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REVIEW PAPER

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A quantitative systematic review of the effects of training interventions on enhancing the competence of nursing staff in managing challenging patient behaviour

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Abstract

Aims: This systematic quantitative review identifies and summarizes the current knowledge and effects of training interventions for managing patients' challenging behaviour.

Background: Challenging behaviour is an acknowledged worldwide healthcare problem and its management can have a huge impact on quality of care. Evidence-based training interventions that focus on managing challenging behaviour are needed, but few tools for the systematic evaluation of these interventions are currently offered.

Design: A quantitative systematic review following the 2008 Centre for Reviews and Dissemination guidelines.

Data Sources: CINAHL, Scopus, PsycInfo, PubMed and Cochrane were searched using the same terms for papers published in English from 2005–2015.

Review Methods: Studies were assessed for quality and risk of bias, according to the Cochrane Effective Practice and Organisation of Care Group criteria. A narrative summary was conducted.

Results: We included 17 studies and evaluated 16 training interventions. Interventions were classified into four key themes: disengagements, communication, controlling behavioural symptoms and restrictive measures. Our review showed that interventions were more likely to decrease violent incident rates and increase staff confidence than change staff attitudes or increase knowledge. The elements of competence used to manage challenging behaviour were measured unilaterally. The evidence provided by studies was largely weak.

Conclusion: The variety of measurements used in the studies made comparing the effectiveness of the training interventions difficult. An individual's competence to manage challenging behaviour needs to be defined and a comprehensive scale for evaluating competence is also needed. Patient safety should be included in future evaluations.

KEYWORDS

aggression, behaviour management, challenging behaviour, effective interventions, nursing, patient safety, restraints, staff competence, Systematic review, violence

1 | INTRODUCTION

Nursing staff face great risks at work from the violent and aggressive behaviour of patients and visitors (Estryn-Behar et al., 2008; Wassell, 2009). Workplace violence is defined as: "Incidents where staff are abused, threatened or assaulted in circumstances related to their work, including commuting to and from work, involving an explicit or implicit challenge to their safety, well-being or health" (WHO, 2017). Violence can be both physical and psychological. Staff working in psychiatry often have to deal with patient aggression (McCann, Baird, & Muir-Cochrane, 2015; Moylan, 2009), but workplace violence has now become a common phenomenon in general nursing (Kowalenko, Gates, Gillespie, Succop, & Mentzel, 2013; Kynoch, Wu, & Chang, 2011) and in emergency, primary (National Institute for Health and Care Excellence (NICE), 2015) and elderly care (Graneheim, Hornsten, & Isaksson, 2012; Sharipova, Hogh, & Borg, 2010). About one in three nurses worldwide have reported exposure to physical violence, with about a third of these reporting injuries (Spector, Zhou, & Che, 2014). Hospitals have reported that Registered Nurses are the most severely injured victims in about a third of patient assaults (Staggs, 2015). Verbal and physical violence from patients causes nursing staff distress, make them feel threatened and leads to non-somatic symptoms (Foster, Bowers, & Nijman, 2007, Gates, Gillespie, & Succop, 2011; Needham, Abderhalden, Halfens, Fischer, & Dassen 2005a; Waschgler, Ruiz-Hernandez, Llor-Esteban, & Garcia-Izquierdo, 2013). Furthermore, they have a negative impact on staff in terms of work productivity (Gates et al., 2011) and are related to staff wanting to change their profession or workplace (Estryn-Behar et al., 2008).

In this review, patient violence and aggression is called challenging behaviour and is defined as behaviour that "threatens the quality of life and/or the physical safety of the individual or others and is likely to lead to responses that are restrictive, aversive or result in exclusion" (Royal College of Psychiatrists, 2007). Challenging behaviour is a socially constructed and dynamic concept and the feelings it invokes in others can be either intolerable or overwhelming. The reasons for patients' challenging behaviour may include pain, stress, lack of privacy and long waiting times (Gacki-Smith et al., 2009). Challenging behaviour is often related to dementia (Zwijsen et al., 2014), learning disabilities (Lowe et al., 2007) and psychiatric disorders (Ridenour et al., 2015) and is usually dangerous, frightening or distressing for staff. Managing challenging behaviour means that staff manage patients' behavioural symptoms using communication and physical or mechanical restraints. Restraint can be defined as holding a patient against their will through active resistance (Paterson et al., 2003). Physical restraint means that staff are physically holding patients to prevent or restrict their movement (Stewart, Bowers, Simpson, Ryan, & Tziggili, 2009), to prevent them from harming themselves, endangering others or compromising the therapeutic environment (NICE, 2015).

