organisations. No further detail provided.	and number of beds. CMI data covered a 15-month period (three-month pre intervention - 12 months post trial) and was grouped into three time points for analysis. Rate of seclusion was calculated per 1000 occupied bed days, per ward, per month. The Fidelity Checklist was employed to measure consistency of interventions.	follow up compared to baseline, p=<.05 No difference in seclusion rate was observed in control wards. Fidelity to interventions increased from baseline to trial through to follow up, with nine of 10 interventions being implemented by follow up.	
Lickiewicz et al., (2020)	Psychiatric hospital, male adult inpatient wards in Poland.	Quasi-experimental, non-equivalent control group design.	N= 450 (total male patients in both control and experimental periods)	Primary presenting difficulties were alcohol and drug issue (37-47% of sample); Schizophrenia (16-29%) and mood disorders (4-16%).	Incident data was compared with the corresponding eight-month time frame from the previous year. A document called the "Coercive Measure Card" was used to identify when restraint had been used.	Statistically significant reduction in number of mechanical restraint events during day shifts (21% p<.01), night shifts (27% p<.01) post-intervention. A significant different was also seen in the mean number of restraint events for both shift patterns post Safewards implementation (24% p<.01). Significant difference in number of patients restrained post-intervention (34% p< .01). Overall reduction of 31% in restraint episodes	81% High

Study	Setting: Country	Design	Total sample size (N)	Sample characteristics	Variables measured; outcomes measures; outcome tool	Primary finding (s)	Quality assessment score (%) and categorisation
Maguire et al., (2018)	Male forensic medium-long term mental health ward in Victoria, Australia.	Mixed methods; repeated measures within subjects (pre and post).	N = 28 (unique service users)	Mean age of 44.3 years. 100% were male. Primary diagnoses were schizophrenia and schizoaffective disorder. Average length of stay was 8.3 years. Mean age of staff was 47.8 years.	Incident data was retrieved from the Victorian Health Incident Management system (VHIMS) and compared with incident data from the year prior. The adapted Fidelity Checklist. Ward climate was assessed using the EssenCES. Content analysis used to evaluate free-text answers in the fidelity checklist to elicit patient and staff experiences of Safewards.	Reported conflict incidents (attempted absconding, substance use, self-harm, medication refusal, verbal aggression, physical aggression, property damage) reduced in the year in which Safewards was implemented, with 65 fewer events. No analysis of statistical significance was undertaken due to size of dataset. Rates of seclusion (per 1000 occupied bed days) remained the same. Physical and mechanical restraint rates increased. Fidelity increased over the course of all four checks. The total mean fidelity for the duration of the study was 94.75%'; Two of the interventions did not reach 100% fidelity ('Calm down methods' and 'Discharge messages'). Results from the EssenCES ward climate measure saw a significant improvement in patient cohesion post-intervention There was a significant increase in staff perceptions of patient cohesion and experienced safety.	54% Moderate

Study	Setting: Country	Design	Total sample size (N)	Sample characteristics	Variables measured; outcomes measures; outcome tool	Primary finding (s)	Quality assessment score (%) and categorisation
Price et al (2016)	Six wards within a regional medium secure forensic unit in the UK.	Service evaluation using a non-randomised controlled design, repeated measures between and within subjects.	N = 61 (service-users)	Intervention sample consisted of: One 16 bed male acute ward, one nine-bed female acute ward, and a four-bed female acute ward. Control wards comprised of: Two, ten-bed make acute wards and one 12-bed female acute ward.	PCC-SR was used to measure conflict and containment. Safewards Researcher Fidelity Checklist was used weekly to measure adherence to the interventions. Staff feedback was collected through individual and group meetings.	Between-ward analysis indicated no statistically significant benefit of Safewards compared to control wards. Conflict and containment reduced in intervention wards (non-significant). A significant relationship was found between ward and conflict and containment. Fidelity to the interventions was poor, with mean adherence 27.28% across all wards. Staff feedback was mixed- no formal analysis of feedback was conducted.	38% Low
Stensgaard et al., (2018)	Adult psychiatric inpatient units in Southern Denmark.	Quasi-experimental design using interrupted time-series analysis on longitudinal data.	N= 26 (wards)	Sample characteristics were described within total N (commenced coercive measures) per quarter. 53.3% male patients. Average age of 41 years.	Data was collected using the Register of Coercive Measure in Psychiatric Treatment. Data was obtained retrospectively for a five-year period and exclusions made to filter the dataset. Frequency of coercive measures was used as the primary outcome.	The rate of coercive interventions fell significantly by 2% per quarter after the implementation of Safewards, when accounting for a pre-existing underlying decreasing trend. This suggested Safewards implementation resulted in continuing decreases in the frequency of coercive measures, but at a quicker rate. The rate of forced sedation also fell significantly by 11% per	62% Moderate

Study	Setting: Country	Design	Total sample size (N)	Sample characteristics	Variables measured; outcomes measures; outcome tool	Primary finding (s)	Quality assessment score (%) and categorisation
						quarter after accounting for projected trend of a 3% increase. No significant effects were found for rates of mechanical restraint.	
				Pre-intervention N/year: 53.2% male, median age 43 years. Post-intervention N/year: 53.5% male, median age 40 years.			

Note.
PSC-SR = Patient Staff Conflict Shift Report; PSCC = Patient Staff Conflict Checklist (Bowers et al., 2005); APDQ = Attitudes to Personality Disorder Questionnaire (Bowers & Allan, 2006); SHAS= Self-harm Antipathy Scale (Patterson, Whittington, & Bogg, 2007); Ward Atmosphere Scale (Moos, 1996); SF-36v2 short form health survey (Ware Jr, 2000); EssenCES = Essen Climate Evaluation Schema Questionnaire (Schalast, Redies, Collins, Stacey, & Howells, 2008).

Description of included studies

Of the 12 studies included for review, only one was a randomised controlled trial (Bowers et al., 2015); two used a quasi-experimental design (Lickiewicz et al., 2020; Stensgaard, Andersen, Nordentoft, & Hjorthøj, 2018); one used a non-randomised control design with repeated measures (Price, Burbery, Leonard, & Doyle, 2016); one used a repeated measures design with a matched control group (Fletcher et al., 2017); two studies used cross-sectional designs (Fletcher, Buchanan-Hagen, Brophy, Kinner, & Hamilton, 2019a; Fletcher, Hamilton, Kinner, & Brophy, 2019b); three studies used a mixed repeated measures design (Cabral & Carthy, 2017; Davies et al., 2020; Maguire, Ryan, Fullam, & McKenna, 2018) and two used repeated measures pre-post design with no control (Baumgardt et al., 2019; Hottinen et al., 2019). Studies were undertaken in a range of settings, predominantly adult secure/forensic psychiatric wards, as well as general adult psychiatric inpatient wards; mixed adult and adolescent psychiatric inpatient wards; adolescent psychiatric inpatient wards and an acute assessment and treatment unit for people with intellectual disabilities (PWID).

The included studies compared Safewards to an active treatment condition control group (program to improve staff physical health; Bowers et al., 2015) and to a non-randomised control of treatment as usual (TAU; Price et al., 2016). One study also compared to TAU using a matched control group (Fletcher et al., 2017). A retrospective comparison to TAU was made in 3 studies, all of which drew upon incident data collected previously (Lickiewicz et al., 2020; Maguire et al., 2018; Stensgaard et al., 2018). Four of the included studies adopted repeated measures pre-post designs with no control group (Baumgardt et al., 2019; Cabral & Carthy, 2017; Davies et al., 2019; Hottinen et al., 2019). The final two studies adopted a post-intervention cross-sectional survey design, thus did not use repeated measures nor include a control group (Fletcher, Buchanan-Hagen, et al., 2019a; Fletcher, Hamilton, et al., 2019b)

Sample sizes varied due to how the sample was defined within each study. In studies where N denoted number of service users, sample sizes ranged from 15 to 450 (mean =164.5). In those where N represented number of wards, this ranged from 26 to 44 (mean =33.7). The remaining

study samples represented both staff and service-users exposed to Safewards (N= 125), staff responses to survey evaluations (N=103) and service-user responses to survey evaluations (N=10). Studies were conducted across a number of countries: UK (N= 4); Australia (N=4); Germany (N=1); Finland (N=1); Poland (N=1) and Denmark (N=1).

Quality of included studies

Quality assessment scores can be seen in Appendix 3. Scores were calculated based on the total score possible as a result of the different study designs; for those of mixed design, scores were granted out of a total of 48, where studies were only quantitative or qualitative, scores were out of a total of 42. For studies of mixed design, scores ranged from 14 to 30 with a mean score of 23 (5.90). For studies using only quantitative or qualitative methods scores ranged from 26 to 34 with a mean score of 30.17(4.02).

It was noted that most of the studies failed to recruit a representative sample of a reasonable size, with only Bowers et al. (2015) and Lickiewicz et al. (2020) scoring moderately (17% of the total studies). Whilst this was common across the settings (and perhaps indicative of client group), it is important to consider the ability to generalise findings and interpret results with care due to the risk of false-positives (Hackshaw., 2008).

Whilst all of the studies chose methods of data collection and analysis appropriate to the research question, many failed to report justifications or rationales for their design, nor comment on the reliability or validity of their chosen measurement tool or analysis. Only 17% scored two and above for QATSDD criterion "Statistical assessment of reliability and validity of measurement tool(s) (Quantitative only)". Despite this, 75% of studies scored two and above for "Good justification for analytical method selected", with most providing specific explanations of why the analytical method was chosen, including limitations to sample size, abnormal distributions and aims of evaluating significance of change. In addition, 73% of studies also scored two or more for criterion "Evidence of

sample size considered in terms of analysis" which is important for ensuring statistical rigour and particularly for specific study designs such as randomised controlled trials.

A number of studies failed to provide a clear enough description of the setting (Cabral & Carthy, 2017; Stensgaard et al., 2018), data collection procedure (Baumgardt et al., 2019; Cabral & Carthy, 2017; Lickiewicz et al., 2020; Price et al., 2016) and recruitment data (Baumgardt et al., 2019; Cabral & Carthy, 2017; Davies et al., 2020; Fletcher, Buchanan-Hagen, et al., 2019a; Fletcher, Hamilton, et al., 2019b; Price et al., 2016; Stensgaard et al., 2018) in order to be replicable. This may partly be due to the nature of the settings in which staff and service-user populations change rapidly, thus creating inconsistent samples.

Common strengths across all twelve studies included QATSDD criterions "Statement of aims/objectives in main body of report", "Fit between stated research question and method of data collection" and "Fit between research question and method of analysis", with 100% of studies scoring two (*moderately*) or three (*completely*). Over 90% of studies scored two or above for the criteria of having an "Explicit theoretical framework", perhaps the result of sharing the empirical basis on which Safewards was developed, which in itself is extensive (Bowers et al., 2014).

The use of common measurement tools is an additional strength, in that many of the studies shared target outcomes which allows direct comparisons (such as use of the Patient-Staff Conflict Checklist -Shift report and Essen Climate Evaluation Schema questionnaire). However, there were also discrepancies between some of the studies with regards to which behaviours were monitored and how these were defined. For example, studies such as Lickiewicz et al. (2020) chose to compare the frequency of "mechanical restraint", others such as Stensgaard et al. (2018) compared frequency of "coercive measures" (which included mechanical restraint as well as forced sedation) and further studies collected information on "seclusion" only (Fletcher et al., 2017). As a result, it is necessary to be cautious when drawing comparisons or parallels between studies in order to avoid providing an inaccurate or inconsistent synthesis of the data.

Safewards interventions and mode of implementation

Of the 12 studies included for review, 11 implemented all ten interventions of the model for evaluation. One study (Lickiewicz et al, 2020) utilised three interventions only; "Positive words"; "reassurance"; and "clear mutual expectations". Most of the studies (Baumgardt et al., 2019; Davies et al., 2020; Fletcher et al., 2017; Hottinen et al., 2019; Lickiewicz et al., 2020; Maguire et al., 2018; Stensgaard et al., 2018) described utilising staff opportunities such as workshops, "train the trainer" sessions, staff meetings or education meetings in order to conduct intervention teaching. Two studies reported using steering groups (Baumgardt et al., 2019; Maguire et al., 2018), one reported a local working party (Maguire et al., 2018) and four reported using key individuals on the ward as "Safewards champions" or recruiting staff to take responsibility for the implementation of individual interventions (Baumgardt et al., 2019; Davies et al., 2020; Hottinen et al., 2019).

One study in particular, Baumgardt et al. (2019) reported using a number of the above methods for their implementation strategy, including a steering group, training workshops, Safewards champions and responsible individuals/groups. Of all the studies this provided the most detail and illustrated the most well-designed strategy for implementation of the model, also rendering it the most replicable in terms of procedure. In contrast, the original randomised control trial of the model (Bowers et al., 2015) assessed as high quality, failed to describe in detail the process by which staff/key personnel were trained in the interventions, but did report staff training on the use of associated outcome measures. It is clear that some studies ensured a more comprehensive implementation strategy than others, which is pertinent when interpreting the results of such evaluations and considering exposure rates and degree of implementation.

Impact on conflict

Four of the 12 studies reported quantitative outcomes relating to conflict events. Three of the studies utilised the Patient-Staff Conflict Checklist (PSCC) or Patient-Staff Conflict Checklist- Shift

Report (PSCSR; Bowers et al., 2015; Davies et al., 2020; Price et al., 2016), which examine 22 conflict items within broader categories of “aggression”, “self-harm”, “general rule breaking”, “substance use”, “absconding” and “medication related”. One study, Maguire et al. (2018) measured instances of aggression (physical, verbal and towards property) alongside “attempted absconding”, “affected by drugs/alcohol”, “self-harm” and “medication refusal”.

All studies reported a reduction in conflict events following the implementation of Safewards, two of which reported statistically significant reductions (Bowers et al., 2015; Davies et al., 2020). Bowers et al. (2015), a high-quality study, reported a significant reduction in the number of conflict events ($p<.01$). The use of a randomised controlled design indicated that Safewards were more effective in reducing conflict than a control intervention, although some decrease in conflict was also seen in control wards despite staff blinding to the interventions. Effect sizes were not reported, meaning the magnitude of this difference cannot be concluded. Significant reductions were also reported in Davies et al. (2020) for some, but not all, conflict events including; aggression ($p<0.01$); absconding ($p<0.05$); and medication related behaviours ($p<0.05$). Nine out of the total 21 sub-questions within the PSCSR showed significant reductions. Whilst of moderate quality, difficulties in the study relating to sample consistency were noted. This impacts on the individual characteristics and presentations exposed to the interventions (i.e. potentially greater complexity of need is not accounted for) as well as the overall exposure rate, which should be considered when interpreting results.

Both Price et al. (2016) and Maguire et al. (2018) found a reduction of conflict, however this did not reach statistical significance in the former and statistical analyses were not utilised in the latter study. The use of a service-evaluation design as well as low adherence rates in Price et al. (2016) poses stark limitations to how these results can be interpreted, as it is unclear the degree to which the interventions contributed to the reported reductions in conflict. This is also true of Maguire et al. (2018) in that it cannot be concluded whether reductions were meaningful or significant, nor if they were the result of the interventions themselves.

Impact on containment

Eight studies reported quantitative outcomes relating to instances of containment. As noted, the definition of "containment" and subsequent outcomes varied across studies. The key events measured include those within the PSCC and PSCSR: "Given PRN medication (psychotropic)"; "Given IM medication(enforced)"; "Sent to PICU or ICA"; "Seclusion"; "Special observation (intermittent)"; "Special observation (continuous)": "Show of force"; "Manually restrained" and "Time out". Additional events measured included: "Mechanical restraint"; "limitation to free movement"; "forced medication" and "forced sedation". Rates reported included both individual events measured as well as combinations or overall totals of containment. Variations in how containment was measured occurred in part due to the range of countries in which the studies were conducted, and thus ways of managing conflict differed due to legal, organisational and cultural reasons.

The use of the PSCC or PSCSR to measure containment was seen in three studies (Bowers et al., 2015; Davies et al., 2020; Price et al., 2016). Despite using the same checklists, variations were seen across the studies with two using eight descriptions of containment (Bowers et al., 2015; Price et al., 2016) and Davies et al (2020) reporting only six. This was due to 'blending' of categories such as "PRN medication" and "intramuscular medication (enforced)" and "special observations (continuous)" and "special observations (intermittent)". Where studies did not use the PSCC, measurements of containment included accessing routine incident data (Fletcher et al., 2017; Lickiewicz et al., 2020; Maguire et al., 2018; Stensgaard et al., 2018) or collecting specific data for containment incidents (frequency and duration; Baumgardt et al., 2019).

Seven studies reported reductions in containment events, five of which reported statistically significant findings (Baumgardt et al., 2019; Bowers et al., 2015; Davies et al., 2020; Lickiewicz et al., 2020; Stensgaard et al., 2018). All studies were of moderate or high quality. Fletcher et al. (2017) and Price et al. (2016) both reported non-significant reductions in containment and were of high and low quality respectively. One study (Maguire et al., 2018), reported no change in the rates of seclusion and increases in physical and mechanical restraint. The study was of moderate quality;

however, it is acknowledged that sample size was small and existing levels of conflict and containment were already low, which meant meaningful statistical analysis was not feasible. Whilst frequency of containment was the primary outcome, one study did also demonstrate a significant reduction in duration of containment measures overall ($p<0.05$; Baumgardt et al., 2019), however the reported effect size of Cohen's d (0.2) indicates only small effect of the interventions.

Impact on ward atmosphere or climate

Three studies used the Essen Climate Evaluation Schema Questionnaire (EssenCES; Schlast, Redies, Collins, Stacey & Howells, 2008) to evaluate change in ward climate following Safewards implementation. The EssenCES is a 15-item questionnaire designed to measure social climate using three sub-scales that evaluate "experience of safety", "patient cohesion" (the extent to which patients support each other) and "therapeutic hold" (the extent to which patients feel they develop therapeutic alliances).

Hottinen et al. (2019) found that staff experience of safety and patient sense of therapeutic hold improved significantly from baseline to follow-up ($p<0.05$). Patient reporting of "sense of patient cohesion" also improved significantly when compared with baseline measures ($p<0.01$), a finding replicated in Maguire et al. (2018) who found a significant increase in staff perceptions of patient cohesion and staff experience of safety ($p<0.01$). Cabral and Carthy (2017) reported an improvement of mean scores across all three sub-scales following implementation of Safewards. The study was rated as low quality and had a limited sample size; further statistical analyses were not conducted and the significance of these changes cannot be inferred.

Staff and service-user perceptions of the interventions and model's acceptability

One study evaluated staff perceptions of the Safewards model and interventions as its primary outcome, using a bespoke online survey (Fletcher et al., 2019b). A further four studies

included staff perceptions of the model as qualitative outcomes. This data was collected through focus groups/staff feedback sessions (Cabral & Carthy, 2017; Price et al., 2016), analysing free-text response to the Organisation Fidelity Checklist (Maguire et al., 2018) and through inviting key staff to provide feedback specific to interventions they had been responsible for (Davies et al., 2019).

Through using a bespoke, online survey, Fletcher et al. (2019b) elicited staff views of the model post-intervention using both quantitative and qualitative questions. Quantitative data showed that staff generally felt that Safewards interventions had made a positive impact on physical and verbal conflict, and that staff *usually* or *always* felt safer and more positive on the wards. This reflects the qualitative data seen in Cabral and Carthy (2017) and Maguire et al. (2018), whereby staff suggest improved sense of safety and overall ward climate. The responses to the survey by Fletcher et al. (2019b) demonstrated an overall positive perception of Safewards in relation to reducing some elements of conflict, however, qualitative themes such as "procedural concerns" or "incompatible" indicated staff felt there was a lack of ownership of interventions and/or the model was incompatible with their professional role and responsibilities. This too was seen within Cabral and Carthy (2017) and Price et al. (2016) where, despite viewing the interventions as positive themselves, issues such as lack of knowledge and skills meant staff felt they had been unable to implement them effectively. It appears that staff acceptability is most likely heavily influenced by having clear implementation procedures including adequate training and consistent senior oversight; thus, such findings perhaps reflect the poorer quality of studies where implementation planning and processes lacked clarity.

Davies et al. (2020) approached staff feedback non-analytically to consider the use of each intervention, particularly with regards to the setting (acute assessment and treatment unit for PWID). An issue throughout feedback was needing to adapt interventions and resources for accessibility, e.g. using pictures instead of text. For the intervention "clear mutual expectations", there was increased difficulty engaging service-users regarding ability to understand the topic or severity of presentation. Interventions, such as "soft words" and "talk down", however were

perceived positively in implementation and impact and adopted longer-term into ward processes. It is difficult to determine an overall perspective of staff given the lack of formal analytical method used, however Davies et al. (2020) provide an insight into how the acceptability of Safewards may also be dependent on how well it can be adapted to fit the setting. This issue is similar to that in Cabral and Carthy (2017) and Price et al. (2016) in some respects, in that clear implementation processes, adequate training and supervision may mitigate difficulties in delivering interventions effectively and therefore increase perceived acceptability.

Only one paper evaluated consumer (service-user/patient) perceptions and experiences of the Safewards model as its primary outcome (Fletcher et al., 2019a) which reflects the poor scores on the QATSDD relating to service-user involvement. The only other study of service-user perspective was also the only to provide patients with training on the model and interventions prior to implementation (Maguire et al., 2018). Both papers report findings similar to those expressed in evaluations of staff perceptions, with mixed views from patients on the impact of interventions. Some reported improved sense of safety, improved relationships and reduced incidents, yet also found language and methods to be "child-like" and not appropriate for adults. In addition, service-users views seemed to be dependent on how well staff implemented interventions, which not only echoes how staff felt themselves about the model, but also indicates that – as intended by Bowers et al. (2014) – the success and impact of Safewards is reliant on staff commitment and ability to deliver interventions effectively.

