A literature review to examine the effectiveness of de-escalation strategies for the prevention and de-escalation of violent and aggressive behaviour.

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Abstract

Reducing levels of physical and face down restraint is a challenge for professionals in clinical practice (Department of Health (DH), 2014a). The literature review presented here aimed to identify the evidence for de-escalation strategies to prevent aggressive behaviour, using a systematic search of electronic databases for papers published between 2000 and 2015. Evidence was found for physical and pharmacological interventions to de-escalate aggressive behaviour; limited to no evidence supporting the use of verbal de-escalation techniques in similar clinical settings. Research is needed to identify evidence-based strategies for the prevention and de-escalation of aggressive behaviour without using restraint.

Key Words: De-escalation; restraint; aggression

Introduction

Violent and aggressive behaviour has been defined as “the intention to harm, damage or hurt another person physically or psychologically”, verbal or nonverbal gestures and threats, intimidation and/or abuse (National Institute for Health and Care Excellence (NICE), 2014, p. 15).Aggressive behaviour accounts for around a quarter of all incidents in NHS hospitals, with 9,591 incidents occurring in inpatient mental health settings (National Patient Safety Agency, 2006). Nurses working in mental health settings and nursing homes are most likely to encounter aggression in the workplace (Edward, Ousey, Warelow et al., 2014).

Restraint is when a person’s freedom to move is limited (The Royal College of Nursing (RCN), 2008). Movement can be restricted in different ways; physically by holding someone, chemically through medication use or psychologically by telling someone they are not allowed to do something. Between 2011 and 2012, 39,883 incidents involved physical restraint on service users by staff members in NHS mental health settings (MIND, 2013). Variations reported in the use of physical restraint exist between hospitals, ranging from 3346 incidents in one trust to 38 incidents in another trust, and also in the forms of restraint utilised; 923 incidents of face down restraint occurred in one trust compared to zero incidents of restraint in other trusts (MIND, 2013). Across the UK, physical restraint was estimated to have been used on around 12% of patients in a 2010 census (Care Quality Commission, 2011). Across mental health and learning disabilities services between 2013/2014 5.7% of patients were still subject to restraint on at least one occasion (The Health and Social Care Information Centre (HSCIC), 2015).

Physical restraint can have adverse physical health effects on service users (Barnett, Stirling & Pandyan, 2012). The DH (2014a, p. 7) emphasised the need to “radically reduce the use of all restrictive practices and take action to end the use of high risk restraint, including face down restraint and holding people on the floor” recommending the use of ‘positive behaviour support’, training for professionals and closer monitoring of guidelines in practice.MIND (2013, p. 7) highlighted the concern of using physical restraint as the predominant strategy to manage aggressive behaviour, stating that ‘physical restraint, rapid tranquillisation, seclusion and observation should only be used where de-escalation has proved insufficient’. However current statistics suggest that this is an ongoing challenge in clinical practice.

De-escalation techniques are strategies which aim to either prevent aggression from occurring or decrease its intensity (Price & Baker, 2012).This differs from management of aggression which aims to contain the behaviour (Bowers, 2014). Techniques used in everyday practice should have a sound evidence base, based on evidence from controlled studies (Muralidharan & Fenton, 2006). This paper presents a literature review which assessed the utility of de-escalation techniques for use in practice, due to the concerns raised by the DH (2014a) and MIND (2013) of the overuse of physical interventions.

