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Published in:
International Journal of Mental Health Nursing

DOI:
[10.1111/inm.12677](https://doi.org/10.1111/inm.12677)

Publication date:
2020

Document Version
Peer reviewed version

[Link to publication in Discovery Research Portal](#)

Citation for published version (APA):
Jalil, R., Huber, J. W., Sixsmith, J., & Dickens, G. L. (2020). The role of interpersonal style in aggression and its containment in a forensic mental health setting: A correlational and pseudoprospective study of patients and nursing staff. *International Journal of Mental Health Nursing*, 29(3), 427-439. <https://doi.org/10.1111/inm.12677>

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**THE ROLE OF INTERPERSONAL STYLE IN AGGRESSION AND ITS
CONTAINMENT IN A FORENSIC MENTAL HEALTH SETTING: A
CORRELATIONAL AND PSEUDO PROSPECTIVE STUDY OF PATIENTS AND
NURSING STAFF**

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This study was part of author RJs PhD funded by St Andrew's Healthcare and the University
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Word Count: 5,151

ABSTRACT

Inpatient aggression on mental health wards is common and staff-patient interactions are frequently reported antecedents to aggression. However, relatively little is known about the precise relationship between aggression and these interactions, or their relationships with aggression and staff containment responses such as restraint and seclusion. This study aimed to determine the roles of anger and interpersonal style among mental health nurses and between nurses and patients in the occurrence of aggression and its containment. A correlational, pseudo-prospective study design was employed. $n=85$ inpatients and $n=65$ nurses were recruited from adult, low- and medium- secure wards of a secure forensic mental health service. Participants completed validated self-report anger and transactional interpersonal style measures. Inpatient aggression and containment incident data for a 3-month follow-up period were extracted from clinical records. Dyadic nurse-patient relationships were anti-complementary. Patients' self-reported anger and staff-rated hostile interpersonal style were significantly positively correlated; staff self-reported anger and patient-rated dominant interpersonal style were also positively correlated. Patient anger predicted aggression and their interpersonal style predicted being subject to containment in the form of restraint and seclusion. There were no statistically significant differences identified on measures between staff who were and were not involved in containment. More targeted intervention for patients' anger may have a positive impact on interpersonal style and lead to the reduction of incidents. Staff education and skills training programmes should emphasise the importance of interpersonal styles which could help to promote and enhance positive interactions.

Keywords: Aggression and violence, Anger, Interpersonal style, Seclusion, Restraint

Introduction

The identification of potentially aggressive patients in inpatient mental health settings has traditionally focused on their clinical presentation and demographic characteristics, often codified in comprehensive violence risk assessment tools (e.g., Douglas et al., 2013; Webster et al., 2009). In recent years, briefer instruments that aim to assess violence risk on a day-to-day basis rather than the more extended timeframes of the aforementioned tools have received attention (e.g., Almvik & Woods, 1998; Ogloff & Daffern, 2006), focusing on a smaller range of mostly visible, behavioural risk factors. Despite the focus on risk factors that can be viewed largely as emanating solely from the patient, a number of other variables are known to play a role in the risk of aggression including external and situational/interactional factors (Nijman, 2002). External aspects include lack of privacy, space, unit design and organisational routines while the situational/interactional category includes the *relationships between* staff and patients as precursors to aggression. While much of the treatment-focus in secure and forensic mental health services specifically is on psychopharmacological interventions and individual psychological programs, much of the day-to-day therapeutic care is based upon relationships, most frequently between ward-based nursing staff and patients (Stockman, 2005). As a result, and in this context, a focus on these relationships, the associated interactions, and their connections with characteristics of *both* patients and nurses is warranted. However, this is a neglected area of research (Daffern et al., 2012) and investigation of aspects of these relationships, therefore, has the potential to provide new insights into how to reduce conflict including aggression and violence.

Background

A role for staff-patient interactions in aggression is strongly evidence-based. Papadopoulos et al.'s (2012) meta-analysis of 71 studies found that staff-patient interaction

was the most frequently recorded of all antecedents with 39% of all incidents involving it as an immediate precursor; further, analysis of recordings of the nature of interactions strongly suggested that it is the application of limits by nursing staff through the denial of requests or enforcement of restrictions that is most implicated in the escalation of staff-patient conflict (Papadopoulos et al., 2012). Here, in order to identify the specific contribution made by the current study, we introduce the theoretical backdrop to the examination of interpersonal relationships in forensic and correctional settings.

Theoretical context

Based on Sullivan's (1953) Interpersonal Theory, Leary (1957) defined a range of interpersonal styles resulting from two orthogonal motivational dimensions; one of power and control (dominance vs. submission), and one of affiliation (hostility vs. friendliness). An individual's interpersonal style results from their implicit beliefs about the self and others along these two dimensions. Thus, for example, an individual's belief that he is powerful (*dominance*) coupled with a view of others as *hostile* is associated with a *dominant-hostile* interpersonal style. The four possible combinations of dimensionality (i.e., *Dominant Friendly*; *Friendly Submissive*; and *Submissive Hostile* in addition to *Dominant Hostile*) has been graphically portrayed as an interpersonal circle or circumplex (Kiesler, 1983) upon which degrees of intensity of interpersonal style within, and congruence between individuals can be measured (see *Figure 1*). The interpersonal circle model posits that individuals are predisposed to establish interactional relationships with other people whose own style reinforces their self-conceptualisation through its complementarity. The responses that are elicited from others' interpersonal style during interactions can be categorised as either: *complementary* whereby both persons' behaviours are corresponding on both dimensions (e.g., affiliation: friendly evokes friendly; control: dominant evokes submission); *acomplementary* whereby both persons' behaviour are corresponding on one dimension but

