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Safewards: the empirical basis of the model and a critical appraisal

L. BOWERS[1] RMN PhD, J. ALEXANDER[11] RMN PhD, H. BILGIN[12] PhD,
M. BOTHA[13] MSc, C. DACK[6] PhD, K. JAMES[2] BSc(Hons) MSc,
M. JARRETT[5] BSc MSc RMN, D. JEFFERY[8] BA, H. NIJMAN[14] PhD,
J. A. OWITI[9] RMN PhD, C. PAPADOPOULOS[10] PhD, J. ROSS[7] BSc,
S. WRIGHT[3] BSc(Hons) Dip Psychol PG Dip MSc & D. STEWART[4] BA PhD

[1]*Professor of Psychiatric Nursing,* [2]*Research Assistant,* [3]*Research Assistant,* [4]*Research Fellow, Section of Mental Health Nursing,* [5]*Research Assistant, HSPR, Institute of Psychiatry, Kings College London,* [6]*Research Associate,* [7]*Research Associate, Department of Primary Care and Population Health, University College London,* [8]*Trainee Occupational Therapist, Brunel University, London,* [9]*Postdoctoral Research Fellow, Queen Mary Westfield College, University of London, London,* [10]*Senior Lecturer in Public Health, University of Bedfordshire, Belford, UK,* [11]*Director of Undergraduate Studies, Irish College of Humanities and Applied Sciences, Limerick, Republic of Ireland,* [12]*Associate Professor, Florence Nightingale School of Nursing, Istanbul University, Turkey,* [13]*Independent clinical psychologist, Stellenbosch, South Africa, and* [14]*Professor, ACSW/faculteit der sociale wetenschappen, Radboud University, Nijmegen, Netherlands*

Accessible summary

- In the previous paper we described a model explaining differences in rates of conflict and containment between wards, grouping causal factors into six domains: the staff team, the physical environment, outside hospital, the patient community, patient characteristics and the regulatory framework.
- This paper reviews and evaluates the evidence for the model from previously published research.
- The model is supported, but the evidence is not very strong. More research using more rigorous methods is required in order to confirm or improve this model.

Abstract

In a previous paper, we described a proposed model explaining differences in rates of conflict (aggression, absconding, self-harm, etc.) and containment (seclusion, special observation, manual restraint, etc.). The Safewards Model identified six originating domains as sources of conflict and containment: the patient community, patient characteristics, the regulatory framework, the staff team, the physical environment, and outside hospital. In this paper, we assemble the evidence underpinning the inclusion of these six domains, drawing upon a wide ranging review of the literature across all conflict and containment items; our own programme of research; and reasoned thinking. There is good evidence that the six domains are important in conflict and containment generation. Specific claims about single items within those domains are more difficult to support with convincing evidence, although the weight of evidence does vary between items and between different types of conflict behaviour or containment method. The Safewards Model is supported by the evidence, but that evidence is not particularly strong. There is a dearth of rigorous outcome studies and trials in this area, and an excess of descriptive studies. The model allows the generation of a number of different interventions in order to reduce rates of conflict and containment, and properly conducted trials are now needed to test its validity.

Background

In a previous paper, we describe in detail a new model of conflict and containment on psychiatric wards (the Safewards Model). By conflict we mean events that threaten staff or patient safety, including verbal abuse, physical aggression to others, self-harm, suicide, absconding, etc.; and by containment we mean those things staff do in order to prevent these events from occurring or minimizing the harmful outcomes, including the use of extra sedating medication, special observation, manual restraint, seclusion, etc. Wards vary up to tenfold or more in their rates of conflict and containment. Understanding the reasons for these differences offers the opportunity of devising ways to reduce the frequency of risky and harmful events, therefore keeping patients and staff safer.

The Safewards Model identifies six originating domains which are the key influences over conflict and containment rates: the patient community, patient characteristics, the regulatory framework, the staff team, the physical environment, and outside hospital. These domains naturally give rise to flashpoints which can trigger conflict and/or containment. The model describes both patient and staff modifiers that can influence the originating domains, their capacity to give rise to flashpoints, the connection between flashpoints and conflict, and the connection between conflict and containment. In this paper, we describe the evidence underpinning the Safewards Model. The model applies primarily to acute psychiatric wards providing time limited care to admissions of severely and acutely mentally ill people from the community. The sources of evidence drawn upon in devising this model related primarily to this type of ward and this client group. However, the model may also be applicable to some degree to forensic inpatient wards, rehabilitation wards, adolescent wards, and with some modifications to wards for children and to wards for older people.