Methodology

A review of published literature was undertaken using a joint electronic search on the databases MEDLINE, PsycINFO, CINAHL; and a separate search on Cochrane. Search terms included: (aggress\* / violenc\*” OR conflict\* / containment\* / risk\* AND mental\* / acu\* / psych\* / hospital\* OR de-escalat\* NOT dementia\* / learning disab\* / self-harm\* / depression / intensive care), limited to publication years 2000-2015 to ensure the obtained literature was relevant to current practice. All types of methodology were included, both qualitative and quantitative research, but papers reviewed were limited to those written in English and concerning studies on people aged 18 and over. Studies were excluded if data was not provided, they were solely descriptive, or were based on a specific illness or condition such as dementia or learning disabilities. For the purposes of this review, de-escalation referred to any strategy or technique used to either prevent aggression or “calm down an escalating situation or service user” such as verbal de-escalation or ‘as required’ medication (National Institute for Health and Care Excellence, NICE, 2005, p. 28). 108 studies were retrieved, reduced to 80 after duplicates were removed. 20 studies were identified as relevant through further examination. The full content of the 20 studies were analysed using thematic analysis and organised based on the themes they discussed (See Table 1).

Results

Three themes were identified from the literature; research on the recognition of aggressive or violent behaviour; de-escalation strategies being used in practice; and finally preventative measures that have been considered for use in clinical practice. The findings in relation to each of these themes will be discussed in turn.

*Recognition of aggressive behaviour*

Research has explored how aggression can be recognised through the identification of early warning signs. Recognition was defined as any potential trigger which could precede a violent or aggressive episode. Specific behaviours such as anger, social withdrawal, superficial contact and non-aggressive antisocial behaviour were identified by staff working with service users on acute wards as early warning signs for aggressive behaviour (Fluttert et al., 2012; Bowers, Allan & Simpson, 2009). Through assessment of the prevalence of aggression using a cross-sectional design, 45 items were proposed as indicators of aggression including “tension, agitation, anger, social isolation, decreased social contact and changes in daily activities” (Fluttert et al.,2012, p. 1553).Anger was identified as the most prominent warning sign, with no significant differences found between the type of aggressive behaviour displayed and the mental illness the person was experiencing, with the exception of psychopathy (Fluttert et al., 2012).

Bowers et al (2013) also identified warning signs of aggression, using a cross-sectional design, as conflict behaviours on wards which included verbal aggression, refusing to attend to daily routine such as getting up, attending to personal hygiene and going to bed, refusing or demanding medication and absconding. Bowers Alexander, Bilgin et al (2014) highlighted risk factors called ‘flashpoints’ in clinical practice based on a literature review of empirical research on patient violence; ‘flashpoints’ were identified as events or situations which could trigger conflict such as the ward environment or staff present.

In a randomised controlled trial (RCT), Arnetz and Arnetz (2000) assessed the effectiveness of a violent incident form to help participants identify aggressive behaviour and clinical risk, followed by discussion and feedback around clinical incidents. The intervention group reported better awareness of risk, with an increase in self-reported risk after intervention, the effects of which were both significant. Bowers et al (2009) also researched early warning signs using a conflict checklist and aggression scale over a 6 month period, collecting data from 136 acute psychiatric wards, but no significant relationships between violence and patient characteristics, environmental factors and staff were found on analysis. Consequently, if early warning signs can be identified in practice, it may improve risk prediction and consequently patient safety.

*The evidence-base for de-escalation strategies*

The second theme surrounded the types of de-escalation strategies that can be used to decrease the intensity of violent and aggressive behaviour that is likely to escalate. Aggressive and violent episodes can be seen as comprising of a cycle of escalating aggression; de-escalation strategies; and ‘as needed’ or pro re nata (PRN) medication (Bowers et al., 2013). Events more likely to lead to de-escalation strategies and PRN medication being administered included “verbal aggression; aggression to objects; physical aggression; self-harm; suicide attempt” (Bowers et al., 2013, p. 518).

