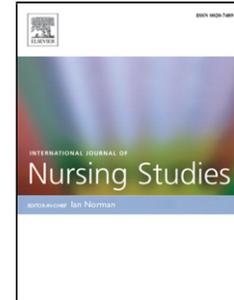


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AND USE OF COERCIVE MEASURES: CROSS
SECTIONAL QUESTIONNAIRE SURVEY

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AGGRESSION: NURSES' EMOTIONS, ATTITUDES AND MANAGEMENT

**MENTAL HEALTH NURSES' EMOTIONS, EXPOSURE TO PATIENT
AGGRESSION, ATTITUDES TO AND USE OF COERCIVE MEASURES: CROSS-
SECTIONAL, CORRELATIONAL STUDY**

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Abstract

Background: Mental health nurses are exposed to patient aggression, and required to manage and de-escalate aggressive incidents; coercive measures such as restraint and seclusion should only be used as a last resort. An improved understanding of links between nurses' exposure to aggression, attitudes to, and actual involvement in, coercive measures, and their emotions (anger, guilt, fear, fatigue, sadness), could inform preparation and education for prevention and management of violence.

Objectives: To identify relationships between mental health nurses' exposure to patient aggression, their emotions, their attitudes towards coercive containment measures, and their involvement in incidents involving seclusion and restraint.

Design: Cross-sectional, correlational, observational study.

Settings: Low and medium secure wards for men and women with mental disorder in three secure mental health hospitals in England.

Participants: $N=68$ Mental health nurses who were designated keyworkers for patients enrolled into a related study.

Methods: Participants completed a questionnaire battery comprising measures of their exposure to various types of aggression, their attitudes towards seclusion and restraint, and their emotions. Information about their involvement in restraint and/or restraint plus seclusion incidents was gathered for the three-month period pre- and post- their participation. Linear and logistic regression analyses were performed to test study hypotheses.

Results: Nurses who reported greater exposure to a related set of aggressive behaviours, mostly verbal in nature, which seemed personally derogatory, targeted, or humiliating, also reported higher levels of anger-related provocation. Exposure to mild and severe physical aggression was unrelated to nurses' emotions. Nurses' reported anger was significantly positively correlated with their endorsement of restraint as a management technique, but not with their actual involvement in restraint episodes. Significant differences in scores related to anger and fatigue, and to fatigue and guilt, between those involved/not involved in physical restraint and in physical restraint plus seclusion respectively were detected. In regression analyses, models comprising significant variables, but not the variables themselves, predicted involvement/non-involvement in coercive measures.

Conclusions: Verbal aggression which appears targeted, demeaning or humiliating is associated with higher experienced anger provocation. Nurses may benefit from interventions which aim to improve their skills and coping strategies for dealing with this specific aggressive behaviour. Nurse-reported anger predicted approval of coercive violence management interventions; this may have implications for staff deployment and support. However, anger did not predict actual involvement in such incidents. Possible explanations are that nurses experiencing anger are sufficiently self-aware to avoid involvement or that teams are successful in supporting colleagues who they perceive to be 'at risk'. Future research priorities are considered.

Keywords: Violence, aggression, anger, restraint, seclusion, mental health, de-escalation, emotion

Introduction

Healthcare staff commonly experience workplace aggression (Farrell & Shafiei, 2012) ranging from verbal aggression to targeted physical violence by individuals including patients, their visitors, and even their colleagues (Jackson et al., 2002; McKenna et al., 2003). Given their proportionate contribution to the size of the clinical workforce, and their highly visible frontline role, it is perhaps unsurprising that they are the most frequently assaulted professional group (Royal College of Psychiatrists, 2007). Mental health settings are particularly affected: in one review, 55% of mental health nurses had experienced physical aggression at work, a higher rate than in any other health care setting (Spector et al., 2014).

Aggression by patients can negatively affect the social, emotional, and psychological wellbeing of nursing staff (Carmel & Hunter, 1989, 1993; Fujishiro et al., 2011). Serious incidents commonly result in injuries to the head (Carmel and Hunter, 1993), to major joints (Harris & Rice, 1986), open wounds (Flannery et al., 2003), and bruises, sprains, or welts (Daffern et al., 2003). The emotional and psychological effects of patient aggression on nursing staff include an increased risk of post-traumatic stress disorder (Richter & Berger, 2006), a tendency to question their own professional competency, emotional confusion (Deans, 2004), anger, fearfulness, guilt, and shame (Needham et al., 2005).

The impact of patient aggression on nursing staff has potential knock-on consequences for patient care itself. Bowers et al. (2011) proposed that emotional self-regulation is a key pillar of effective mental health nursing practice. When powerful emotions including anger are heightened in nursing staff it is possible that their performance in effectively carrying out patient care and teamwork duties could be compromised. Therefore, while many nurses report that workplace aggression is simply an expected part of the job role (Deans, 2004), there is a clear need to understand its impacts in the interests of workplace safety and in the delivery of therapeutic patient care; most specifically that related to the management of aggression.