Our sources of evidence are threefold. First, we draw upon a large cross topic literature review we conducted on all conflict and containment items.

Previous literature reviews on conflict and containment have focused on single items, for example violence only, or absconding only. Instead, we review empirical research literature across all types of conflict and containment in inpatient psychiatric settings. Given the paucity of relevant randomised controlled trials (RCTs), this review encompassed all empirical research literature on inpatients, mainly in English, and published from 1960 onwards. This task was so enormous it spanned many years before completion, running from 2005–2012, and in total, 1181 papers were included in the review. The second major source of our thinking was our own research programme

into conflict and containment. This programme commenced in 1996 and continues to date. More recently it has included several very large-scale studies, and has resulted in over 100 peer reviewed publications. The third source was reasoned thinking and integrative gestalt. Given the research findings available, their diversity, age, and the methodologies used, there are very few certainties in the field. Many more studies, especially of interventions and with controls will be required before findings converge. Thus, the Safewards Model seeks to integrate the most likely causes and extrapolate slightly from them into to produce a cohesive and comprehensive picture. The model is therefore speculative and is a tentative proposal rather than a final, comprehensive, solid, established evidence-based conclusion.

Evidence for the Safewards Model by originating domain

Staff team

Our own programme of research has consistently demonstrated the importance of structure (routine and rules for patient conduct) as an important determinant of conflict and containment rates. The City-128 study, a large-scale multivariate cross-sectional study, found that structure was more firmly and consistently related to conflict and containment rates than was the positive appreciation of patients (Bowers 2009). Further analysis showed that while structure was most influenced by teamwork, attitudes to patients were influenced by structure, rather than both varying together or the reverse (Bowers *et al*. 2007c). The Tompkins Acute Ward (TAWS) longitudinal study also affirmed the importance of structure, as structure predicted subsequent conflict rates on wards (Bowers *et al*. 2007b). A study of prison officers in a specialist unit for personality disordered inmates showed that a consistent ideology and purpose had a strong influence over positive staff attitudes (Bowers *et al*. 2003b). During the TAWS study, a new measure of ward structure was trialled. While this did not prove to be successful, factor analysis of the questionnaires revealed dimensions relating to the cleanliness and tidiness of the ward, and to the efficient operation of the ward as a care delivering organizational unit (Bowers 2007). The measures of structure used during the City-128 and TAWS studies were the Ward Atmosphere Scale (Moos 1974) sub-scores of 'order and organization' and 'programme clarity'. These went beyond rules and routines, and included elements of ideology and of efficient organization and their association with conflict and containment rates (Bowers *et al*. 2009a, 2012b) also support a broadening of the concept of structure beyond rules and routines.

There is also clear evidence that choice of containment methods for the management of conflict behaviours was culturally local: some hospitals in the UK not using seclusion (Bowers *et al.* 2010b, 2011b); hospitals in other countries using mechanical restraint (Bowers *et al.* 2007d). This evidence indicated that containment choice was perhaps a matter of custom and practice, tradition, at particular locations. That body of staff 'custom and practice' could also be included under the umbrella term 'internal structure', now including: rules; routines; efficient organization; cleanliness and tidiness; ideology/direction; and custom and practice. The way in which that internal structure produces calmer wards was identified as: the production of internal psychological clarity for patients; a greater sense of safety in relations to threatening and frightening other patients; a greater sense of predictability of the environment, reducing anxiety and defensive aggression; a greater sense of purpose in being on the ward; and greater ward stability allowing more therapeutic activities to take place (Bowers 2002).