not the other; or *anticomplementary* whereby both persons' behaviours correspond on neither dimension. The use of Kiesler's (1983) interpersonal circle model facilitates testable hypotheses about the results of interactions between persons of similar or dissimilar interpersonal styles. Acomplementary and anticomplementary interactions are hypothesised to generate conflict in the relationship. Daffern et al., (2010) suggests that an acomplementary (e.g., assertive) rather than complementary (e.g., submissive) reaction typically occurs when staff members are confronted in an aggressive manner by patients who are attempting to secure a dominant position. The current study addresses this issue by examining the relationship between the degree of complementarity in the nurse-patient dyad and the level of patient aggression and subsequent containment.

Patients' interpersonal style as a source of conflict

Interpersonal style in secure forensic mental health settings is important because of the emphasis on all aspects of security. In the context of physical, relational, and procedural security arrangements it is important to understand how patients react to the denial of requests or to the demands placed on them relates to interactional outcomes. Research indicates that aggressive patients differ from nonaggressive patients in terms of their interpersonal style; further, that interpersonal style is associated with increased risk of violent behaviour, even whilst controlling for age, gender, length of stay, and presence of major mental disorder (Doyle & Dolan, 2006). In another study which used the same interpersonal measure (CIRCLE; Blackburn & Glasgow, 2006), Daffern et al. (2010) reported that a coercive interpersonal style, characterised by extremity in *both* hostility and dominance, was associated with more frequent aggressive and self-harming behaviour. On the other hand, Cookson et al. (2012) found that only the dominance scale of interpersonal style predicted aggression against staff. Further, interpersonal style may be independent of psychiatric symptomatology (Podubinski et al., 2012). The researchers evaluated the relationship

between a hostile-dominant interpersonal style and paranoia over a one-year period of hospitalisation and found that hostile-dominance remained stable over time even though symptoms of paranoia subsided. This finding reinforces the need to consider interpersonal style in risk assessment for inpatient aggression and highlights the need to develop targeted interventions to manage unhelpful styles in order to prevent aggression. Promisingly, Daffern et al., (2013) showed that the level of hostile-dominance can be reduced by relevant, *completed* treatment. Overall, while research on interpersonal style is in its infancy, further study is highly applicable to further understanding of inpatient aggression. Key questions addressed by the current study relate to the relationships between nurse-rated patient interactional style, notably hostility and dominance, and patients own self-reported anger, expressed aggression, and subjection to containment.

Nurses' interpersonal styles and their role in patient aggression and use of coercion

Research on nurses' interactional styles is scarce. Bilgin's (2009) self-report study found that nurses who reported less sociability reported more exposure to physical aggression, a finding in line with Whittington's (1994) suggestion that nurses who are perceived as socially distant can provide aversive stimulation for some patients, especially those who constantly demand nurses' attention. Further, nurses who are help-seeking reported more exposure to verbal aggression. This might arise from greater distrust by patients who experience dissonance as a result of the relatively greater deviation from usual style when using coercive methods.

One notable gap in the current literature pertains to whether nurses' interpersonal style is related to their use of coercive containment methods. The way in which nursing staff manage their own anger to prevent or manage patient aggression through their interpersonal style should be considered carefully, especially given that the use of coercive containment

methods is an indicator of the quality of inpatient treatment (Donat, 2003). Zijlmans et al., (2012) found that nursing staff who perceived patients' challenging behaviour as within their control (intentional) scored higher on the hostility and control subscales of a measure of interpersonal style. Chien et al. (2005) explored aggressive patients' experiences and resulting feelings about physical restraint. Patients reported negative effects of physical restraint which were, in their view, related to the attitudes and behaviours of the staff participating in the intervention. Patients felt that staff did not satisfy their needs for concern, empathy, active listening, and information about the procedure during and after its use. Whittington et al., (2012) investigated whether the first aggressive incident involving an individual patient is managed differently from subsequent incidents in terms of the degree of coercion used, concluding that repeated patient aggression increased the coerciveness of response suggesting that emotions generated in the first incident may play a role in 'upping the ante' on successive occasions. In the present study, key questions related to the nurses' patient-rated interpersonal style and their self-reported anger and involvement in coercive practices.

Study aim and hypotheses

The literature presented above suggests a need for the relationships between nurses and patients to be further explored in relation to aggressive incidents and the use of coercive containment. Therefore, the current study aims to measure self-reported anger and reciprocally-rated interpersonal styles in order to explore the relationship between complementary and anticomplementary nurse-patient interaction styles with aggression (in the case of patients) and with involvement in restraint and seclusion (nurses). Specific study hypotheses are that: i) self-reported patient anger will be positively associated with a nurse-rated hostile-dominant patient interpersonal style; ii) self-reported nurses' anger will be positively associated with patient rated hostile-dominant nurse interpersonal style; iii) higher

levels of patient hostile-dominance will be positively associated with the frequency of incidents of their aggression and iv) the frequency of their subjection to containment interventions; v) higher levels of an hostile-dominant interpersonal style of the nurse as rated by the patient will be positively associated with nurses' involvement in incidents of containment; and vi) keyworker-patient relationship dyads that deviate from complementarity will be positively associated with incidents of inpatient aggression and containment.