The preferred approach to management of patient aggression as a first line intervention is de-escalation, 'the use of techniques (including verbal and non-verbal communication skills) aimed at defusing anger and averting aggression' (National Institute for Health and Care Excellence, 2015 p.14). More restrictive and coercive containment methods such as restraint and seclusion are, rightly, controversial due to a lack of evidence for their effectiveness (Stewart et al., 2009) and their use is considered an important indicator of care quality – or lack of - in mental health settings (Sacks & Walton, 2014). Two coercive techniques, physical restraint (i.e., physically holding the patient, preventing movement), followed or not by seclusion (isolation in a locked room) can be used, as a last resort, to manage behaviour that is otherwise likely to cause harm to self and/or others (Royal College of Nursing, 2008). Relevant factors in nurses' decisions to use coercive containment methods include their own characteristics (educational level, experiences, stress, training, and attitudes), the patient, the environment, and the organisation (Larue et al., 2009). Further, decisions made by nurses may in turn affect team norms (Paterson et al., 2013); thus it is important to explore, for example, staff experiences and attitudes in relation to coercive containment methods as part of an overall strategy to reduce their use.

Farrell et al. (2010) have discussed how nursing staff's emotional processes during the management of aggressive behaviour are important and may contribute to a vicious circle. Emotional reactions may sensitize staff to perceive patient behaviour as challenging, thus lowering their tolerance threshold to behaviour; further, they may influence staff behaviour, which might itself trigger or maintain patient aggression. This in turn may further reinforce staff perceptions of patients as challenging. This is supported by Chen et al.'s (2010) findings that poor psychological wellbeing in nursing staff, measured within seven days before an incident had occurred, was a predictor of patient aggression. There is some literature relevant to the connected issues of aggression management and nursing experience or attitudes. Bowers

et al. (2007) found that positive attitudes among nursing staff were associated with the approval of less restrictive containment methods such as intermittent and continuous observations over seclusion and restraint. Concomitantly, however, nursing staff also reported feeling angry when they deemed patients' aggression to be unacceptable. As a result, the authors speculated that nursing staff's feelings of anger could be related to their preparedness to use containment measures. Indeed, this hypothesis has been to some extent supported by De Benedictis et al. (2011) who examined whether nursing staff's perceptions of team-related characteristics predicted the use of physical restraint and seclusion to contain patient aggression. The perception of increased levels of anger among team members, the frequency of patient self-directed physical aggression, and insufficient safety measures in the workplace all independently predicted greater use of physical restraint and seclusion. In a qualitative study of nurses' accounts of physical restraint, Sequeira and Halstead (2004) reported that anger emerged as a theme that was often experienced during the physical restraint process. Nursing staff made sense of this anger through the association of patients hurting them or colleagues, and because of the frustration with patients not responding to less restrictive containment methods. Interestingly, patients interviewed in the same study believed that physical restraint was used to punish them and perceived its use to be largely due to nursing staff being angry.

Further understanding of nursing staff factors, and emotional aspects in particular, in relation to patient aggression and its management could help to inform support mechanisms in clinical practice and advance training programmes for staff working in mental health services. This is especially important given that Needham et al. (2005a) found that a training course on the management of patient aggression had no effect on nurses' perception and on the negative feelings that arise from such incidents.

Aims of the present study

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The aim of the present study was to clarify our understanding of anger in mental health nursing staff by using a standardised measure to explore its relationships with the prevalence of exposure to patient aggression, and with their attitudes towards, and actual involvement in, physical restraint and seclusion. The specific study hypotheses were i) that greater exposure to patient aggression would be related to higher levels of nursing staff anger; and ii) higher levels of nursing staff emotion (anger, fear, sadness, guilt and fatigue) would be positively associated with greater approval of physical restraint and seclusion, and with actual involvement in the use of these coercive containment methods.

Methods**Participants and setting**

The current study was one of a series of investigations into the role of anger and its constituent components in inpatient aggression, staff responses to and management of aggression, and staff-patient interpersonal relationships in a secure mental health inpatient setting. The present study was conducted in the medium and low-secure wards constituting the men's and women's adult mental disorder pathways at St Andrew's Healthcare, a United Kingdom provider of specialist secure mental health care. Relevant wards are located in Northampton, Birmingham and Essex. Eligible participants were qualified nursing staff who were keyworkers for patients who consented to participate in the related studies.

Design

A correlational design was used to explore a) the hypothesised relationship between exposure to patient aggression and nursing staff anger; and b) between nursing staff anger and related emotions (i.e., fear, guilt, sadness and fatigue), and i) approval of physical restraint and seclusion, and ii) involvement in the use of physical restraint with/without seclusion over a 6-month period (3-months prior to and 3-months post the study assessment). This period was chosen i) for consistency with procedures for a parallel study involving patients as participants

(to be reported elsewhere); and ii) to avoid the potential for bias should all follow-up data be collected post-assessment since this might allow staff to consciously or unconsciously regulate their emotions thus changing their behaviour.

Procedure

The study was one part of a doctoral study by author RJ. The study received approval from the University of Northampton Research Ethics Committee, the Leicestershire, Northamptonshire and Rutland NHS Research Ethics Committee (Reference: 13/EM/0020. IRAS ID: 120833) and the St Andrew's Healthcare Research and Development Committee. Nursing staff interested in the study were given the study information brief detailing what their participation would entail and, where relevant, provided written informed consent. Subsequently, a one-to-one interview took place in a quiet room on the ward during which study questionnaires (see below) were completed. Data about the involvement of participant nurses incidents of restraint and seclusion were retrieved from the electronic incident recording system (Datix) for the 3-month prior to and post participation in the current study. Data collection was conducted between 2013 and 2015.