Support for structure as important in the generation of violence is strong in the wider literature. Three common circumstances acting as antecedents to patient violence were consistently found in the literature: denial of a patient request by the staff; staff demand that the patient act in some way; staff request that the patient desist from some action. More than half of all papers reporting quantitative evidence on antecedents to violent behaviour cited these as a factor, and meta analysis suggested that patient–staff interaction contributes to 39% of patient violence (Bowers *et al.* 2011c). The same review covered quantitative and qualitative staff and patient perceptions on the nature, function, and consequences of violent behaviour on the ward. That review provided strong confirmatory evidence on limit setting, staff demand, and request denial as antecedents. It also showed that in the perception of staff aggression was linked to:

- poor staff patient communication, lack of interaction skills
- disrespectful, rude, and/or authoritarian staff behaviour
- boredom and lack of meaningful activity

Limit setting, staff demand, and request denial also act as antecedents to self-harm by patients (James *et al.* 2012). These factors clearly reflect the structure in terms of rules, routines, and ideology (meaningful activity), moreover they show that it is the way in which staff implement and impose the ward structure that can have a critical impact on the generation or avoidance of aggressive behaviour.

Interviews of patients and staff about the causes of patient violence gave strong support to the importance of positive appreciation, emotional regulation, teamwork skill, technical mastery, moral commitments, and effective structure in avoiding violent incidents (Lowe 1992, Finnema *et al.* 1994, Bensley *et al.* 1995, Bond & Brimblecombe 2004, Spokes *et al.* 2004). Ethnographic studies combining interviews and observation told a similar story, supporting the importance of positive appreciation, emotional regulation, technical mastery, and effective structure. In a particularly important study, participant observation coupled with interviews of 131 staff (mainly psychiatrists and doctors) collected over 38 months on four acute and two chronic wards (Katz & Kirkland 1990), led to the conclusion that violence was more common in wards with unclear staff functions, and activities/events or other patient–staff interactions were unpredictable. Violence was less frequent in wards with strong psychiatric leadership, clear staff roles, and events which were standardized and predictable (effective structure). Staff on peaceful wards were able to remain calm and help patients manage their own behaviour (emotional regulation). These findings were the result of an in-depth ethnographic study by a research anthropologist, including working on the wards, recording observations, shadowing of psychiatrists and managers, interviews, attendance at meetings, etc.

Staff surveys, some coupled with correlations on violent incident rates, also supported the causal role of positive appreciation, emotional regulation, effective structure, and technical mastery (Bowers *et al.* 2011c). Our own large cross-sectional multivariate study (Bowers *et al.* 2009a) on 136 acute wards found an inverse association between structure and the incidence of physical assault (but not aggression to objects or verbal abuse). There are a number of intervention studies on violence prevention in the literature; however the design of the majority of these was weak, being before and after studies without controls, with short outcome periods and on small numbers of wards. Interventions were often complex packages and not fully described. It can be said that those interventions incorporating elements of positive appreciation, emotional regulation, and effective structure tended to be successful, however most published studies had a positive outcome and publication bias must be suspected. Only two RCTs are reported in the literature, one based on risk assessment followed by nursing action (from de-escalatory activities through to severe containment, with a positive outcome (Abderhalden *et al.* 2008), the other in which the intervention was a reporting system, found increases in violence in the experimental group (Arnetz & Arnetz 2000).

Some support was also found in a literature review on ward rules (Alexander & Bowers 2004). Although most studies had small sample sizes, several provided supporting evidence that patients were calmer and less disruptive on wards with clear rules, consistent rules, and clear roles for staff (another way of stating ward ideology). Several other

studies made the case that nurses interactions with patients could trigger difficult behaviour when the rule imposed was arbitrary, or the mode of imposition was threatening, insulting, or critical. Other studies made a link between nurses' response to rule breaking and their judgements of patients' moral responsibility, with more punitive responses evident when patients were judged to be in control of their behaviour rather than the behaviour being symptomatic of their illness, thus indicating links between nurses moral commitments and patient behaviour around rules. Alexander's subsequent PhD (Alexander 2005) reported a detailed study of two wards and their practices, based on ethnographic observation coupled with interviews of patients and staff. She found that rule clarity, consistency, and flexibility were important in producing a calm ward. Barriers to this were reported to be particularly threatening and intimidating patients; ambivalence on the part of staff to the exercise of power; poor nurse practices around rule communication and enforcement (arbitrary, unpredictable, and humiliating for patients).