Methods

Settings and Participants

The study was conducted on the adult mental disorder pathway, gender-specific, medium- and low-secure wards at St Andrew's Healthcare, a United Kingdom provider of specialist mental health care. Eligible participants were inpatients residing on, and nursing staff working on, these wards. Patient participants were 18 years plus, diagnosed with one or more mental disorder (World Health Organisation, 2011). They were not eligible if they had a diagnosis of a neurocognitive or neurodevelopmental disorder, lacked capacity to consent, or were unable to speak English. Nurses were eligible if they were a recruited patient's designated keyworker since this was the measure ensuring that reciprocal rating was based on an objective criterion-related definition of 'a nurse-patient relationship'.

Design

A correlational, pseudo-prospective cohort design was employed to test the hypothesised relationship between self-reported anger and nurse-rated/patient-rated interpersonal style, as well as recorded incidents of aggression, physical restraint followed by seclusion, and physical restraint-only in the follow-up period.

Measures

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Novaco Anger Scale (NAS; Novaco, 2003)

The NAS is a 60-item measure comprising four subscales, each addressing one aspect of anger disposition: Cognition, Arousal, Behaviour, and Regulation. The response format is a 3-point unipolar visual analogue scale (1 = *Never True*, 2 = *Sometimes True*, and 3 = *Always True*); scoring produces subscale and total scores. The NAS was developed for use with various populations, including clinical forensic patients, and has excellent reliability (Cronbach's alpha .94), construct, and concurrent validity (Novaco, 2003).

Impact Message Inventory – Circumplex (IMI-C; Kiesler & Schmidt, 2006)

The IMI-C is a self-report inventory based on the assumption that the interpersonal style of one individual can be validly defined and measured by assessing the evoked covert reactions of another with whom they interact. It contains 56 items measuring eight categories of interpersonal behaviour: Dominant, Hostile-Dominant, Hostile, Hostile-Submissive, Friendly-Submissive, Friendly, and Friendly-Dominant (see *Figure 1*). Subscales each comprise seven statements concerning direct feelings, actions, tendencies, and perceived evoking messages in the respondent. Response is on a 4-point unipolar scale measuring the extent that 'each item accurately describes the impact a particular target person produced in him or her during an interaction' (Kiesler & Schmidt, 2006). A formula (See Appendix) is applied to calculate axis scores. The resulting points for each patient-nurse dyad are plotted, note taken of which of the four circle quadrants (friendly-dominant, friendly-submissive, hostile-submissive, hostile-dominant) each individual's interpersonal style is perceived by the other, and the deviation from complementarity of fit (maximum=12) from perfect (score=0) (Kiesler, 1983) of the dyad. Internal consistency of IMI-C subscales ranges from .69 to .85 indicating acceptable to very good reliability (Cortina, 1993).

Overt Aggression Scale (OAS; Yudofsky et al., 1986)

The OAS captures information about the frequency and severity of four categories of aggressive behaviour (verbal, physical against objects, self or others). Each category of aggression is scored on a criterion-based 5-point scale ranging from 0 (no aggression of this type) to 4 (most severe aggression of this type). Narrative accounts of all aggressive incidents were rated. Intraclass correlation coefficients of reliability for aggressive behaviours ranges from .77 to 1.00 (Yudofsky et al., 1986). Interrater reliability for this study was tested on all incidents and categorical agreement on aggression type was in the substantial range ($K = 0.74$).

Incidents of physical restraint and seclusion.

Details of all incidents of restraint or seclusion involving patient participants during follow-up were retrieved from hospital records and the following information noted: event involving restraint only or restraint *and* seclusion; involvement of the patient's keyworker. Data concerning patients and nursing staff participants were categorised dichotomously as either having been or not been subjected to/involved in either i) physical restraint not followed by seclusion; or ii) physical restraint followed by seclusion incidents during the 3-month follow-up period. The form on which event data is gathered 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.

Clinical and Demographic Characteristics

Patients' gender, age, self-reported ethnicity, admission/discharge date (length of stay), ward security level and ICD-10 diagnoses were extracted from clinical records. Also, a registered psychologist from each clinical team completed the Clinical Global Inventory-Severity (CGI-S; Busner & Targum, 2007) which is a 1-item measure (on a 7-point scale) to provide an overall clinician-determined summary measure of the patients' mental illness

severity. Nursing staff completed a demographic questionnaire relating to their gender, age self-reported ethnicity, length of service, nursing grade, and ward security level deployed in.

Procedure

The study was approved by 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. Patients and nursing staff were recruited between April 2013 and May 2015. Participants were given an information pack and provided written consent. Study questionnaires were completed in an interview in a quiet room on the ward (RJ). Interpersonal styles were measured using the IMI-C was completed by patient participants with the instruction to consider their interactions with their named keyworker; participant nurses to consider their interactions with the named patient. In cases where nurse participants were designated keyworker for two or more patients in the study, the scores were calculated as a mean from all relevant ratings.