Measures

Novaco Anger Scale – Provocation Inventory (Novaco, 2003). This instrument was developed for use with both general population and clinical samples and comprises a 60-item anger measure (Novaco Anger Scale) plus a 25-item provocation inventory. The Novaco Anger Scale comprises four subscales each addressing an aspect of anger-related disposition: Cognition, Arousal, Behaviour, and Regulation. Each item requires a response on 3-point unipolar visual analogue scale (1 = *Never true*, 2 = *Sometimes true*, and 3 = *Always true*). Scoring produces three subscale totals and a total score. The Provocation Inventory focuses on five issues: disrespectful treatment, unfairness, frustration, annoying traits of others, and irritations as felt in specific situations (e.g., 'Being pushed or shoved by someone in an

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argument'). The response scale is a 4-point unipolar visual analogue scale (1 = *not at all angry*, 4 = *very angry*). The Provocation Inventory produces a single total score. The Novaco Anger Scale total is intended to represent the respondent's overall level of anger and the Provocation Inventory total score to represent anger intensity. Conceptually, the Provocation Inventory differs from the Novaco Anger Scale since it asks about anger in specific provocation situations, rather than focusing on an individual's personal disposition toward anger. It is suggested that this may help overcome resistance to self-disclosure involved in reporting anger (Novaco, 2003)

The Novaco Anger Scale – Provocation Inventory has consistently been found to have good reliability across many different samples, including clinical forensic samples. The tool has also been used with non-clinical samples (Culhane & Morera, 2010; Jones et al., 1999). Construct and concurrent validity of the tool is also excellent (Novaco, 2003). Internal reliability estimates (Cronbach's alpha) in the standardization sample were .94 (Novaco Anger Scale total score) and .95 (Provocation Inventory total score). The tool also includes an Inconsistent Responding Index based on 16 selected item-pairs; random or apparently deliberately inconsistent responding is indicated by a larger than normal proportion of dissimilarity between item-pair scores and affected questionnaires should be excluded (Novaco, 2003).

Positive and Negative Affect Schedule – Expanded Form (Watson & Clark, 1994).

This is a mood measurement scale requiring participant responses to 60 words or phrases related to different emotions (e.g., 'alone', 'disgusted with self'). The tool measures two tiers of emotion: the General Dimension Scales measure overall levels of negative and positive affect; while three further scales measure specific basic negative emotions (fear, hostility, guilt, sadness), basic positive emotions (joviality, self-assurance, attentiveness), and other affective states (shyness, fatigue, serenity, surprise). Respondents are required to indicate to what extent

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they have felt this way for each item over a specified time period on a unipolar 5-point scale (1 = *Very slightly or not at all*, 2 = *A little*, 3 = *Moderately*, 4 = *Quite a bit*, 5 = *Extremely*). The tool has been used with eight different specified time period instructions (e.g., 'In the past few weeks'; see Watson & Clark, 1994 for further details). In this study, the time instruction: 'in general, that is, on the average' was used. However, scale reliability is unaffected across different time instructions and participant population (student, adult, or patient). Internal reliability for positive and negative affect ranges from .83 to .90. The scales have significant convergent, discriminant, and concurrent validity (Watson & Clark, 1994). The subscale scores for Fear, Sadness, Guilt and Fatigue were used for the study, since these have been the most commonly reported experiences of nurses in the literature.

Perception of Prevalence of Aggression Scale (Oud, 2000). The Perception of Prevalence of Aggression Scale is a 16-item questionnaire which aims to gauge participants' perception of the prevalence of each of the following inpatient behaviours: non-threatening verbal aggression, threatening verbal aggression, humiliating aggressive behaviour, proactive aggressive behaviour, passive-aggressive behaviour, aggressive 'splitting' behaviour, threatening physical aggression, destructive aggressive behaviour, mild physical violence, severe physical violence, mild violence against self, severe violence against self, suicide attempts, completed suicide, sexual intimidation/harassment, and sexual assault/rape. To aid clarity, each aggression-type is accompanied by a written example of the behaviour. Respondents are required to indicate the extent to which they have been exposed to each type of aggression during the course of their work in the past year. The responses are on a 5-point unipolar scale (0 = *Never*, 1 = *Occasionally*, 2 = *Sometimes*, 3 = *Often*, and 4 = *Frequently*). An approximation of the number of times each behaviour has occurred in the past year is also requested. In this study, the rating scale responses were used for analysis. Internal consistency of the scale has been reported to be good (Cronbach's $\alpha=.86$); a degree of convergent validity

may be inferred from correlations between reported exposure to severe physical violence and number of days sick leave reported (Nijman et al., 2005) . To the best of our knowledge the tool has not been subject to factor analysis.

The Attitudes to Containment Measures Questionnaire (Bowers et al., 2004). The Attitudes to Containment Measures Questionnaire explores participants' attitudes towards 11 containment methods: consensual pro re nata (or 'as required') medication, compulsory intramuscular sedation, physical restraint, intermittent observation, constant observation, time-out, transfer to a psychiatric intensive care unit, locked-door seclusion, open-area seclusion, mechanical restraint, and use of a net bed. With the exception of the last two, which are used in some European nations (Whittington et al, 2009), all of these methods are used in UK psychiatric settings. A short description and photograph is provided and respondents are asked to indicate their approval of the containment method on a 5-point Likert scale (5 = *Strongly agree*, 4 = *Agree*, 3 = *Uncertain*, 2 = *Disagree*, 1 = *Strongly disagree*). In this study, scores relating to the extent of approval for physical restraint and seclusion were used in the analyses.