Review of the literature on absconding yielded no evidence supporting the importance of structure and the way that nurses instantiate it (Bowers & Stewart 2010). In our own research, interviews of absconded patients did cite boredom and lack of meaningful activity as a reason for absconding (Bowers et al. 1999); however most reasons for absconding were unrelated to structure. Reviews of substance and alcohol use by inpatients found no evidence relating to internal structure (Bowers & Jeffery 2008), as did the review of inpatient suicide (Bowers et al. 2009b). A review of medication refusal also found no evidence additional to our own study showing a statistical association between good ward structure and lower rates of medication refusal, controlling for all other variables (Baker et al. 2009). Review of the literature on self-harm (James et al. 2011) did locate evidence for the importance of structure. As already stated, demands, limit setting, and denials of requests were found to provoke self-harm as well as violence. In addition, several studies supported the significance of interaction skill (technical mastery), teamwork, and emotional regulation in efforts to reduce the frequency of self-harm. Our own research (City-128) has found that a larger number of patient activities, contributing to routine and ideology/purpose, were associated with lower rates of self-harm on wards (Bowers et al. 2008).

In reviews of containment, the literature on special observation (Stewart et al. 2010) yielded no evidence, as did that on mechanical restraint (Stewart et al. 2009b). The review of manual restraint (Stewart et al. 2009a) also yielded no evidence, but our own research (City-128) showed structure was associated with lower restraint use (Bowers et al. 2012b). Similarly, the literature on psychiat-

ric intensive care unit (PICU) care (Bowers 2006) provided no direct evidence, although our own research indicated that greater anxiety on the part of acute ward nurses resulted in more transfers to PICU being seen as appropriate (Bowers et al. 2003c), thus evidencing the importance of emotional regulation. In addition, our most recent analysis of the City-128 data showed the availability of a PICU, or transfers to it, had no impact on conflict rates on associated acute wards (Bowers et al. 2012a). One study of seclusion found that nurses' moral judgements of patients ability to control their behaviour, that is, nurses psychological understanding of that behaviour, influenced nurses' decisions to use it (Leggett & Silvester 2003). This is an evidence for the ways that nurses implement structure, particularly the moral commitments and psychological understandings that underpin their choice of response, being important factors. Three other seclusion studies indicated that nurses' anxiety and fear increased their propensity to use seclusion, thus providing evidence that nurses' emotional regulation impacts upon their implementation of structure and the management of disturbed behaviour (Fisher 1995, Daffern et al. 2003, Parkes 2003). The seclusion review (Van Der Merwe et al. 2009) also located numerous studies that provided supporting evidence that staff training in interaction skill (technical mastery) could contribute to significantly reducing rates, again supporting the idea that the way in which nurses implement the structure is critically important. The evidence on teamwork and cohesiveness was more mixed, with evidence supporting both a positive and negative impact on seclusion rates. Only two studies identified by the seclusion review provided evidence specifically on ward rules, however evidence was again divided: in one the studies, clarity around ward rules and expectations was part of an intervention package that led to reduced seclusion (Mistral et al. 2002), in another a similar intervention as part of another package resulted in increased seclusion (Morrison et al. 2002).

Physical environment

Different and distinct features of the physical environment of wards have a bearing on the frequency of various conflict and containment behaviours.

Having the ward permanently locked is associated with decreased absconding, showing physical security measures are important (Nijman et al. 2011); but increased aggression (Bowers et al. 2009a), self-harm (Bowers et al. 2008), and medication refusal (Baker et al. 2009) controlling for all other factors. The nature of the connection between the locked doors and conflict behaviours has been demonstrated to be the sense of imprisonment and confinement, the identification of the ward as a prison by patients,

increased resentment fuelling non-cooperation, and plummeting self-esteem through social exclusion and stigmatization (Muir-Cochrane & Bowers 2011). A better quality physical environment is associated with decreased absconding (Nijman *et al.* 2011), possibly because it is more pleasant and/or expresses respect for patients and builds self-esteem.

The complexity of the ward layout also has some effect, although the evidence for this is indirect. It is known that suicides are more likely to be attempted in the private areas of the ward, such as bedrooms, bathrooms, and toilets (Bowers *et al.* 2010a), thus the more such areas there are, the higher the risk. Higher rates of intermittent observation are associated with lower rates of self-harm (Bowers *et al.* 2008), a number of suicide attempts are prevented from being completed by discovery during intermittent observation (Bowers *et al.* 2011a), and rates of intermittent observation are in a dynamic relationship with other features affecting the capacity to observe patients (Stewart & Bowers 2012). Together, these findings indicate a negative effect for a complex ward environment.