The quantitative and qualitative data presented across all studies examining staff and service-user perceptions of the model go beyond that of measuring outcomes such as conflict and containment alone. However, some limitations restrict the weight that can be given to these findings. In particular the reliability of qualitative data depends on data quality and the neutral reflexive stance of the practitioner (Noble & Smith, 2015). Caution should be taken when interpreting conclusions, for example Davies et al. (2020) did not use any formal analytical methods and Cabral and Carthy (2017) specify that a psychoanalytical influence may have resulted in a less

objective and reliable method. Quantitative data from Fletcher et al. (2019b) was gathered using a bespoke survey, which although provides tailored data collection, sacrifices the reliability and objectiveness of existing measures impacting credibility of results. The ability to interpret either staff or service-user views on the acceptability of Safewards is limited given the flaws above; few differences in quality assessment also restrict the ability to discriminate between the value of findings.

Fidelity to the model

Adherence to the Safewards model and the interventions was evaluated in six out of the 12 studies using the Organisation Fidelity Checklist, a measure created specifically for this purpose (Baumgardt et al., 2019; Bowers et al., 2015; Cabral & Carthy, 2017; Fletcher et al., 2017; Maguire et al., 2018; Price et al., 2016). The use of the checklist aims to demonstrate evidence or observations of Safewards implementation and includes tick-box and free-text answers. Whilst the checklist is useful in that it provides a structure by which to measure adherence, it is limited in that it is an indirect measure and fails to recognise use of interventions which might be difficult to log or observe. It is also subjective and thus results are vulnerable to being skewed depending on who completes it. The results therefore need to be interpreted with this in mind, and consider other biases that may be present within each study.

Three studies reported high fidelity rates by the end of the study period (Baumgardt et al., 2019; Fletcher et al., 2017; Maguire et al., 2018), one reported 50% fidelity (Bowers et al, 2015), one reported low fidelity (mean = 27.8%; Price et al, 2016) and one reported that at six months post-intervention “most of the ten interventions were implemented”, only implying a good level of fidelity. Whilst Fletcher et al. (2017) and Maguire et al. (2018) provided mean percentages of fidelity (90-95% and 94.75% respectively), Baumgardt et al. (2019) only reported fidelity as “high” and did not provide quantitative results of the checklist. Interestingly Bowers et al. (2015), was one of the highest quality rated studies and the only one to utilise an RCT design, yet reported an average of

only 50% fidelity by the end of the study; considering the level of exposure to the intervention alongside this (38%), the possibility that other factors contributed to the outcomes must be considered. Of the studies that found high levels of adherence, quality was assessed as being moderate or high. Two studies, Price et al. (2016) who reported low fidelity and Cabral and Carthy (2017) who implied good fidelity were assessed to be of low quality, which may pertain to flaws in design and implementation of the interventions.

All studies which recorded adherence to the interventions found improvements in primary outcomes (conflict, containment and ward climate), however only two of these reported improvements as statically significant (Baumgardt et al., 2019; Bowers et al., 2015). If we were to assume a positive association between fidelity and reductions in conflict and containment, we could expect to see high fidelity studies demonstrating reductions in both. However, in some instances such as Maguire et al. (2018), high fidelity was present alongside no changes in containment events. Given the variation in fidelity and outcomes across the studies, no conclusions can be drawn about any relationship between fidelity to Safewards interventions and the impact this may have on reducing conflict and containment or improving ward climate.

Discussion

The aim of this review was to identify outcome studies reporting implementation of Safewards, evaluate their scientific rigour and synthesise the data in order to investigate the effectiveness of the Safewards Model. Twelve studies were identified with considerable variation in methodological designs. Quality of the studies also varied, with only three of the studies being assessed as “high” quality, seven “moderate” quality and two “low” quality. Only one study utilised a randomised controlled trial design allowing a more robust evaluation of intervention outcomes, yet still presents methodological flaws. As such, there is a lack of quality empirical research from which to draw conclusions about the effectiveness of Safewards. Nonetheless the aims of this review will

now be used to structure the discussion of current evidence for the model and to consider ongoing clinical and research implications

Does implementation of the Safewards model lead to a reduction in conflict incidence?

Overall the Safewards interventions have been shown to reduce levels of conflict (Bowers et al., 2015; Davies et al., 2020; Maguire et al., 2018; Price et al., 2016), however only two of these reported statistically significant changes. Only one study, Bowers et al. (2015) used a strong methodological design (randomised controlled trial) meaning interventions have generally not been statistically compared against a control group. It is important to acknowledge that, despite using an RCT design, various issues were present that limit the findings in Bowers et al. (2015). As noted by Mustafa (2015), the "true" degree of blinding of participants cannot be ascertained given the most-likely stark differences between the control and experimental conditions as well as the movement of staff between wards. The issue of low fidelity and exposure rates also call into question the degree to which the interventions were implemented and how significant outcomes were still reported-were other factors not accounted for that also contributed to the findings, or were the interventions effective despite low usage? More generally, across all of the included studies, elements of "conflict events" varied and as such there was little consistency between studies as to what was evaluated. Studies such as Davies et al. (2020) found that Safewards had an effect on some conflict events but not all, making it difficult to interpret the interventions overall effectiveness; it is unclear whether this is due to better implementation of some interventions over others, or if some interventions appear to target certain types of conflict. This lack of clarity and consistency impedes the ability to establish effectiveness conclusively with regards to specific outcomes.

Where studies employed the same outcome measurement tool, it is unclear as to individual understanding and interpretations of definitions, meaning measures requiring a level of self-report may lose the element of objectivity required. Processes of implementation varied too, with no study

following the same strategy or number of resources/procedures to support intervention use. This therefore makes it unfeasible to draw conclusions as to whether external factors (such as staff buy-in, management or organisational support) had any impact as to how effective interventions were in reducing conflict. These findings replicate those in other reviews evaluating conflict or restraint that note the equivocal nature of the research (Goulet et al., 2017; Woods & Ashley, 2007) and who acknowledge the complex factors at play that contribute to conflict events and the consequential need for multifaceted and multi-layered interventions (Duxbury, 2015). Despite this, this review does indicate that the Safewards interventions can result in some level of reduction in conflict events. Given the effects of conflict on both staff and service-user wellbeing (Appleby et al., 2006; Gooding et al., 2018; Renwick et al., 2016; Strout, 2010), it is pertinent to recognise this impact and consider how to improve the evidence base and inform future care.

Does implementation of Safewards lead to a reduction in containment incidence?

Impact on containment was reported in eight studies (Baumgardt et al., 2019; Bowers et al., 2015; Davies et al., 2020; Fletcher et al., 2017; Lickiewicz et al., 2020; Maguire et al., (2018); Price et al., 2016; Stensgaard et al., 2018), seven of which reported reductions in containment and five of which reported significant reductions. All studies were of moderate or high quality. Methodological limitations were present similarly to those reporting on conflict, with only one using an RCT design and multiple studies using small sample sizes. The generalisability of findings is therefore limited. The findings correspond with other reviews of restraint reduction programmes (Goulet et al., 2017; Scanlan., 2010) that demonstrate overall positive changes following implementation but also note the poor-quality and limited empirical research available.

It is interesting to note that studies considered containment (such as restraint) the primary outcome and a larger number of studies evaluated containment than conflict, given that the relationship between conflict events and containment is complex and can be bi-directional (Bowers,

2006). Bowers (2006) has suggested however that some containment events are not in response to conflict, therefore measuring these variables independently may still provide meaningful results.

A key difficulty in interpreting results of Safewards implementation is the inability to derive from the data which intervention(s) were more successful than others and whether individual methods or combinations are most effective. Bowers et al. (2014) recognise in the creation of the model that this information is limited and that there is less evidence to support single items within each domain of the model. Whilst we therefore cannot conclude why there were improvements, these findings can be used to support the use of Safewards in an attempt to reduce rates of containment in settings where this is prevalent and an issue all stakeholders.

Does implementation of Safewards lead to an improvement in ward climate?

Improvement in ward climate was seen in three studies (Cabral & Carthy, 2017; Hottinen et al., 2019; Maguire et al., 2018), two of which were significant. The use of a validated and reliable measure meant outcomes were evaluated consistently across all three studies and improves the scientific robustness of each study. The same methodological flaws were still present as described above, in that all three used small sample sizes and as a result have limited ecological validity and generalisability of findings. One study, Cabral and Carthy (2017), was also assessed as low quality and low internal validity was indicated.

When considering these outcomes, we can tentatively suggest that Safewards interventions have a positive impact on ward climate, which may be unsurprising if reductions in conflict and containment are achieved as this may indicate an improvement in staff-patient relationships. However, Maguire et al. (2018) did not see any reductions in containment, which suggests further work is needed to understand the mechanisms or processes by which these changes were attained, whether they can be directly attributed to Safewards, or whether ward climate improvement is the culmination of multiple factors at play.

Is Safewards and its interventions perceived as acceptable by staff and service-users?

Of the studies that evaluated staff and/or service-user perceptions of the model, most used thematic analysis or a thematic approach to analyse data. One utilised content analysis and one reported overall feedback. The variation in analysis reflected the degree to which perceptions of the model were considered an outcome within the studies, that is, where studies identified staff or patient views as primary outcomes, a more objective and structured analytical approach was taken.

Views were overall positive and provided rich information with regards to how the model was received by both staff and patients. It also allowed consideration of barriers to implementation or challenges, or contributed to some explanation of low rates of model fidelity/outcome changes. The information gathered in these studies lacks scientific rigour, however does provide an understanding of the process of implementing the Safewards model not gained through quantitative methods alone. This in itself renders the data meaningful in how it can be used to inform future research and clinical practice. For example, some studies demonstrated that staff felt ill-equipped to use the interventions, or felt that they were incompatible with existing roles and responsibilities, suggesting it would be difficult to embed the model to any significant degree and thus limiting positive outcomes (Davies et al., 2020; Fletcher et al., 2019a; Fletcher et al., 2019b; Maguire et al., 2018; Price et al., 2016).

Whilst it is certainly encouraged to work collaboratively with service-users and to provide opportunities for autonomy, the provision of training in the interventions in studies such as Maguire et al (2018) might have introduced elements of social desirability and bias in responses – particularly when considering the power differentials between patients and staff in secure care. Across all studies evaluating service-user views, it is possible that patients felt unable to express negative views, or felt that it was necessary to provide affirmation of the effectiveness of the model with regards to its aims of reducing conflict and containment. As a result, it is important to consider these factors when interpreting such qualitative data and when contemplating implications for future research to ensure data is a true representation of consumer views.

Clinical Implications and recommendations

The implications of this review are modest, given the lack of scientific robustness of the studies included. It does however suggest that Safewards can be effective in reducing conflict and containment, alongside improving ward climate, relationships between staff and patients and within patient groups, and increasing feelings of safety within wards. As such, this provides useful clinical information for healthcare settings and providers, particularly within the mental-health field and where conflict and containment events are prevalent.

The review demonstrates that Safewards and the interventions tested may be helpful in settings where conflict and containment rates are high and presents an alternative method of care to restrictive interventions. This in itself is important to consider, given the negative consequences of restrictive practices on both patients and staff (Appleby et al., 2006; Needham et al., 2005) and the risk of traumatisation within inpatient settings in particular (Cusack et al., 2018). Safewards has shown that adapting existing ways of working and considering the role staff play in preventing conflict and containment can greatly reduce incidents. Clinically this has implications for how patient care is provided by staff, how staff are trained to work in inpatient settings and how staff respond to difficulties on wards. Given the underlying benefit of Safewards in improving staff attitudes to patients, this has implications for the role of clinical psychology specifically in enhancing skills underpinned by psychology theory and mindedness, improving staff understanding of conflict and behaviour that challenges, as well as supporting staff reflective practice to maintain compassionate ways of working and reduce compassion fatigue. It would be recommended therefore for psychological practitioners to be active in developing services to reduce restrictive practices, as well as playing key roles in upskilling staff, disseminating psychologically- based theory and practice and working in ways that enhance staff compassion. Considering UK government guidance and aims to reduce the use of restrictive measures, this review also provides an overview of how this can be achieved through the use of Safewards, as well as demonstrating to all stakeholders how the risks

posed to staff and service-user wellbeing as a result of conflict and containment events can be mitigated.

Research Implications

As discussed throughout this paper, a better understanding of the effectiveness of the Safewards model and its impact on both staff and service-users is dependent on future research being conducted. Currently there is very limited evidence for Safewards as a result of the lack of publications, however given the model is relatively new, it is anticipated that settings may be increasingly adopting Safewards and may produce a number of additional papers in the future. It is particularly crucial that future studies are of sufficient quality to contribute meaningfully to the evidence-base, utilising larger samples, more robust methodological designs over longer periods and with clear processes to reduce risk of bias and improve replicability. One primary recommendation for future research is consider how to embed Safewards holistically and at a wider systemic level, to increase buy-in and motivation from staff and ensure fidelity to the model. Future research should also attempt to utilise outcome measures that improve the consistency of reporting across studies and that are in themselves valid and reliable. This will in turn improve the quality of research and strength of findings.

Finally, a key recommendation is for research to consider establishing which of the interventions are most impactful, whether all interventions are needed to promote positive change and if not, which combination of interventions is most effective. As seen in this paper, utilisation of just three of the 10 interventions can produce significant results (Lickiewicz et al., 2020). Given the ongoing pressures and demands of staff within healthcare settings, making new models and interventions easier to implement and minimising the amount of new knowledge and skills required to do so, may have a beneficial effect on staff uptake and adherence resulting in more controlled and reliable research.

Strengths and limitations

A fundamental strength of this review is the use of a quality assessment tool (QATSDD, Sirriyeh et al., 2011) to examine the rigour of included studies and to inform conclusions drawn from the research. The authors note however that this tool has been criticised in the past for lack of explicit language and examples to guide assessment (Fenton, Lauckner & Gilbert., 2015). A further strength is that, due to the protected nature of the name, Safewards was neatly defined and thus it is assumed that all studies evaluating Safewards that met the inclusion criteria have been reviewed. This also means that within the studies reviewed, there were no differences in how the ten interventions were defined.

Several limitations to this review should be noted. First, a formal reliability check of quality assessing was only done partially, whereby a random sample of the papers were assessed independently by the second author. It would have been more robust for all studies to have been quality assessed independently by two of the researchers, in order to report inter-rater reliability. In addition, there were few high-quality studies available to be included, meaning this paper can only synthesise data from studies that require improvement to methodological design and scientific robustness. In particular, only one study reported effect size which was small (Baumgardt et al 2019), meaning that the actual magnitude of effect the interventions had on outcomes (and therefore degree of effectiveness) cannot be determined. It also acknowledged that, due to the variation in quantitative outcomes reported (including measures and definitions of outcomes), diverse study designs and lack of randomised controlled trials, a meta-analysis was not undertaken. The authors acknowledge that conclusions drawn about the effectiveness of Safewards is limited without a precise, statistical estimate of the overall effect of the model on the reported outcomes, and therefore establishing how effective the Safewards model is cannot be definitively stated within this review. In future, utilising a more pragmatic approach and possible random-effects model for a meta-analysis would significantly improve the statistical strength of conclusions made regarding the effectiveness of Safewards. Finally, it is important to recognise the generalisability of the findings of

this review, given the small number of studies and limited sample sizes within those included- a limitation which is currently inherent of the evidence-base for the Safewards model in itself.

Conclusion

This paper is the first to systematically review the evidence for the Safewards model and examine the empirical basis for its effectiveness. Whilst there is some evidence to suggest The Safewards Model may be effective in reducing conflict and containment, it is not yet possible to conclusively say that it does so. This is despite its growing popularity in healthcare settings and its inclusion within government guidance. Further robust research is required in order to determine effectiveness and to continue contributions to the models growing evidence base.

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The Relationships between Adverse Childhood Experiences, Attachment, Resilience, Psychological Distress and Trauma among Forensic Mental Health Populations

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[2] Tables/Figures have been placed within the text and word count extended for the purposes of academic examination.

Abstract

Existing research has found an association between adverse childhood experiences (ACEs), attachment style and resilience with later life psychological distress, yet this area remains surprisingly under-researched among forensic mental health populations. The current study aimed to explore predictive relationships between ACEs, attachment and resilience and later-life psychological distress and trauma within a sample with a forensic mental health history. A total of 128 participants completed six questionnaires relating to these factors: the Adverse Childhood Experiences International Questionnaire (ACE-IQ); the Vulnerable Attachment Scale Questionnaire (VASQ); the Child and Youth Resilience Measure (CYRM); the Resilience Research Centre Adult Resilience Measure (RRC-ARM); the Clinical Outcomes in Routine Evaluation- 10 (CORE-10) and the International Trauma Questionnaire (ITQ). ACEs were found to be highly prevalent and significant relationships were found between adult resilience and attachment with increased psychological distress and reaching ITQ diagnostic criteria. Attachment was also found to mediate some of these relationships. The findings propose a model in which higher ACEs may lead to insecure attachment style and low resilience, thereby resulting in higher levels of later life psychological distress and trauma presentations. Attachment and resilience may be important factors to consider for preventative and reactive interventions within forensic mental health care.

Keywords: Adverse childhood experiences, Trauma, Psychological distress, Attachment, Resilience, Mental Health

Introduction

Adverse Childhood Experiences Prevalence and Effects

Adverse Childhood Experiences (ACEs) research has grown rapidly since the late 1990's, particularly since the 1998 "ACEs Study" by Felitti et al, whereby a strong graded relationship between ten stressful life events in early childhood and causes of death in adulthood was recognised. Subsequently, the indirect relationship between ACEs and mortality-risk factors (such as health behaviours) has become highly prioritised and of epidemiological interest. Whilst the primary focus of ACEs has been their relationship with later-life *physical* risk factors (such as heart and lung conditions), the use of research to examine outcomes more closely have found that the impact of ACEs on mental health outcomes is far reaching, and at times outweighs that of outcomes such as physical activity (Hughes et al., 2017).

Adverse childhood experiences (ACEs) and subsequent physical and mental health difficulties in adulthood are now well evidenced (Felitti et al., 1998; Dube et al., 2001, 2003; Merrick et al., 2017). ACEs, including abuse, neglect or chaotic living circumstances, associate with numerous subsequent physical and mental health problems including mood disorder (Chapman et al., 2004), suicide attempts, self-harming behaviours, and drug use (Dube et al., 2001; Friestad, Åse-bente, & Kjelsberg, 2016). ACEs and offending behaviours also correlate (Craig, Piquero, Farrington, & Tto, 2017), and specific mental health disorders also associate with childhood adversity, including depression, anxiety, personality disorder and post-traumatic stress disorder (PTSD; Bierer et al., 2003; Carr, Martins, Stingel, Lemgruber, & Juruena, 2013; Lindert et al., 2014). Prevalence of ACEs in the general population are high, with some studies indicating 50%-66% of individuals have experienced at least one ACE (Campbell, Walker, & Egede, 2016; Felitti et al., 1998). There is also evidence of a dose-response relationship; individuals experiencing multiple types of ACE are at a greater risk of developing physical and mental health difficulties (Campbell et al., 2016; Dube et al., 2003; Gilbert et al., 2015; Kessler et al., 2010; Bellis et al., 2015). This dose-response relationship

may be present between childhood adversity and PTSD and complex post-traumatic stress disorder (CPTSD) in particular. PTSD is generally defined by individual response to a traumatic event, characterised by some degree of fear, and symptoms such as re-experiencing the event (e.g. flashbacks), avoiding reminders of it and hypervigilance (Karatzias et al., 2017). CPTSD has similar features, but with additional difficulties e.g. emotional dysregulation, disturbances in relationships and disturbances in self-organisation (negative views of self and threatening views of others; Karatzias et al., 2017). Research suggests a strong dose-response relationship is found between experiencing multiple ACEs and meeting CPTSD diagnostic criteria, more so than with PTSD (Hyland et al., 2017a). Whilst CPTSD can follow many forms of trauma, experiencing recurring, prolonged multiple childhood adversities- especially interpersonal types e.g. abuse or neglect- most strongly associates with CPTSD response (Cloitre et al., 2009).

Prison Populations

Childhood adversity is more prevalent in adult and youth offenders (Baglivio et al., 2014; Dierkhising et al., 2013; Levenson, Willis, & Prescott, 2014; Matsuura, Hashimoto, & Toichi, 2013; Messina & Grella, 2006) and studies of ACE prevalence in offender populations report disproportionate exposure to childhood adversity compared with the general population. Levenson, Willis, and Prescott (2014) found rates of four or more ACEs in a female sex-offender population were far higher than the general female population (41% vs. 15%: Centres for Disease, Control & Prevention, 2016) and that they are more likely than non-offenders to have been sexually abused, have experienced emotional neglect, or had a family member imprisoned during their childhood. Increased rates of ACEs (compared to community samples) are also found in male offenders (Levenson et al., 2014), youth offenders (Baglivio et al., 2014; Matsuura et al., 2013), and prison samples overall (Bowen, Jarrett, Stahl, Forrester, & Valmaggia., 2018; Ford et al., 2018; Stinson, Quinn, & Levenson., 2016).

These findings are unsurprising considering many studies suggest associations between childhood adversity and negative outcomes (Grubaugh, Zinzow, Paul, Egede, & Frueh, 2011; Malvaso, Delfabbro, & Day, 2016; Schilling, Jr, & Gore, 2007). ACEs or exposure to early abuse may predict offending in adulthood, particularly serious and chronic types (Craig, Piquero, Farrington & Ttofi., 2017; Fox, Perez, Cass, Baglivio, & Epps., 2015). However, childhood adversity research is often cross-sectional, relying on retrospective reports. As such, temporal relationships between ACEs and onset of physical or mental health issues is unclear, and recall bias is an issue (Maughan & Rutter, 1997; Norman et al., 2012). In addition, many studies fail to adequately profile other contributors to poorer physical or mental health, and numerous other factors align with a history of offending behaviour, including low-income backgrounds, lower IQ, and poorer parent-child relationships (Barnes, 2013; Keijsers, Loeber, Branje, & Meeus, 2011; Miller & Barnes, 2013; Swanson et al., 2002; Walsh, McCartney, Smith, & Armour, 2019). Consequently, associations between childhood adversity and poor mental or physical health while significant and consistent, have unestablished causality, and are confounded with other significant socioeconomic factors (Norman et al., 2012; Walsh et al., 2019).