Restrictive interventions have been used too often in many European countries (Raboch et al., 2010) and sometimes they have even been used to inflict pain, humiliate or punish patients. The use of restraints requires nurses to balance two responsibilities, namely ethics and safety. Patients deserve to be treated with the utmost dignity, even in difficult situations and always be shown the respect that is ethically required by the nursing profession code (Moylan, 2009).

Why is this review of the research needed?

- Challenging behaviour, including aggression and violence, is an acknowledged problem in healthcare settings worldwide. Dealing with such behaviour has a negative impact on nursing staff and managing challenging behaviour may seriously risk patient safety.
- Many healthcare providers focus on delivering restraint-free services. However, if this cannot be delivered, they need to minimize restrictive practices, by ensuring that front-line staff are well trained and competent in using restraints, so that adverse outcomes are prevented.
- Training providers and training commissioners need comparable information on the effectiveness of training interventions designed to manage challenging behaviour, to use in programme development, evaluations and return on investment analyses.

What are the key findings?

- Training interventions were classified into four categories based on the way that challenging behaviour was managed. Interventions were more likely to decrease violent incident rates and increase staff confidence than change staff attitudes or increase knowledge.
- Competence in managing challenging behaviour was measured unilaterally from one perspective. There was no comprehensive scale for evaluating competence to manage challenging behaviour.
- The evidence provided by the studies was mostly weak.

How should these findings be used to influence future policy/practice/research/education?

- Patient safety should be recognized and addressed when assessing the effectiveness of specific interventions used to manage challenging behaviour.
- Nursing professionals should receive training to ensure that they have the communication skills and competence to manage challenging behaviour.
- A comprehensive scale for evaluating the competence of nursing staff to manage challenging behaviour is needed.

1.1 | Background

Restrictive interventions often make a major contribution to delays in recovery and have been linked to causing serious physical and

psychological trauma to people who use nursing services (Department of Health, 2014). Managing challenging behaviour can cause risks to patient safety and violence has been associated with nursing tasks being delayed and increases in medication errors (Roche, Diers, Duffield, & Catling-Paull, 2010). Physical interventions used to manage aggression are known to cause injuries to patients (Hollins & Stubbs, 2011; Stubbs, 2009; Stubbs & Alderman, 2008) and even restraint-related deaths have occurred (Barnett, Stirling, & Pandyan, 2012).

We found four systematic reviews (Heckemann et al., 2015; Kynoch et al., 2011; Nelstrop et al., 2006; Wassell, 2009) on managing challenging behaviour (Table S1). The studies included in these reviews were conducted in hospital settings, emergency departments, mental health facilities and elders care. The overviews indicated three different types of interventions: training to manage aggression, the use of physical, chemical and mechanical restraints and the use of seclusion. The contents of these interventions were quite similar between the studies and included theoretical models of aggression, prevention and legal aspects. Communication skills, but not physical management skills, were included in all of the programmes (Heckemann et al., 2015). Interventions focused on developing staff competencies, which were then measured regarding attitudes, confidence, knowledge, skills (Heckemann et al., 2015; Kynoch et al., 2011), incident rates and staff injuries (Wassell, 2009) and problem-solving (Heckemann et al., 2015). The paper of Nelstrop et al. (2006) focussed on effectiveness and safety of various forms of physical intervention and seclusion.