Finally, the physical environment can either provide for certain conflict and containment events, or make them much less available as options for patients of staff. In relation to suicide, many UK wards have significantly reduced the availability of ligature points. Inpatient suicides are most likely to be by hanging (Bowers *et al.* 2010a), and it is known that reducing the availability of the means of suicide is an effective strategy. The numbers of inpatient suicides have reduced in England and Wales as ligature points have been removed (Appleby *et al.* 2006). There is greater certainty that the availability of different types of containment has a big impact on their usage. The relative availability of seclusion rooms (Bowers *et al.* 2010b) and Psychiatric Intensive Care (Bowers *et al.* 2012a) is strongly associated with how frequently they are used. Extrapolating from this, we may assume that the use of extra care/intensive care areas on the wards depends strongly on the provision of purpose designed ward rooms, and that the availability of comfort, or sensory, or de-escalation, or quiet rooms might similarly shape the usage of such strategies to managed disturbed and agitated patients.

Outside hospital

Events and relationships outside hospital also have an impact on ward conflict and containment rates. Evidence for this exists for multiple types of conflict and containment. A range of external issues are linked to violence, including lack of access to money, unresolved family problems, distressing news from outside the hospital, visits from family members or friends, accounting for approximately 3% of violent incidents (Bowers *et al.* 2011c). Suicide while on leave has also been linked to unresolved family problems (Bowers *et al.* 2010a), while absconding can be motivated by the desire to see family and friends, to meet family responsibilities, to check on home accommodation (Bowers *et al.* 1999). A successful absconding reduction intervention incorporated action on some of these issues (Bowers *et al.* 2003a). Prospective discharge may also be linked to inpatient suicide, where the patient concerned is leaving for less valued accommodation (Bowers *et al.* 2010a). For others, the prospect of being discharged represents a loss of supportive friendships from staff and patients, plus demands on their self-care skills which may have become atrophied during a hospital stay, also known as institutionalization (Jones *et al.* 2010). Access to substances and or alcohol while a patient is on leave or absconded are often blamed for intoxication on the ward, and its accompanying conflict and containment sequelae (Bowers *et al.* 2011c). Ward security policies seek to prevent patients from importing any items with which they might harm themselves or others (Bowers *et al.* 2002), although there is little research evidence on their efficacy. Evidence for the influence of factors outside the hospital is sparse, and restricted to conflict; nevertheless it is persuasive.

Our self-harm review also found evidence for the impact of factors outside of hospital. One paper found that 'external factors' were reasons for 19.77% (*n* = 207) incidents of self-harm, this included anniversaries of traumatic life events and seasonal events (Beasley 1999). Another study found that family matters featured in 3.2% (*n* = 10) of incidents, and the loss of a friend or relative in 3.2% (*n* = 10) of incidents (Mannion 2009). The 'permeability' of acute wards to influences from outside have been identified in ethnographic research (Quirk & Leliott 2002, Quirk *et al.* 2004).

Patient community

The role of patients and interactions within the patient community in the generation of conflict and containment has not so far received the attention it deserves. One large marker of how important this is comes from our meta-analysis of the violence literature. A quarter of violent incidents among inpatients are preceded by patient–patient interaction (Bowers *et al.* 2011c), including: physical contact; intrusion into personal psychological or physical space; reaction to sexual approach; miscommunication; victim doing something patient wanted stopped; competition; retaliation; and teased. Common among these situations are bullying between patients (Ireland 2006) and stealing of each other's' property or property damage

(Jones *et al*. 2010). Moreover, there is significant evidence for contagion between patients, with the conflict behaviour of one eliciting conflict from another. At its simplest, this would be defensive aggression from a patient who is under attack from a fellow patient. However, this also includes:

- Copycat activity in relations to suicide, where several case studies of repetition by fellow patients using the same method are documented in the literature (Bowers *et al*. 2009b).
- Absconds triggered by fear of fellow patients (Bowers *et al*. 1999)
- Drug or alcohol consumption from substances passed or sold from patient to patient (Phillips 2006)