Muralidharan and Fenton (2006) carried out a systematic review of the literature for strategies to manage and de-escalate aggressive behaviour, which did not include the use of seclusion, restraint and pharmacological means. They searched a total of 2808 studies using a meta-analysis, but their search only yielded six studies which in turn also had to be excluded as none of them utilised non-pharmacological methods. Muralidharan and Fenton (2006) concluded that no evidence currently exists which supports the use of non-pharmacological interventions due to lack of research which could be found in this area. Evidence supporting the effectiveness of pharmacological interventions such as rapid tranquilisation for calming incidents was found by Bowers, Ross, Owiti et al (2012), yet they highlighted that this should not be used when the service user solely presents in a verbally aggressive manner and alternative ways to de-escalate a crisis should have been attempted first. Muralidharan and Fenton (2006) emphasised the urgency for future research to provide a clear rationale for any techniques which could be regarded as intrusive to service users. Research by Bowers, Ross, Owiti et al. (2012) supported these findings pinpointing how aggressive behaviour is typically followed up by the offering of medication, and subsequently coerced medication if the previous measure has not worked.Where there was a high recorded use of coerced intramuscular medication on acute wards, patients reported greater dissatisfaction with the interventions used to manage violent and aggressive behaviour (Dack, Ross & Bowers, 2012).

In a systematic review of the literature, staff training was identified as most effective for improving staff knowledge and confidence in managing aggressive behaviour (Price, Baker, Bee et al., 2015), but limited in terms of evidence supporting staff ability to de-escalate aggressive behaviour. Through the implementation of a de-escalation package, Cowin, Davies, Estall et al. (2003) found an improvement in nurses’ knowledge of how to de-escalate situations therapeutically. The package comprised of nurse education around de-escalation through the use of a poster presentation and educational session along with surveys to assess knowledge intake. The study did not assess whether the nurses were able to implement this knowledge on the wards or whether there was any reduction in the use of physical restraint. Similarly Johnson and Hauser (2001) explored nurses’ perceptions of their ability to de-escalate situations where patients were becoming aggressive; nurses felt comfortable matching an appropriate de-escalation intervention to the needs of the patient.Due to the study being on a small scale, direct observation of what the nurses did in practice did not take place, which may have impacted upon the reliability of the results.

Laker, Gray and Flach(2009) also assessed the outcome of staff training in verbal de-escalation techniques, finding no significant impact on clinical practice following the implementation of training in comparison to not receiving any training. Previous research has assessed staff training for mental health nurses on risk prediction, finding that it helped reduce the frequency of physical restraint use, but had no effect on the number of aggressive incidents which occurred (Needham, Abderhalden, Meer et al., 2004). Due to the apparent limitations of staff training for improving the management of aggression in practice, alternative strategies such as more preventative measures may be a more valuable resource.

*Research on preventative strategies*

The use of preventative strategies to minimise the frequency of violent and aggressive behaviour may assist in reducing the need for de-escalation. Interventions highlighted by research studies included constant special observations, locked wards, behavioural contracts, providing clearly structured daily routines for people in hospital and identifying a suitable environment (Bowers et al., 2013; Muralidharan & Fenton, 2006; Bowers et al., 2009). Muralidharan and Fenton’s (2006) meta-analysis of RCTs was unable to provide evidence supporting the use of preventative strategies. Bowers et al. (2009) found that “the imposition of restrictions on patients exacerbates the problem of violence” associated with aggressive behaviour amongst people who were formally detained on admission because they were identified as a “risk of harm to others” (Bowers et al.,2009, p. 260). The study utilised a rigorous model for data collection and analysis, using a well-validated and reliable tool for measuring aggression (Yudofsky et al., 1986)to provide a strong evidence-base for potential causes of aggression. However, most of the data analysis only revealed a correlation between aggression and imposed restrictions, and thus it could not determine whether aggressive behaviour was caused by the specific restrictions or not.