In the study setting, clinical staff are required to make at least one narrative entry per patient per shift; in addition, each entry is electronically 'flagged' for occurrence of risk events under a number of categories. As a result, the EMR can be easily searched for all relevant flagged entries. Record entries flagged for relevant aggressive incidents in the 3-month period following participation were obtained and coded using the OAS. To reduce the number of aggression types analysed, aggressive outcomes were dichotomised for the presence or absence of aggression per patient during follow-up. 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 including all episodes of seclusion and restraint. These records were accessed in order to gather relevant information.

Data Analysis

Data were tested for normality of distribution; bootstrapping was applied where assumptions of normality were violated. This is a robust method to correct for bias by resampling with replacement and provides confidence intervals for a statistical parameter including the mean, odds ratio, correlation and regression coefficients (Field, 2013).

Descriptive statistics were calculated followed by inferential statistics. Independent *t*-tests were used to ascertain differences in self-reported anger and interpersonal style scores between patients who were and were not aggressive, and patient subjection/non-subjection to/nursing staff involvement/non-involvement in physical restraint-only, or in physical restraint followed by seclusion. The magnitude of difference in scores is denoted by the *t*-value converted into an *r*-value (Rosnow & Rosenthal, 2005) for an effect size, with the following thresholds: small (.20), medium (.30) and large (.50). Pearson's correlation was used to test the relationship between self-reported anger and nurse-rated/patient-rated interpersonal style subscales (IMI-C Hostile, IMI-C Hostile-Dominant, and IMI-C Dominant). A model that predicts patient aggression, patient subjection to/nursing staff involvement in containment, were tested with logistic regressions with predictor variables informed by the independent *t*-tests. Analyses were conducted using IBM Statistics version 22 for Windows (SPSS Inc., Version 22).

Results

Participant Clinical and Demographic Characteristics

In total, $N=150$ participants were recruited (See Table 1); $n=85$ patients (53% male) and $n=65$ nurses (70.8% female). Patients had been resident for 2.7 years on average ($SD = 2.6$) and were considered 'moderately ill' ($M [SD]=3.8[1.5]$) in terms of severity of mental disorder. Nurses were all ward-based; 49.2% had five years' plus experience and 72.3% had

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two to five years' experience. Thirty-eight (44.7%) patients exhibited aggression during follow-up and 11 were subject to containment. There were 85 unique nursing staff-patient relationship dyads. Eighteen nurses were the designated keyworker of two patients, and one nurse served this role for three patients.

>>Insert Table 1 about here<<

Association between anger and interpersonal style, and between aggressive and containment outcomes

Correlational analyses revealed positive associations between patients' self-reported anger and staff-ratings of the patient's hostile interpersonal style; and between nursing staff self-reported anger and the patient's rating of the keyworker's dominant interpersonal style (See Table 2).

>>Insert Table 2 about here<<

Scale scores for aggressive/non-aggressive patients, and for restrained/non-restrained were ascertained. Table 3 shows that aggressive patients had significantly higher NAS scores (more anger) than non-aggressive patients (small effect size). Table 4 shows that the logistic regression model was statistically significant ($\chi^2(1) = 6.17, p < .05$), explained 10% of the variance in aggressive incidents, and correctly classified 63.8% of cases. Sensitivity was 47.2%, specificity was 77.3%, positive predictive value was 62.9% and negative predictive value was 64.2%. Anger was a statistically significant predictor variable. Interaction terms were not significant $p > .05$, and thus did not violate the assumption.

>>Insert Tables 3 & 4 about here<<

As shown in Table 3, patients subjected to physical restraint had significantly higher NAS total and IMI-C Hostile-Dominant subscale scores than non-restrained patients.

However, those subjected to physical restraint-only (i.e. no seclusion) scored lower on *complementarity* (more 'near to perfect') than those not subjected. Table 4 shows the extent to which anger, complementarity and hostile-dominance interpersonal style predicted that patients will be subject to physical restraint-only. The Hosmer and Lemeshow test indicated that the model was an acceptable fit ($\chi^2 (3) = 5.94, p < .05$), explained 25% of the variance in physical restraint-only incidents, and correctly classified 95% of cases. Sensitivity was 0%, specificity was 100%, positive predictive value was 0% and negative predictive value was 95%. Of the three predictor variables, anger and hostile-dominant interpersonal style were statistically significant. Interaction terms were not significant $p > .05$, and thus did not violate the assumption. Collinearity diagnostics confirm that there were no concerns with multicollinearity (Average VIF = 1.03, Average Tolerance = 0.96).

Patients who were and were not subjected to physical restraint plus seclusion differed significantly on IMI-C Hostile subscale score (See Table 3), with those subjected scoring higher (more hostile) than those not subjected (small effect size). Table 4 shows that hostile interpersonal style predicted that patients would be subjected to physical restraint plus seclusion. The logistic model was statistically significant $\chi^2 (1) = 6.35, p < .05$, explained 17% of the variance in physical restraint and seclusion incidents, and correctly classified 93% of cases. Sensitivity was 14.3%, specificity was 100%, positive predictive value was 100% and negative predictive value was 92.9%. Patients' hostile interpersonal style was a statistically significant predictor variable. Interaction terms were not significant $p > .05$, and thus did not violate the assumption.