Training to manage aggression increased staff confidence, but no clear evidence was found that training had an impact on staff attitudes, lowered the rates of patient aggression (Heckemann et al., 2015; Kynoch et al., 2011), or reduced injuries from violence aimed at healthcare workers (Wassell, 2009). This training has been proven effective in reducing the use of restraints and other coercive control devices. However, insufficient evidence is available to determine whether seclusion and restraint are safe and/or effective interventions for the short-term management of challenging behaviour in adult psychiatric inpatient settings (Nelstrop et al., 2006). A study carried out in an acute care setting showed that chemical restraints reduced the incidence of aggressive behaviour and the risk of harm to both patients and staff. In addition, mechanical restraints were effective in reducing harm to both patients and staff and produced minimal complications when used for short periods of time (Kynoch et al., 2011).

Despite the need for effective and safe interventions to manage the challenging behaviour that is generally acknowledged in health care, there is little comparable evidence available about the overall effectiveness of such interventions. There is a need for more systematic information on the management of challenging behaviour based on the standardized scales to be used for assessments. There is also a need for more research using versatile research designs, including the ethical, legal and safety aspects (Nelstrop et al., 2006), to identify which specific aspects of training programmes are the most effective (Wassell, 2009).

2 | THE REVIEW

2.1 | Design

The study design was a systematic quantitative review conducted and reported according to the guidelines of the Centre for Reviews and Dissemination (CRD, 2008) and on the principles of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (CRD, 2008; Moher, Liberati, Tetzlaff, & Altman, 2009). No meta-analyses were conducted, due to the diversity of interventions, study designs and measurements of the included studies.

2.2 | Aim and the research questions

The aim of this systematic quantitative review was to identify and summarize the current knowledge and effects of training interventions on the management of challenging behaviour in nursing.

The research questions for this review were:

1. What kinds of training interventions have been conducted to improve the competence of nursing staff to manage challenging behaviour?
2. What kinds of measurements have been used to evaluate the competence of nursing staff to manage challenging behaviour?
3. What kind of effects do training interventions for the management of challenging behaviour have on the competence of nursing staff, violent incident rates and the use of restraints?

2.3 | Search methods and inclusion criteria

The comprehensive search strategy was developed in cooperation with an academic library information retrieval expert. The following databases were searched for original qualitative and quantitative papers published in English from 2005–2015: CINAHL, Scopus, PsycInfo, PubMed and Cochrane. The key search terms were: aggression, aggressive, violent or challenging behaviour, dangerous behaviour, patient assaults, prevention, physical holding, aggression management, restraint and manual restraint (Table S2). The search strategy was executed for all the databases using identical search terms for the titles, abstracts and keywords. Reference lists from the retrieved articles were also manually searched. A search alert in the Scopus database produced one paper from December 2015. The studies had to meet all of the following criteria for inclusion in this review:

1. Population
   Participants had to be nursing staff working in health care.
2. Intervention
   The intervention had to be a training intervention that enhanced the competence of staff when managing challenging behaviour.

3. Comparators
   The study design included systematic before and after measurements.
4. Outcomes
   The study examined the effects of training interventions on how healthcare staff managed challenging behaviour.

2.4 | Search outcomes and exclusion criteria

The systematic search yielded 1,507 papers after the removal of duplicates. The titles and abstracts of all the identified papers were independently screened against the inclusion criteria by three reviewers (ST, PP, ALH). At this stage, papers were excluded if they were not published in English and/or the training intervention to manage the patients' challenging behaviour was not the primary focus of the paper. The full texts of the 39 studies that appeared to be potentially relevant were then independently reviewed against the inclusion criteria by two reviewers (ST, RK) and 22 papers were excluded at this stage (Figure 1). The reasons for the papers being excluded were insufficiently described interventions, study designs that were not intervention studies, inadequacies in the data collection or interventions that were not implemented by nursing staff. To ensure reproducibility, the selection of the studies was carefully documented using RefWorks® (Centre for Reviews and Dissemination, 2008).