A study in a psychiatric hospital in Germany identified the major risk factors for aggression to include organic brain injury and schizophrenia; concluding that there was a need to focus on prevention and staff training to manage such behaviour (Ketelsen, Zechert, Driessen et al., 2007). Research by Nijman et al. (2011) drew attention to the link between increased aggression in patients and an increase in physical containment methods such as locked wards; this was attributed to feelings of imprisonment expressed by patients.Bowers (2009) exemplified the value of structure in inpatient settings, considering how the physical environment, day-to-day routines on the ward and staff variables correlated with patient aggression. Using a multivariate cross-sectional design, they were able to test the effects of the ward arrangements finding that an increase in staff ratios was positively associated with higher levels of aggressive behaviours.

Bowers (2014) proposed ‘Safewards’; a modelwhich highlighted potential antecedents to ‘conflict’ behaviour including aggression and strategies for ‘containment’ including as required medication, locked wards, special observation and seclusion. The model provides an explanation for potential causes of aggressive and violent behaviour with recommendations for techniques which could both prevent and reduce such incidents. For example, monitoring charts for service users for early signs of aggressive behaviour and flowcharts for when strategies such as ‘as required’ medication or time out may aid this. Analysis using the Safewards model (Bowers, 2014) helps to account for variations in the amount of aggressive behaviour across different mental health hospitals, and provides a rationale for how and why the ward environment should be reasonably adjusted to meet the needs of service users and keep people safe. However, in a review of the evidence for the model, Bowers, Alexander, Bilgin et al. (2014) stated that there was a deficit of clinical trial studies to date to support its evidence-base at present, but that it has allowed for the identification and exploration of an array of different possible intervention strategies which further research needs to assess and validate.

Research on prevention through observation levels has also explored nurses’ perceptions of the risk of aggression on acute wards, determining that early intervention, maintaining safety and prevention were crucial for effective observation to take place (Mackay, Paterson, Cassells, 2005). Prevention included monitoring signs for increased arousal and/or agitation and removing where possible from the situation any potential objects that could be used as weapons. Other prevention strategies suggested for use, this time by patients, include providing meaningful activities to decrease boredom; and separating acutely distressed patients from each other (Meehan, McIntosh, Bergen, 2006). Duxbury (2002) identified environmental factors and a lack of communication as common triggers for aggressive behaviour, proposing that more proactive measures including the development of interpersonal skills for staff to help them improve their awareness of the impact of their interactions with service users. This may be a step forward to improve practice, reducing the need for de-escalation techniques to be used by more proactive and preventative measures.

Discussion

The use of physical restraint in clinical practice can have detrimental effects on both the wellbeing of service users and staff members. However, reducing the use of restraint appears to be a current challenge for clinicians and its use still appears to be widespread. Although both preventative measures and de-escalation strategies are advocated, they still seem to be under used. One reason might be because practitioners are unclear about the evidence base for these strategies, and hence investigating why these strategies are not being utilised may help to improve their future uptake and inform practice.

The research brought to light how early warning signs, if recognised, can potentially be de-escalated before crisis point is reached; Fluttert et al’s(2012) study identified a gap in the literature with regard to the risk management of early warning signs of aggression but did not discuss how it can be prevented or de-escalated.This approach has been supported byNICE (2005) guidelines, which highlighted the need for the prediction of violent behaviour through considering potential antecedents, ensuring staff are aware of warning signs, and by carrying out risk assessments.

Studies considered the effectiveness of pharmacological methods and physical methods to de-escalate aggressive behaviour (Muralidharan & Fenton, 2006). These included the use of ‘as required’ medication, rapid tranquillisation and physical restraint. Yet many studies were limited to a specific group of people, or to longer stay patients, and relied on self-report measures which depended onpatients’ case notes to make inferences about the strategies used to manage aggressive behaviour (Bowers et al., 2013). RCTs were used at times, recognised as the gold standard for producing evidence of value(Bench, Day & Metcalfe, 2013; Torgerson & Torgerson, 2008),but potential bias of treatment effects could have occurred where double-blinds were not used (Bench et al., 2013).