Scale scores for nursing staff involvement and non-involvement in containment (physical restraint-only, physical restraint plus seclusion) were ascertained prior to modelling the relevant predictor variables in a regression analysis. Table 5 shows that nurses who were

and who were not involved in either type of containment did not significantly differ on anger and interpersonal style measures.

Discussion

This study investigated relationships between staff and patient self-rated anger, perceived interpersonal style, and involvement in the use of restraint and seclusion (staff) or experience of that use of seclusion and/or restraint (patients). Hypothesis one, that self-reported anger would, for all participants, be related to others' ratings of their interpersonal style was supported. Patients' self-reported anger was positively related to nurse-rating of the patient's hostile interpersonal style, a finding contrary to previous research (Doyle & Dolan, 2006) which found that patients' interpersonal style was associated with increased risk of violent behaviour, but that the hostile subscale of the interpersonal measure did not correlate with self-reported anger. In the current study, however, it was found that patients' self-reported anger is in line with nurses' view of a more hostile interpersonal style in the patient. The first finding suggests that nurses can correctly gauge patient hostility to some extent simply from their clinical impression lending some credence to the face validity of nurses' judgements of patient hostility. Patient anger, however, was, the stronger predictor of aggression in this study, a finding which reinforces the importance of considering anger as a treatment need which, if successfully addressed, could minimise the way in which it is manifested in their interactions with nursing staff. Nursing staffs' own self-reported anger was positively related to patient-rating of nurses' dominant, but not hostile, interpersonal style. Thus, findings among nurses and patients of links between their self-rated anger and perceived interpersonal style were to an extent similar; though the manifestation of anger in nurses' observable behaviour may have been milder, or better controlled than for patients. One could further speculate that patients generally do not perceive individual nurses to be

hostile, but rather they perceive that it is the nurses' professional duty to sometimes assert dominance – sometimes in the form of coercive containment - in order to control situations. Nevertheless, self-awareness from nurses about their own anger and how this can impact on their interpersonal style could be helpful since the ability to temper one's natural dominant style could, where this is anti- or a-complementary to the patients' style, reap dividends in terms of reduced conflict.

The second hypothesis, that patients' hostile-dominant interpersonal style would be associated with i) inpatient aggression and ii) containment, was only partially supported. Aggressive patients had higher mean scores on Dominant, Hostile-Dominant, and Hostile subscales than non-aggressive patients but the difference was not statistically significant. This may have resulted from the absence of distinction in our data of reactive and instrumental aggression (Vitacco et al., 2008). The former may potentially have a stronger relationship with interpersonal style than the latter; if this is correct then incidents of instrumental aggression might mask truly significant differences. Analysis of patients' self-reported anger did, however, reveal a significant difference between aggressive and non-aggressive patients, and predicted aggression. Patients' self-reported anger, and a hostile-dominant interpersonal style predicted being subject to physical restraint-only (i.e. not plus seclusion). A hostile interpersonal style predicted being subject to physical restraint followed by seclusion. This finding suggests there clearly is a role for assessment of hostility/anger when judging risk and/or when planning to reduce restrictive measures for a patient. It is somewhat surprising that, although patients' interpersonal style did not predict aggression, it predicted patients subjected to containment. A possible explanation is that coercive action may have been taken against the patient where the exhibited aggression was, or had the potential to be, at a more severe level (i.e. physical aggression toward self and/or others). Prior de-escalation attempts

in such instances may have failed because of the patient's hostile-dominant interpersonal style (Whittington & Richter, 2005).

Hypothesis three, that nursing staffs' patient-assessed hostile-dominant interpersonal style would be associated with involvement in containment was unsupported. While nursing staff involved in containment had a higher dominant interpersonal style score than those not involved, the difference was not statistically significant. No staff variable predicted involvement in physical restraint with or without seclusion. It is likely that the simple fact of involvement in restriction measures is too simplistic or insensitive a measure to detect levels of relative over- or under- involvement in coercion. These activities are not entirely within the bailiwick of the individual nurse since they are generally delivered by a team.

Hypothesis four, that a relationship dyad characterised as deviating from complementarity would be associated with i) inpatient aggression and ii) patients subjected to containment, was not supported by the current findings. Paradoxically, patients who were aggressive, and who were subjected to seclusion, had lower complementarity scores (i.e. nearer to 'perfect complementarity'), than patients who were not aggressive or aggressive but not subjected to seclusion. This is a difficult finding to explain, though perhaps unsurprising given that restraint and seclusion are complex phenomena that are instigated and implemented by a team and it may not be possible to disentangle the effects of the patient-keyworker relationship from the other relevant variables.

In attempting to establish the characteristic nature of the relationship between nursing staff and patients, Kiesler's (1982) complementarity principle offers an indication of how conflict may be generated between two persons based on their interpersonal styles on two dimensions (i.e., affiliation and control). Studies have not yet attempted to investigate complementarity between nursing staff and patients in forensic mental health research. The

concept of therapeutic alliance (Cookson et al., 2012) which could be considered analogous to complementarity has, however, been studied. For instance, in order to establish mutual goals, tasks, and bonds (therapeutic alliance), a relationship that is characteristic of minimal conflict within interactions (complementarity) may, hypothetically, facilitate this process more effectively. The findings of complementarity in the current study revealed that the mean amount that relationship dyads deviated from complementarity (perfect complementarity = 0) was 2.93 [CI: 2.62, 3.44] out of a possible maximum score of 12.0. This suggests that individuals within the relationship dyad are not completely reciprocating on the control dimension (e.g., dominant nurse actions evoke submissive patient reactions, or submissive patient actions evoke dominant nurse reactions), and not completely corresponding on the affiliation dimension (friendliness evoke friendliness, or hostility evoke hostility in each other's reactions). However, the deviation from a perfect complementarity score found in this study is small. This finding is therefore interesting when considering staff-patient relationships in the context of therapeutic alliance, which can work as a catalyst for mental health recovery (Marshall & Adams, 2018).