2.5 | Risk of bias assessment

We included 17 studies in this review: four were randomized controlled trials (RCTs), two used a controlled before-after (CBA) study design and 11 used an interrupted time series (ITS) study design. The included studies were assessed for risk of bias according to the criteria suggested by the Cochrane Effective Practice and Organisation of Care Group (EPOC) in 2015 by two authors (ST, RK). The RCT and CBA studies were evaluated using nine criteria and the ITS studies were evaluated using seven criteria (Table S3). Ten of the studies were assessed as having a low risk of bias, three had an unclear/mixed risk and four had a high risk, with more than two items rated as high risk. All the studies with a high risk of bias were ITS studies with related risks, in addition to other risks of bias, because there were issues with the independence of the intervention, they did not provide sufficient information on the allocated interventions and they inadequately addressed incomplete outcome data.

2.6 | Data extraction and narrative summary

The following characteristics of the studies were collated during the data extraction phase: authors, year of publication, country where the study was performed, study participants and clinical context, intervention type, outcome measures, outcomes and strength of evidence (Table S4). A narrative summary was chosen to describe the

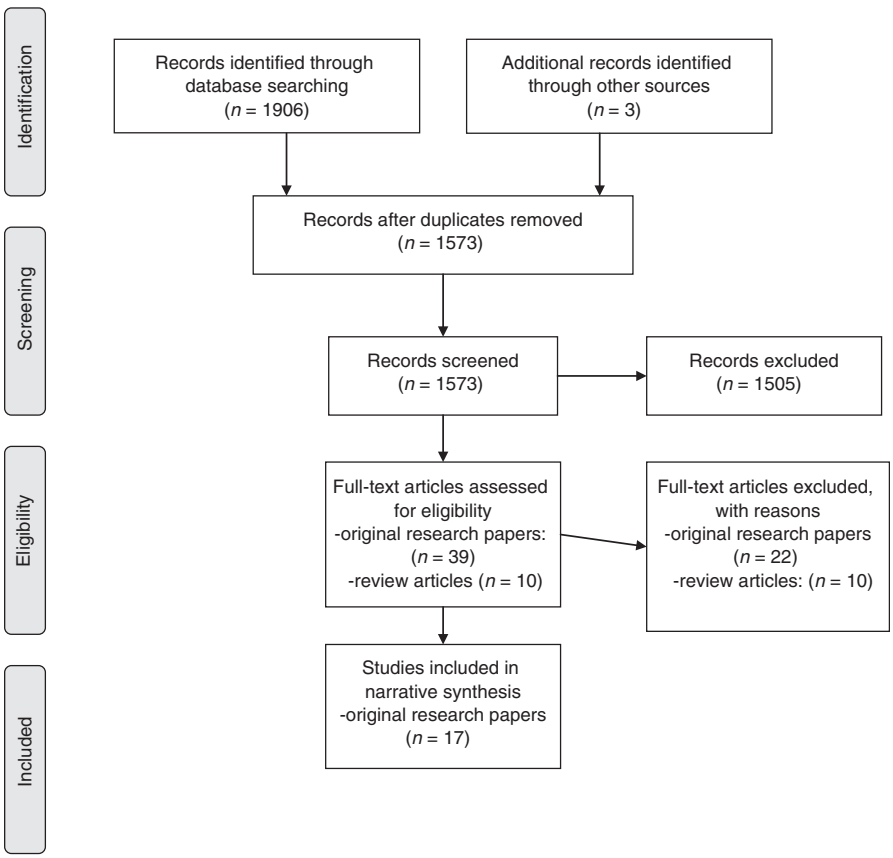


FIGURE 1 PRISMA flow chart

content of the studies due to the methodological diversity of the included studies. (Effective Practice and Organisation of Care (EPOC), 2013 and Effective Practice and Organisation of Care (EPOC), 2015.) Training interventions were classified into four categories and specified based on: course content, teaching method, length and measured competence (Table 1). Finally, the scales used to measure the elements of competence were also identified and grouped (Table 2).