Limited contemporary research was found in support of verbal de-escalation strategies (Muralidharan & Fenton, 2006). Little is known about the options nursing staff feel are available to them to de-escalate an aggressive situation, including when specific interventions such as verbal de-escalation techniques should be used. This could be due to the stringent inclusion criteria used in the search strategy (Muralidharan and Fenton, 2006), and/ or that study designs did not allow for the assessment of the relative effectiveness of management interventions compared with other strategies such as verbal de-escalation.Although there is limited research for verbal de-escalation strategies, it does not mean that they are not effective, just that more research is required to discern their effectiveness, and to provide a firm evidence-base for when it is most likely to be effective in clinical practice. At present though, verbal de-escalation does not appear an evidence based alternative to physical restraint, despite being recommended by the DH (2014b; 2014c), as research has been able to support its effectiveness in practice so far. It is possible that the use of non-physical de-escalation practices is being influenced by other factors such as reduced staff numbers and fewer commissioned training events with smaller budgets available making it harder for staff to attend those events that are available (Buchan, Seccombe and Queen Margaret University, 2012). Individual characteristics of staff members may also be linked to de-escalation ability and if the patient has had previous episodes of aggression the effectiveness of interventions may be less (Laiho, Kattainen, Astedt-Kurki et al., 2013).

NICE (2005) guidelines advised that risk assessments and de-escalation techniques should be attempted first to help prevent violent behaviour, prior to rapid tranquillisation, seclusion and physical interventions, including psychosocial interventions to attempt to calm the service-user down via verbal de-escalation, taking the person to a quieter space and/or using a ‘specially designated space for de-escalation’ (NICE, 2005, p. 24). Yet alternative evidence-based options to physical restraint are constrained with limited to no evidence in favour of non-pharmacologicalstrategies in clinical practice (Muralidharan & Fenton, 2006), suggesting that at the this time, the use of non-pharmacological interventions and de-escalation techniques have not been researched enough to be safe and effective in clinical practice. Therefore, preventative measures seem to be the most plausible option at present.

The findings of this literature review suggest that preventative strategies, linked to the early warning signs of aggressive behaviour, are the most promising way forward (Mackay, Paterson, Cassells, 2005; Huckshorn, 2004) due to the problematic nature of physical restraint and the current constraints of de-escalation techniques. The Safewards model exemplified how the ward environment can be managed differently in order to increase safety and better spot early signs of aggression (Bowers Alexander, Bilgin et al., 2014). Through closer analysis of the antecedents of aggression, the model may help to improve understanding of why aggressive behaviour might occur in the first place. The model highlighted the relationship between preventative versus no preventative measures, and the presence of aggressive behaviour. Service users have identified boredom as a key factor which can provoke aggression, so ensuring wards have clear structures with regular activities scheduled, and making sure service users are encouraged to participate in these activities may help to prevent aggressive behaviour from developing (Meehan, McIntosh, Bergen, 2006). NICE (2005) proposed three types of alarm systems essential for clinical practice; panic buttons, personal alarms and complex personal alarms. Although there has been limited research carried out to explore these features in clinical practice, in order to reduce levels of physical restraint, these features may help de-escalate situations more quickly by enabling easier discovery of a person deemed at risk.

The use of audits for incidents of aggression may bring to light triggers of aggression so that adjustments can be made for the provision of care for service users. This may help clinicians to formulate more concise risk management plans for people who display threatening behaviour; if conflict behaviours are recorded and assessed using an aggression inventory, risk may be more accurately measured for future occurrences.Limitations to concordance with current guidelines may compounded by issues including staff shortages or lack of training. Staff training in the recognition of early warning signs of aggression for individuals prone to aggression may improve this.The literature review was limited to the analysis of inpatient mental health settings for adult populations over the age of 18. It is likely that in order to meet the needs of service users not included in this group, variation in strategies may exist.

Conclusion

Alternative approaches to physical restraint need to be considered to improve the safety and standards of care for both service users and healthcare professionals in inpatient settings. With a focus on proactive practice based on preventative measures, such as the Safewards Model (Bowers, 2014), clinical practice can be improved by focusing on techniques which are both evidence-based and safe for service users.