Deviation from complementarity in relationship dyads did not predict both patient aggression *and* patients being subjected to containment. In accordance with this counterintuitive finding, Cookson et al., (2012) also found that a poor therapeutic alliance did not predict aggression. The current study highlights the need to further consider whether nursing staff-patient relationships are risk or protective factors in the occurrence of inpatient aggression, since findings thus far are inconclusive. However, several alternative possible explanations for this pattern of result of complementarity occur to us. First, it could reflect that decisions to restrain and seclude involve multiple dyad. A second explanation relates to the generally small mean deviation from perfect complementarity. It would be useful to know

at which deviation point incidents are more likely to occur, though of course it may be that skilled mental health nurses may already intuitively adjust their style to reduce dissonance.

Limitations

The most important limitation of this study is the investigation of only one nursing staff member per patient when, in reality, patients have interactions with many nurses. However, a systematic approach was taken to recruiting samples: respective key-workers were identified since they are likely to know the patient well and provide a more valid response to gauge patients' interpersonal styles. The reported incidents of aggression, or containment, may have involved other members of staff and not necessarily the identified key-worker. It is also important to note that the antecedents to patient aggression in this study may not solely be characteristic of staff-patient interactions. It is also possible that patient-patient interactions were antecedents (Papadopoulos et al., 2012) to the incidents in this study. The challenge is therefore to investigate complementarity to understand the nature of the relationship dyad consisting of aggressive patients and members of the ward team who have been frequently involved in the antecedent to an incident.

Further, due to working shift rotas, a proportion of sampled designated key workers could have been assigned to work night shifts during the three-month participation period. This means that there would inevitably be a limited opportunity for these particular members of nursing staff to be involved in incidents as patients would, supposedly, be asleep or in their bedroom for most of their working shifts. However, it is not uncommon for incidents to occur during night shift hours (Bradley et al., 2001). Future studies would need to overcome these challenges to establish the importance of complementarity, and nurses' interpersonal style, in inpatient aggression and its containment. It would be particularly useful if incident data

pertaining to patient aggression that was targeted specifically towards staff, is captured and used in the analyses to ascertain the role of nurses' interpersonal style.

Conclusion

This study set out to understand the interpersonal styles of both nursing staff and patients, and the characteristic nature of nursing staff-patient dyads, in relation to inpatient aggression and its containment. Despite much aggressive behaviour in mental health care settings arising from staff-patient interaction, the study of interactional aspects is limited. This study has revealed the relevance of patients' interpersonal style in both incidents of aggression and coercive containment. More targeted intervention for anger may have a positive impact on interpersonal style and lead to the reduction of incidents. The study has shown that the relationship between patients and a member of the nursing team is often not complementary. Staff education and training programmes which incorporate an understanding of interpersonal style and skills to manage relationships could help to promote and enhance positive communication between nursing staff and patients. Positive communication within nursing staff-patient relationships could have the potential to minimise the negative effects when coercive containment is required.

Relevance for clinical practice

The findings of this study have several possible implications. Firstly, patients' interpersonal style is relevant in incidents of aggression and its containment. Patient anger predicted incidents of aggression; however, both patient anger and interpersonal style predicted the occurrence of containment. This implies that anger-focused treatments, as anger may be underpinning the interpersonal style, may help to reduce aggressive behaviour or make sure it does not escalate to the point where coercive containment is required. Secondly, the examination of complementarity in this study could help to inform the managerial task of

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key-worker designation to achieve at least near to “perfect complementarity” for nursing staff-patient relationships as much as possible. This could enable the formation of better therapeutic alliances, though this remains a future research question. Finally, these findings could inform nursing staff training programmes. Equipping nurses with skills to manage patients’ interpersonal styles, and the recognition of their own (dominant) interpersonal style and anger, would help to reduce discomfort and problematic relationships.

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Table 1. Participant demographics and characteristics

Characteristics of participants N=150	n=85 patients n (%)	n=65 staff n (%)
Gender:		
Male	45 (53.0)	19 (29.2)
Female	40 (47.0)	46 (70.8)
Ethnicity:		
Caucasian	62 (73.0)	23 (35.4)
Black	16 (19.0)	39 (60.0)
Asian	7 (8.0)	1 (1.5)
Other	-	2 (3.1)
Primary diagnosis:		
Personality disorder	42 (49.4)	-
Schizophrenia spectrum disorder	38 (44.7)	-
Bipolar and related disorder	5 (5.9)	-
Role:		
Ward based clinical	-	53 (81.5)
Ward based with managerial responsibilities	-	12 (18.5)
Employment status:		
Full time	-	61 (93.8)
Part time	-	4 (6.2)
Security Level resided/worked on:		
Low secure	56 (65.9)	37 (56.9)
Medium secure	29 (34.1)	28 (43.1)
Length of service:		
<1 year	-	8 (12.3)
1-2 years	-	10 (15.4)
2-5 years	-	15 (23.1)
5-10 years	-	14 (21.5)
10+ years	-	18 (27.7)
Exhibited aggressive behaviour:		
No	47 (55.3)	-
Yes	38 (44.7)	-
Subjected to/Involved in^a physical restraint plus seclusion:		
No	78 (91.8)	36 (59.0)
Yes	7 (8.2)	25 (41.0)
Subjected to/Involved in^a physical restraint-only:		
No	81 (95.3)	42 (68.9)
Yes	4 (4.7)	19 (31.1)
Age years (Mean [SD])	34.1 [21.1]	41 [9.0]