General evidence for contagion is provided by several studies, including one large study of officially reported adverse incidents showing that the occurrence of one on a ward makes another more likely within the same week (Weaver *et al*. 1978, Bowers *et al*. 2007a). In addition, many studies of the timing of violent incidents during the day or by day of the week suggest that peaks occur during activities or at times of the day when patients have to interact, for example during meal times (Bowers *et al*. 2011c). Several studies also show an association between admissions to the ward and conflict (Bowers *et al*. 2007a, 2009a, Nijman *et al*. 2011). While this might reflect the disturbed behaviour of newly admitted severely ill patients, an additional mechanism might be the anxiety caused to other patients by the introduction of a new and therefore unpredictable person into the patient community.

It is not a large step to extrapolate from the staff-related findings that similar factors determine the degree to which patient community factors are likely to generate conflict. For example, the psychological understanding of patients for each others' behaviour, their ability to control; their own anxiety and irritation, their moral commitments and values as human beings, and their technical mastery of social interaction. In addition, we know that mutual support is extremely important to inpatients (Jones *et al*. 2010), and this may be an additional mediator of the capacity for patient–patient interactions to give rise to conflict. Personal clinical experience suggests that patients frequently intervene as third parties to de-escalate disputes between each other or to prevent other harm arising through simply managing each other's behaviour.

Taking this one step further still, staff can have a significant impact on how patients interact with each other. They can do so by role modelling de-escalating interventions, making interpretations of patient's behaviour to other patients to help expand their psychological understanding, and give information and explanations about psychiatric symptoms. What is more, the capacity for patients to copy each other's conflict behaviours can sometimes be prevented by removal of the means to do so, and staff presence means that all these mechanisms can be deployed at the earliest stages of any arguments between patients.

Patient characteristics

These emerged as a consistent theme in the reviews. Several demographic features were fairly consistently associated with conflict behaviour and being subject to containment. Table 1 displays the main patient characteristics exhibiting some degree of consistent association with conflict and containment. In the table, 'no information' indicates an absence of evidence, 'insufficient information' indicates too few studies and possibly contradictory findings, and 'mixed' indicates plainly contradictory findings across a number of studies. Identifying links with diagnosis was particularly challenging due to the different systems used and variations in the way information was repeated. However, it is clear that schizophrenia is associated with conflict and containment, and to a lesser degree so are manic states. In the 'other diagnosis' category, the most frequently evidenced was personality disorder, although the evidence was, overall, weak. Apart from self-harm and suicide, where the link was positive, depressive symptoms were inversely associated with conflict or containment when this was reported. It is also clear from the table that conflict and containment are fairly consistently associated with younger age, male gender, a diagnosis of schizophrenia, and formal detention (these factors were supported by meta-analysis in the case of aggression). Indicative evidence suggests that such events are also associated with being unmarried, unemployed, and previously admitted to psychiatric hospital. Ethnic minority status was not systematically associated with conflict or containment. There was insufficient evidence to determine any pattern of associations with accommodation type outside hospital, physical health problems or disabilities, specific medications or medication types, previous criminal convictions or legal involvement.

Our specific literature review on violence and aggression showed a strong meta-analytic finding that patient symptoms were antecedents in 28% of violent incidents, indicating the importance of patients' illness generically, rather than in relation to specific diagnoses. (Bowers *et al*. 2011c). The same review covered quantitative and qualitative studies of staff perceptions of the causes of aggression, also highlighting the role of patient illness and their symptoms in the generation of aggressive behaviour. Severity and duration of illness were also found to be important causal factors in a review of inpatient suicide research (Bowers *et al*. 2009b).