Incidents of physical restraint and seclusion. It is a policy directive in the study setting that an electronic incident form be completed for all adverse events concerning a patient within 2-h of its occurrence. The form must be completed by a member of staff who has witnessed the incident and it must be validated by a line manager within 48-h. The form is designed to capture comprehensive information, including descriptive information, related to the incident time, date, and location, and type; the sequence of events, and the immediate action that was taken. Information recorded about physical restraint includes: start and end time of restraint, position of restraint (i.e., prone and/or supine), patient behaviour during restraint, staff members involved and their role in the procedure. Information about seclusion incident includes: name of observing staff, reason for seclusion, start and end time/date of seclusion and reason for termination of seclusion. Nursing staff participants were categorised as either having been or

not been involved in either i) physical restraint not followed by seclusion; or ii) physical restraint followed by seclusion incidents during the 3-months prior to and post study participation.

Data analysis

Sample size for the study was essentially fixed ($N=68$) since it comprised the 'named nurses' of a cohort of all low and medium secure mental health patients who agreed to participate in a separate study in which nurse-patient dyads were investigated. However, sample size calculation revealed that a total sample of $N=32$, equivalent to a medium-to-large effect size ($r=.45$), would allow detection of a difference between those exposed and those not exposed to aggression in standardized T scores on the primary outcome measure (Novaco Anger Scale) equivalent to a 2-categories (standardized $T=10$), i.e., 'average' compared with 'high' on a continuum running 'very low' – 'low' – 'low average' – 'average' – 'high average' – 'high' – 'very high'). To detect a difference of a single category (e.g., 'average' to 'high average' or standardized $T = 5$) would require a total sample of $N=88$; this is equivalent to a small-to-medium effect size ($r=.24$). We considered a 2-category shift to be of likely clinical significance and thus consider the study to be adequately powered to detect meaningful differences.

Means and standard deviations for scale variables and frequencies/percentages for categorical variables were calculated. Data were tested for normality of distribution prior to analysis using the Shapiro-Wilk test in conjunction with the combination of histogram, kurtosis and skewness values as recommended by Field (2003); bootstrapping was applied where assumptions of normality were violated. Bootstrapping creates thousands of alternate versions of the existing sampling data for what is likely to represent the population. This method reduces the impact of outliers and anomalies. Bootstrapping provides estimates of the confidence

intervals of a parameter including the mean, odds ratio, and correlation and regression coefficients (Field, 2003).

Spearman's correlation (ρ) was calculated to examine the relationship between nursing staff anger measures and i) the prevalence of their reported exposure to types of patient aggression and ii) their approval of physical restraint and seclusion as containment methods.

In order to avoid multiple testing of the Perception of Prevalence of Aggression Scale's 16-items we conducted a Principal Components analysis (PCA) of respondents' data to inform us about the presence of any multivariate latent constructs. Decisions about the suitability of the data for factor analysis (Stewart, 1981), number of factors extracted (Costello & Osborne, 2005), and data rotation (Tabachnick & Fidell, 2007), were based on standard techniques. Variables significantly correlated with nursing staff anger were entered into a linear regression model to determine how much of the variance was explained by the prevalence of exposure to patient aggression.

Independent *t*-tests were used to ascertain differences in nursing staff anger and related emotions between those involved or not involved in coercive containment methods over the combined 6-months of 'follow up'. Potential covariates, namely gender (male/ female), security level of ward worked on (low secure/ medium secure), and ethnicity (white/ other) of anger-related variables were also identified using similar tests. The effect size (*r*) of differences was calculated by conversion of *t*-values; thresholds for small, medium, and large effects are .20, .30, and .50 respectively (Rosnow & Rosenthal, 2005). A model that predicts nursing staff involvement in coercive containment method incidents was tested with a logistic regression, with predictor variables and covariates informed by the independent *t*-tests. The model fit using Omnibus Tests of Model Coefficients is reported, as well as the amount of variance explained using Nagelkerke's R^2 . Two further tests were used to ensure assumptions of the logistic regression were met: linearity of the logit and multicollinearity. Linearity of the logit checks

that each continuous predictor variable is linearly related to the log of the outcome variable. Variance Inflation Factor and Tolerance values allows for a check of whether a strong correlation exists between two or more predictors. Variance Inflation Factor values greater than 10 and Tolerance values below 0.1 are indicative of multicollinearity (Field, 2003). All analyses were conducted using IBM Statistics version 22 for Windows (SPSS Inc., Version 22).

Results

In total, $N=68$ qualified nurses (70.6% female) were recruited into the study. Participants were all ward-based nurses (see Table 1), some with additional managerial responsibilities (Ward Manager, Deputy Ward Manager). Most ($n=35$; 51.5%) had more than five years' experience and almost three quarters (73.6%) had more than two years' experience.

Significant Shapiro-Wilk tests, kurtosis and skewness values, and examination of histogram plots, indicated that the Novaco Anger Scale – Provocation Inventory, Positive and Negative Affect Schedule – Expanded Form, and Perception of Prevalence of Aggression Scale data violated the assumptions of normality and were subject to bootstrapping.