These, alongside other limitations of ACEs research, have provoked some criticism of the field. Specifically, how conceptual and measurement issues limit the application of research and theory into practice, which has large implications for how research has been used to develop public health strategies and policies and inform "trauma-informed care" initiatives (Lacey & Minnis., 2019). It is important to consider throughout ACEs research the varying definitions of ACEs and what constitutes "adversity". Indeed, some criticisms suggest that childhood adversity is "a construct in search of a definition" (McLaughlin.,2016: p. 363). Whilst early literature focuses predominantly on individual or family adversity (such as abuse or neglect), it has been suggested that the introduction of more systemic, community or cultural adversity should be considered (Cronholm et al., 2015) and the initial use or inclusion of the original ten ACEs by Felitti et al (1998) has remained somewhat unquestioned. Studies have since made attempts to include additional ACEs, including poverty and

parenting styles (Appleton, Holdsworth, Ryan & Tracy., 2017), bullying, war and parental death (World Health Organisation., 2018). It has also been suggested that associations between ACE scores and health outcomes can be improved through the addition of adversities such as peer rejection, community violence or peer victimisation (Finkelhor et al., 2013). With this in mind, it is important to consider that often the data presented, whilst demonstrating strong associations between ACEs and poorer outcomes, may be limited in methodology and represents a simplified picture of a highly complex and often subjective issue.

Psychiatric Inpatients

Similarly to prison populations, psychiatric inpatients also present with disproportionate rates of childhood adversity (Alvarez et al., 2011; Shack, Averill, Kopecky, Krajewski, & Gummattira, 2004; Spidel, Lecomte, Greaves, Sahlstrom, & Yuille, 2010). ACEs are associated with psychosis (Morgan & Fisher, 2007; Read, van Os, Morrison, & Ross, 2005), severe depressive disorders, personality disorders and anxiety in this population (Bierer et al., 2003; Chapman et al., 2004; Edwards et al., 1990; McLean & Gallop, 2003).

Kessler et al (2010) compared 12 childhood adversities and 20 diagnostic mental health disorders in adults, using World Health Organisation (WHO) studies across 21 countries (N = 51,945 adults). Each adversity significantly associated with increased risk for all 20 diagnoses. ACEs associated with maladaptive family function (e.g. abuse, neglect or parental mental illness) provided the best statistical model; including both number of ACEs and type (such as family dysfunction) proved best fit overall ($p<.01$), suggesting considering *type* of adversity, alongside ACEs prevalence, is important for understanding associations with later life distress.

However the complexity of these associations is important; individuals often do not fit single diagnoses and mental health disorders are highly comorbid (Beck, Davis, & Freeman, 2015; Davidson, 2007). A diagnosis based on meeting specific criteria may not truly convey the impact of ACEs, nor explain multifaceted psychological processes that occur consequentially. Some suggest

behaviours classified as “mental disorder”, are part of a range of reactions to trauma, particularly ACEs, and should be considered complex trauma responses (Courtois & Ford, 2009; Morrison, Frame, & Larkin, 2003). Courtois and Ford (2009) note the histories of individuals experiencing complex trauma are usually based in chaotic unusual family contexts with multiple, cumulative adverse experiences. As such, psychological formulation is perhaps a better aid to understanding the impact of childhood adversity and unpicking complicated, intergenerational cycles of traumatic experiences.

These concerns have been echoed elsewhere where the measurement of ACEs has been called into question. As Lacey and Minnis (2019) note, issues arise due to the methods of measurement themselves, but also how this varies across ACEs research, causing inconsistencies in the literature. Most commonly, a cumulative “risk score” is adopted, whereby types of ACEs are presented often in checklist form with individuals gaining a “point” for each category of ACE. This presents difficulties similar to that of diagnosis, in that it simplifies the complexities of traumatic experiences. This also assumes that each category or ACE results in similar outcomes, disregards specific patterning of ACEs and fails to uncover the mechanisms by which they lead to poorer outcomes in later-life (Lacey & Minnis., 2019). This can mean the use of findings to inform interventions is restricted, as we have limited information on how individual or combined ACEs affect health and therefore rely on a “one size fits all” approach (Lacey & Minnis., 2019; Lanier et al., 2018).

Forensic Inpatient Populations

Research on individuals who are both offenders and psychiatric inpatients is still limited. This subpopulation often have particularly severe and enduring mental health difficulties, alongside histories of interpersonal violence or other criminal behaviours (Stinson, Quinn, & Levenson, 2016). Individuals within secure care often demonstrate more complex needs, are frequently detained

under the Mental Health Act (1983), exhibit high risk behaviours and present chronic difficulties unmitigated by intervention and support (Joint Commissioning Panel for Mental Health, 2013).

Studies of forensic inpatient populations show childhood adversity is more common than in the general population (Bruce & Laporte, 2015; Mckenna, Jackson, & Browne, 2019). Research suggests those in secure care often have higher individual types of ACEs such as abuse and neglect, which remains true across settings e.g. inpatient sexual offenders (Stinson & Becker, 2011), secure care for people with intellectual disabilities (Stinson & Robbins, 2014), and female forensic inpatient units (Beck et al., 2017). Additionally, higher adverse experiences correlate with earlier hospitalisation or arrest in forensic mental health samples (Stinson et al., 2016) and increase the risk for suicidality in male and female adult forensic inpatients, with every additional ACE increasing risk by 123% (Dudeck et al, 2015; Clements-Nolle, Wolden & Bargmann-Losche 2009).

Attachment and Resilience as Protective Factors

Unearthing protective factors which buffer against serious consequences is a priority, as these can be targeted to develop preventative and reactive psychological interventions for those with ACE histories. Supportive relationships and good resilience buffer the effects of early adversity; even in individuals with four or more ACEs, those reporting supportive relationships with an adult who made them feel safe as a child were less likely to report poor physical health or mental wellbeing (Crouch, Radcliff, Strompolis, & Srivastav, 2019; Hughes, Ford, Davies, Homolova, & Bellis, 2018).

Attachment theory (Bowlby 1980) may explain this. Individuals experiencing early trauma are less likely to develop secure attachments, and more likely to demonstrate insecure attachment styles in adulthood (Grady, Levenson & Bolder, 2016; Taussig & Culhane, 2010) and insecure or disorganised attachment is associated with mental health disorders across childhood (Dube et al., 2012; Murphy et al., 2014). Poorer attachment also aligns with increased criminality, and poorer emotional or behavioural regulation (Rosenberg et al, 2007; Bogaerts, Vanheule & Declercq, 2005).

Whilst there remains no conclusive theory of the underlying mechanism, some suggest the impact of poor attachments on Theory of Mind (ability to understand and empathise with others mental states), and associated lack of connection with others contribute to higher risk of violence (MacBeth et al, 2013; Adshead, 2002). Macinnes, Macpherson, Austin and Schwannauer (2016) demonstrated childhood trauma and insecure attachment significantly predict psychological distress and violence risk among forensic inpatients. Thus, in vulnerable populations who usually have higher levels of ACEs, attachment difficulties could have significant implications for working with and supporting individuals in forensic mental health settings.

Resilience is a further protective factor which may buffer the effects of early trauma. Whilst supportive relationships and strong attachments contribute to the concept of 'resilience', studies measuring resilience as a factor in itself suggest it moderates the impact of ACEs and is associated with greater wellbeing, reduced psychological distress and reduced depressive symptoms regardless of childhood adversity (Hughes et al., 2018) . Although this relationship is unclear due to overlapping constructs, evidence suggests even in adults with four or more ACEs, higher resilience associates with decreased reporting of mental illness, self-harm or suicidal ideation (Hughes et al., 2018).

Current Study Overview and Aims

Given childhood adversity rates among forensic mental health subpopulations, and high comorbid mental health needs and risks, understanding relationships between ACEs and psychological distress/ trauma in adulthood alongside protective factors like attachment and resilience seems essential. The aim of this study was to explore these relationships in current forensic mental health inpatients, and those with both forensic histories and mental health difficulties within a community sample. Using a series of self-report questionnaires to measure ACEs, attachment, childhood and adult resilience, psychological distress and complex trauma, the following hypotheses were examined:

1) Higher ACEs and insecure attachment styles will predict increased levels of psychological distress and symptoms of trauma.

2) Higher levels of resilience in childhood/resilience will predict reduced symptoms of trauma and psychological distress.

Method

Setting

The study was conducted in several settings; low/medium secure forensic mental health hospitals, an independent support organisation and online recruitment from the general population. In total, eight settings were approached with five contributing to data collection. Two of the eight sites (independent low-secure forensic mental health hospitals) were unable to support the research. A further site (NHS medium-secure hospital), was involved but was unable to recruit from their current inpatients and so did not contribute to the sample.

Sample size

To ensure adequate power of the study, the required sample size was calculated using G*Power (Faul et al., 2009). Based on using a linear multiple regression analysis, with medium effect size = 0.15, power = 0.80 and four predictors, the required sample size calculated was 85. Minimal literature exists on which to base anticipated effect sizes; Macinnes et al. (2016) demonstrated effect sizes of $f^2 = 0.19$ indicating medium effects, thus similar was selected.

Participants

Inclusion criteria stipulated adults aged 18 or over, able to provide informed consent with no significant communication difficulties could participate. It was also stipulated that they must be current inpatients in forensic care, or have past forensic histories and mental health difficulties. Finally, individuals within inpatient settings were excluded if participation would be detrimental to

their wellbeing, as assessed by clinical team. Warnings about the sensitive nature of some study questions were included in online recruitment materials to ensure participants considered their wellbeing before proceeding, and provided informed consent to take part.

Participants (N=128) were primarily recruited online using Prolific.co (N= 100). A further 27 participants were recruited from an independent hospital and one from independent support services. Data for total individuals approached was requested, but accurate response rates could not be recorded due to limited returns.

Most respondents were male (N=75, 58.6%), with predominant age range of between 25 and 39 years old (N=62, 8.4%). Ethnicity was predominantly Caucasian (N=106, 82.8%). The sample characteristics were similar to previous studies with regards to ethnicity, gender and age. However, gender was represented more equally in the present study, with a greater number of female responses compared to 96.9% male respondents in studies such as Macinnes et al (2016). Further demographic information is provided in Table 1.

Table 1

Participant Demographics

		Number (% of total sample)
Gender	Male	75 (58.59%)
	Female	52 (40.63%)
	Other	1 (0.78%)
Age	18-24	9 (7.03%)
	25-39	62 (48.44%)
	40-60	48 (37.50%)
	60+	9 (7.03%)
Ethnicity	Caucasian	106 (82.81%)
	Other ethnicity	22 (17.19%)
Civic status	Single	61 (47.66%)
	Married	29 (22.66%)
	Living as a couple	18 (14.06%)
	Divorced or separated	13 (10.16%)
	Widowed	4 (3.13%)
	Other	2 (1.56%)
	Prefer not to say	1(0.78%)
Inpatient status	Current inpatient	27 (21.09%)
	Past inpatient	59(46.1%)

	No inpatient admissions	42(32.81%)
Employment status	Employed	36 (28.13%)
	Self-employed	28 (21.88%)
	Retired	4 (3.13%)
	Unemployed	55 (42.96%)
	Non-paid/volunteer	5 (3.91%)
Education	Postgraduate degree	5 (3.91%)
	College/University completed	59 (46.09%)
	Secondary/High school completed	57 (44.53%)
	Primary school completed	6 (4.69%)
	No formal schooling	1 (0.78%)

Of previous or current inpatients (N=86), 30 participants were admitted once (34.88%), 30 had three or more admissions (34.88%) and 25 had two admissions (29.07%). One participant did not disclose (1.16%). Information on types of admission is shown in Table 2.

Table 2

Service-types for Participants with Histories of Inpatient Admissions.

Service type	**Number (% of past/current inpatient sample, N=86)**
Low/Medium Secure	31 (36.05%)
Acute Mental Health Ward	31 (36.05%)
Psychiatric Intensive Care Unit (PICU)	3 (3.48%)
Rehabilitation and Recovery Services	21 (24.42%)

Measures

Six measures were used with two resilience questionnaires to capture both child and adult resilience. All measures were presented via Qualtrics (Qualtrics, 2020) allowing offline collection using a secure iPad. This method allowed for ease of collection and managing the data volume needed for analyses. It also facilitated remote survey completion; a necessity during the COVID19 pandemic. Offline iPad use was also essential to comply with site rules and regulations for inpatient

wards. The same survey was used for online recruitment, with additional questions for understanding inpatient histories and adding to overall sample characteristics information (Appendix 5).

Adverse Childhood Experiences

The WHO (2018) ACE IQ questionnaire populated data on ACEs (Appendix 6). The ACE IQ is a 42-item measure designed for use globally on individuals aged 18 upwards, covering adversities such as physical, sexual and emotional abuse, neglect, peer violence, family dysfunction, community and collective violence. The questionnaire is valid and reliable, with good content reliability (Cronbach's alpha =0.83) and test-retest reliability (ICC=0.90) (Ho et al., 2019; Kidman, Smith, Piccolo, & Kohler, 2019).

Complex Trauma and Psychological Distress

The International Trauma Questionnaire (ITQ; Cloitre et al., 2018), a self-report measure of PTSD and CPTSD, is a brief diagnostic tool aligned with new criteria for the 11th version of the International Classification of Diseases (ICD-11; Appendix 7). The measure has been validated (Cloitre et al, 2018) with good internal consistency (Cronbach's alpha= 0.79) and factorial and construct validity (Haselgruber, Solva, & Leuger-Schuster, 2020; Hyland et al., 2017b). The ITQ was selected for a measure of complex trauma producing clinically relevant results, allowing consideration of participants that might present at the threshold for clinical diagnoses.

The CORE-10 (Barkham et al., 2013) was used as an adjunct to the ITQ to indicate global distress and as an additional determinant of mental health difficulties that might not be captured with other measures (Appendix 8). The CORE-10 includes six problem domain items, three functioning domain items and one risk item; higher scores indicative higher distress. Good internal reliability (Cronbach's alpha=0.90), and adequate sensitivity and specificity with a cut-off score of 13 (0.92, CI=0.83-1.0 and 0.72, CI=0.60-0.83 respectively) are reported (Barkham et al., 2013).

Attachment

To examine attachment style, the Vulnerable Attachment Style Questionnaire (VASQ; Bifulco, Mahon, Kwon, Moran & Jacobs., 2003) was used (Appendix 9). The questionnaire identifies a total score, alongside two subscales "insecurity" and "proximity- seeking". Cut-off scores were derived from median ratings in a high-risk community sample, with individual cut-offs used for each subscale and the total score to determine attachment styles validated against the Attachment Style Interview (ASI). High scores on the insecurity subscale were correlated with interview-based degree of insecurity and those assessed as having "Fearful" or "Dismissive" styles. High scores on the proximity-seeking subscale were correlated with those assessed as having an "Enmeshed" attachment style at interview. The total VASQ score uses a cut off of >57 which discriminates *all* vulnerable attachment styles within the ASI, and thus this was used in the present study to ensure a comprehensive assessment of insecurity of attachments within participants.., The measure has been validated against existing interview-style measures such as the ASIand the Relationships Questionnaire (RQ; Bartholomew & Horowitz, 1991)with good test-retest reliability for the total score ($r=0.65$, $p<0.001$) and internal consistency for both insecurity sub scale (Cronbach's alpha= 0.82) and proximity seeking subscale (Cronbach's alpha =0.63). The VASQ total score was correlated at $r=0.43$ ($p<.01$) with the RQ and with marked insecurity assessed at interview (Bifulco et al., 2003).

Resilience

The Child and Youth Resilience Measure (CYRM; Appendix 10) and Adult Resilience Measure (RRC-ARM; Resilience Research Centre, 2018; Appendix 11) are 12 item self-report questionnaires measuring social-ecological resilience. Both stem from a 58-item scale evaluated across numerous contexts, with good internal reliability/consistency (CYRM $\alpha=0.82$, ARM $\alpha= 0.88$) and test-retest reliability (>0.7) (Daigneault, Dion, Hébert, Mcduff, & Collin-vézina, 2013; Jefferies, Mcgarrigle, & Ungar, 2018). The CYRM was administered retrospectively, replicating the Welsh Adverse Childhood Experiences and Resilience Study (Hughes et al., 2018).

Recruitment and Procedure

Recruitment was conducted in two ways due to COVID19 restrictions. Prior to these, researchers visited relevant sites explaining the study and processing recruitment. Clinical teams identified participants meeting inclusion criteria for whom participation would not be destabilising, in line with National Research Ethics Service (NRES) guidance. Clinical teams received information sheets (Appendix 12) to approach participants and discuss the research. An additional "easy-read" format was also made available (Appendix 13). These were signed to consent to meeting a researcher during which participants could discuss the study and complete the consent form (Appendix 14). Participants then completed the survey using an iPad and were awarded a £5.00 voucher of their choosing.

Due to COVID19 restrictions, recruitment become remote-only in April 2020. Online recruitment through Prolific.co was implemented to ensure sample size and study power. Remote recruitment at existing research sites continued through digitising participant information and consent forms (Appendix 15). A secure, anonymous weblink was sent to ward managers and psychologists supporting the study, alongside additional guidance and instructions for staff supporting participants (Appendix 16).

Recruitment via Prolific.co involved providing the survey URL with a description of the research for advertisement (Appendix 17). To match populations where possible, demographic filters were applied to limit visibility of the study aligned to inclusion criteria, including age and first language. Further filters elicited responses only from participants with prison/jail histories *and* mental health difficulties utilising questions from Prolific's own screening. Participants were paid minimum wage per hour, pro-rata for their time, based on average completion time of 20 minutes.

Ethical Approval

Health and Care Research Wales awarded ethical approval for this study and any amendments submitted (REC Reference: 19/WA/0290, Appendix 18). Cardiff University acted as the sponsor of the research (Appendix 19).

Statistical Analyses

Analyses were conducted using SPSS 25 (IBM Corp., 2017). Variables were created based on total ACE scores from ACE-IQ, total VASQ scores and total resilience scores for CRYM and RRC-ARM. The ITQ was scored according to guidance (Cloitre et al.,2018); a binary variable was formed: *non diagnosis* (did not meet diagnostic criteria) and *diagnosis* (met criteria for PTSD and CPTSD)[3]. On reviewing ACE-IQ data after scoring, it was noted participants had only been presented with three of the four questions within the "collective violence" category, therefore it is possible ACE scores were underestimated. Retrospective responses for the missed question were collected from 54.7% of the sample (N=70) and exploratory analyses considered the implications of this. Cronbach's alpha reached the same acceptable level with and without the omitted question (α=.87) suggesting good internal consistency was maintained.

Results

Descriptive statistics were used to calculate mean scores for each variable except ITQ. Mean number of ACEs was 8.3 (SD 2.72), with 95.31% of the sample having four or more ACEs in total. Mean CORE-10 score for psychological distress was 17.53 (SD 8.86) above the clinical cut-off score of 13. Mean scores were calculated for VASQ total (88, SD 10.7), for insecurity subscale (39.72, SD 8.33) and for proximity subscale (29.63, SD 4.86) although only total score was used in further analyses.

[3] Initial classification was of three categories, however due to low cell counts restricting analysis, d*iagnosis* category was collapsed to include scores reaching both PTSD and CPTSD cut-off.

Mean resilience scores were 34 (SD 11.3) and 39.09 (SD 10.44) for CRYM and RRC-ARM respectively. Summaries of scoring for each variable were also produced, shown in Table 3.

Table 3

Scoring summaries of each variable

Measure	Scores	Number (% of total sample)
CORE-10	0-5 Healthy	12 (9.38%)
	>5-10 Low level	24 (18.75%)
	>10-15 Mild	15 (11.72%)
	>15-20 Moderate	24 (18.75%)
	>20-25 Moderate-to-severe	30 (23.44%)
	>25-40 Severe	23 (17.97%)
VASQ	<57	17 (13.28%)
	≥57 Vulnerable attachment style	111 (86.72%)
CRYM	≤ 42 Low	99 (77.34%
	43-49 Moderate	18 (14.06%
	50-53 High	0 (0%)
	≥54 Exceptional	11 (8.59%)
RRC-ARM	≤42 Low	76 (59.38%)
	43-49 Moderate	28 (21.88%)
	50-53 High	13 (10.16%)
	≥54 Exceptional	11 (8.59%)
ITQ	No Trauma	87 (67.97%)
	PTSD	9 (7.03%)
	CPTSD	32 (25%)
ACEs	0	0 (0%)
	1	1 (0.78%)
	2-3	5 (3.91%)
	4+	122 (95.31%)

The ACE-IQ scores indicated all participants reported having experienced parental separation/ divorce, 86% childhood emotional abuse (N=110), 85% bullying (N=109), 84% seeing/ hearing household member(s) treated violently (N=108) and 83% seeing/ hearing community violence (N=106). A full summary of ACEs categories is in Table 4.