3 | RESULTS

3.1 | Description of the studies

The 17 papers described and evaluated 16 different training interventions, as two of the studies (Hahn, Needham, Abderhalden, Duxbury, & Halfens, 2006, Needham, Abderhalden, Halfens, Dassen et al., 2005b) evaluated the same intervention using different scales. Studies were conducted across diverse healthcare organizations and most of these were hospitals. Six of the 16 interventions we reviewed were conducted in psychiatric care, four in emergency departments, two in community nursing, two in neuroscience and two in dementia care. Twelve of the studies evaluated the competence that the intervention produced, four evaluated the rates of violent incidents and one evaluated the use of restraints. In one study, the patients' perspectives were also included (Björkdahl, Hansebo, & Palmstierna, 2013). Four of the studies were conducted in the United States, three in the United Kingdom, three in Australia, two in Switzerland and one each in Sweden, Norway, Finland, New Zealand and The Netherlands (Table S4).

3.2 | Training interventions managing challenging behaviour

Interventions were classified into four categories based on the way that the challenging behaviour was managed: disengagement skills, communication skills, controlling behavioural symptoms and restrictive measures (Table 1). The one training intervention in the disengagements category was described by Lamont, Brunero, Bailey, and Woods (2012) and was designed to develop physical breakaway skills for nursing staff to use in aggressive situations. The length of this classroom-based intervention was 2 hours and it did not include any theoretical or communication content (Table 1).

Eight studies described training interventions that enhanced staff communication skills. All the other interventions used classroom teaching as their teaching method, except for the intervention described by Gillespie, Farra, and Gates (2014), which used a combination of classroom teaching and eLearning. The length of the training varied from 45 min–2 days (Table 1). All of the training interventions included theoretical content, for example the reasons for aggression and communicational skills that participants could use to de-escalate situations.

Three training interventions that were described in the included studies were classified as controlling behavioural symptoms. An important additional element to the theory and communication provided by these interventions was making behavioural and/or care plans for patients that exhibited challenging behaviour with the support of colleagues. All these training interventions used classroom teaching and the length of interventions varied from 1 day (Narevic et al., 2011) to 2 days (Testad, Aaslan, & Aarsland, 2005; Visser et al., 2008).

Four training interventions in the restrictive measures category were described in five studies (Table 1) and these were all conducted in psychiatric inpatient care. In addition to the theoretical and communication content, they included the use of mechanical and physical restraints and seclusion. One training intervention was based on eLearning and only included theoretical content about the legal and ethical aspects related to the use of restraints and seclusion (Kontio et al., 2011). The other three training interventions were taught in classrooms. Interventions that enhanced staff skills with regard to the use of restrictive measures were longer than the interventions in other categories. For example, training interventions that included physical holding skills lasted four and 5 days (Table 1) and the training intervention that was designed to enhance staff knowledge was 120 hr (Kontio et al., 2011).

3.3 | Measurement of competence evaluation

All of the 11 scales used in the studies were self-reporting scales for measuring the elements of competence and the number of items varied from 10-53. The elements of competence were staff attitudes and perceptions of violence and what caused it, their confidence to cope with challenging behaviour and their knowledge of good practice in managing challenging behaviour. Five scales measured confidence, three measured attitudes and three measured knowledge. Neither the level of pursued competence, nor comprehensive competence in the management of challenging behaviour was defined. Most of the scales were newly developed and three of the scales were developed just before conducting the original research included in this review. The validity of the scales was not tested in three of the studies (Björkdahl et al., 2013; Davies, Griffiths, Liddiard, Lowe, & Stead, 2015; Gillespie et al., 2014) (Table 2).

Ten of the scales measured the competence unilaterally for one dimension (Table 2). The scale used in the Cahill (2008) study was a three-dimension questionnaire that measured the incidence of aggression, confidence in managing aggressive behaviour and attitudes towards aggression. In one study, the E13 questionnaire was developed for use by both staff and patients and reflected the causes of patient aggression, ward rules, the staffs' emotional regulation and early interventions (Björkdahl et al., 2013). The scale used in the study by Kontio et al. (2011) measured the competence to use restraints or seclusion based on two dimensions, namely knowledge and attitudes.