Perception of Prevalence of Aggression Scale data was adequate for factor analysis (Kaiser Meier Olkin test=.79; Bartlett's test of sphericity $P<.001$). Principal components analysis using Varimax rotation revealed two latent constructs relating in the view of the authors to i) perception of prevalence of self-harming behaviour ('Minor violence against self', 'Serious violence against self', and 'Suicidal attempts'; factor loadings .86 - .91; Cronbach's $\alpha=.87$); and ii) perception of prevalence of personally valent aggression ('Verbal aggression', 'Humiliating aggressive behaviour', 'Provocative aggressive behaviour', 'Passive aggressive behaviour', and 'Aggressive splitting behaviour'; factor loadings .66 - .78; Cronbach's $\alpha=.79$). Other items either cross-loaded on both factors or did not load onto either factor. Factor total scores were calculated and used in all further analyses of the Perception of Prevalence of

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Aggression Scale's relationships with other study variables in place of the constituent single items. In addition, because we judged it important to examine potential relationships between physical aggression and anger, we report on the single-item scores on the tool for 'Mild physical violence' and 'Severe physical violence'.

Table 1: Participant demographics and characteristics

Characteristics of registered nurse participants (N=68 except where indicated)	n (%)
Gender	
Female	48 (70.6)
Male	20 (29.4)
Ethnicity:	
Black	40 (58.8)
Caucasian	25 (36.8)
Asian	1 (1.5)
'Other'	2 (2.9)
Role:	
Ward based clinical	55 (80.9)
Ward based with managerial responsibilities	13 (19.1)
Security Level worked on:	
Low secure	45 (66)
Medium secure	23 (34)
Employment status:	
Full time	63 (92.6)
Part time	5 (7.4)
Length of service:	
<1 year	8 (11.8)
1-2 years	10 (14.7)
2-5 years	15 (22.1)
5-10 years	15 (22.1)
10+ years	20 (29.4)
Involvement in coercive methods:	
Physical restraint plus seclusion ^a	31 (45.6)
Physical restraint no seclusion ^a	30 (44.1)
Age years (Mean [SD])	41.6 [9.0]

^a N=64 because for n=4 participants it could not be identified in the Datix database whether they had or had not been involved in the coercive activity

Relationship between anger, anger provocation and perception of patient aggression

Correlational analyses (Table 2) revealed that anger provocation was significantly positively associated with greater exposure to the multivariate factor comprising items suggestive of personally valent aggressive patient behaviour. The perceived extent of exposure

to self-harming behaviour, mild or severe physical violence was not correlated with nursing staff anger or anger provocation scores.

To test the extent to which nursing staff anger provocation was predicted by patients' personally valent aggressive behaviour, linear regression was conducted using reported exposure as the outcome variable (See Table 3). This revealed that exposure to personally valent aggressive behaviour by the patient predicted anger provocation as measured by the Provocation Inventory total score, $F(1,66) = 5.22, p < .05$. and accounted for 6% of the explained variability in nursing staff anger provocation.

Relationships between nursing staff anger, anger provocation, negative emotions and their attitudes towards coercive containment techniques

Correlations presented in Table 2 revealed that nursing staff anger was significantly positively correlated with the Attitudes to Containment Measures Questionnaire approval of physical restraint measure. Positive and Negative Affect Schedule – Expanded Form expressions of guilt were significantly negatively correlated with anger provocation in nursing staff.

Relationships between nursing staff anger, anger provocation, negative emotions and involvement in coercive interventions

Scale scores for nursing staff involvement and non-involvement in physical restraint-only incidents were ascertained prior to modelling the relevant predictor variables in a logistic regression analysis. Analysis of potential covariates revealed that females had significantly higher Positive and Negative Affect Schedule – Expanded Form scores in relation to Fear, Guilt, Sadness, and Fatigue; there were no significant differences on any of the predictor variables related to security level in which the participant worked or participant ethnicity. Table 4 shows that nurses who were and who were not involved in physical restraint-only incidents differed significantly on the Novaco Anger Scale total score and on the Positive and

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Negative Affect Schedule – Expanded Form fatigue subscale, with those involved scoring lower (less anger, less fatigue) than non-involved staff (small effect size).

Table 5 shows the logistic regression model that was performed to ascertain the extent to which anger and fatigue predicted that nursing staff will be involved in physical restraint-only incidents. The logistic model was statistically significant $\chi^2 (2) = 7.3, p < .05$, explained 15% of the variance in physical restraint-only incidents, and correctly classified 65.1% of cases. Sensitivity was 70%, specificity was 60.6%, positive predictive value was 61.8% and negative predictive value was 69%. The two predictor variables were not statistically significant. Interaction terms were not significant $p > .05$, and thus did not violate the linearity of the logit assumption. Collinearity diagnostics confirm that there were no concerns with multicollinearity (Average Variance Inflation Factor = 1.23, Average Tolerance = 0.82).

Scale scores for nursing staff involvement and non-involvement in physical restraint followed by seclusion incidents were ascertained prior to modelling the relevant predictor variables in logistic regression analyses (See Tables 4 and 5). Table 4 shows that nursing staff involved/ not involved in physical restraint followed by seclusion differed significantly on mean scores for Positive and Negative Affect Schedule – Expanded Form guilt and fatigue, with involved staff scoring lower than non-involved staff (small effect size). Table 5 shows the logistic regression performed to ascertain whether guilt and fatigue predicted nursing staff involvement in incidents of physical restraint followed by seclusion. The logistic model was statistically significant $\chi^2 (2) = 6.4, p < .05$. The model explained 13% of the variance in

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Table 2. Descriptive statistics for, and Spearman's ρ correlations between NAS-PI (n=68), PANAS-X subscales (n=67), ACMQ (n=68), and POPAS (n=66)