^a n=61 because for n=4 staff participants it could not be identified in the Datix database whether they had or had not been involved in the coercive activity

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Table 2. Descriptive statistics for patients and nursing staff, and Pearson's *r* correlations between NAS and IMI-C subscales

Measure	Mean (SD)	95% CI	NAS Total ρ [95% CI]
NAS Total			
Patients	90.75 (15.87)	[87.3, 94.42]	-
Staff	71.33 (11.25)	[68.33, 74.03]	-
IMI-C			
Complementarity	2.93 (1.96)	[2.62, 3.44]	
Dominant			
Patients	1.79 (0.59)	[1.71, 1.93]	.15 [-.12, .39]
Staff	1.77 (0.66)	[1.62, 1.91]	.20 [0.0, .45]
Hostile-Dominant			
Patients	1.51 (0.49)	[1.42, 1.63]	.15 [-.06, .37]
Staff	1.49 (0.65)	[1.32, 1.74]	-.04 [-.22, .28]
Hostile			
Patients	1.59 (0.58)	[1.51, 1.71]	.28** [.10, .46]
Staff	1.46 (0.59)	[1.31, 1.63]	-.05 [-.22, .32]

** $p < .01$

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Table 3. Independent samples *t*-tests for patients' self-reported anger and staff-rated interpersonal style between exhibited/not exhibited aggression and containment methods

Patient aggression and patients subjected to containment								
Aggression								
Aggression (n=38) No aggression (n=47)								
M (SD) 95% CI M (SD) 95% CI t (df) P r								
NAS Total		95.52 (16.3)	90.42, 100.81	86.84 (14.5)	82.33, 91.41	-2.51(78)	0.01	0.27
IMI-C								
	Complementarity	2.78 (1.6)	2.33, 3.34	3.13 (2.3)	2.63, 3.84	.81(83)	0.40	0.08
	Dominant	1.90 (0.6)	1.72, 2.12	1.70 (0.6)	1.52, 1.91	-1.56(83)	0.12	0.17
	Hostile-Dominant	1.61 (0.5)	1.52, 1.81	1.43 (0.5)	1.32, 1.61	-1.63(83)	0.09	0.18
	Hostile	1.70 (0.7)	1.53, 1.91	1.50 (0.5)	1.42, 1.71	-1.64(83)	0.10	0.17
Physical restraint								
Subjected to (n=4) Not subjected to (n=81)								
NAS Total		105.50 (16.3)	93.05, 128.01	89.97 (15.6)	86.53, 93.42	-1.94(78)	0.03	0.21
IMI-C								
	Complementarity	2.23 (0.7)	1.54, 3.11	3.01 (2.0)	2.62, 3.41	.77(83)	0.04	0.08
	Dominant	1.75 (0.4)	1.31, 2.33	1.79 (0.6)	1.74, 1.91	-.39(83)	0.78	0.02
	Hostile-Dominant	2.00 (0.5)	1.33, 2.41	1.49 (0.5)	1.42, 1.63	-2.06(83)	0.02	0.22
	Hostile	2.21 (1.1)	1.01, 3.62	1.56 (0.5)	1.41, 1.72	-2.21(83)	0.20	0.23
Physical restraint plus seclusion								
Subjected to (n=7) Not subjected to (n=78)								
NAS Total		96.71 (18.5)	83.42, 110.61	90.17 (15.6)	86.6, 93.7	-1.04 (78)	0.36	0.12
IMI-C								
	Complementarity	2.31 (1.3)	1.42, 3.53	3.04 (2.0)	2.61, 3.53	.93(83)	0.17	0.10
	Dominant	1.89 (0.7)	1.41, 2.43	1.78 (0.6)	1.73, 1.94	-.49(83)	0.65	0.05
	Hostile-Dominant	1.79 (0.7)	1.32, 2.31	1.48 (0.5)	1.43, 1.62	-1.59(83)	0.23	0.17
	Hostile	2.18 (0.8)	1.61, 2.93	1.54 (0.5)	1.3, 1.72	-2.89(83)	0.03	0.30

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Table 4. Logistic regression models for patients' self-reported anger and staff-rated interpersonal style in aggression and containment outcomes using significant variables from t-tests

	B [95% CI]	OR (95% CI)
Aggression ^a		
Constant	-3.57 [-7.37, -0.84]	
NAS Total	0.04 [0.01, 0.08]	1.04 (1.01, 1.07)
Physical restraint only ^b		
Constant	-10.16 [-.385.34, -2.92]	
NAS Total	.005 [-0.00, 2.81]	1.05 (0.99, 1.12)
IMI-C Hostile-Dominant	1.71 [-1.24, 56.34]	5.53 (0.79, 38.65)
IMI-C Complementarity	-0.24 [-4.21, 0.44]	0.79 (0.41, 1.51)
Physical restraint plus seclusion ^c		
Constant	-5.11 [-10.02, -2.71]	
IMI-Hostile	1.47 [0.12, 3.32]	4.38 (1.36, 14.03)