Separate scales were used in most of the studies (Table 2). The Confidence in Coping with Patient Aggression Instrument developed

TABLE 1 Characteristics of training interventions in included studies

Intervention and classification	Clinical context					Length of training					Teaching method			Measured Competence		
	Psychiatry	Emergency	Neuro Sc.	Dementia c.	Homecare	≤2 hr	≤1 day	≤2 days	4–5 days	120 hr	Classroom	eLearning	Combination	Attitude	Confidence	Knowledge
Disengagements																
Breakaway technique training. (Lamont et al., 2012)			x			x					x				x	
Communication																
ACT-SMART for Scripps Mercy. (Cahill, 2008)		x					x				x				x	
Positive behavioural support. (Davies et al., 2015).	x						x				x				x	
Management on Clinical Aggression — Rapid Emergency Department Intervention. (Gerdtz et al., 2013).		x				x					x			x		
Workplace violence educational prevention program. (Gillespie et al., 2014)		x						x					x			x
Positive Behaviour Management. (Killick & Allen, 2005)	x						x				x				x	x
Aggression Management Training Program. (Oostrom & Van Mierlo, 2008)					x			x			x				x	
A communication skills intervention. (Swain & Gale, 2014)[a]					x		x				x					

(Continues)

TABLE 1 (Continued)

Intervention and classification	Clinical context					Length of training					Teaching method			Measured Competence		
	Psychiatry	Emergency	Neuro Sc.	Dementia c.	Homecare	≤2 hr	≤1 day	≤2 days	4–5 days	120 hr	Classroom	eLearning	Combination	Attitude	Confidence	Knowledge
Non-violent Crisis Intervention Training. (Wakefield Gillam, 2014)[a]		x					x				x					
Controlling behavioural symptoms																
Staff training on the management of aggression. (Narevic et al., 2011)[a]			x				x				x					
Staff training on the use of restraint in dementia. (Testad et al., 2005)[a]				x				x			x					
Managing behavioural symptoms of dementia. (Visser et al., 2008)				x				x			x			x		
Restrictive measures																
Aggression management training programme. (Hahn et al., 2006; Needham, Abderhalden, Halfens, Dassen et al., 2005b)	x								x		x			x		
Prevention and Management of Violence and Aggression (Bovers et al., 2006)[a]	x								x		x					
The Bergen model (Björkdahl et al., 2013)	x								x		x			x		
ePsych.Nurse.Net. (Kontio et al., 2011)	x									x		x				x

[a]No competence measured.

TABLE 2 Competences and Scales in included studies

Competence	Scales and author	Validity tested		Development		Items
		Yes	No	Prior	New	
Staff attitudes and perceptions	E 13, Violence prevention and management climate in ward (Björkdahl et al., 2013)		x		x	13
	Management of Aggression and Violence Attitude Scale, MAVAS. Scale includes "internal", "external" and "situational/interactional" models about the perceived causes of patients' aggression and statements reflecting the general management approach. (Gerdtz et al., 2013; Hahn et al., 2006)	x		x		Socio-biographic items and 27 statements
	Perception of Aggression Scale (POAS-S)				x	12 items
	Impact of Patient Aggression on Carers Scale (IMPACS). (Needham et al. 2005b)	x				Three factors
	Staff Attitudes Questionnaire. (Visser et al., 2008)	x			x	16 statements
Confidence	Incidence of and Attitudes Towards Aggression in the Workplace, a three dimension questionnaire for managing the aggressive and violent patients in the ED. (Cahill, 2008)	x		x		Three dimension, 33 items
	Confidence in Coping with Patient Aggression Instrument					10 items
	1. Killick and Allen (2005)	x		x		
	2. Adapted version in Davies et al.(2015)		x			
	General Self-Efficacy Scale. (Kontio et al., 2011)	x			x	10
	A 12-item questionnaire: confidence and safety on working with aggressive patients, exposure to the various domains of breakaways and confidence in the safe breakaways. (Lamont et al., 2012)	x			x	12
	24-item questionnaire: "Insight into assertiveness and aggression" and "Ability to cope with adverse working situations". (Oostrom & Van Mierlo, 2008)	x			x	24
Knowledge	Workplace violence test: knowledge in preventing, managing and reporting incidents of workplace violence. (Gillespie et al., 2014)		x		x	20 questions
Competence in seclusion/restraint	Physical Restraint Questionnaire: knowledge and attitudes (modified for seclusion). (Kontio et al., 2011)	x			x	53