Table 1
Literature review findings on conflict/containment and patient features

Conflict of containment item	Younger age	Male gender	Ethnic minority	Unmarried	Employment & education	Schizophrenia	Affective disorder	Other diagnosis	Formal detention	Previous admissions
Violence	Yes	Yes in acute, but not in forensic	No	Yes	No (education), insufficient information (unemployment)	Yes	No	No	Yes	Yes
Substance use	Yes	Yes	Mixed	Insufficient evidence	No information	Insufficient information	Insufficient information	Insufficient information	No information	Yes
Absconding	Yes	Yes	No	Mixed	Yes (unemployment)	Yes	No	Yes	Yes	No information
Medication refusal	Mixed	No	No	No	Yes (unemployment)	No	No	No	Mixed	Yes
Self harm	Yes	Mixed	Mixed	No	Insufficient information	Yes (attempted suicide)	Yes (attempted suicide)	Yes (self-harm)	Mixed	Insufficient evidence
Suicide	No	No	No	No	Mixed	Yes	Yes	No	No	Mixed
PRN medication	Mixed	Mixed	Yes	Insufficient evidence	Insufficient evidence	Yes	Yes (mania)	No	Insufficient evidence	No information
Coerced medication	Insufficient evidence	Insufficient evidence	No	No	No information	Mixed	Insufficient information	Insufficient information	Yes	Yes
Mechanical Restraint	Mixed	No	No	Insufficient evidence	No information	Mixed	Mixed	Mixed	Yes	No information
Manual restraint	Insufficient evidence	Yes	No	Insufficient evidence	No information	No	No	No	Yes	No information
Psychiatric Intensive Care	Yes	Yes	Yes	Yes	Yes (unemployment)	Yes	Yes (mania)	No	Yes	Insufficient evidence
Seclusion	Yes	No	No	Mixed	Mixed	Yes	Yes (mania)	No	Yes	Mixed
Special observation	Insufficient evidence	Opposite (females more likely)	No	Yes	No information	Insufficient information	Insufficient information	Insufficient information	Yes	No information

Where it is available, evidence on repeaters (patients who engage in the same conflict behaviour or who are subject to the same containment method more than once during their admission) identifies similar demographic features distinguishing them from the 'once only' patients. In comparison to once only absconders, repeaters tended to be young, male, and formally detained (Bowers & Stewart 2010). Repetitive violence was associated with male gender (Bowers *et al*. 2011c). However for self-harm, repetition was associated with female gender and diagnosis of personality disorder (James *et al*. 2011). While our literature review highlighted the importance of repeaters in contributing to rates on wards, few studies reported specific information identifying this group. Where there was evidence, findings affirmed the validity of the associations between these demographic features and conflict and containment.

Regulatory framework

In the systematic literature reviews, formal detention was statistically associated with violence, absconding, self-harm, coerced medication, mechanical restraint, manual restraint, psychiatric intensive care, seclusion, and special observation. There were mixed results for medication refusal, no link with suicide, insufficient evidence on pro re nata (PRN) medication, and no information on its relationship to substance/alcohol use (see Table 1). Qualitative studies revealed other connections, with absconding sometimes being prompted by refused leave, refused discharge, or a failed appeal against formal detention (Bowers *et al*. 1999). In addition, a locked ward door carried profound symbolism of detention, strengthening stigma, low self-esteem, depression, anger, frustration, and perception of the ward as a prison and nurses as guards. The locked door is associated with higher rates of aggression, self-harm, and medication refusal (Nijman *et al*. 2011), as are rates of total conflict and containment (Bowers 2009), reaffirming the impact of formal detention. While it is known that detention rates vary considerably by country, we do lack any information on relationships between legislative systems, their features, and conflict and containment rates on wards. A few studies of aggression on Italian wards – a country with perhaps the most liberal mental health legislation of all – do show significantly lower rates; however none of these studies have sampled widely enough to support any generalization (Grassi *et al*. 2001, 2006, Bowers *et al*. 2005a).

National policies have been shown to influence containment use. Two studies have demonstrated that national policy can lead to reduction in seclusion use (Templeton *et al*. 1998, Smith *et al*. 2005). Changes in PRN prescription policies have also been shown to produce significant

change (Thapa *et al*. 2003, Stein-Parbuty *et al*. 2008). Evidence on mechanical restraint is less secure, with one study suggesting policy driven reduction (Currier & Farlet-Toombs 2002), and another showing no impact (Keski *et al*. 2007).

Structure has been shown by our own research programme to be associated with lower rates of conflict and containment (Bowers *et al*. 2007b, Bowers 2009). Our concept of structure initially included rules for patient conduct and routines of ward life to which patients were expected to adhere (Bowers 2002, Alexander & Bowers 2004, Alexander 2005). However on the basis of subsequent research, this later expanded to include the efficiency of the ward as an organization, its cleanliness and tidiness (Bowers 2007), and the existence of a consistent ideology, direction, and purpose to the ward (Bowers *et al*. 2003b, 2005b, Bowers 2005). Although these things are, to a degree, in the hands of the ward staff themselves, a significant amount is determined by the hospital's procedures, policies, and operational management. The formal complaints system and its effective operation, as well as the hospital policy over prosecution for assaults and property damage, may also be seen as part of the external (to the ward) regulatory framework for patient behaviour. These factors perhaps partly underpin variations in conflict and containment rates by hospitals and organizations (Bowers 2000).