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Table 1

Data Extraction Table

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| --- | --- | --- | --- | --- | --- | --- |
| **Article/Title** | **Aim(s)** | **Type of study & Analysis used** | **Theme 1: Early warning signs** | **Theme 2: De-escalation / management techniques employed (verbal, pharm., physical etc)** | **Theme 3: Prevention** | **Limitations** |
| Arnetz and Arnetz (2000): Implementation and evaluation of a practical intervention programme for dealing with violence towards health care workers. | To apply an intervention to manage violence from patients to staff and evaluate its effectiveness in practice. | Randomised control trial (RCT) involving 47 participants over 1 year period. Quantitative analysis of 1203 completed questionnaires. | Recognition can improve staff awareness of the risks. Statistics found to vary in the reporting of violence and aggression. | - | Risks for violent behaviour considered. | Relied on self-reported measures, question over internal consistency. Limited discussion on how to improve practice.  Did not state if double-blind used. |
| Bowers (2005): On conflict, containment and the relationship between them. | To identify link between conflicts and containments on wards. | Literature review using data from Patient-Staff Conflict Checklist. | Identified threats to safety and maintenance of safety as characteristics of aggression. | Identified containment strategies that are used to manage aggressive behaviour including intrusion of boundaries, separation and physical restriction of movement. | - | Study was purely descriptive, studies do not appear up-to-date. |
| Bowers, Alexander, Bilgin et al (2014): Safewards: The empirical basis of the model and a critical appraisal | Safewards Model, causes of patient violence, emotional regulation. | Analysis of large cross topic literature review of all empirical research from 1960 onwards. Commenced in 2005 until 2012, 1181 papers were reviewed. | Examined threats to staff/patient safety. Identifies six domains where conflict and containment issues likely to occur. Identifies risk factors ‘flashpoints’ | - | Identified factors which could impact upon and improve safety and prevent aggression. | Study was purely descriptive, based on a limited evidence-base. |
| Bowers, Allan,  Simpson, Jones and Van Der Merwe (2009):  Identifying key  factors associated  with aggression on acute inpatient  psychiatric wards. | To assess the relationship between violent behaviour from service users and other potential variables. | Multivariate cross-sectional design in 136 acute psychiatric wards over 6 months. Multilevel modelling used for analysis. | Recognition of early warning signs could aid in pre-emptive de-escalation, such as patient characteristics. | Aggression managed through containment strategies including locking ward doors, increasing staff numbers, using physical restraint, and coerced medication. Aggression associated with intensity of restriction. | Special observations, structure to daily routine, ‘as required’ (PRN) medication. | No effects found from statistical analysis so no firm conclusions could be drawn from the study. |
| Bowers, James,  Quirk, Wright,  Williams and  Stewart (2013):  Identification of the “Minimal Triangle” and Other Common  Event to-Event  Transitions in  Conflict and  Containment | To explore the relationship between conflict and containment events and to identify the key factors involved in this process. | Cross-sectional design based on 522 patients across 84 acute psychiatric wards.  Analysis involved chi square test after events had been sequenced and tabulated. | Conflict behaviours identified which were seen as escalating signs of aggression. Verbal abuse and medication refusal identified as warning signs. | Containment where de-escalation used for managing verbal and physical aggression, self-harm and suicide. Pharmacological interventions and de-escalation employed. Cycle of verbal aggression, de-escalation and PRN medication identified. | Suggestions made including as required medication, improving structure and routine on wards. | Data only collected following first two weeks of admission; limited generalisability. Relied on self-reported measures. |
| Bowers, Ross, Nijman et al. (2012): The scope for replacing seclusion with time out in acute inpatient psychiatry in England. | To identify the process involved before and after time out and seclusion periods. | Cross-sectional design of 522 admissions on 84 acute wards in England. | - | Identified use of seclusion and time out in hospitals as means to contain violent behaviour. | - | Relied solely upon self-report measures from clinical notes of nursing staff. |