Measure	Mean (SD)	95% CI	Novaco Scale Total ρ [95% CI]	Anger Provocation Inventory Total ρ [95% CI]
Novaco Anger Scale - Provocation Inventory				
Novaco Anger Scale Total	71.1 (11.1)	[68.4, 73.8]	-	-
Provocation Inventory Total	59.3 (13.1)	[56.1, 62.5]	-	-
Positive and Negative Affect Schedule – Expanded Form				
Fear	9.1 (3.9)	[8.2, 10.1]	.19 [-.05, .40]	-.12 [-.35, .14]
Guilt	8.3 (3.5)	[7.4, 9.1]	.02 [-.24, .24]	-.27* [-.49, -.02]
Sadness	8.0 (3.7)	[7.1, 8.9]	-.08 [-.18, .34]	-.18 [-.43, .09]
Fatigue	8.3 (3.4)	[7.4, 9.1]	-.05 [-.32, .21]	-.22 [-.42, .00]
Attitudes to Containment Measures Questionnaire				
Physical restraint	4.0 (0.8)	[3.9, 4.2]	.28* [.08, .46]	-.04 [-.27, .21]
Seclusion	4.1 (0.8)	[3.9, 4.3]	-.06 [-.23, .28]	.18 [-.07, .42]
Perception of Prevalence of Aggression Scale				
Self-harming behaviour (3-items)	7.0 (3.2)	[6.2, 7.7]	-.13 [-.33, .10]	-.09 [-.30, .15]
Personally valent aggression (5-items)	16.2 (4.3)	[15.3, 17.2]	.21 [-.01, .40]	.29* [.04, .51]
Mild physical violence (single item)	2.7 (1.3)	[2.4, 3.0]	.14 [-.12, .39]	.19 [-.06, .42]
Severe physical violence (single item)	1.4 (0.9)	[1.2, 1.7]	-.10 [-.35, .18]	-.01 [-.06, .42]

* $p < .05$

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Table 3. Linear model of personally valent aggression as a predictor of nursing staff anger and nursing staff anger provocation

			B [95% CI]	SE B	β	P
Nurse provocation (Provocation Inventory score)	anger	Constant	45.99 [34.9, 57.4]	6.03		
		Personally valent aggression	.82 [.12, 1.5]	.36	.27	.02

physical restraint followed by seclusion incidents and correctly classified 63.5% of cases. Sensitivity was 71%, specificity was 56.3%, positive predictive value was 61.1% and negative predictive value was 33.3%. However, the two predictor variables were not statistically significant. Interaction terms were not significant $p > .05$, and thus did not violate the linearity of the logit assumption. Collinearity diagnostics confirm that there were no concerns with multicollinearity (Average Variance Inflation Factor = 1.31, Average Tolerance = 0.76).

Discussion

We aimed to explore relationships between mental health nurses' emotions, most notably those related to anger, their attitudes to coercive management measures, and their exposure to various types of patient aggression. There are three main findings to report. First, exposure to a cluster of patient behaviours, identified as related through principal components analysis, including personal insults, name-calling, and discriminatory remarks that were perceived as having humiliating intent were positively associated with the provocation inventory of the Novaco Anger Scale. The second hypothesis, that higher levels of negative emotions, including anger, would be related to the approval of physical restraint and seclusion; and the third, that emotions would also predict involvement in use of these containment methods, were partially supported. There was a significant positive correlation between anger provocation and the approval of restraint, but not seclusion, as an intervention. Amongst related emotions, guilt was negatively correlated with the approval of seclusion; thus, the greater the

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level of experienced guilt the less the level of approval of seclusion. Other emotions did not correlate with the approval of either physical restraint or of seclusion. With regard to involvement in physical restraint-only incidents, there was a significant difference in reported levels of anger and fatigue which was contrary to the study hypothesis since lower levels of anger and fatigue were actually found in nurses who were involved in these incidents compared to nurses that were not involved. Similarly, there was a significant contra-hypothetical difference in reported levels of guilt and fatigue between staff involved and those not involved in physical restraint plus seclusion. However, on closer examination, neither variable actually predicted involvement in the respective containment method.

The association between reported exposure to personally valent patient aggression and nursing staff anger revealed in the current study is supported by the *emotional confusion* theme identified in Deans' (2004) qualitative exploration of nurses' lived experience of aggression in the workplace. Anger, one of many emotions captured within the theme, was described as 'diffuse' as opposed to targeted (Deans, 2004: p. 35) and directed as much against perceived systemic inequity, and perceived lack of colleague-support as it was against individual patients. This may go some way to explain why exposure to this particular type of aggression, but not others, explained a statistically significant amount of variability in anger provocation. The immediate implication of this link is a need for training and education in aggression management to focus on interventions or methods to help staff deal with their reaction to this specific type of behaviour. Emotional regulation is recognised as a key element of, and partly comprises training in, de-escalation (Bowers, 2014); however, within this context it is used to refer to controlling *the expression of* emotion (e.g., irritation) in

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Table 5. Logistic regression models for prediction of nurse involvement in physical restraint-only and physical restraint plus seclusion incidents using significant variables from independent t-test analyses