Table 4

Prevalence of ACEs within the sample

ACE Category	Number (% of total sample)*
Parental Separation Or Divorce	128 (100%)
Emotional Abuse	110 (86%)
Bullying	109 (85%)
Household Member Treated Violently	108 (84%)
Community Violence	106 (83%)
Physical Abuse	101 (79%)
Physical Neglect	77 (60%)
Alcohol or Drug Abuse In Household	65 (51%)
Lived with depressed, suicidal or mentally Ill Household Member	65 (51%)
Emotional Neglect	56 (44%)
Sexual Abuse	55 (43%)
Incarcerated Household Member	44 (34%)
Collective Violence	37 (29%)

**% total more than 100% due to cumulative scoring*

Correlational analyses examined relationships between all variables. Distribution of all variables except the VASQ were skewed (Shapiro-Wilk, $p<.05$), therefore a Spearman's rho correlational analysis was conducted between all variables and CORE-10. (Appendix 20). A point biserial correlation was conducted between all variables and ITQ scores (Appendix 21). Significant relationships were found between CORE-10 and attachment, child resilience, adult resilience and ACE total scores ($p<.01$). Significant relationships were found between ITQ classification (*diagnosis* or *non-diagnosis*) and all other variables ($p<.01$).

Hypothesis one: Higher numbers of ACEs and insecure attachment styles will predict increased levels of psychological distress and symptoms of trauma.

A hierarchical linear regression model tested hypothesis two after meeting all assumptions. CORE-10 was the dependent variable, with model one including total ACE-IQ scores as the first independent variable and model two adding total VASQ scores as a further independent variable. Results from the first model reached statistical significance with an R^2 of 0.54 $F(1, 126) = 7.151$

(p<.05), showing ACE scores were predictive of psychological distress. Inclusion of VASQ in model two led to a statistically significant increase in R^2 of .403 F (1,125)= 92.849 (p<.01), demonstrating more insecure attachment styles significantly predict greater psychological distress. However, in this model ACE-IQ scores had a non-significant coefficient. Multicollinearity assumptions were met, (VIF= 1.094) suggesting VASQ scores are more significantly predictive of psychological distress than ACEs, or that the effect of ACEs on psychological distress is mediated by attachment style. Both models are in Table 5.

Table 5

Hierarchical linear regression analysis to predict psychological distress.

	Beta	Std.Error	Std.Beta	t	Sig.
Model 1					
ACEs (ACE-IQ)	.754	.282	.232	2.674	<.01
Model 2	-20.882	3.826		-5.457	<.01
ACEs (ACE-IQ)	.121	.224	.037	.539	.59
Attachment (VASQ)	.550	0.57	.664	9.636	<.01

R^2=0.54 for model 1 (p>.05); ΔR^2 = .403 for model 2 (p<.01).

Binomial logistic regression examined the effects of ACEs and insecure attachment on the likelihood participants would meet diagnostic criteria of PTSD or CPTSD, as measured by ITQ. The Box-Tidwell (1962) procedure assessed linearity of independent variables (number of ACEs and attachment style) in relation to the logit of the dependent variable. Assumptions required to continue with the regression were met.

The model was statistically significant $X^2(4) = 42.372$, p<.01 and explained 39.4% (Nagelkerke R^2) of variance in PTSD/CPTSD diagnosis, with 78.9% of cases correctly classified. Sensitivity was 56.1%, specificity was 89.7%. Positive predictive value was 71.9%, negative predictive value 81.2%. In addition, a ROC curve further illustrated specificity and sensitivity; area under the ROC curve was

.831 (95% CI, .761 to .901) demonstrating excellent discrimination (Hosmer et al, 2013). The model (Table 6) demonstrated increased number of ACEs and vulnerable attachment style significantly predicted higher likelihood of meeting diagnostic criteria for both PTSD and CPTSD.

Table 6

Binomial logistic regression predicting likelihood of PTSD or CPTSD diagnosis based on number of ACEs and insecure attachment.

	Beta	Std.Error	Wald	df	P	Odds Ratio	95% CI for Odds Ratio	
							Lower	Upper
Attachment	.134	.030	19.438	1	<.01	1.143	1.077	1.213
ACEs	.208	.095	4.791	1	<.05	1.231	1.022	1.483
Constant	11.937	2.308	26.749	1	<.01	.000		

Hypothesis two: Greater resilience in childhood/adulthood will predict reduced symptoms of trauma and psychological distress in adulthood.

Hierarchical linear regressions were conducted for hypothesis two. Childhood resilience scores (CRYM) were entered into the first model and adult resilience (RRC-ARM) the second, with CORE-10 as dependent variable. The results of the first model were statistically significant, R^2=.159 F(1,126)=23.802 (p<.01), showing higher childhood resilience significantly predicted lower psychological distress. The model was improved by adding adult resilience which explained a further 21% of the variance in CORE-10 scores and was statistically significant, R^2=.370 F(1,125)=41.783 (p<.01); both models are in Table 7. When adult resilience was added, childhood resilience was no longer a statistically significant predictor. Assumptions of multicollinearity were met by examining correlation coefficients and tolerance values, VIF=1.435, demonstrating an acceptable level of correlation. This suggests another relationship between childhood resilience and adult resilience variables, e.g. effect of childhood resilience on psychological distress being explained through adult resilience. Only adult resilience was retained in the final model (Table 7).

Table 7

Regression model predicting psychological distress based on childhood and adult resilience.

	Beta	Std.Error	Std.Beta	t	Sig.
Model 1					
Childhood resilience (CYRM)	-.313	.064	-.399	-4.879	<.01
Model 2					
Constant	38.345	2.543		15.081	<.01
Adult resilience (RRC-ARM)	-.467	.072	-.550	-6.464	<.01

A binomial logistic regression examined whether greater childhood or adult resilience predicted likelihood of meeting diagnostic criteria for PTSD or CPTSD. The regression model was statistically significant $X^2(2) = 23.337$, $p<.01$ explaining 23.3% of variance in diagnostic classification (Nagelkerke $R^{2)}$. Overall, the model classified 75% of cases correctly, with 68% sensitivity and 76.7% specificity. Area under the ROC curve was .762 (95% CI, .672 to .851), an acceptable level of discrimination (Hosmer at al., 2013). Whilst the model was statistically significant, only adult resilience significantly predicted likelihood of meeting diagnostic criteria for PTSD or CPTSD. Simply put, individuals with higher adult resilience were less likely to meet thresholds of PTSD or CPTSD (Table 8).

Table 8

Logistic regression predicting likelihood of PTSD or CPTSD diagnosis based on levels of childhood and adult resilience.

	Beta	Std.Error	Wald	df	P	Odds Ratio	95% CI for Odds Ratio	
							Lower	Upper
Childhood resilience	-.042	.024	3.051	1	.08	.959	.914	1.005
Adult resilience	-.071	.025	8.016	1	.005	.931	.887	.978
Constant	3.270	.948	11.901	1	.001	26.304		

The significant results from hypotheses two and three were used to create further regression models, firstly examining predictive relationships using the CORE-10 as the dependent variable and including attachment (VASQ), childhood resilience (CRYM) and adult resilience (RRC-ARM) as independent variables. Model one included attachment, adult resilience was included in model two and child resilience in model three. The first two models produced statistically significant results with the largest increases in R^2. 45% of the variance in CORE-10 scores was explained by attachment scores and a further 16% by adult resilience scores. Including child resilience in model three did not significantly increase $R^{2.}$

Higher scores on the VASQ were indicative of more insecure attachment styles which significantly predicted higher scores on CORE-10; the more insecure attachment style, the greater the psychological distress R^2= .456 F (1, 126) = 105.518(p<.01). Adding adult resilience scores led to a significant increase in R^2 = .619 F (1,125) = 53.789 (p<.01) and significantly predicted lower CORE-10 scores, that is, the higher participants resilience in adulthood, the less likely they were to experience psychological distress. Child resilience was not retained and the final model in Table 9 indicates low levels of adult resilience and insecure attachment styles are cumulatively strongest predictors of higher psychological distress.

Table 9

Final regression model predicting psychological distress measured by the CORE-10.

	Beta	Std.Error	Std.Beta	t	Sig.
Model 1					
Attachment (VASQ)	-.559	.054	.675	10.272	<.01
Model 2					
Constant	1.580	4.354		.363	.717
Attachment (VASQ)	.444	.048	.536	9.176	<.01
Adult Resilience (RRC-ARM)	-.364	.050	-.428	-7.334	<.01

R^2=0.456 for model 1 (p>.01); ΔR^2 = .164 for model 2 (p<.01).

Similar results were produced for a final binomial logistic regression model based on significant findings for each hypothesis. The ITQ was the criterion variable, with each independent variable previously showing a significant predictive relationship included in blocks. Block one included ACE-IQ scores, block two added adult resilience (RRC-ARM) and block three added attachment (VASQ). The model indicated ACE-IQ scores did not reach statistical significance when both adult resilience and attachment were present, so this was not retained, resulting in a small decrease in percentage of variance explained by predictors from 46.4% to 43.7% (Nagelkerke R^2). Overall, the final model (Table 10) was statistically significant X^2 (2) = 47.875, p<.01 and classified 78.9% of cases correctly with 69.4% sensitivity and 82.6% specificity. Area under the ROC curve was .851 (95% CI, .786 to .913), an excellent level of discrimination (Hosmer et al, 2013). Both variables were statistically significant, demonstrating low adult resilience and vulnerable attachment styles significantly increase likelihood of reaching diagnostic criteria for PTSD or CPTSD.

Table 10

Final logistic regression model predicting likelihood of PTSD/CPTSD diagnosis based on levels of adult resilience and insecure attachment.

	Beta	Std.Error	Wald	df	P	Odds Ratio	95% CI for Odds Ratio	
							Lower	Upper
Adult resilience	-.076	.025	9.370	1	<.01	.927	.882	.973
Attachment	.138	.031	19.087	1	<.01	1.147	1.079	1.220
Constant	-7.626	2.384	10.231	1	<.01	.000		

Exploratory analyses

Findings for each hypothesis prompted additional exploratory analyses. The first reviewed the relationship between ACEs and dependent variables. Most participants (95%) had four or more ACEs, which may have limited predictive value; as such, the ACEs measure was re-scored using the

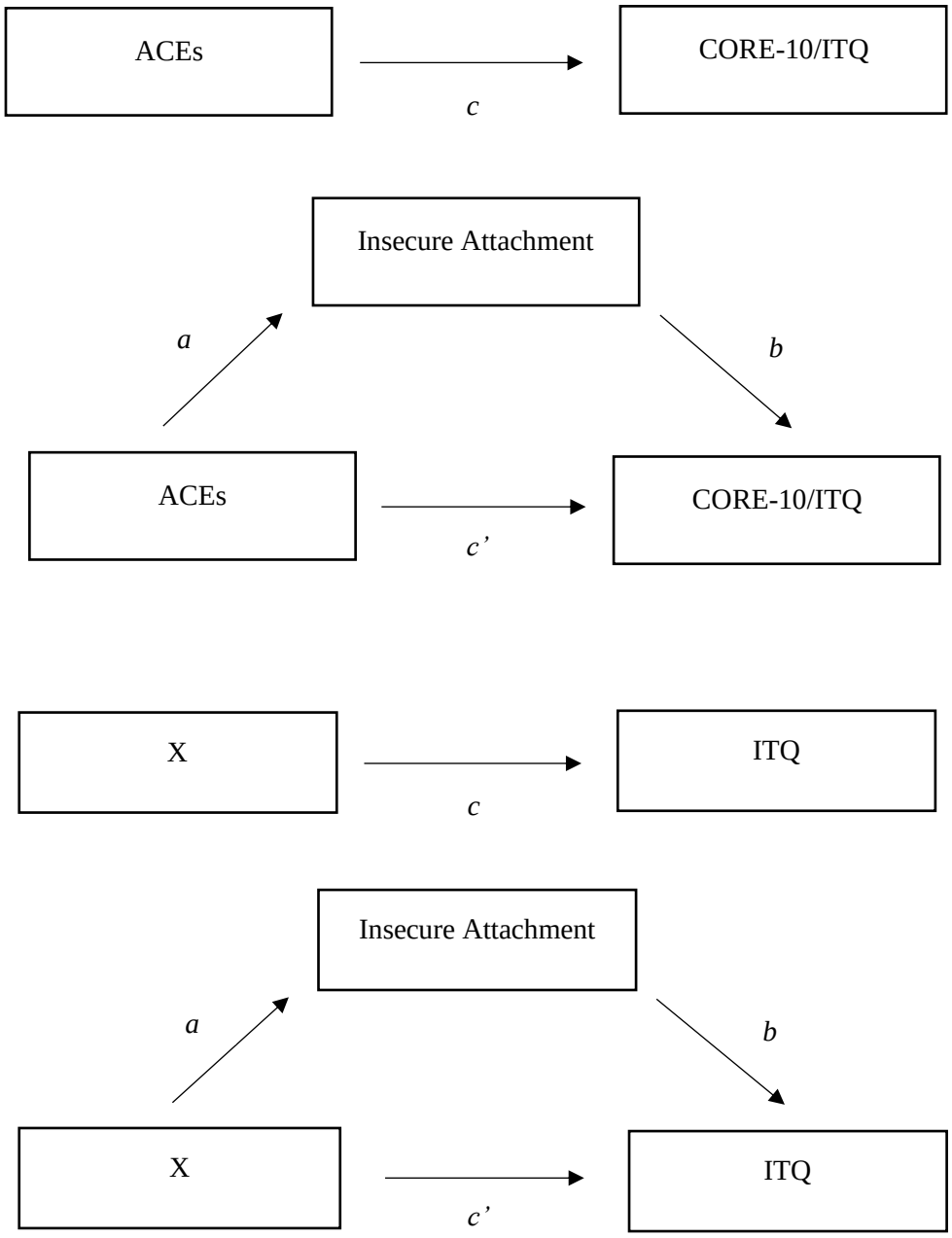
frequency approach; a pre-determined method outlined by WHO (2018) to explore predictive value of ACE frequency on outcomes. This approach considers "severity" of each adverse experience by discriminating between experiencing ACEs *many times*, *a few times* or *once*.

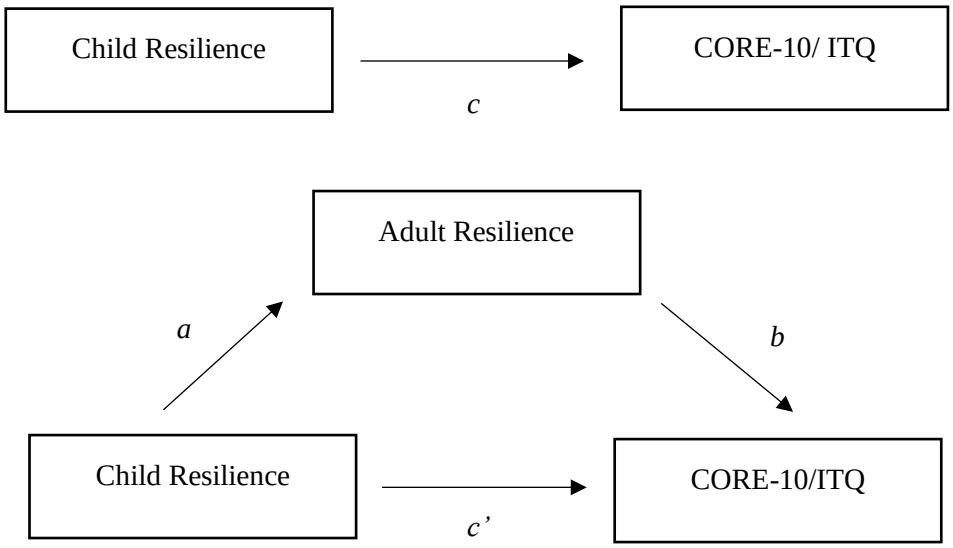
Multicollinearity was assessed with a regression function in SPSS, using ACE scores as dependent variable and ACE frequency scores, RRC-ARM and VASQ as independents. This is because multicollinearity is *independent* of the criterion variable, only exploring relationships between predictor variables. By inputting predictors against a "random" dependent, variation inflation factor was analysed indicating little to no multicollinearity (VIF= 1.229). ACE frequency scores produced a statistically significant linear regression model R^2 .078 F (1,126) =10.720 (p<.01) = accounting for 7.8% of the variance in CORE-10 scores as the only predictor variable, however these were not significant when including the RRC-ARM and VASQ. ACE frequency scores were also used in logistic regression model with ITQ as dependent variable. ACE frequency scores remained significant predictors of ITQ classification, even when including adult resilience and attachment scores X^2 (3) = 53.065, p<.01. This model accounted for 47.5% of variance within the ITQ variable. Using the frequency scoring approach only increased range of scores minimally and remained abnormally distributed.

The regression analyses suggested relationships between ACEs and both psychological distress and ITQ classification warranted further investigation. Specifically, whether attachment mediated relationship between ACEs and psychological distress, and between ACEs and ITQ classification and whether adult resilience mediated relationships between child resilience and CORE-10/ITQ variables. SPSS PROCESS macro version 3.5, (Hayes., 2017) was used to conduct four mediation analyses (model 4). The analysis used 5000 resamples and 95% confidence intervals (CI) to test relationships. The hypothesised models are presented in Figure 1.

Figure 1

Hypothesised Mediation Models





The first analysis examined relationships between total ACE scores and CORE-10 scores and whether attachment was a mediator of this relationship. Step 1 of the mediation model (path *a*) was significant R^2 = .08, F(1,126) = 11.8330, p<.01, as was step 2 (paths *b, c, c')* R^2 = .46, F(2,125) = 52.6069, p<.01, suggesting higher ACEs associate with greater psychological distress, higher ACEs associate with insecure attachment, and insecure attachment associates with higher psychological distress. Results are shown in Table 11. The indirect effect tested through bootstrapping indicated a significant mediating effect; the relationship between ACEs and psychological distress was mediated by insecure attachment style IE= .6330 (95% CI = .2028, 1.0983). Dividing indirect effect coefficient by total effect coefficient suggested 87.9% of variance in psychological distress was accounted for by ACE scores *via* insecure attachment styles.

Table 11

Mediation path coefficients: Attachment, ACE scores and Psychological Distress.

	B (SE)	CI	t	p
Path *a*: Attachment- ACE scores	1.15 (.33)	(.49, 1.81)	3.44	<.01
Path *b*: Attachment	.55 (.06)	(.44, .66)	9.63	<.01
Path *c*: ACEs total	.75 (.82)	(.20, 1.31)	2.67	<.01
Path *c'*: ACEs direct	.12 (.22)	(-.32, .56)	.54	.59
ACEs indirect	.63 (.23)	(.20, 1.10)	n/a	n/a

The second analysis used ITQ as its outcome variable, examining whether attachment mediated the relationship between ACEs and likelihood of reaching PTSD/CPTSD diagnosis. Step 1 (path *a*) was significant as above. Step 2 (paths *b, c, c'*) was also significant with direct effect between ACEs and ITQ β= .2079, S.E = .0950, p<.05 and between attachment and ITQ β= .1336, S.E = .0303, p<.01. The indirect effect was also significant, suggesting attachment mediates relationship between ACE scores and likelihood of reaching PTSD or CPTSD diagnostic criteria, IE= 1.537 (95% CI = .0490, .3367), that is, higher number of ACEs results in insecure attachment style leading to greater likelihood of PTSD or CPTSD diagnoses.

A third analysis examined whether adult resilience mediated the relationship between child resilience and psychological distress. Step 1 of the model was significant, R^2 = .11, F (1,126) = 14.9918, p<.01 as was step 2 R^2 = .62, F (2,125) = 101.7575, p<.01. Indirect effect suggested a significant mediating effect of adult resilience, IE= .1156 (95% CI = .0515, .1869), demonstrating higher child resilience may influence higher adult resilience, leading to lower levels of psychological distress. Mediation coefficient paths are shown in Table 12.

Table 12

Mediation path coefficients: Adult resilience, Child resilience and Psychological Distress.

	B (SE)	CI	t	p
Path *a*: Adult resilience- Child resilience	.51 (.07)	(.44, .75)	7.40	<.01
Path *b*: Adult resilience	-.47 (.07)	(-.61, -.32)	-6.46	<.01
Path *c*: Child resilience total	-.31 (.06)	(-.44, -.18)	-4.89	<.01
Path *c'*: Child resilience direct	-.07 (.07)	(-.21, .06)	-6.46	.26
Child resilience indirect	-.24 (.05)	(-.34, -.15)	n/a	n/a

The final mediation analysis examined the relationship between child resilience and ITQ classification. Adult resilience was a significant mediator of this relationship; increased child resilience may influence increased adult resilience thus reducing likelihood of reaching PTSD/CPTSD classification β = -.0711, S.E = .0251, p< .01.

Further exploratory analyses reviewed differences between means of subgroups in the sample. First, the two methods of recruitment used (online "community" sample and inpatients) using a Mann Whitney U test across all dependent variables. For these, distributions of scores were assessed visually and were not similar. Psychological distress (CORE-10 scores) were significantly higher for the online sample (mean rank = 69.56) than inpatient sample (mean rank = 46.45), U = 894.5, z = -2.916, p=<.01. Child resilience scores were significantly higher for the inpatient sample (mean rank = 76.70) than online participants (mean rank= 61.09), U = 1741.5, z = 1.970, p = <.05. Adult resilience scores were significantly higher for the inpatient sample (mean rank = 89.77) than the online sample (mean rank = 57.42), U = 2107.5, z= 4.081, p=<.01. No other significant differences in dependent variables between groups were found.

The final analyses considered implications of the missing question in the *collective violence* category of ACE-IQ. ACE-IQ cumulative total scores and frequency scores were re-calculated

including additional responses gained retrospectively. A new categorical variable was created to group participants as having “complete” or “incomplete” ACE-IQ. A Mann Whitney U test compared means between the two groups. Scores were similarly distributed (assessed visually using population pyramids) with no significant difference between groups for ACE-IQ total or frequency scores ($p>.05$).

Discussion

This is the first study to the author’s knowledge to investigate predictive associations between ACEs, attachment and resilience with psychological distress and trauma within forensic mental health populations. This is important due to increased prevalence and complexity of mental health difficulties within this group and subsequent complex support needs (JCPMH, 2013). The findings from this study are now discussed as related to the stated hypotheses.