| Bowers, Ross, Owiti et al. (2012): Event sequencing of forced intramuscular medication in England. | To identify the procedure pre and post the forced administration of intramuscular medication. | Cross-sectional design of 522 admissions on 84 acute wards in England. | - | Aggression and medication refusal precede the use of coerced medication to de-escalate crisis situation. | Use and offering of as required medication as an alternative. | Relied solely upon self-report measures from clinical notes of nursing staff. |
| *Cowin et al (2003)* De-escalating aggression and violence in the mental health setting | To explore the development of a de-escalation kit to improve awareness in form of a poster. | 21 nursing staff, 24 items derived from 112 statements.  Surveys analysed using SPSS, each survey had 11 items in total. Results revealed increase in de-escalation knowledge and awareness, yet not significant for analysis of variance. | - | Training, verbal de-escalation: defusing, negotiation and conflict resolution. | Identifies potential causes of a & v; patient acuity, staff shortages | Small sample size. |
| *Dack, Ross & Bowers (2012):* The relationship between attitudes towards different containment measures and their usage in a national sample of psychiatric inpatients | To explore patient views on containment strategies and their experiences of them. | Cross-sectional design of 1361 patients across 136 acute wards in England. | - | High frequency of coerced intramuscular medication correlated to negative views by patients of de-escalation methods. | - | Correlational study, relied solely on self-report measures. |
| Duxbury (2002): An evaluation of staff and patient views of and strategies employed to manage inpatient aggression and violence on one mental health unit: a pluralistic design | To identify systems in place to manage violence and aggression on mental health wards. | Cross-sectional study using questionnaires and interviews on 80 patients, 72 nurses and 10 other medical staff. | Patients report poor communication and environmental factors lead onto aggressive behaviour. Staff believed it to be due to both internal and external factors about patients. | Link found between type of aggressive behaviour displayed and de-escalation strategy employed. 47% cases included the use of medication, restraint or seclusion. | **-** | Correlational study so unable to infer causal link. Convenience sample used. |
| Fluttert, Meijel, Bjørkly, Leeuwen and Grypdonck (2012):  The investigation of early warning signs of aggression in forensic patients by means of the ‘Forensic Early Signs of Aggression Inventory’ | To identify early warning signs of aggression using designed inventory, to explore how it can be used to prevent violent and aggressive behaviour, and to explore subgroups of service users. | Cross-sectional design based on 171 patient plans from 2 forensic hospitals. 45 items divided into 15 categories assessed using rank order correlation analyses. | Recognition and identification of early warning signs of aggression; identified antecedents of aggressive behaviour. | - | Considered prevention and identified a gap in literature surrounding risk management. | Smaller sample size for quantitative study.  Only 2 hospitals – unlikely to be representative on wider scale. |
| Hendryx, Trusevich, Coyle et al. (2010): The distribution and frequency of seclusion and/or restraint among psychiatric patients | To identify the frequency of seclusion and restraint practice in an acute hospital. | Cross-sectional study of 1266 adult patients in 1 acute hospital. | - | Seclusion used on 15% of patients as a way to manage their behaviour. | Discussed how to prevent the use of restraint through staff education and training in de-escalation. | Selection criteria not specified. |
| Johnson & Hauser (2001): The practices of expert psychiatric nurses: accompanying the patient to a calmer personal space | To explore how nurses de-escalate situations where patients are becoming aggressive. | Qualitative study using unstructured interviews of 20 nurses, interpretative phenomenological analysis. | Nurses able to recognise behaviours in patients and when behaviour was escalating. | Nurses reported feeling comfortable with matching de-escalation intervention with the needs of the patient. | - | Small sample size, solely self-report measures used. |