^aNote. $R^2 = .07$ (Cox & Snell) .10 (Nagelkerke). Model $\chi^2(1) = 6.17$ $p < .05$

^bNote. $R^2 = .08$ (Cox & Snell) .25 (Nagelkerke). Model $\chi^2(1) = 6.70$ $p > .05$

^cNote. $R^2 = .08$ (Cox & Snell) .17 (Nagelkerke). Model $\chi^2(1) = 6.35$ $p < .05$

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Table 5. Independent samples *t*-tests for nursing staff' self-reported anger and patient-rated interpersonal style between involvement/non-involvement in containment methods

		Staff involved in containment				<i>t</i> (<i>df</i>)	<i>P</i>	<i>r</i>
		Physical restraint						
		Involved (<i>n</i> =19)		Not involved (<i>n</i> =42)				
		<i>M</i> (<i>SD</i>)	95% <i>CI</i>	<i>M</i> (<i>SD</i>)	95% <i>CI</i>			
NAS Total		69.42 (8.9)	65.32, 73.51	70.95 (12.0)	67.33, 74.54	.49(59)	0.59	0.06
IMI-C								
	Dominant	1.85 (0.8)	1.52, 2.21	1.76 (0.6)	1.62, 2.04	-.46(59)	0.66	0.06
	Hostile-Dominant	1.69 (0.7)	1.44, 2.01	1.43 (0.6)	1.32, 1.71	-1.41(59)	0.19	0.18
	Hostile	1.62 (0.7)	1.31, 2.04	1.42 (0.6)	1.32, 1.61	-1.91(59)	0.27	0.15
		Physical restraint plus seclusion				<i>t</i> (<i>df</i>)	<i>P</i>	<i>r</i>
		Involved (<i>n</i> =25)		Not involved (<i>n</i> =36)				
		<i>M</i> (<i>SD</i>)	95% <i>CI</i>	<i>M</i> (<i>SD</i>)	95% <i>CI</i>			
NAS Total		70.72 (10.8)	67.03, 75.32	70.30 (11.3)	66.72, 74.01	-.14(59)	0.88	0.02
IMI-C								
	Dominant	1.66 (0.4)	1.53, 1.81	1.88 (0.8)	1.72, 2.23	1.25(59)	0.17	0.17
	Hostile-Dominant	1.37 (0.5)	1.21, 1.53	1.61 (0.8)	1.41, 1.92	1.42(59)	0.12	0.17
	Hostile	1.36 (0.4)	1.23, 1.53	1.56 (0.7)	1.43, 1.82	1.29(59)	0.17	0.21

Appendix

Impact Message Inventory-Circumplex (Kiesler & Schmidt, 2006)

Axis scores measure the two dimensions that constitute the axes of the interpersonal circle: Control (dominance-submission) and Affiliation (friendless-hostility). The following mathematical formulas are applied using the subscale scores to calculate the axis scores:

$$\text{CONTROL} = \text{Dominance} - \text{Submissive} + .707(\text{Hostile-dominance} + \text{Friendly-dominant}) - .707(\text{Hostile-submissive} + \text{Friendly-submissive})$$

$$\text{AFFILIATION} = \text{Friendly} - \text{Hostile} + .707(\text{Friendly-dominance} + \text{Friendly-submissive}) - .707(\text{Hostile-dominance} + \text{Hostile-submissive})$$

The Control and Affiliation axis scores for each individual in the dyad are used to calculate a complementarity score in the following two steps:

Step 1. Absolute scores (ABS) on control and affiliation for each individual are calculated. Subscripts ¹ and ² refer to the IMI-C scores of each individual.

$$\begin{aligned} \text{ABS}_c &= \text{ABS} (\text{CONTROL}^1 + \text{CONTROL}^2) \\ &= \text{ABS} [(\text{DOMINANCE}^1 - \text{SUBMISSIVE}^1) + (\text{DOMINANCE}^2 - \text{SUBMISSIVE}^2)] \end{aligned}$$

$$\begin{aligned} \text{ABS}_a &= \text{ABS} (\text{AFFILIATION}^1 - \text{AFFILIATION}^2) \\ &= \text{ABS} [(\text{FRIENDLY}^1 - \text{HOSTILE}^1) - (\text{FRIENDLY}^2 - \text{HOSTILE}^2)] \end{aligned}$$

Step 2. The absolute scores from the previous step are used to calculate the three complementarity scores: control, affiliation and total.

$$\begin{aligned} \text{COMP}_c &= \text{ABS}_c \\ &= \text{ABS} (\text{CONTROL}^1 + \text{CONTROL}^2) \end{aligned}$$

$$\begin{aligned} \text{COMP}_a &= \text{ABS}_a \\ &= \text{ABS} (\text{AFFILIATION}^1 - \text{AFFILIATION}^2) \end{aligned}$$

$$\text{COMP}_{\text{tot}} = \text{ABS}_c + \text{ABS}_a$$