Higher numbers of ACEs and insecure attachment styles will predict increased levels of psychological distress and/or symptoms of trauma.

The hierarchical linear regression analyses suggest both ACEs and attachment styles significantly predict psychological distress and trauma, however with CORE-10 scores, ACEs were no longer a significant predictor when the attachment variable was present. This suggests insecure attachment style predicts psychological distress more strongly than childhood adversity, consistent with a model where attachment style mediates the association between ACEs and psychological distress. This is supported by the results of an exploratory mediation analysis, in which attachment was a significant mediator of the relationship between ACEs and psychological distress. This suggests a pathway where high numbers of ACEs result in more insecure attachment style, thereby increasing psychological distress experienced in adulthood.

The VASQ cut-off score used for this variable encompasses several vulnerable attachment styles defined in the Attachment Style Interview (Bifulco et al, 2002a, b), including 'fearful', 'angry-dismissive', 'enmeshed' and 'withdrawn'. Whilst individual attachment styles were not assessed, 86.7% scored above cut-off, indicating some degree of insecure attachment style; this suggests higher prevalence of insecure attachment than general population rates of around 40% (Mickelson, Kessler, & Shaver, 1997). Significant relationships between attachment and psychological distress and mediating effect of attachment on relationships between ACEs and psychological distress is unsurprising, given prior findings that insecure attachment styles associate with poorer outcomes. For example, viewing close relationships with others as harmful ("dismissive attachment style") associates with violence and offending (Stirpe, Abracen, Stermac & Wilson., 2006), insecure attachment associates with diagnoses of personality disorders (Bakermans-Kranenburg & van IJzendoorn, 2009) and dismissive attachment partially mediates the relationship between childhood adversity and depression/ anxiety (Bifulco et al., 2006).

In contrast, number of ACEs significantly predicted meeting the threshold for PTSD or CPTSD when included in a logistic regression model with attachment. This suggests number of ACEs *and* insecure attachment styles significantly predict later-life trauma diagnoses, but *only* attachment is significant in predicting general psychological distress. It's possible the difference between these models demonstrates that the study discriminated between severity of psychological distress of participants; that is, childhood adversity plays a larger role in later significant mental health difficulties, such as PTSD and CPTSD, than in general poor mental health.

Importantly, it is unknown if later-life trauma relates specifically to the early life ACEs that are measured here. The ITQ asks respondents to recall a traumatic memory that has had the most impact on life. This could have occurred at any point in the respondents' lifetime; therefore, we cannot determine whether classification of ITQ scores recalls early experiences or later-life trauma. An alternative pathway might be that ACEs predispose people to experience further traumatic situations later in life, or interpret situations more traumatogenically. The results here can only be

interpreted as consistent with, but not confirmatory of, causal linkages between variables under investigation, given the cross-sectional design used. Longitudinal studies are needed to establish causal pathways, and reliance on retrospective data is often criticised in ACEs research (Lacey & Minnis, 2020).

Greater resilience in childhood/adulthood will predict reduced symptoms of trauma and psychological distress in adulthood.

Analysis for the third hypothesis suggests child resilience significantly predicts psychological distress but only as a sole predictor. The logistic regression also suggests childhood resilience significantly predicts meeting diagnostic criteria for PTSD or CPTSD, but not when adult resilience is added. The inclusion of adult resilience resulted in non-significant child-resilience coefficient for both models, suggesting RRC-ARM was the superior predictor variable. It also suggests relationships between child resilience and psychological distress and ITQ classification are mediated by adult resilience, as supported by exploratory mediation analyses. This could suggest poor child resilience may predict poor adult resilience, which in turn increases psychological distress experienced and likelihood of meeting PTSD/CPTSD diagnostic criteria.

This implies increasing individual resilience in adulthood may significantly reduce psychological distress, replicating Hughes et al., (2018). Indications that adult resilience mediates the relationship between child resilience and psychological distress are important; they suggest considering individual sources of resilience during childhood may be pertinent in avoiding poorer mental health and wellbeing *via* improving adult resilience. This may be useful when considering developing future psychological interventions; focusing on attachment and interpersonal skills (and resulting resilience) may be most beneficial for ameliorating distress and reducing trauma symptoms.

Additional findings

Exploratory analyses considered other factors additional to the research questions. One unexpected result was significant difference between participants recruited online, forming a "community" sample, and an inpatient sample. Mean rate of psychological distress was significantly higher within the community sample, whilst levels of childhood and adult resilience were significantly lower. It was hypothesised that this may be due to greater numbers of ACEs reported within the online sample, but this difference was non-significant, suggesting alternative factors may have produced this result. This highlights a common criticism of ACEs research; that multiple individual and systemic factors of early adversity, and biopsychosocial factors influencing poor mental and physical health and offending behaviour, are unaccounted for (Metzler, Merrick, Klevens, Ports, & Ford, 2017; Walsh et al., 2019). Thus, caution is needed when interpreting findings, as without comprehensive and holistic accounts of individual circumstances, how some factors (such as IQ and socioeconomic status) influence levels of adversity and distress cannot be examined.

This finding may cause concern, as it demonstrates levels of community distress beyond those of acute inpatient forensic mental health settings. It also may highlight the impact of ACEs long-term; even in individuals not requiring inpatient admission, psychological distress remains severe and enduring. Another possibility is despite high rates of childhood adversity, inpatient settings effectively support individuals in managing psychological distress; whether this is by forming secure relationships with staff, predictable environments or perhaps medication, requires further investigation.

Strengths and Limitations

This study has several strengths. Firstly, it explores an area where research is lacking despite a subpopulation of psychological complexity (JCPMH, 2013). Second, it demonstrates clinical relevance which may inform care and support for individuals with histories of childhood adversity. In

particular, recognising the predictive nature of childhood adversity, attachment and adult resilience on psychological distress and trauma presentations may inform preventative and reactive interventions. Using ACE "scores" allowed simple, statistically viable methods for measuring childhood adversity, and examination of statistical associations. It also acknowledges childhood adversity is often concurrent, allowing capture of larger numbers of adverse experiences without limiting "categories" of adversity to single examples. The sample size was also ample to adequately power the study and the sample characteristics indicated relatively equal gender representation. This is interesting given previous studies such as Macinnes et al (2016) report greater numbers of male respondents and figures generally indicate that females make up just 18% of forensic psychiatric patients in England and Wales (Tomlin et al., 2020). This may suggest the current study collected data from a greater number of females than would be expected, and may be an indication that the use of online recruitment resulted in a sample not truly representative of forensic mental health populations. Indeed, consideration should be given to bias that may have occurred as a result of this recruitment process, and the characteristics of individuals that may have opted to take part. This may post limitations as to how results can be generalised to forensic mental health settings as a whole, however, given the lack of literature available within this area it is hard to draw definitive conclusions.

There are several other limitations which should be acknowledged. The ACE-IQ- is a relatively new tool still undergoing validation testing across numerous countries (WHO, 2018). This was chosen for the comprehensive range of ACEs included, e.g. community and collective violence and bullying, which other measures have omitted. This was important, as since the original ACEs study (Felitti et al., 1998), literature has highlighted several additional adversities of interest, including witnessing violence and experiencing bullying (Cronholm et al., 2015). Whilst early piloting and validation studies have demonstrated good internal consistency and test-retest reliability, validation within the UK is unexplored. Therefore, the use of the ACE-IQ in the UK and within forensic mental health, as well interpretation of results, should be done with some caution.

It is noteworthy that ACE prevalence in the sample appeared considerably higher than past research, particularly rates of four or more ACEs (95.3%). Previous research suggests underreporting childhood adversity (Macinnes, Macpherson, Austin, & Schwannauer, 2016), others suggest an overall prevalence rate of 75% (Austin, 2011). In a population study, prevalence of one ACE was 61.5% and five or more 2.9% (Kessler et al., 2010). In comparison, only one participant in the current study reported one ACE; 122 reported four or more, with an average of 8.3. While unsurprising given the much higher rates of childhood adversity within this particular sample, it may also reflect ACE-IQs sensitivity and specificity, thus further validation of the measure across a range of populations is required.

The use of an ACEs measure itself poses some limitations. Whilst useful in a research capacity, the concept of measuring ACEs simplifies highly complex experiences and processes. This is not reflective of wide-ranging negative effects and processes often resulting from trauma or adversity; whilst ACE's may predict poorer later-life outcomes, ACE research remains blind to pathways by which association occurs without longitudinal and prospective studies. Furthermore, using ACE scores means where participants share the same 'score', we cannot distinguish someone who experienced chronic and severe adversity (e.g. long-term abuse or neglect) from someone experiencing a single adverse experience such as parental separation. The impact ACEs have depends on multiple factors, within the individual and their wider external systems. Ignoring specific patterning means assuming the same outcomes for individuals regardless of very different experiences, something research has demonstrated as untrue (Green et al., 2010; Chartier, Walker & Naimark., 2010).

Regarding measuring trauma with the ITQ, how data was collected may limit study findings. Due to anticipated use of ITQ as a brief diagnostic tool, data was scored and recorded as a dichotomous variable. Whilst providing clinically relevant data – we can interpret trauma symptoms as significant enough to warrant clinical diagnosis – it also provides limited information regarding what these symptoms are, their severity or duration. It is inferred through ITQ that diagnosis of

either PTSD or CPTSD is associated with greater impairment, however unlike a continuous variable such as CORE-10, this cannot be demonstrated in a scaled manner. As a result, hypotheses around the roles of childhood adversity, resilience and attachment in heightening or reducing trauma symptoms are not explicitly examined but rather implied by findings.

The use of retrospective measures also poses limitations to the study; as acknowledged widely, utilising retrospective data results in vulnerability to recall bias, subjectivity and issues in gauging the accuracy of reporting. In relation to factors such as resilience (alongside childhood trauma), memory processes, mood states and symptomatology at time of recall can all influence the accuracy of retrospective reports, including the difficulties in determining recall of recovered or false memories (Maughan & Rutter., 1997). With this in mind, the data presented measuring childhood resilience should be interpreted with caution and should take into account the presenting mental health and relational difficulties among participants and how this may influence their assessment of past and present resilience. The use of comparable literature, if available, would be useful in order to consider whether the data collected represents similar levels of resilience within other samples and to further assess the reliability of the present study.

Additional limitations include comparisons drawn between this study's sample- a higher-risk and potentially more vulnerable population, and the general population. The current study did not include a control group, nor were samples matched when comparing with results from community studies. As such, direct statistical comparisons cannot be made; differences between this study and other research discussed should be interpreted with this in mind. It should also be noted further studies are needed to examine whether associations found in this study are typical and generalisable to the wider population of those with forensic mental health backgrounds.

Finally, the cross-sectional nature of this study only allows for testing the predictive power of variables such as ACEs and resilience in a statistical sense, not in the true causal sense.

Implications and Recommendations for Future Research

A main implication of this study is its clinical relevance to understanding predictive relationships between ACEs, adult resilience and attachment and later-life psychological distress and trauma. Further work of longitudinal design would be required to establish a specific and consistent temporal sequence for these associations; indeed, the broader literature on ACEs and their predictiveness of mental health-related outcomes suffers from a lack of highly-controlled longitudinal designs (Liming & Grube, 2018). By learning more about direction of associations, we can consider current methods of supporting forensic mental health patients and enhancing effectiveness of their interventions. This study also highlights the mediating role of attachment, already explored as a partial mediator of relationship between childhood adversity and depression or anxiety (Bifulco et al., 2006), suggesting secure relationships may be vital to positive mental wellbeing. Significantly, ability to build relationships is not only a predictor of outcomes (McCabe & Priebe, 2004) but aids understanding of emotional regulation and engagement with services (Gumley, Taylor, Schwannauer, & MacBeth, 2014), and therefore may be a key target within future psychological interventions.

The study also draws attention to high prevalence rate of ACEs within forensic mental health subpopulations, particularly compared to general population rates of childhood adversity or trauma. This is in itself is striking, suggesting more research is needed to gather overall prevalence rates within this particular group. It would be beneficial additionally, to consider the role of socioeconomic factors in risk of adversity, and how these may influence trauma presentations and experience of psychological distress. The use of a comprehensive measure of ACEs would also allow consideration of the individual effects of differing types of adverse experiences, severity of adversity experienced and how these may correlate with outcomes.

Greater clarity is required when examining the role of resilience regarding how the concept is defined and measured. Questions still remain for future research relating to which (if any) aspects of resilience are most significant in coping with trauma and managing subsequent psychological

distress, and how these may overlap with attachment styles. Utilising qualitative and quantitative data would also lend a more holistic perspective on how early adversity, attachment and resilience relate to poorer mental health in adulthood and mitigate some limitations posed by using statistical and diagnostic measures.

Conclusion

This study suggests individuals with forensic backgrounds and mental health difficulties, and those who are current forensic mental health inpatients, have high levels of adverse childhood experiences beyond that of the general population. As a result, they are more likely to experience severe psychological distress, have more vulnerable or insecure attachment styles and lower levels of resilience in adulthood. ACEs, low resilience and insecure attachment are all significant predictors of psychological distress, increasing likelihood of having symptoms meeting clinical diagnostic thresholds for PTSD or CPSTD. Attachment in particular mediated relationships between childhood adversity and poorer later-life outcomes. Further work is needed to explore these relationships, including defining resilience more clearly, utilising appropriate measures, and considering the role of attachment in greater depth. The current study makes significant steps towards these goals demonstrating that the role of childhood adversity in relation to mental health difficulties in adulthood, alongside factors such as attachment style and resilience, should be considered routinely within forensic mental health services and consistently used to inform interventions and support.

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Appendices

Appendix 1

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Appendix 2

Quality Assessment Tool for Studies with Diverse Designs (QATSDD)

Table 1 Quality assessment tool and scoring guidance notes

Criteria	0 = Not at all	1 = Very slightly	2 = Moderately	3 = Complete
Explicit theoretical framework	No mention at all.	Reference to broad theoretical basis.	Reference to a specific theoretical basis.	Explicit statement of theoretical framework and/or constructs applied to the research.
Statement of aims/objectives in main body of report	No mention at all.	General reference to aim/objective at some point in the report including abstract.	Reference to broad aims/objectives in main body of report.	Explicit statement of aims/objectives in main body of report.
Clear description of research setting	No mention at all.	General description of research area and background, e.g. 'in primary care'.	General description of research problem in the target population, e.g. 'among GPs in primary care'.	Specific description of the research problem and target population in the context of the study, e.g. nurses and doctors from GP practices in the east midlands.
Evidence of sample size considered in terms of analysis	No mention at all.	Basic explanation for choice of sample size. Evidence that size of the sample has been considered in study design.	Evidence of consideration of sample size in terms of saturation/information redundancy or to fit generic analytical requirements.	Explicit statement of data being gathered until information redundancy/saturation was reached or to fit exact calculations for analytical requirements.
Representative sample of target group of a reasonable size	No statement of target group.	Sample is limited but represents some of the target group or representative but very small.	Sample is somewhat diverse but not entirely representative, e.g. inclusive of all age groups, experience but only one workplace. Requires discussion of target population to determine what sample is required to be representative.	Sample includes individuals to represent a cross section of the target population, considering factors such as experience, age and workplace.
Description of procedure for data collection	No mention at all.	Very basic and brief outline of data collection procedure, e.g. 'using a questionnaire distributed to staff'.	States each stage of data collection procedure but with limited detail, or states some stages in details but omits others.	Detailed description of each stage of the data collection procedure, including when, where and how data were gathered.
Rationale for choice of data collection tool(s)	No mention at all.	Very limited explanation for choice of data collection tool(s).	Basic explanation of rationale for choice of data collection tool(s), e.g. based on use in a prior similar study.	Detailed explanation of rationale for choice of data collection tool(s), e.g. relevance to the study aims and assessments of tool quality either statistically, e.g. for reliability & validity, or relevant qualitative assessment.
Detailed recruitment data	No mention at all.	Minimal recruitment data, e.g. no. of questionnaire sent and no. returned.	Some recruitment information but not complete account of the recruitment process, e.g. recruitment figures but no information on strategy used.	Complete data regarding no. approached, no. recruited, attrition data where relevant, method of recruitment.
Statistical assessment of reliability and validity of measurement tool(s) (Quantitative only)	No mention at all.	Reliability and validity of measurement tool(s) discussed, but not statistically assessed.	Some attempt to assess reliability and validity of measurement tool(s) but insufficient, e.g. attempt to establish test–retest reliability is unsuccessful but no action is taken.	Suitable and thorough statistical assessment of reliability and validity of measurement tool(s) with reference to the quality of evidence as a result of the measures used.
Fit between stated research question and method of data collection (Quantitative)	No research question stated.	Method of data collection can only address some aspects of the research question.	Method of data collection can address the research question but there is a more suitable alternative that could have been used or used in addition.	Method of data collection selected is the most suitable approach to attempt answer the research question
Fit between stated research question and format and content of data collection tool e.g. interview schedule (Qualitative)	No research question stated.	Structure and/or content only suitable to address the research question in some aspects or superficially.	Structure & content allows for data to be gathered broadly addressing the stated research question(s) but could benefit from greater detail.	Structure & content allows for detailed data to be gathered around all relevant issues required to address the stated research question(s).
Fit between research question and method of analysis	No mention at all.	Method of analysis can only address the research question basically or broadly.	Method of analysis can address the research question but there is a more suitable alternative that could have been used or used in addition to offer greater detail.	Method of analysis selected is the most suitable approach to attempt answer the research question in detail, e.g. for qualitative IPA preferable for experiences vs. content analysis to elicit frequency of occurrence of events, etc.
Good justification for analytical method selected	No mention at all.	Basic explanation for choice of analytical method	Fairly detailed explanation of choice of analytical method.	Detailed explanation for choice of analytical method based on nature of research question(s).
Assessment of reliability of analytical process (Qualitative only)	No mention at all.	More than one researcher involved in the analytical process but no further reliability assessment.	Limited attempt to assess reliability, e.g. reliance on one method.	Use of a range of methods to assess reliability, e.g. triangulation, multiple researchers, varying research backgrounds.
Evidence of user involvement in design	No mention at all.	Use of pilot study but no involvement in planning stages of study design.	Pilot study with feedback from users informing changes to the design.	Explicit consultation with steering group or statement or formal consultation with users in planning of study design.
Strengths and limitations critically discussed	No mention at all.	Very limited mention of strengths and limitations with omissions of many key issues.	Discussion of some of the key strengths and weaknesses of the study but not complete.	Discussion of strengths and limitations of all aspects of study including design, measures, procedure, sample & analysis.

Appendix 3

Quality Assessment Scores

QATSDD Criteria	Score (0 = Not at all; 1 = Very slightly; 2 = Moderately; 3 = Completely)											
Explicit theoretical framework	3	3	2	2	3	3	3	3	2	1	2	3
Statement of aims/objectives in main body of report	3	3	2	3	3	3	3	3	3	3	3	3
Clear description of research setting	2	3	1	3	3	2	3	2	3	2	1	3
Evidence of sample size considered in terms of analysis	3	3	0	2	0	2	2	2	2		0	3
Representative sample of target group of a reasonable size	0	2	0	0	0	1	1	1	0	1	1	2
Description of procedure for data collection	1	3	1	2	3	2	3	2	2	1	2	1
Rationale for choice of data collection tool(s)	3	2	1	2	3	2	3	2	2	1	3	2
Detailed recruitment data	1	3	0	1	2	1	2	1	2	1	1	3
Statistical assessment of	0	1	0	0	1	0	1	0	1	0	2	2

reliability and validity of measurement tool(s) (Quantitative only)												
Fit between stated research question and method of data collection	2	3	2	2	3	3	3	3	2	2	3	3
Fit between stated research question and format and content of data collection tool e.g. interview schedule (Qualitative)	n/a	n/a	2	1	n/a	2	n/a	2	1	1	n/a	n/a
Fit between research question and method of analysis	3	3	2	3	3	2	3	2	2	2	3	3
Good justification for analytical method selected	3	3	0	3	3	2	3	2	1	1	3	3
Assessment of reliability of analytical process (Qualitative only)	n/a	n/a	0	0	n/a	0	n/a	2	1	0	n/a	n/a
Evidence of user involvment in design	0	0	0	0	0	0	0	0	1	0	0	0

Strengths and limitations critically discussed	2	3	1	2	1	1	2	3	1	2	2	3
Total score	26/42	35/42	14/48	26/48	28/42	26/48	32/42	30/48	26/48	18/48	26/42	34/42
	62%	83%	29%	54%	67%	54%	76%	63%	54%	38%	62%	81%
Study	Baumgardt et al (2019)	Bowers et al (2015)	Cabral & Carthy (2017)	Davies et al (2019)	Hottinen et al (2019)	Fletcher et al (2019)	Fletcher et al (2017)	Fletcher et al (2019a)	Maguire et al (2018)	Price at al (2016)	Stensgaard et al (2018)	Lickiewicz et al (2020)
"GRADE" classification	Moderate	High	Low	Moderate	Moderate	Moderate	High	Moderate	Moderate	Low	Moderate	High

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Appendix 5

Additional Demographic Questions Presented to Online Sample

Q4.1 What is your first language?

- ○ English (1)
- ○ Other (2)

Q4.2 Do you have – or have you had – a diagnosed, on-going mental health/illness/condition?