| Ketelsen, Zechert, Driessen et al. (2007). Characteristics of aggression in a German psychiatric hospital and predictors of patients at risk | To explore prevalence and types of aggressive behaviour displayed in 1 psychiatric hospital. | Cross-sectional design of 2210 patients using Staff Observation of Aggression Scale and multivariate analysis. | Major risk factors of aggression identified including organic brain injury and schizophrenia. | - | Focus on prevention via staff training in management and de-escalation. | Limited variables assessed which may instigate aggressive behaviour. |
| Laiho, Kattainen, Astedt-Kurki et al. (2013): Clinical decision making involved in secluding and restraining an adult psychiatric patient: an integrative literature review. | To clarify the process for the use of seclusion and restraint in clinical practice. | Systematic review of 32 studies from 3 databases. | - | Identified factors that preceded the use of management techniques to be dynamic and circumstantial. Also found to be influenced by individual staff members and previous episodes by patient. | - | Proposed model not assessed in clinical practice. |
| Laker, Gray and Flach (2010):  Case study evaluating the impact of de-escalation and physical intervention training. | To investigate how de-escalation training affects the likelihood that staff will use it in practice, and how likely this will reduce the number of incidents. | Quasi experimental design on a Psychiatric Intensive Care Unit (PICU) in 1 trust. Incidents analysed over 12 month period using Poisson model and logistic regression. | - | Explored incidents in relation to use of rapid tranquilisation, physical restraint, increased observations. | Considered prevention via training model, although no significant decrease found in number of incidents after de-escalation training. | Data generated solely from one trust and therefore difficult to generalise on wider scale. No control group or measures used to assess validity of the training itself. |
| Mackay, Paterson & Cassells (2005): Constant or special observations of inpatients presenting a risk of aggression or violence: nurses’ perceptions of the rules of engagement. | To explore the perceptions of mental health nurses of risk of violence and aggression in patients on acute psychiatric wards. | 6 unstructured qualitative interviews with mental health nurses. | Considered nurses’ perceptions of risk and how they would identify this. | Interventions considered including special or constant observations. | Prevention and maintaining safety identified through risk management and observations. | Solely descriptive study. |
| Meehan, McIntosh & Bergen (2006): Aggressive behaviour in the high-secure forensic setting: the perceptions of patients. | To explore patients’ perceptions of causes of aggressive behaviour, and to identify strategies to reduce the risk. | 27 patients in high-secure hospital participated in a focus group. Analysed by content analysis. | Identified potential causes of aggression including: empty days, medication issues, and staff and patient factors. | - | Prevention strategies included: providing meaningful activities to decrease boredom and separating acutely distressed patients from each other. | Does not compare staff attitudes to patients; relies solely on patient’s reports. |
| Muralidharan & Fenton (2006):  Containment strategies for people with serious mental illness (Review). | To contrast the effects of different strategies to manage crisis situations, excluding physical restraint and seclusion. | Quantitative meta-analysis, review of 2808 studies using RCTs. | - | Verbal de-escalation and negotiation discussed explored. Limited evidence found for use of non-pharmacological strategies. | Special observations, locked wards and behavioural contracts considered as forms of prevention. | Review limited by very stringent inclusion criteria; potentially too restrictive; only considered RCTS. |
| Needham, Abderhalden, Meer et al. (2004): The effectiveness of two interventions in the management of patient violence in acute mental inpatient settings: report on a pilot study | To assess whether violence decreases when systematic risk assessment and training courses are employed. | Non-randomised intervention study over a 10 month period using a check list and risk ratings. Analysis involved Chi-square tests. | - | Used of risk prediction and staff training helped to reduce physical restraint use, although had no effect on number of aggressive incidents. | Identified interventions which may help prevent the use of coercive measures in management of violent behaviour. | Potential selection bias due to non-randomised sample, and recording bias for staff reports of aggression. |