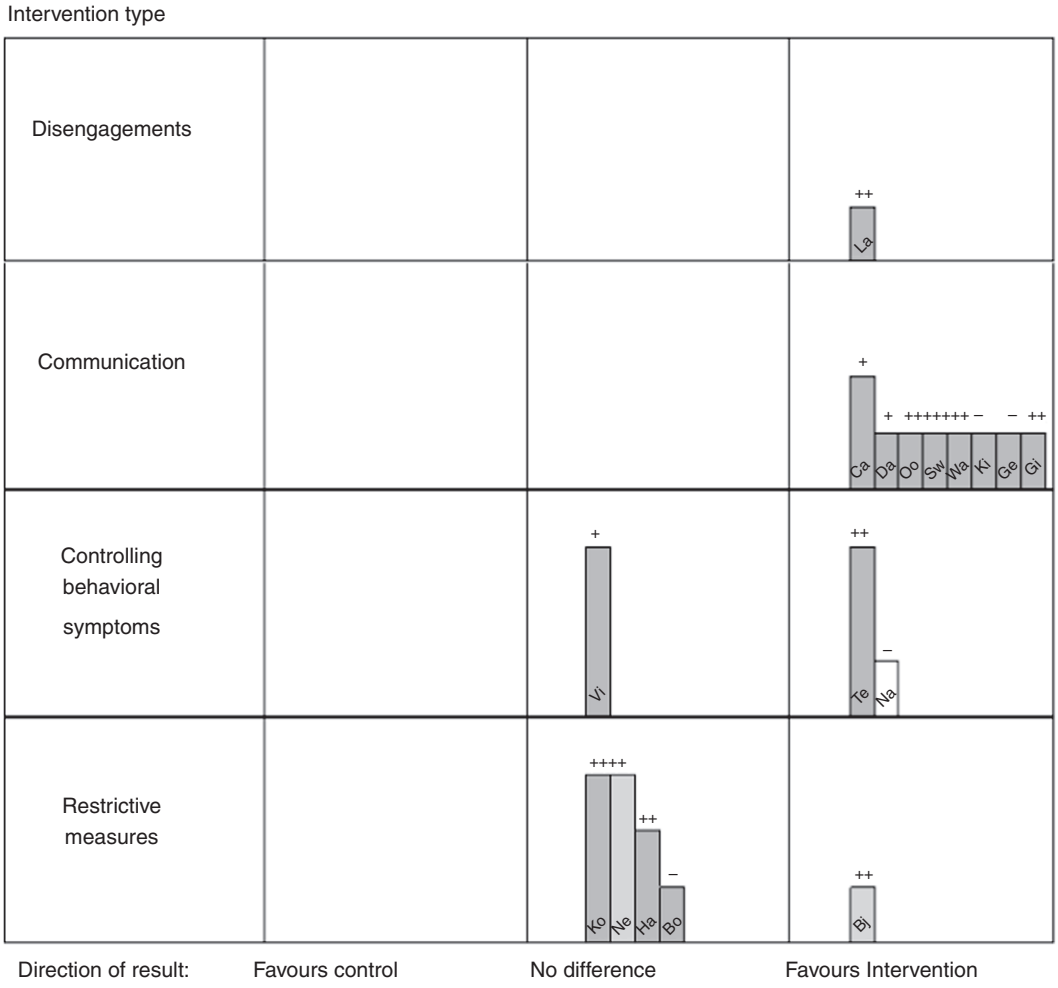
by Thackrey (1987) was used in two of the studies (Davies et al., 2015; Killick & Allen, 2005), although the scale used in the latter study was an adapted, but not tested, version. The MAVAS scale developed by Duxbury (2003) was also used in two of the studies (Gerdtz et al., 2013; Hahn et al., 2006). Ten studies used one scale for their measurements, while Kontio et al. (2011) used two individual scales in their study.

3.4 | Effects of training interventions on primary outcomes

The primary outcomes that came out of the evaluations of training interventions to manage challenging behaviour are presented in Figure 2 and they use the Harvest Plot developed by Turley et al. (2013). These primary outcomes were: elements of competence, violent incident rates and the use of restraints.