- ○ Yes (1)
- ○ No (2)

Q4.3 Have you ever been in prison for committing a crime? (Answers will only be available to the researchers in an anonymised way)

- ○ Yes (1)
- ○ No (2)

End of Block: Screening Validation

Start of Block: Inconsistent screening responses

JS

Q5.1 *You are ineligible for this study, as you have provided information which is inconsistent with your Prolific pre-screening responses. Please return your submission on Prolific by selecting the 'Stop without completing' button.*

End of Block: Inconsistent screening responses

Start of Block: Demographics

X→

Q6.7 Have you ever been admitted to inpatient mental health care? If yes, please specify below:

- ○ Acute inpatient ward (1)
- ○ Psychiatric intensive care unit (PICU) (3)
- ○ Low secure forensic services (4)
- ○ Medium secure forensic services (5)
- ○ High secure forensic services (6)
- ○ Recovery and rehabilitation services (7)
- ○ Not applicable (8)

Skip To: Q6.10 If Have you ever been admitted to inpatient mental health care? If yes, please specify below: = Not applicable

Q6.8 How old were you when you were first admitted to inpatient care?

- ○ Under 18 (1)
- ○ 18-24 (2)
- ○ 25 - 39 (3)
- ○ 40-59 (10)
- ○ 60+ (11)

Q6.9 How many times have you been admitted to inpatient care?

- ○ Once (1)
- ○ Twice (2)
- ○ Three or more (3)

Appendix 6

ACE-IQ (WHO, 2018) Measure of Adverse Childhood Experiences

Participant Identification Number: [ ][ ] [ ][ ] [ ][ ]

Adverse Childhood Experiences International Questionnaire (ACE-IQ)

0	DEMOGRAPHIC INFORMATION	
0.1 [C1]	Sex (*Record Male / Female as observed*)	Male Female
0.2 [C2]	What is your date of birth?	Day [ ][ ] Month [ ][ ] Year [ ][ ][ ][ ] Unknown *(Go to Q.C3)*
0.3 [C3]	How old are you?	[ ][ ]
0.4 [C4]	What is your [*insert relevant ethnic group / racial group / cultural group / others*] background?	[*Locally defined*] [*Locally defined*] [*Locally defined*] Refused
0.5 [C5]	What is the highest level of education you have completed?	No formal schooling Less than primary school Primary school completed Secondary/High school completed College/University completed Post graduate degree Refused
0.6 [C6]	Which of the following best describes your main work status over the last 12 months?	Government employee Non-government employee Self-employed Non-paid Student Homemaker Retired Unemployed (able to work) Unemployed (unable to work) Refused
0.7 [C7]	What is your civic status?	Married *(Go to Q.M2)* Living as couple Divorced or separated Single Widowed *(Go to Q.M2)* Other Refused
1	**MARRIAGE**	
1.1 [M1]	Have you ever been married?	Yes No *(Go to Q.M5)* Refused
1.2 [M2]	At what age were you first married?	Age [ ][ ] Refused
1.3 [M3]	At the time of your first marriage did you yourself choose your husband/wife?	Yes *(Go to Q.M5)* No Don't know / Not sure Refused
1.4 [M4]	At the time of your first marriage if you did not choose your husband/wife yourself, did you give your consent to the choice?	Yes No Refused
1.5 [M5]	If you are a mother or father what was your age when your first child was born?	Age [ ][ ] Not applicable Refused

2	RELATIONSHIP WITH PARENTS/GUARDIANS	
	When you were growing up, during the first 18 years of your life . . .	
2.1 [P1]	Did your parents/guardians understand your problems and worries?	Always Most of the time Sometimes Rarely Never Refused
2.2 [P2]	Did your parents/guardians **really** know what you were doing with your free time when you were not at school or work?	Always Most of the time Sometimes Rarely Never Refused
3		
3.1 [P3]	How often did your parents/guardians **not** give you enough food even when they could easily have done so?	Many times A few times Once Never Refused
3.2 [P4]	Were your parents/guardians too drunk or intoxicated by drugs to take care of you?	Many times A few times Once Never Refused
3.3 [P5]	How often did your parents/guardians **not** send you to school even when it was available?	Many times A few times Once Never Refused
4	**FAMILY ENVIRONMENT**	
	When you were growing up, during the first 18 years of your life . . .	
4.1 [F1]	Did you live with a household member who was a problem drinker or alcoholic, or misused street or prescription drugs?	Yes No Refused
4.2 [F2]	Did you live with a household member who was depressed, mentally ill or suicidal?	Yes No Refused
4.3 [F3]	Did you live with a household member who was ever sent to jail or prison?	Yes No Refused
4.4 [F4]	Were your parents ever separated or divorced?	Yes No Not applicable Refused
4.5 [F5]	Did your mother, father or guardian die?	Yes No Don't know / Not sure Refused

These next questions are about certain things you may actually have heard or seen IN YOUR HOME. These are things that may have been done to another household member but not necessarily to you.

When you were growing up, during the first 18 years of your life . . .		
4.6 [F6]	Did you see or hear a parent or household member in your home being yelled at, screamed at, sworn at, insulted or humiliated?	Many times A few times Once Never Refused
4.7 [F7]	Did you see or hear a parent or household member in your home being slapped, kicked, punched or beaten up?	Many times A few times Once Never Refused
4.8 [F8]	Did you see or hear a parent or household member in your home being hit or cut with an object, such as a stick (or cane), bottle, club, knife, whip etc.?	Many times A few times Once Never Refused
These next questions are about certain things YOU may have experienced. When you were growing up, during the first 18 years of your life . . .		
5		
5.1 [A1]	Did a parent, guardian or other household member yell, scream or swear at you, insult or humiliate you?	Many times A few times Once Never Refused
5.2 [A2]	Did a parent, guardian or other household member threaten to, or actually, abandon you or throw you out of the house?	Many times A few times Once Never Refused
5.3 [A3]	Did a parent, guardian or other household member spank, slap, kick, punch or beat you up?	Many times A few times Once Never Refused
5.4 [A4]	Did a parent, guardian or other household member hit or cut you with an object, such as a stick (or cane), bottle, club, knife, whip etc?	Many times A few times Once Never Refused
5.5 [A5]	Did someone touch or fondle you in a sexual way when you did not want them to?	Many times A few times Once Never Refused
5.6 [A6]	Did someone make you touch their body in a sexual way when you did not want them to?	Many times A few times Once Never Refused
5.7 [A7]	Did someone attempt oral, anal, or vaginal intercourse with you when you did not want them to?	Many times A few times Once

		Never
		Refused
5.8 [A8]	Did someone actually have oral, anal, or vaginal intercourse with you when you did not want them to?	Many times
		A few times
		Once
		Never
		Refused
6	**PEER VIOLENCE**	
	These next questions are about BEING BULLIED when you were growing up. Bullying is when a young person or group of young people say or do bad and unpleasant things to another young person. It is also bullying when a young person is teased a lot in an unpleasant way or when a young person is left out of things on purpose. It is not bullying when two young people of about the same strength or power argue or fight or when teasing is done in a friendly and fun way. **When you were growing up, during the first 18 years of your life . . .**	
6.1 [V1]	How often were you bullied?	Many times
		A few times
		Once
		Never *(Go to Q.V3)*
		Refused
6.2 [V2]	How were you bullied most often?	I was hit, kicked, pushed, shoved around, or locked indoors
		I was made fun of because of my race, nationality or colour
		I was made fun of because of my religion
		I was made fun of with sexual jokes, comments, or gestures
		I was left out of activities on purpose or completely ignored
		I was made fun of because of how my body or face looked
		I was bullied in some other way
		Refused
	This next question is about PHYSICAL FIGHTS. A physical fight occurs when two young people of about the same strength or power choose to fight each other. **When you were growing up, during the first 18 years of your life . . .**	
6.3 [V3]	How often were you in a physical fight?	Many times
		A few times
		Once
		Never
		Refused
7	**WITNESSING COMMUNITY VIOLENCE**	
	These next questions are about how often, when you were a child, YOU may have seen or heard certain things in your NEIGHBOURHOOD OR COMMUNITY (not in your home or on TV, movies, or the radio). **When you were growing up, during the first 18 years of your life . . .**	
7.1 [V4]	Did you see or hear someone being beaten up in real life?	Many times
		A few times
		Once
		Never
		Refused
7.2	Did you see or hear someone being stabbed	Many times

[V5]	or shot in real life?	A few times Once Never Refused
7.3 [V6]	Did you see or hear someone being threatened with a knife or gun in real life?	Many times A few times Once Never Refused
8	**EXPOSURE TO WAR/COLLECTIVE VIOLENCE**	
	These questions are about whether YOU did or did not experience any of the following events when you were a child. The events are all to do with collective violence, including wars, terrorism, political or ethnic conflicts, genocide, repression, disappearances, torture and organized violent crime such as banditry and gang warfare. **When you were growing up, during the first 18 years of your life . . .**	
8.1 [V7]	Were you forced to go and live in another place due to any of these events?	Many times A few times Once Never Refused
8.2 [V8]	Did you experience the deliberate destruction of your home due to any of these events?	Many times A few times Once Never Refused
8.3 [V9]	Were you beaten up by soldiers, police, militia, or gangs?	Many times A few times Once Never Refused
8.4 [V10]	Was a family member or friend killed or beaten up by soldiers, police, militia, or gangs?	Many times A few times Once Never Refused

Appendix 7

International Trauma Questionnaire (ITQ)

THE INTERNATIONAL TRAUMA QUESTIONNAIRE (ITQ)

OVERVIEW:
The attached instrument is a brief, simply-worded measure, focusing only on the core features of PTSD and CPTSD, and employs straightforward diagnostic rules. The ITQ was developed to be consistent with the organizing principles of the ICD-11, as set forth by the World Health Organization, which are to maximize clinical utility and ensure international applicability through a focus on the core symptoms of a given disorder. The ITQ is freely available in the public domain to all interested parties. Evaluation of the measure continues particularly as it relates to the definition of functional impairment for both PTSD and CPTSD and possibly the content of the items as they might relate to being predictive of differential treatment outcome.

DIAGNOSTIC ALGORITHMS are as follows:
PTSD. A diagnosis of PTSD requires the endorsement of one of two symptoms from the symptom clusters of (1) re-experiencing in the here and now, (2) avoidance, and (3) sense of current threat, plus endorsement of at least one indicator of functional impairment associated with these symptoms. Endorsement of a symptom or functional impairment item is defined as a score ≥ 2.

CPTSD. A diagnosis of CPTSD requires the endorsement of one of two symptoms from each of the three PTSD symptoms clusters (re-experiencing in the here and now, avoidance, and sense of current threat) and one of two symptoms from each of the three Disturbances in Self-Organization (DSO) clusters: (1) affective dysregulation, (2) negative self-concept, and (3) disturbances in relationships. Functional impairment must be identified where at least one indicator of functional impairment is endorsed related to the PTSD symptoms and one indicator of functional impairment is endorsed related to the DSO symptoms. Endorsement of a symptom or functional impairment item is defined as a score ≥ 2.

An individual can receive either a diagnosis of PTSD or CPTSD, not both. If a person meets the criteria for CPTSD, that person does not also receive a PTSD diagnosis.

Scoring instructions are available at the end of this document.

THE REFERENCE for the measure is:
Cloitre, M., Shevlin M., Brewin, C.R., Bisson, J.I., Roberts, N.P., Maercker, A., Karatzias, T., Hyland, P. (in press). The International Trauma Questionnaire: Development of a self-report measure of ICD-11 PTSD and Complex PTSD. *Acta Psychiatrica Scandinavica*. DOI: 10.1111/acps.12956

BACKGROUND PUBLICATIONS:
Brewin, C. R., Cloitre, M., Hyland, P., Shevlin, M., Maercker, A., Bryant, R. A.,...Reed, G. M. (2017). A review of current evidence regarding the ICD-11 proposals for diagnosing PTSD and complex PTSD. *Clinical Psychology Review*, 58, 1-15. doi: 10.1016/j.cpr.2017.09.001.

Karatzias T., Shevlin M., Fyvie C., Hyland P., Efthymiadou E., Wilson D.,...Cloitre M. (2017). Evidence of distinct profiles of posttraumatic stress disorder (PTSD) and complex posttraumatic stress disorder (CPTSD) based on the new ICD-11 trauma questionnaire (ICD-TQ). *Journal of Affective Disorders*, 207, 181-187. http://dx.doi.org/10.1016/j.jad.2016.09.032

Hyland, P., Shevlin M., Brewin C.R., Cloitre M., Downes A.J., Jumbe, S.,...Roberts, N.P. (2017). Validation of post-traumatic stress disorder (PTSD) and complex PTSD using the International Trauma Questionnaire. *Acta Psychiatrica Scandinavica*. 136, 313-322. doi: 10.1111/acps.12771.

Shevlin, M., Hyland, P., Roberts, N. P., Bisson, J. I., Brewin C.R. & Cloitre M. (2018). A psychometric assessment of Disturbances in Self-Organization symptom indicators for ICD-11 Complex PTSD using the International Trauma Questionnaire, *European Journal of Psychotraumatology*, 9:1, DOI: 10.1080/20008198.2017.1419749

International Trauma Questionnaire

Instructions: Please identify the experience that troubles you most and answer the questions in relation to this experience.

Brief description of the experience _____

When did the experience occur? (circle one)

a. less than 6 months ago
b. 6 to 12 months ago
c. 1 to 5 years ago
d. 5 to 10 years ago
e. 10 to 20 years ago
f. more than 20 years ago

Below are a number of problems that people sometimes report in response to traumatic or stressful life events. Please read each item carefully, then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

	Not at all	*A little bit*	*Moderately*	*Quite a bit*	*Extremely*
P1. Having upsetting dreams that replay part of the experience or are clearly related to the experience?	0	1	2	3	4
P2. Having powerful images or memories that sometimes come into your mind in which you feel the experience is happening again in the here and now?	0	1	2	3	4
P3. Avoiding internal reminders of the experience (for example, thoughts, feelings, or physical sensations)?	0	1	2	3	4
P4. Avoiding external reminders of the experience (for example, people, places, conversations, objects, activities, or situations)?	0	1	2	3	4
P5. Being "super-alert", watchful, or on guard?	0	1	2	3	4
P6. Feeling jumpy or easily startled?	0	1	2	3	4

In the past month have the above problems:

P7. Affected your relationships or social life?	0	1	2	3	4
P8. Affected your work or ability to work?	0	1	2	3	4
P9. Affected any other important part of your life such as parenting, or school or college work, or other important activities?	0	1	2	3	4

Cloitre et al. (2018) *Acta Psychiatrica Scandinavica*. DOI: 10.1111/acps.12956

Below are problems that people who have had stressful or traumatic events sometimes experience. The questions refer to ways you typically feel, ways you typically think about yourself and ways you typically relate to others. Answer the following thinking about how true each statement is of you.

How true is this of you?	*Not at all*	*A little bit*	*Moderately*	*Quit a bit*	*Extremely*
C1. When I am upset, it takes me a long time to calm down.	0	1	2	3	4
C2. I feel numb or emotionally shut down.	0	1	2	3	4
C3. I feel like a failure.	0	1	2	3	4
C4. I feel worthless.	0	1	2	3	4
C5. I feel distant or cut off from people.	0	1	2	3	4
C6. I find it hard to stay emotionally close to people.	0	1	2	3	4
In the past month, have the above problems in emotions, in beliefs about yourself and in relationships:					
C7. Created concern or distress about your relationships or social life?	0	1	2	3	4
C8. Affected your work or ability to work?	0	1	2	3	4
C9. Affected any other important parts of your life such as parenting, or school or college work, or other important activities?	0	1	2	3	4

1. Diagnostic scoring for PTSD and CPTSD

PTSD
If P1 or P2 ≥ 2 criteria for Re-experiencing in the here and now (Re_dx) met
If P3 or P4 ≥ 2 criteria for Avoidance (Av_dx) met
If P5 or P6 ≥ 2 criteria for Sense of current threat (Th_dx) met
AND
At least one of P7, P8, or P9 ≥ 2 meets criteria for PTSD functional impairment (PTSDFI)
If criteria for 'Re_dx' AND 'Av_dx' AND 'Th_dx' AND 'PTSDFI' are met, the criteria for PTSD are met.

CPTSD
If C1 or C2 ≥ 2 criteria for Affective dysregulation (AD_dx) met
If C3 or C4 ≥ 2 criteria for Negative self-concept (NSC_dx) met
If C5 or C6 ≥ 2 criteria for Disturbances in relationships (DR_dx) met
AND
At least one of C7, C8, or C9 ≥ 2 meets criteria for DSO functional impairment (DSOFI)
If criteria for 'AD_dx' AND 'NSC_dx' AND 'DR_dx', and 'DSOFI' are met, the criteria for DSO are met.

PTSD is diagnosed if the criteria for PTSD are met but NOT for DSO.
CPTSD is diagnosed if the criteria for PTSD are met AND criteria for DSO are met.
Not meeting the criteria for PTSD or meeting only the criteria for DSO results in no diagnosis.

2. Dimensional scoring for PTSD and CPTSD.

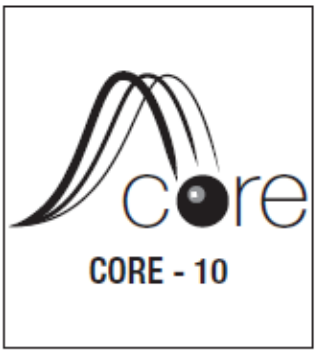
Scores can be calculated for each PTSD and DSO symptom cluster and summed to produce PTSD and DSO scores.

PTSD
Sum of Likert scores for P1 and P2 = Re-experiencing in the here and now score (Re)
Sum of Likert scores for P3 and P4 = Avoidance score (Av)
Sum of Likert scores for P5 and P6 = Sense of current threat (Th)
PTSD score = Sum of Re, Av, and Th

DSO
Sum of Likert scores for C1 and C2 = Affective dysregulation (AD)
Sum of Likert scores for C3 and C4 = Negative self-concept (NSC)
Sum of Likert scores for C5 and C6 = Disturbances in relationships (DR)
DSO score = Sum of AD, NSC, and DR

Appendix 8

CORE-10



Site ID

letters only | numbers only

Client ID

Therapist ID | numbers only (1) | numbers only (2)

Sub codes

Date form given: D D / M M / Y Y Y Y

Age

Male ☐ Female ☐

Stage Completed

S Screening
R Referral
A Assessment
F First Therapy Session
P Pre-therapy (unspecified)
D During Therapy
L Last Therapy Session
X Follow up 1
Y Follow up 2

Stage ☐

Episode ☐

IMPORTANT – PLEASE READ THIS FIRST

This form has 10 statements about how you have been OVER THE LAST WEEK.
Please read each statement and think how often you felt that way last week.
Then tick the box which is closest to this.
Please use a dark pen (not pencil) and tick clearly within the boxes.

Over the last week

		Not at all	Only Occasionally	Sometimes	Often	Most or all the time
1	I have felt tense, anxious or nervous	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
2	I have felt I have someone to turn to for support when needed	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
3	I have felt able to cope when things go wrong	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
4	Talking to people has felt too much for me	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
5	I have felt panic or terror	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
6	I made plans to end my life	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
7	I have had difficulty getting to sleep or staying asleep	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
8	I have felt despairing or hopeless	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
9	I have felt unhappy	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
10	Unwanted images or memories have been distressing me	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

Total (Clinical Score*) ☐

* **Procedure**: Add together the item scores, then divide by the number of questions completed to get the mean score, then multiply by 10 to get the Clinical Score.

Quick method for the CORE-10 (if all items completed): Add together the item scores to get the Clinical Score.

THANK YOU FOR YOUR TIME IN COMPLETING THIS QUESTIONNAIRE

Appendix 9

Vulnerable Attachment Style Questionnaire (VASQ)

APPENDIX 1

VASQ items showing two factor solution and scoring procedure

	Factor 1 Insecure	*Factor 2 Proximity-seeking*
1. I take my time getting to know people.	0·39	
2. I rely on others to help me make decisions.		*0·47*
3. People let me down a lot.	0·60	
4. I miss the company of others when I am alone.		*0·72*
5. Its best not to get too emotionally close to other people.	0·60	
6. I worry a lot if people I live with arrive back later than expected.		*0·35*
7. I usually rely on advice from others when I've got a problem.		*0·55*
8. I feel uncomfortable when people get too close to me.	0·62	
9. People close to me often get on my nerves.	0·57	
10. I feel people are against me.	0·62	
11. I worry about things happening to close family and friends.		*0·33*
12. I often get into arguments.	0·36	
13. I am clingy with others.		*0·48*
14. I look forward to spending time on my own. (R)		*−0·43*
15. I like making decisions on my own. (R)		*−0·42*
16. I get anxious when people close to me are away.		*0·45*
17. I feel uneasy when others confide in me.	0·34	
18. I find it hard to trust others.	0·66	
19. Having people around me can be a nuisance.	0·64	
20. I feel people haven't done enough for me.	0·53	
21. Its important to have people around me.		*0·61*
22. I find it difficult to confide in people.	0·62	
Eigen value	4·14	*2·65*

Rated: 5, strongly agree; 4, agree; 3, unsure; 2, disagree; or 1, strongly disagree.
Factor analysis: Extraction Method; Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in three iterations.
R, reversed scoring (items 14 and 15).
Scoring: Scale 1 items insecurity (1, 3, 5, 8, 9, 10, 12, 17, 18, 19, 20, 22) summed; Scale 2 items proximity-seeking (2, 4, 6, 7, 11, 13, 14, 15, 16, 21) summed; Total score = sum of all items.

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Appendix 10

Child and Youth Resilience Measure – 12 item with Retrospective Phrasing

When you were growing up, during the first 18 years of your life, to what extent would the following sentences have described you?