The direction of causality is contentious for both detention and structure. Detention is undoubtedly a response to risk, acute illness, and unwillingness to accept treatment. However it seems likely, especially given the way that patient say they respond to the locked door (Muir-Cochrane *et al*. 2012) and to detention (Katsakou & Priebe 2006) with combined feelings of anger and hopelessness that causality runs also in the opposite direction. This is more certain with structure, where cyclical relationships with conflict over time have been found (Bowers *et al*. 2007b). In other words, these relationships are bidirectional.

Limitations

Despite the scale and scope of the literature review, the vast majority of studies were descriptive, and the numbers of controlled trials are very small indeed. This severely limited the strength of conclusions that can be drawn from it. Where trials or natural experiments were reported, these tended to report single conflict or containment outcomes, and to be relatively un-theoretical or not explicit about their underlying theory. The small numbers and lack of theory testing meant that there have been few or no confirmatory studies or accumulation of useful knowledge.

In constructing the Safewards Model, we may have over-valued our own findings and downplayed those of others. This is difficult to disentangle as the research we have done was generated in response to previously published research and targeted at evaluating previously made proposals or extending them. Our research programme was thus deliberately designed to respond to the published corpus of other research and cannot be entirely disentangled from it so that it can be neutrally evaluated on an equal footing. The reader will have to determine whether we have done a fair job.

Our reasoning may also be subject to criticism. Our largest leap was to move from knowledge of what generated conflict in interactions between staff and patients to a supposition that similar interaction issues between patients also generated conflict. We did discover from the literature review that patient–patient interaction was important, however the features of that interaction were not established by research, and we have extrapolated these from what we know of staff–patient interaction. This may be an error, as may other lesser steps in our logical reasoning.

A further criticism might be that we have been over-inclusive, incorporating into our model every possible factor that may relate to higher rates of conflict and/or containment. This may indeed be so. However, the evidence for most things is so poor that it is difficult to discriminate between one weakly supported factor and another in order to rule one out. We have therefore probably erred on the side of including too much; however, consider that to be appropriate at this stage given the evidence available.

Others may argue that although there is empirical support for the concepts of conflict and containment, more specific causal models may be superior. It is likely, for example, that the causal elements contributing to inpatient suicide are different in certain important respects from those contributing to aggression or to drug/alcohol use; or that the balance of contributory factors (patient characteristics, regulatory framework, etc.) may be differently weighted for seclusion vs. as required medication. We would accept that these arguments have some weight and validity; however our focus has been on the totality and the identification of common contributory causes. Others may seek to research specific behaviours.

However, this hints at another point the Safewards Model leaves unstated, that is, what is the relative strength of contribution of the different domains to rates of conflict and containment? Is the physical environment more important than influences from outside hospital, for example? We can only answer that the current state of the evidence does not allow a reply.

Conclusion

There is good evidence that the six domains are important in conflict and containment generation. Specific claims about single items within those domains are more difficult to support with convincing evidence, although the weight of evidence does vary between items, and indeed between different types of conflict behaviour or containment method. The Safewards Model is supported by the evidence, but that evidence is not particularly strong. There is a dearth of rigorous outcome studies and trials in this area, and an excess of descriptive studies, but that is not unusual. Descriptive studies are both easier and much cheaper to undertake.

The Safewards Model allows the generation of a number of different interventions in order to reduce rates of conflict and containment. It is clear from the model that no single intervention or even package of interventions is going to provide a final answer. The situation is complex and varying rates of conflict/containment between wards are determined by a multitude of factors. Nevertheless, future trials should focus on utilizing the identified *staff modifiers* to induce changes and reduce risk. As always, such trials need to be conducted rigorously with adequate sample sizes and the use of control groups and placebo interventions. We hope to report the outcome of such a trial in the near future.

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