	B [95% CI]	OR (95% CI)
Physical restraint only ^a		
Constant	3.49 [-.45, 9.87]	
NAS Total	-.03 [-0.09, 0.02]	0.97 (0.92, 1.02)
PANAS-Fatigue	-0.17 [-0.38, -0.01]	0.85 (0.70, 1.03)
Physical restraint plus seclusion ^b		
Constant	2.0 [0.51, 5.7]	
PANAS Guilt	-0.15 [-0.8, 0.1]	0.86 (0.69, 1.10)
PANAS-Fatigue	-0.11 [-0.32, -0.01]	0.89 (0.75, 1.08)

^aNote. $R^2 = .11$ (Cox & Snell) .15 (Nagelkerke). Model $\chi^2(1) = 7.3$ $p < .05$

^bNote. $R^2 = .10$ (Cox & Snell) .13 (Nagelkerke). Model $\chi^2(1) = 6.4$ $p < .05$

potentially violent situations rather than *the experiencing of* emotion possibly in scenarios that do not necessarily threaten imminent physical aggression. This is consistent with Hochschild (1983) who distinguishes between skilled use of emotional labour performed through ‘surface acting’ that involves managing the expression of behaviour rather than ‘deep acting’ that involves managing feelings. Interestingly, it is the former rather than the latter which has been found to be associated with higher levels of emotional exhaustion (Brotheridge & Lee, 2003), possibly due to increased dissonance between ‘acting like one does not care’ and ‘not caring’ when aggression is experienced as insulting or humiliating. This said, just 6% of variability in provocation was explained by this type of aggression and it is likely that other issues contribute including a wide range of personal, environmental, and organisational factors (McKenna et al., 2003). For example, NAS total score has been reported to be associated with one's own personal history of abuse and exposure to family violence (Novaco & Taylor, 2008). Also, previous researchers working in forensic settings have noted that nurses' emotions other than those investigated in the current study play a role in their relationships with patients, notably those with personality disorder. For example, nurse interviewees reported feelings of disgust and repugnance especially towards those with index offences involving sexual activity with

minors (Bowers et al. 2000). Finally, it has been argued that corrupted organisational cultures can lead to the inappropriate use of coercive measures (Paterson et al., 2013). The current study finding, however, extends Needham et al.'s (2005b) conclusions derived from a systematic review concerning the effects of patient aggression on nursing staff, where anger is one of the frequently reported effects because our results indicate that a particular set of aggressive patient behaviours, rather than aggression in general, predicts anger in nursing staff.

It was interesting that other types of patient aggression - such as mild or severe physical violence - were *not* associated with nurses' anger. One possibility is that emotional processes in nurses are important because they may sensitise them to perceiving patient behaviour as challenging. It is therefore possible that nurses could have become immune to particular types of patient aggression, which consequently may impact on their subjective reporting of the prevalence of the type of behaviour to which they have been exposed (Farrell et al., 2010).

As highlighted by Larue et al. (2011), several factors could shape nursing staff's decision to use coercive methods to contain patient aggression, including nurses' attitudes and experiences. The present study finding that nurses' anger provocation is positively correlated with the approval of physical restraint reflects but also extends previous research results. Bowers et al. (2007) found that, in instances where staff believed patient aggression to be intolerable, they also had feelings of anger present. However, those researchers did not directly measure anger, but rather it was embedded within the construct of 'feelings of acceptance' that included the absence of anger, irritation and alienation from patients. The current study's use of a standardised measure of anger therefore supports Bowers et al.'s (2007) conclusion that there is an association between nursing staff anger and the use of patient aggression containment methods. We speculated that this association might be reflected in nurses' subsequent preparedness to use coercive containment methods such as physical restraint. Paradoxically, however, in the current study, nurses who were actually involved in physical

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restraint incidents reported lower levels of anger than those who were not. A possible explanation might be that, although nursing staff with higher levels of anger have a more favourable attitude toward the use of physical restraint, they may have consciously avoided involvement in such incidents because they were sufficiently self-aware that it could trigger or evoke the aversive emotion. The inducement of the aversive emotion has been evidenced in Sequiera and Halstead's (2004) study, which reported that nurses became angry during the physical restraint process. An alternative explanation is that nurses who were more skilled in the use of emotional labour performed through the 'surface acting' that involves managing the expression of behaviour rather than feelings (Hochschild, 1983), were more likely involved in physical restraint incidents since they would be engaged in steps of the de-escalation process which ultimately resulted in last resort physical restraint. However, it is also likely that other factors such as local culture and the presence of other staff, might play a role.

For seclusion, a different pattern of findings emerged. From the emotions measured, guilt was negatively related to the approval of seclusion, and nurses involved in physical restraint followed by seclusion incidents reported lower levels of both guilt and fatigue than those not involved. There was no association between anger and involvement in physical restraint followed by seclusion incidents. These findings therefore do not support De Benedictis et al.'s (2011) study, which found that staff perception of a higher level of expression of anger among team members predicted greater use of physical restraint and seclusion of patients. This discrepancy could be attributed to the difference in measurement between the perception of other colleagues' anger and the self-reporting of the nurse's own anger. What is being suggested with the present study findings, however, is that other self-reported emotions such as guilt and fatigue could also play a role in the attitudes of, and involvement in, physical restraint followed by seclusion incidents. That nursing staff experience guilt could be due to the potential injuries on the patient and/or staff members which may occur as a result of the

procedure, or because of the long period observing secluded patients who are further deprived of their liberties. In the current study setting, nurses were often working 12-hour shifts and feelings of fatigue were perhaps unsurprising. However, that greater fatigue was associated with less involvement in physical restraint plus seclusion may be considered surprising. Again, it may be that more fatigued nurses, as with those with higher levels of anger, consciously avoid involvement in such scenarios.