	Not at all	A little	Somewhat	Quite a bit	A lot
I had people I looked up to	○	○	○	○	○
Getting an education was important to me	○	○	○	○	○
My parent(s)/caregiver(s) knew a lot about me	○	○	○	○	○
I tried to finish activities that I started	○	○	○	○	○
I was able to solve problems without harming myself or others (e.g. without using drugs or being violent)	○	○	○	○	○
I knew where to go in my community to get help	○	○	○	○	○
I felt that I belonged in my school	○	○	○	○	○
My family would stand by me during difficult times	○	○	○	○	○
My friends would stand by me during difficult times	○	○	○	○	○
I was treated fairly in my community	○	○	○	○	○
I had opportunities to develop skills to help me succeed in life (like job skills and skills to care for others)	○	○	○	○	○
I enjoyed my community's cultures and traditions	○	○	○	○	○

Appendix 11

Adult Resilience Measure (RRC-ARM) 12 item

	Not at all	A little	Somewhat	Quite a bit	A lot
I have people I can respect in my life	○	○	○	○	○
Getting and improving qualifications or skills is important to me	○	○	○	○	○
My family know a lot about me	○	○	○	○	○
My family is supportive towards me	○	○	○	○	○
I can solve problems without harming myself or others (e.g. without using drugs or being violent)	○	○	○	○	○
I know where to get help in my community	○	○	○	○	○
I feel that I belong in my community	○	○	○	○	○
My family stand by me during difficult times	○	○	○	○	○
My friends stand by me during difficult times	○	○	○	○	○
I am treated fairly in my community	○	○	○	○	○

Appendix 12

Participant Information Sheet

The Association between Adverse Childhood Experiences (ACEs), Attachment and Resilience in Forensic inpatient Populations

Participant Information Sheet (Version 1.1)

We would like to invite you to take part in a research study to help us understand how attachment and resilience are associated with Adverse Childhood Experiences (ACEs). ACEs can often be experiences that were traumatic, scary or distressing and we know talking about these can be very emotive and sensitive. This is why it is important you know what taking part in this study may involve and that you do not have to talk about anything you do not want to. Below, details about this study are provided; it is important for you to read these carefully before deciding whether to take part in the study and to ensure you ask any questions if there is anything you don't understand or would like to know more about.

The researchers

My name is Katie Finch and I am a Trainee Clinical Psychologist on the South Wales Doctoral Programme in Clinical Psychology based at Cardiff University. I am carrying out this project as part of my training. The research is being supervised by Dr Chris Hartwright (Clinical Psychologist and Senior Clinical Tutor, South Wales Doctoral Programme in Clinical Psychology). The project also has other people involved who work at the different sites we have contacted about this study.

What is the purpose of the research?

The aim of this study is to see whether there is a link between someone's early experiences, their attachments and self-resilience, particularly whether attachment and/or resilience have any effect on the impact of adverse childhood experiences in adulthood. You do not need to know what ACEs, attachment or resilience is to take part.

Previous research has begun to show that someone who has had lots of ACEs is more likely to show signs of distress in adulthood, but things like resilience and having good relationships make this less likely. Research has also shown that individuals who are in forensic in-patient settings are more likely to show signs of psychological distress. We hope that, through this study, we will be able to find out whether people in secure care are more likely to have experienced ACEs, whether attachment and resilience play a part in reducing the impact of adverse childhood experiences in adulthood and explore how we can use this information to better support individuals in these settings

Why have I been invited to take part in the research?

You have been invited to take part as you are currently in an in-patient setting and may have been approached by your clinical team because you are eligible to take part. Invites are **NOT** based on prior knowledge regarding your childhood experiences or current wellbeing.

What exactly is involved if I agree to take part?

If you decide to take part in the research, you will be given five questionnaires to complete that ask about: your current feelings and emotional wellbeing; your relationships with other people; how you support yourself or how you gain support from others and your experiences as a child. You can be supported to complete these if you wish and you can ask questions if there is anything on the questionnaires you don't understand. The questionnaires may take around 20 to 30 complete at the most. You may want to take breaks between each questionnaire and you can take as many as you need.

Your name will not be recorded on the questionnaires, instead you will be assigned a participant number to ensure all details are anonymous.

All of your anonymous answers from the questionnaire will be put into one big dataset with other participants answers and analysed. We only use the data from the questionnaires if you have been able to give your consent to take part and can understand what that involves- this is called having capacity. If we feel you do not have capacity **during** the study (when you are filling in the questionnaires) we will stop the study and your data will not be used. If you have capacity before and during the study, but not once it has been completed, **your data from the questionnaires will still be used unless you explicitly ask for it to be withdrawn.**

What will happen after I take part?

You will not need to do anything else once you have completed the questionnaires although you will be able to contact the research team if you have any further questions. The researcher will be using your data from the questionnaires with others who take part to see if there are any links between what each questionnaire measures (for example, is there a link between the questionnaire measuring your current wellbeing and one that explores your

relationships with others). If you feel you would like to talk to someone after taking part, the clinical team are there to support you and you can let the researcher know if you found anything distressing.

Do I have to take part?

It is your decision whether to take part in the study and you can ask the researcher if you have any questions or are worried about taking part. If you decide you would like to participate, you will be asked to sign a consent form to show you have been given this information sheet and have understood the details of the study. Whether you choose to participate in the study or not will have no impact on any current or future support you receive.

What are the possible disadvantages of taking part?

It is important to know that some of the questionnaires will ask you about early experiences that might have been traumatic or distressing, and also your current well-being which might involve answering questions around feeling depressed/anxious or suicidal.

We know that answering these questions might be sensitive and emotive; whilst we will try to provide a safe environment for you to do this, it is possible you might find some of the questionnaires upsetting. You will be able to take as many breaks as you need and you can also opt to stop taking part at any time if you feel unable to carry on. There will be a chance to debrief after you have completed the questionnaires and if there is anything you wish to talk about further or feel you need additional support with, we will (with your consent) inform your clinical team so that this can be arranged. There will also be an opportunity for you to ask any further questions about the study.

What are the benefits of taking part ?

Taking part in the study may not benefit you directly, however it is hoped that the research will help us have a greater understanding of the impact of adverse childhood experiences and therefore provide opportunity to develop better ways to support individuals. The findings may also mean future research in the area can be conducted to continue to develop our knowledge and inform how healthcare professionals can work with individuals.

Participants will be given a £5 amazon or "Love 2 Shop" voucher as a thank you for taking part- you can choose which you would prefer.

Will my participation in the study be confidential?

Your participation in the research will be kept strictly confidential. Your clinical team and the researchers will know that you have taken part, but your individual questionnaires will be anonymised and will not show any personal details; all names of participants, services and geographical locations will be removed to protect your identity.
The anonymised questionnaires will be kept at the university for 15 years in a secure location and will then be destroyed. All of your personal information is used in adherence to data protection legislation and General Data Protection Regulation (GDPR).

Are there any situations when the researcher may have a duty to disclose my information?

The safety of you and others is priority throughout the research and there may be times when your confidentiality cannot be maintained as a result. It is important that you are aware of under what circumstances your confidentiality will be broken, which are described below:

- If you tell the researcher that you are currently thinking about ending your life.
- If you tell the researcher that you have a plan to end your life now or in the future.
- If you tell the researcher about any thoughts or plans to harm yourself without the intention to die.
- If you tell the researcher about any plans to harm somebody else.
- If you mention anything which raises concerns about a vulnerable adult.
- If you mention anything which raises concerns about someone under 18.
- If you have previously been a survivor of childhood sexual and/or other abuse and you disclose that you are aware that the perpetrator still has access to children.
- If you disclose a crime that has been committed and has not been reported.

It is important that you are aware that if you mention any of the above, that your information will be passed to services to support you and keep you, and others, safe. This may include the emergency services, the police and social services. Discussions regarding how to best ensure your own and other's safety will be held with the research supervisor and clinical team. You will be informed of any information that is shared with other services.

IF YOU HAVE ANY QUESTIONS ABOUT CONFIDENTIALITY, PLEASE ASK THE RESEARCHER BEFORE THE INTERVIEW.

Research Sponsor's General Data Protection Regulation (GDPR) Statement:

Cardiff University is the sponsor for this study based in the United Kingdom. We will be using information from you in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. Cardiff University will keep identifiable information about you for 15 years after the study has finished. Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information at https://www.cardiff.ac.uk/public-information/policies-and-procedures/data-protection. The University's Data Protection Officer can be contacted at: inforequest@cardiff.ac.uk

What happens if I decide after the interview that I don't want to take part?

You can withdraw from the research at any time by letting the researchers or clinical team know. You can ask to stop at any point during completion of the questionnaires- you do not have to complete them. If after taking part you decide you want to withdraw you can contact the researchers and ask for your information to be removed for **up to 14 days following taking part**. We only allow 14 days for you to withdraw your information as after this point it is added to a larger dataset without your participant number and is no longer traceable back to you.

You will not need to provide a reason for deciding to withdraw. If you withdraw, it will not affect any current or future support you receive from services.

What will happen with the study's findings?

The findings will be written in a report which will be sent to a journal for publication. You will not be able to be identified in any report or publication that follows this study. The findings will be written up and submitted to Cardiff University in order to fulfil the requirements for a Doctorate in Clinical Psychology. You can request a summary of the report by letting Dr Chris Hartwright or Katie Finch know. This will then be sent to you once completed.

Who has reviewed this study?

This study has been reviewed by an NHS ethics committee panel and received a favourable opinion.

What if I have a concern or complaint about this study

If you have any concerns or complaints about this project, please speak to the researcher in the first instance to see if these can be resolved. If you feel unable to do so however you can contact the research supervisor, Dr Chris Hartwright (Senior Clinical Tutor). 11th Floor, School of Psychology, Tower Building, 70 Park Place, Cardiff, CF10 3AT. Telephone: 02920 870582.

Further Information and Contact Details

If you have any further questions about taking part in this study, please do not hesitate to contact the research team. In the first instance please contact the project lead:

	Project Lead	Chief Investigator
Name	**Katie Finch**	**Dr Chris Hartwright**
Organisation	Cardiff University	Cardiff University
Role	Trainee Clinical Psychologist	Clinical Psychologist/ Senior Clinical Tutor
E-mail	FinchK@Cardiff.ac.uk	HartwrightC@cardiff.ac.uk
Telephone	02920 870582	02920 870582
Address	South Wales Doctoral Programme in Clinical Psychology, School of Psychology, 11th Floor, Tower Building, 70 Park Place, Cardiff, CF10 3AT.	

THANK YOU FOR TAKING THE TIME TO READ THIS INFORMATION AND FOR YOUR INTEREST AND CONSIDERATION IN TAKING PART IN THIS RESEARCH

Appendix 13

Participant Information Sheet (Easy-read format)

PARTICIPANT INFORMATION SHEET

TITLE: Understanding complex trauma presentations within adult forensic inpatient settings: exploring the mediating relationships between adverse childhood experiences, attachment, resilience and psychological distress in adulthood.

SPONSOR: Cardiff University

INVESTIGATORS: Katie Finch; Dr Chris Hartwright

If you need help to read this form, a person who is not part of the research team can read it to you. They will act as a witness who will sign this form to show it has been read to you. Please sign the form at the end to show you have read the form or that you have had this read to you.

Hello, my name is Katie and I am a trainee clinical psychologist. I am meeting with people in secure care to find out about their life and relationships and their mental health now.	
This will be for a research study- I am interested in how our childhood experiences, relationships and resilience impact on our mental health as an adult. This will involve filling out some questionnaires that ask about all of these.	

It is important that you have been given all of the information about the study and understand what is involved before you agree to take part.	
It is your choice whether you would like to take part or not. You do not have to give a reason and saying no will not affect your care. If you decide to take part and later change your mind, this is OK and you do not have to give a reason. You will be able to withdraw from the study up to 14 days after you have taken part. We only give you 14 days to do this, as after this your answers are moved to a bigger dataset without your participant number and so cannot be identified.	
If you agree to take part, the questionnaires should only take a short time, maybe 20-30 minutes at the most.	
Your answers to the questionnaires will be confidential. This means no one else will see them and your name will not be used. There are some instances where I might need to talk to other people however, for example if I am worried about your safety or the safety of someone else. If I do need to tell someone else, I will try to talk to you first.	

If you disclose information about an unreported crime, I will have to discuss this information with your clinical team and possibly the police.	
You may find that some of the questionnaires can be upsetting or make you think of difficult past experiences. You can take a break at any point if you want to. If you need to talk to someone after, the team are there to support you.	
The personal information (like your name) you provide will be kept private and won't be used in any of the research. Cardiff University is responsible for looking after your personal information and keeping it safe. You can find out more about this by looking at the Cardiff University data protection webpages: https://www.cardiff.ac.uk/public-information/policies-and-procedures/data-protection or by contacting the University's Data Protection Officer: inforequest@cardiff.ac.uk Any personal information that could identify you will be removed.	 
All of your answers from the questionnaire will be put into one big dataset and analysed. We only use the data from the questionnaires if you have been able to give your consent to take part and can understand what that involves. **During the study** (when you are filling in the questionnaires) if we feel you can no longer give your consent or understand what taking part involves, we will stop the study and your data will not be used. If you are able to give consent before and during the study, but can no longer do this once it has been	

completed, **<u>your data from the questionnaires will still be used unless you ask for it to be removed.</u>**	
To say thank you for taking part, you will be given a £5 voucher. You can choose between an Amazon voucher, or "Love2Shop" voucher.	
If you would like to see the finished report or a summary once the project has finished these can be sent to you. Please let me know if you would like this or speak to Dr Hartwright after the study using the contact details below.	
NHS research needs to be reviewed by a group of people called the Research Ethics Committee. This is to make sure you are protected. This study has been given a favourable opinion by them.	 
This research will be submitted as part of a Doctorate in Clinical Psychology. It will also be submitted for publication and might be presented at conferences. No-one will be able to identify you in the project or any publications or presentations.	

	
If you have any concerns about the study, you can ask to speak to Dr Chris Hartwright who is helping me with the study. He can be contacted at: 01873 840555	
If you would like to meet with Katie to find out more and to take part, please sign below to show you have understood the information you have already been given about the research and would like to be contacted to arrange a meeting.	

CONSENT

Please sign below to show you have read and understand the information above and agree to meeting with the researcher, Katie.

Name of Participant (Please Print):

Date:

Signature:

Name of Witness (Please Print) (*if applicable*):

Date:

Signature:

Appendix 14

Participant Consent Form

NHS WALES GIG CYMRU
School of Psychology
Ysgol Seicoleg
South Wales Doctoral Programme in Clinical Psychology
De Cymru Rhaglen Doethuriaeth mewn Seicoleg Glinigol
CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD
Cardiff University
Tower Building
Park Place
Cardiff CF10 3AT
Wales UK
www.cardiff.ac.uk/psych
Prifysgol Caerdydd
Adeilad y Tŵr
Plas y Parc
Caerdydd CF10 3AT
Cymru Y Deyrnas Unedig

CONSENT FORM TO PARTICIPATE

Title: Understanding complex trauma presentations within adult forensic inpatient settings: exploring the mediating relationships between adverse childhood experiences, attachment, resilience and psychological distress in adulthood.

		Please put your initials in in each box below:
I have read and understand the participant information sheet.		
I have had time to think about the information and have been able to ask questions and had them answers.		
I understand that taking part in this study may involve thinking about past experiences which might be upsetting.		

I understand that if I get upset, the researcher and the team will be able to support me.		
I understand that my data will be used in a report and possibly in future reports. My data will be anonymous.		
I understand that taking part in the study is voluntary and I can withdraw without giving a reason. This will not affect my care.		
I understand that if I am unable to consent to taking part at any point during the study, it will be stopped and my data not used. If I can give consent before and during the study, but not after (because I may no longer understand what it involves for example), my answers to the questionnaires will still be used in the research, unless I ask for it to be removed.	 	

I understand my information will be stored securely and will remain private- this means no one will be able to identify me from my answers.		
I understand that if I disclose anything that suggests either myself or others are at risk, this information will be shared with the team and possibly external organisations/individuals.		
I understand that if I disclose an unreported crime, this information will be passed on to clinicians and police.		
I agree to take part in the above study		
I would like a copy of the findings once they study has finished.		

Name of participant	Date	Signature
Name of person taking consent	Date	Signature

Questionnaires completed (date):

I confirm I have received a *Love2Shop/Amazon** (*delete as appropriate) voucher

Signed _____

Voucher number/code _____

Appendix 15

Digitised PIS and Consent Forms as displayed in Qualtrics

ACEs

Start of Block: Informed Consent

Welcome to the research study!

We are interested in learning how our childhood experiences, relationships and resilience might impact our mental health as an adult. To do this, we are asking people to fill out some questionnaires about these topics. This includes answering questions about possible negative childhood experiences, your relationships, your resilience (how much you feel able to cope with bad events/experiences) and your current mental health.

Some of these questionnaires might be difficult or upsetting for some people, so it is important that you have been given all of the information about the study and understand what is involved before you agree to take part. Please read the information below thoroughly before continuing:

- It is your choice whether you would like to take part or not. You do not have to give a reason and saying no will not affect your care.
- If you decide to take part but then change your mind, you can stop the study at any point and do not have to give a reason.
- If the researcher or anyone involved in your care feels the study will be detrimental to your wellbeing, or we do not think you understand what is involved well enough to consent, you will be unable to participate.
- If at any point during the study it is felt that you are unable to give consent, the study will be stopped and your data not collected. If you complete the study and are then deemed unable to give consent, **your data will still be used unless you ask for it to be removed.**
- If you have completed the study and then change your mind, you can ask for us to delete your response. **You have 14 days from completing the study to do this**. This is because after 14 days, all of the responses are uploaded into one big dataset without your participant ID, so we cannot identify individual responses.
- If you agree to take part, the study should only take a short time, around 20-30 minutes at most. Your answers are all confidential. This means no one else will see

them apart from the researchers and your name isn't used. You are given a participant ID which we use instead.

- If you disclose anything that means there are concerns about yours or anyone elses safety, this may have to be passed on to keep everyone safe. You will be told if this might have to happen. If you disclose an unreported crime, this will have to be discussed with your team/support staff and possibly the police.
- Some of the questionnaires might be upsetting or make you think of difficult past experiences. You do not have to talk about anything or give any detail in your answers. You can take a break at any point or stop completely if you want to. If you need support or would like to talk about anything after, please let someone know.
- Cardiff University is responsible for looking after any personal information we collect and keeping it safe. You can find out more about this by looking at the Cardiff University data protection webpages https://www.cardiff.ac.uk/public-information/policies-and-procedures/data-protection or by contacting the University's Data Protection Officer: inforequest@cardiff.ac.uk. In this study, all personal information that could identify you is either not collected, or removed. The study has been reviewed by an NHS ethics committee and has been given a favourable opinion.
- The data will be collected and analysed and a report written. This will then be submitted to Cardiff University as part of a Doctorate in Clinical Psychology.
- If you would like to know the results of the study, we can send you a summary of the report. Just click the relevant box on the next screen.
- To say thank you for taking part and for giving up your time, you will receive a £5 Amazon voucher. This will be emailed to a designated person who can print this for you.
- If you have any questions or concerns about the study, you can contact the researcher, Katie, at FinchK@cardiff.ac.uk, or the Chief Investigator, Dr Chris Hartwright, at HartwrightC@cardiff.ac.uk or on 01873 840555.

If you have any questions you can ask now, or at any point during the study. You can also ask if you aren't sure how to answer a question, or do not understand a question. The next screen will summarise some of this information and you can choose whether to take part or not.

By clicking the button below, you acknowledge that your participation in the study is voluntary, you are 18 years of age, and that you are aware that you may choose to stop the study at any time and for any reason.

You can ask any questions or concerns before you begin and throughout the study if needed. Please let us know if you would like a summary of the report by ticking the additional box below.

- ☐ I consent, begin the study
- ☐ I do not consent, I do not wish to participate
- ☐ I would like to be sent a summary of the report when completed

Appendix 16

Instructions and Guidance for Ward Staff

Understanding complex trauma presentations within adult forensic inpatient settings: exploring the mediating relationships between adverse childhood experiences, attachment, resilience and psychological distress in adulthood.

Thank you for supporting this research project!

This is an online study exploring the relationships between adverse childhood experiences (ACEs), attachment, resilience and later life psychological distress. We are asking participants to complete an online survey which comprises of 5 questionnaires measuring ACEs, attachment, resilience and psychological distress/complex trauma. The study usually takes around 20-30 minutes in total, including time to read the participant information and give consent. The information goes into more detail about participants right to withdraw, confidentiality and so on. Below are some brief notes which may be helpful when supporting someone who is completing the study:

General guidance

- A password is needed to start the study. This is supplied on the additional 1-page instruction document.
- Participants must read the information carefully before giving consent.
- Participants can change their mind, stop, take a break and so on at any point in the study. Taking part is voluntary.
- The study involves some questions that may be upsetting or sensitive to participants. Whilst participants are only invited if they have been assessed as able to take part, some may need a check-in once completed.
- A debrief is included in the study which advices participants to let someone know if they need support, so some 1:1 time/reassurance or monitoring may be needed if they report any difficulties (such as PTSD type thoughts etc). Please report any concerns if you feel someone is struggling having taken part.
- A quiet room or space is advised if possible, as this will help in reading and understanding the questions and ensure confidentiality and privacy for participants.
- A red progress bar is displayed at the top of the study throughout, so participants can see how much is left to complete.

Questionnaires

- The questionnaires are divided into two halves. Part one focuses on the first 18 years of someone's life and the questions are responded to based on experiences during this time. The second is based on experiences as an adult (18+) and answered as things are currently. This is described before each question and so should be clear to participants.
- The questionnaires only require 'yes/no' or frequency responses (i.e. 'once', 'never', 'a few times' and so on). Participants do not have to give any explanation or detail with their answers, nor do they have to verbalise their responses.
- If a participant is unsure or does not know an answer, they can select a 'no' or 'never' response or one that is the best fit.
- We do not anticipate any issues with the questions, however you are able to help clarify or explain a question if needed. If possible, try and avoid having to go into too much detail, a brief re-word or summarising of the question is best (although not always possible).
- The measure for complex trauma/PTSD can cause some confusion or difficulty. It asks participants to bring to mind a negative or bad experience and base their answers on this. If participants struggle to think of an experience, encourage them to bring to mind any experience that perhaps plays on their mind or they think about a lot. If they are unable to, they can answer 'no' or 'never' etc to this set of questions. Any bad experience is fine, and they do not have to tell you or reveal what they are thinking about. For some this might be a difficult question and they may need some support after answering.