Limitations

While the data revealed an association between nurse anger-related variables and exposure to patient aggression, the effect sizes were small and multiple-testing could have increased the risk of type one errors. We aimed to reduce this somewhat by conducting factor analysis of the Perception of the Prevalence of Aggression Scale to reduce the number of items being tested. In the case of scale items that measured exposure specifically to physical aggression (mild or severe), no multivariate latent factors were apparent from the analysis. We judged it unwise not to investigate the potential relationship between anger and exposure to physical aggression specifically and hence examined correlations between single-item constructs and emotion in addition to the two emergent multivariate latent factors. Future research should determine whether there are more adequate multivariate measures of aggression exposure and explore their relationship with nurse anger. ~~Nevertheless, these associations demonstrate the relevance of the measured variables in nursing practice in mental health care settings.~~

It is, of course, important to bear in mind the possible bias in nurses' responses to the measures. The extent to which nurses experience the emotions may have been reported in a way where a distinction had inadvertently been made between personal and work life, as opposed to an overall general trait tendency. The presence of emotions is perhaps better regulated and masked with levels of professionalism in the workplace which could be

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considered as emotional labour (Hochschild, 1983). Also, the measurement of involvement in containment methods may have been confounded to some extent; nurses who avoided involvement probably have elected to work on wards with less patient aggression. Inevitably, however, there would be a limit to how much this can be avoided since it is a professional duty to manage incidents as and when they occur. Further, the way in which the data was captured for the involvement in physical restraint with or without seclusion incidents could be improved. The names of nurses who were recruited into the study were manually searched within electronic clinical records, thus any omissions or misspelling of names on the forms during the recording of incidents will not have been included. However, the six-month time frame of retrieving incidents would have helped to overcome this issue.

Finally, both seclusion and restraint are, as a matter of fact, legitimated within policies and protocols in UK mental health care; use of the former varies as a function of the presence of a seclusion facility (Bowers et al., 2010). Nurses working at the current study site, a large (500-bed) specialist mental health hospital and satellite services, including secure care for mentally disordered offenders, had access to seclusion facilities. Findings specifically about seclusion, therefore, might be less generalisable to acute psychiatric care where the presence of seclusion facilities is patchier. Future studies should replicate the current study across both forensic and general psychiatric settings, including adequate measures of the cultural affirmation of the use of coercive measures, in order to investigate the wider applicability of these findings.

Future research

Further research should be conducted to investigate levels of anger, and related emotions, in nurses who have suffered injuries as a result of patient aggression which has led to time off work for sickness recovery. Quantitative and qualitative studies exploring emotions in nursing staff can be conducted more closely to the time of an incident, whether staff members

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are a victim of patient aggression, or involved in frequent physical restraint with or without seclusion. This would provide a clearer picture of the association between the variables presented in this study. In addition to measuring nursing staff emotion, aspects of the infrastructure and/or operations of the system (i.e., levels of support) used within the hospital should also be included to better understand what influence this may have on containment practices of patient aggression and its effects on staff.

Implications

The relevance of nursing staff emotion, including anger, in relation to patient aggression and the containment of patient aggression raises concerns for the current provision to support nursing staff. The associated variables presented in this study do not imply cause and effect relationships, thus it is unknown whether anger and related emotions determine the use of more coercive containment methods to manage patient aggression, or whether it is these methods that give rise to the emotions in nurses. The association, however, is worthy of closer exploration in efforts to improve wellbeing in nurses and in the quality of care delivery for patients. Support mechanisms such as regular clinical supervision, involving reflective practice to openly discuss thoughts and emotions without the risk of competency being questioned is imperative (Deans, 2004). This would help to alleviate any confusion around nursing staff's experience of emotions and emotional labour, their sense of empowerment as individuals and as a staff team. Education and training programmes could perhaps encourage and promote notions of becoming reflective practitioners by acknowledging the emotions that can persist in nursing staff working in mental health care settings. These efforts would lead in the right direction to influence attitudes and the experiences concerning coercive containment methods to manage patient aggression.

Conclusion

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This study has found support for a positive relationship between nursing staff anger and exposure to patient aggression, specifically that which is perceived as personally valent. As well as research and clinical efforts focusing on reducing the risk of inpatient aggression, it should also consider the role of nurses within that and its impact on them as individuals, as a team and the ward atmosphere. The study has revealed associations between nursing staff emotion and attitude towards, and involvement in, physical restraint with and without seclusion incidents. Recognising how emotions in staff, including anger, may drive or arise in the containment of patient aggression is crucial to understanding the wellbeing of staff and quality of patient care delivery. Initiatives involving reduction in coercive containment methods, such as physical restraint and seclusion, must consider the provision of appropriate support mechanisms for nursing staff.

Contribution of the paper

What is already known about the topic?

- Mental health nurses' attitudes to the use of restraint and seclusion are related to their approval of their use
- Anger is also thought to play a role in nurses' responses to and management of aggression but its role is poorly understood

What this paper adds

- Mental health nurses who were more approving of restraint and seclusion also reported higher levels of anger, but were not more likely to be involved in these interventions
- Reported exposure to verbal aggression of a targeted, demeaning or humiliating nature was associated with greater anger provocation
- Nurses may require help to regulate their emotional responses to specific types of aggression

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