Completed questionnaires

- Once completed, participants will be shown a thank-you page followed by the debrief information.
- Once completed, participants may need some time to ask questions, discuss anything or just need some general support.
- Participants who have completed the study are entitled to a £5 Amazon voucher which will be sent by email in PDF format. This can be printed or just the code can be given to the participant.

Attached to this guidance is a further 1-page document with brief instructions for 'on the day' when someone takes part, and a word document version of the actual questionnaire so you can familiarise yourself with how it looks and the different questions.

Understanding complex trauma presentations within adult forensic inpatient settings: exploring the mediating relationships between adverse childhood experiences, attachment, resilience and psychological distress in adulthood.

On the day instructions:

- Ensure wellbeing of participant (i.e. study will not be detrimental to wellbeing)
- Check that quiet space or room is available
- Laptop/PC is available with internet access
- Access the study at:

  https://cardiffunipsych.eu.qualtrics.com/jfe/form/SV_2sKreC5Zc2ZeMLj
- Password is: ****
- Ensure participant information screen is read before consent is given
- Participants need to enter a unique ID which is made up of initials, hospital code and first two letters of the ward. ***REDACTED*** so, for example, John Smith on ****ward would have a participant ID of: JS04**
- Following completion, a voucher can be requested/given.
- The online study can be closed ready for the next participant

Appendix 17

Description Provided for Prolific.Co Recruitment

Prolific Description (250 words)

We are interested in learning how our childhood experiences, relationships and resilience might impact our mental health as an adult.

To do this, we are asking people who have experience of prison and past/ongoing mental health difficulties to fill out five questionnaires about these topics. This includes answering questions about possible negative childhood experiences, your relationships, your resilience (how much you feel able to cope with bad events/experiences) and your current mental health.

Some of the questionnaires ask about childhood experiences that individuals may find difficult or distressing, including topics such as physical, emotional and sexual abuse. Whilst the questionnaires do not ask for details of any such experiences, please be mindful of your own wellbeing and consider whether such questions may cause you any distress.

We estimate you will need 20-30 minutes to complete the survey depending on individual reading abilities. You will be paid £8.22 per hour pro-rata for the time spent on the survey.

It is your choice whether to participate or not and you can change your mind at any point. We don't use any personal information and all responses are kept confidential and stored securely. Only the researchers have access to the anonymous data collected.

If you take part but wish to have your data removed, you can do so by emailing the researcher Katie within 14 days of participation. Contact details are provided within the information screen of the study. The data will be used to write a report and submitted to the South Wales Doctoral programme in Clinical Psychology as part of a doctoral degree. It will also be submitted for publication in a scientific journal in the future.

We advise you read the participant information screen fully before proceeding in the survey.

The study has been reviewed by an NHS Research Ethics Committee and given a favourable opinion ref: 19/WA/0290

Appendix 18

Confirmation of Ethical Approval

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

Ariennir gan Lywodraeth Cymru
Funded by Welsh Government

Wales Research Ethics Committee 1
Cardiff

Mailing address:
Health and Care Research Wales
Castlebridge 4
15-19 Cowbridge Road East
Cardiff, CF11 9AB

Telephone: 02920 785738
Email: Wales.REC1@wales.nhs.uk
Website: www.hra.nhs.uk

30 October 2019

Dr Chris Hartwright
11th Floor, Tower Building
School of Psychology
Park Place, Cardiff
CF10 3AT

Dear Dr Hartwright

Study title:	**Understanding complex trauma presentations within adult forensic inpatient settings: exploring the mediating relationships between adverse childhood experiences, attachment, resilience and psychological distress in adulthood.**
REC reference:	**19/WA/0290**
Protocol number:	**SPON1774-19**
IRAS project ID:	**271086**

Thank you for your letter responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

The Committee wished to take this opportunity to congratulate you and Miss Finch on the very high standard of the application submitted for ethical review. It was clear during the initial ethical review that a great deal of thought had gone into the application and that potential ethical concerns had been both identified and addressed.

The Committee considered the standard of the participant information to be particularly noteworthy.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revise, subject to the conditions specified below.

Conditions of the favourable opinion

The REC favourable opinion is subject to the following conditions being met prior to the start of the study.

Confirmation of Capacity and Capability (in England, Northern Ireland and Wales) or NHS management permission (in Scotland) should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Each NHS organisation must confirm through the signing of agreements and/or other documents that it has given permission for the research to proceed (except where explicitly specified otherwise).

Guidance on applying for HRA and HCRW Approval (England and Wales)/ NHS permission for research is available in the Integrated Research Application System.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of management permissions from host organisations

Registration of Clinical Trials

It is a condition of the REC favourable opinion that **all clinical trials are registered** on a publicly accessible database. For this purpose, 'clinical trials' are defined as the first four project categories in IRAS project filter question 2. Registration is a legal requirement for clinical trials of investigational medicinal products (CTIMPs), except for phase I trials in healthy volunteers (these must still register as a condition of the REC favourable opinion).

Registration should take place as early as possible and within six weeks of recruiting the first research participant at the latest. Failure to register is a breach of these approval conditions, unless a deferral has been agreed by or on behalf of the Research Ethics Committee (see here for more information on requesting a deferral:

https://www.hra.nhs.uk/planning-and-improving-research/research-planning/research-registration-research-project-identifiers/

As set out in the UK Policy Framework, research sponsors are responsible for making information about research publicly available before it starts e.g. by registering the research project on a publicly accessible register. Further guidance on registration is available at:

https://www.hra.nhs.uk/planning-and-improving-research/research-planning/transparency-responsibilities/

You should notify the REC of the registration details. We will audit these as part of the annual progress reporting process.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

After ethical review: Reporting requirements

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study, including early termination of the study
- Final report

The latest guidance on these topics can be found at https://www.hra.nhs.uk/approvals-amendments/managing-your-approval/.

Ethical review of research sites

Non-NHS/HSC sites

I am pleased to confirm that the favourable opinion applies to any non-NHS/HSC sites listed in the application, subject to site management permission being obtained prior to the start of the study at the site.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	*Version*	*Date*
Covering letter on headed paper [REC Amendments Table]	N/A	25 October 2019
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Cardiff University Letter of Insurance]	N/A	01 August 2019
IRAS Checklist XML [Checklist_11092019]	N/A	11 September 2019
IRAS Checklist XML [Checklist_29102019]	N/A	29 October 2019
Letter from sponsor [Cardiff University Letter of Sponsorship]	N/A	22 August 2019
Participant consent form [Easy Read Consent 1.1]	1.1	25 October 2019
Participant consent form [Consent form 1.1]	1.1	25 October 2019
Participant information sheet (PIS) [Participant Debrief Form]	1.0	21 June 2019
Participant information sheet (PIS) [Easy Read participant information sheet]	1.1	25 October 2019
Participant information sheet (PIS)	1.1	25 October 2019
REC Application Form [REC_Form_11092019]	N/A	11 September 2019
Research protocol or project proposal [Research Protocol]	2.0	21 June 2019
Summary CV for Chief Investigator (CI) [Dr Christopher Hartwright]	N/A	30 September 2019
Summary CV for student [Miss Katie Finch]	N/A	30 September 2019
Validated questionnaire [CORE 10]	N/A	N/A
Validated questionnaire [RRC-ARM and CYRM]	N/A	N/A
Validated questionnaire [International Trauma Questionnaire]	N/A	N/A
Validated questionnaire [Vulnerable Attachment Style Questionnaire]	N/A	N/A
Validated questionnaire [ACE International Questionnaire (ACE-IQ)]	N/A	N/A

Statement of compliance

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

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 Learning

We are pleased to welcome researchers and research staff to our HRA Learning Events and online learning opportunities– see details at: https://www.hra.nhs.uk/planning-and-improving-research/learning/

19/WA/0290	Please quote this number on all correspondence

With the Committee's best wishes for the success of this project.

Yours sincerely

pp
Dr Kathrine J Craig
Chair

Email:Wales.REC1@wales.nhs.uk

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

Dr Chris Hartwright
11th Floor, Tower Building
School of Psychology, Park Place
Cardiff
CF10 3AT

Email: hra.approval@nhs.net
HCRW.approvals@wales.nhs.uk

17 December 2019

Dear Dr Hartwright

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	**Understanding complex trauma presentations within adult forensic inpatient settings: exploring the mediating relationships between adverse childhood experiences, attachment, resilience and psychological distress in adulthood.**
IRAS project ID:	**271086**
Protocol number:	**SPON1774-19**
REC reference:	**19/WA/0290**
Sponsor	**Cardiff University**

I am pleased to confirm that HRA and Health and Care Research Wales (HCRW) Approval has been given for the above referenced study **and for Non-Substantial Amendment 01**, submitted on 29 November 2019, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report

(including this letter) have been sent to the coordinating centre of each participating nation. The relevant national coordinating function/s will contact you as appropriate.

Please see IRAS Help for information on working with NHS/HSC organisations in Northern Ireland and Scotland.

How should I work with participating non-NHS organisations?
HRA and HCRW Approval does not apply to non-NHS organisations. You should work with your non-NHS organisations to obtain local agreement in accordance with their procedures.

What are my notification responsibilities during the study?

The standard conditions document "*After Ethical Review – guidance for sponsors and investigators*", issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- 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.

Who should I contact for further information?
Please do not hesitate to contact me for assistance with this application. My contact details are below.

Your IRAS project ID is **271086**. Please quote this on all correspondence.

Yours sincerely,
Chris Kitchen

Email: hra.approval@nhs.net

List of Documents

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

Document	*Version*	*Date*
Covering letter on headed paper [REC Amendments Table]		25 October 2019
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Cardiff University Letter of Insurance]		01 August 2019
IRAS Checklist XML [Checklist_29102019]		29 October 2019
IRAS Checklist XML [Checklist_11092019]		11 September 2019
Letter from sponsor [Cardiff University Letter of Sponsorship]		22 August 2019
Notice of Non Substantial Amendment [20191125 Signed Amendment notification 271086 (1)]	NSA01	25 November 2019
Other [Organisation Information Doc V0.1]		
Other [Schedule of Events]	1	17 December 2019
Participant consent form [Easy Read Consent 1.1]	1.1	25 October 2019
Participant consent form [Consent form 1.1]	1.1	25 October 2019
Participant information sheet (PIS)	1.1	25 October 2019
Participant information sheet (PIS) [Participant Debrief Form]	1.0	21 June 2019
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Research protocol or project proposal [Research Protocol]	2.0	21 June 2019
Summary CV for Chief Investigator (CI) [Dr Christopher Hartwright]		30 September 2019
Summary CV for student [Miss Katie Finch]		30 September 2019
Validated questionnaire [CORE 10]		
Validated questionnaire [RRC-ARM and CYRM]		
Validated questionnaire [International Trauma Questionnaire]		
Validated questionnaire [Vulnerable Attachment Style Questionnaire]		
Validated questionnaire [ACE International Questionnaire (ACE-IQ)]		

IRAS project ID	271086

Information to support study set up

The below provides all parties with information to support the arranging and confirming of capacity and capability with participating NHS organisations in England and Wales. This is intended to be an accurate reflection of the study at the time of issue of this letter.

Types of participating NHS organisation	Expectations related to confirmation of capacity and capability	Agreement to be used	Funding arrangements	Oversight expectations	HR Good Practice Resource Pack expectations
This is a non-commercial study with two participating NHS organisations. There is one site type involved in the study.	Research activities should not commence at participating NHS organisations in England or Wales prior to their formal confirmation of capacity and capability to deliver the study.	An Organisation Information Document has been submitted and the sponsor is not requesting and does not expect any other site agreement to be used.	No application for external funding has been made. As per the Organisation Information Document, no funding will be provided to the participating NHS organisation.	A Local Collaborator is expected to be in place at the participating organisation.	For research team members that do not have existing contractual relationships with the participating organisation, Letters of Access should be in place if the activities undertaken at the NHS site involve contact with patients (e.g. to take consent), on the basis of Research Passports (if University employed) or NHS to NHS confirmation of pre-engagement checks letters (if NHS employed). The pre-engagement checks should include standard DBS checks and Occupational Health Clearance. No specific pre-engagement checks are

					required to have taken place if the members of the research team are only accessing patients' data.

Other information to aid study set-up and delivery

This details any other information that may be helpful to sponsors and participating NHS organisations in England and Wales in study set-up.

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

Ariennir gan Lywodraeth Cymru
Funded by Welsh Government

Wales Research Ethics Committee 1
Cardiff

Mailing address:
Health and Care Research Wales
Castlebridge 4
15-19 Cowbridge Road East
Cardiff, CF11 9AB

telephone: 02920 785738
email: Wales.REC1@wales.nhs.uk
website: www.hra.nhs.uk

24 June 2020

Miss Katie. L Finch
[redacted]

Dear Miss Finch

Study title:	**Understanding complex trauma presentations within adult forensic inpatient settings: exploring the mediating relationships between adverse childhood experiences, attachment, resilience and psychological distress in adulthood.**
REC reference:	**19/WA/0290**
Protocol number:	**SPON1774-19**
Amendment number:	**SubAmend01**
Amendment date:	**19 June 2020**
IRAS project ID:	**271086**

The above amendment was reviewed on 24 June 2020 by the Sub-Committee in correspondence.

Ethical opinion

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

Approved documents

The documents reviewed and approved at the meeting were:

Document	*Version*	*Date*
Completed Amendment Tool [271086 SubAmend01 19.06.20]	1.1	19 June 2020
Copies of advertisement materials for research participants [Prolific description v1.0]	v1.0	05 June 2020
Covering letter on headed paper [271086 Cover Letter SubAmend01]	1.0	19 June 2020
Research protocol or project proposal [Research Protocol 2.2 (clean)]	2.2	19 June 2020
Research protocol or project proposal [Research Protocol 2.2]	2.2	19 June 2020

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

Working with NHS Care Organisations

Sponsors should ensure that they notify the R&D office for the relevant NHS care organisation of this amendment in line with the terms detailed in the categorisation email issued by the lead nation for the study.

Amendments related to COVID-19

We will update your research summary for the above study on the research summaries section of our website. During this public health emergency, it is vital that everyone can promptly identify all relevant research related to COVID-19 that is taking place globally. If you have not already done so, please register your study on a public registry as soon as possible and provide the HRA with the registration detail, which will be posted alongside other information relating to your project.

Statement of compliance

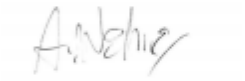
The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

HRA Learning

We are pleased to welcome researchers and research staff to our HRA Learning Events and online learning opportunities– see details at: https://www.hra.nhs.uk/planning-and-improving-research/learning/

19/WA/0290:	**Please quote this number on all correspondence**

Yours sincerely



p.p
Dr Kathrine J Craig
Chair

E-mail: Wales.REC1@wales.nhs.uk

Appendix 19

Confirmation of Cardiff University Sponsorship

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

Research and Innovation Services
Gwasanaethau Ymchwil ac Arloesi

Cardiff University
McKenzie House, 7th Floor
30-36 Newport Road, Cardiff
CF24 0DE, Wales, UK
Tel +44(0)29 2087 5834
www.cardiff.ac.uk

Prifysgol Caerdydd
Tŷ McKenzie, 7ed Llawr
30-36 Heol Casnewydd, Caerdydd
CF24 0DE, Cymru, DU
Ffôn +44(0)29 2087 5834
www.caerdydd.ac.uk

22nd August 2019

Dr Chris Hartwright
South Wales Doctoral Programme in Clinical Psychology
11th Floor, School of Psychology
Tower Building
70 Park Place
Cardiff CF10 3AT

Dear Dr Hartwright,

The Association between Adverse Childhood Experiences (ACEs), Attachment and Resilience in Foresnsic In-Patient Populations

I understand that you are acting as Chief Investigator for the above DClinPsy project to be conducted by Katie Finch.

I confirm that Cardiff University agrees in principle to act as Sponsor for the above project, as required by the UK Policy Framework for Health and Social Care Research.

Scientific Review
I can also confirm that Scientific Review has been obtained from: DClinPsy Supervisors.

Insurance
The necessary insurance provisions will be in place prior to the project commencement. Cardiff University is insured with UMAL. Copies of the insurance certificate are attached to this letter.

Approvals
On completion of your IRAS form (required for NHS REC and HRA/HCRW/NHS R&D permission), you will be required to obtain signature from the Research Governance team for the 'Declaration by the Sponsor Representative'. Please note that you are also required to provide the Organisation Information Document and Schedule of Events to the Research Governance team for review prior to submission to HRA/HCRW.

Please then submit the project to the following bodies for approval:

- an NHS Research Ethics Committee;

[redacted]

The University is considered to have accepted Sponsorship when Research and Innovation Services has received evidence of the above approvals. **Responsibility for providing the Local Information Pack to NHS organisations is delegated from the Sponsor to the Chief Investigator (or their appropriate delegate). Once an NHS organisation has confirmed capacity and capability, responsibility lies with the Chief Investigator (or their appropriate delegate) to follow an appropriate 'green light' procedure to open the study at that Site.**

The Queen's Anniversary Prizes 2017
Stonewall Hyrwyddwyr Amrywiaeth Byd-eang Global Diversity Champion
Athena SWAN Bronze Award
QAA UK Quality Assured Sicrwydd Ansawdd y DU

Roles and Responsibilities

As Chief Investigator you have signed a Declaration with the Sponsor to confirm that you will adhere to the standard responsibilities as set out by the UK Policy Framework for Health and Social Care Research. In accordance with the University's Research Integrity & Governance Code of Practice, the Chief Investigator is also responsible for ensuring that each research team member is qualified and experienced to fulfil their delegated roles including ensuring adequate supervision, support and training.

If your study is adopted onto Health & Care Research Wales Clinical Research Portfolio you are required to upload recruitment data onto the portfolio database.

Contracts

- Roles and responsibilities are detailed adequately in the research protocol- no contract required.

May I take this opportunity to remind you that, as Chief Investigator, you are required to:

- register clinical trials in a publicly accessible database before recruitment of the first participant and ensure that the information is kept up to date
- ensure you are familiar with your responsibilities under the UK Policy Framework for Health and Social Care Research;
- undertake the study in accordance with Cardiff University's Research Integrity & Governance Code of Practice (available on the Cardiff University Staff and Student Intranet) and the principles of Good Clinical Practice;
- ensure the research complies with the General Data Protection Regulation 2016/679;
- where the study involves human tissue, ensure the research complies with the Human Tissue Act and the Cardiff University Code of Practice for Research involving Human Tissue (available on the Cardiff University Staff and Student Intranet);
- inform Research and Innovation Services of any amendments to the protocol or study design, (including changes to start /end dates) and submit amendments to the relevant approval bodies;
- respond to correspondence from the REC, HRA/HCRW and NHS organisation R&D offices within the required timeframes;
- co-operate with any audit, monitoring visit or inspection of the project files or any requests from Research and Innovation Services for further information.

You should quote the following unique reference number in any correspondence relating to Sponsorship for the above project:

SPON1774-19

This reference number should be quoted on all documentation associated with this project.

Yours sincerely

pp

Mr Chris Shaw
Research Governance Coordinator
Direct line: +44 (0) 29208 79277
Email: resgov@cardiff.ac.uk

Cc Katie Finch

Appendix 20

Spearman's rho Correlation Matrix for al Variables and Psychological Distress

		ACEs	Psych Distress	Attachment	Child Res	Adult Res
ACEs	Correlation Coefficient	1	.218*	.293**	-.568**	-.226*
	Sig. (2-tailed)	.	0.013	0.001	0	0.01
	N	128	128	128	128	128
Psych Distress	Correlation Coefficient	.218*	1	.667**	-.382**	-.603**
	Sig. (2-tailed)	0.013	.	0	0	0
	N	128	128	128	128	128
Attachment	Correlation Coefficient	.293**	.667**	1	-.248**	-.338**
	Sig. (2-tailed)	0.001	0	.	0.005	0
	N	128	128	128	128	128
Child Res	Correlation Coefficient	-.568**	-.382**	-.248**	1	.492**
	Sig. (2-tailed)	0	0	0.005	.	0
	N	128	128	128	128	128
Adult Res	Correlation Coefficient	-.226*	-.603**	-.338**	.492**	1
	Sig. (2-tailed)	0.01	0	0	0	.
	N	128	128	128	128	128

*** Correlation is significant at the 0.05 level (2-tailed).**

**** Correlation is significant at the 0.01 level (2-tailed).**

Appendix 21

Point Biserial Correlation Matrix for all Variables and PTSD Classification

		ACEs	Attachment	Child Res	Adult Res	PTSD collapsed
ACEs	Pearson Correlation	1	.293**	-.570**	-.242**	.308**
	Sig. (2-tailed)		0.001	0	0.006	0
	N	128	128	128	128	128
Attachment	Pearson Correlation	.293**	1	-.264**	-.326**	.492**
	Sig. (2-tailed)	0.001		0.003	0	0
	N	128	128	128	128	128
Child Res	Pearson Correlation	-.570**	-.264**	1	.551**	-.321**
	Sig. (2-tailed)	0	0.003		0	0
	N	128	128	128	128	128
Adult Res	Pearson Correlation	-.242**	-.326**	.551**	1	-.382**
	Sig. (2-tailed)	0.006	0	0		0
	N	128	128	128	128	128
PTSD collapsed	Pearson Correlation	.308**	.492**	-.321**	-.382**	1
	Sig. (2-tailed)	0	0	0	0	
	N	128	128	128	128	128

**** Correlation is significant at the 0.01 level (2-tailed).**