3.4.1 | Elements of competence

The most effective training interventions fell into the communication category and most of these had a significant positive impact on confidence. All these studies were assessed as having a low or unclear risk of bias. The study by Cahill (2008) showed that the experimental group significantly improved their scores with regard to their confidence in managing aggressive situations ($t = -6.416$, $df = 42$, $p = .000$), but the difference was not statistically significant when it was compared with the control group ($t = -1.654$, $df = 50$, $p = .104$). However, Cahill (2008) felt the experimental group score was clinically significant. The strength of evidence in this CBA study was considered moderate and the other studies in this category were ITS studies that provided weak evidence. In the study by Davies et al. (2015), confidence increased significantly after training for both qualified (t [29] $= -6.56$, $p = <.001$) and unqualified staff (t [27] $= -5.67$, $p = <.001$). Similar improvements were noticed in the experimental variables that measured competence in the study by Oostrom and Van Mierlo (2008). The largest significant increase — into insight into assertiveness and aggression — occurred between the before and after tests ($t = -4.24$, $p < .01$, $df = 33$) and the follow-up showed that this increase was maintained for up to 5 weeks. A significant increase was also detected in the subject's ability to cope with adverse working situations' before and after the intervention (t[36] $= -7.07$, $p < .01$) and between the posttest and



KEY

Each bar represents a study, referenced byt the two first letters of the first authors' surname. Key study characteristics are represented by the following:

Shading of bar: statistical confidence in point estimate

Dark grey: Evidence of no effect or statistically significant effect at 5% level

Light grey: Statistically significant effect at 10%level

White: Confidence intervals and p-values not reported/estimable

Height of bar: appropriateness of study design

High bar = design can examine causal effect or intervention (RCT)

Mid-height bar = design can infer plausible causality (CBA)

Low bar = desing cannot examine causality (ITS)

Symbol: Risk of bias of study

++ Low risk of bias

+ mixed/unclear risk of bias

–High risk of bias

Please note that 'Ne' and 'Ha' evaluate the same intervention. Studies (N = 17), Interventions (N = 16).

FIGURE 2 A Harvest Plot synthesizing results from studies of training interventions

follow-up scores ($t[23] = -2.47$, $p < .01$). A significant effect on confidence in dealing with aggression over time (F (2.27, 45.35) = 10.55, $p < .001$) was found in the study by Killick and Allen (2005), but at the 1-year follow-up there was no significant difference between the baseline and follow-up scores ($t = 0.2$, $df = 14$, $p > .05$). The intervention in the disengagements category (Lamont et al., 2012) also showed statistically significant increases in confidence ($Z = -3.17$, $p = .002$) and safety ($Z = -3.74$, $p = <.001$) levels in all breakaway domains: wrist grabs ($Z = -3.166$, $p = .002$), clothing grabs ($Z = -2.66$, $p = .008$), hair pulls ($Z = -3.8$, $p < .001$), choking and strangling ($Z = 4.17$, $p < .001$) and bear hugs ($Z = -4.05$, $p < .001$). The study did not have a follow-up and was assessed as providing weak evidence and having a low risk of bias (Figure 2, Table 1 and Table S3).

In addition to having a positive impact on confidence, interventions in the communication category also had limited effects on staff attitudes in the study by Gerdtz et al. (2013). This study found significant change in four out of 12 items, namely: "if the physical environment were different, patients would be less aggressive" ($Z = -3.30$, $p = .00$), "patients commonly become aggressive because staff do not listen to them" ($Z = -5.47$, $p = .00$), "there appear to be types of patients who frequently become aggressive towards staff" ($Z = -2.53$, $p = .01$) and "physical restraint is sometimes used more than necessary" ($Z = -2.79$, $p = .00$). No follow-up was conducted in this study. The study by Gillespie et al. (2014) found a significant increase in knowledge (Wilk's $\lambda = 0.390$, F (2, 118) = 26.554, $p < .001$, $\eta^2 = 0.310$, $p < .001$), which increased at the 6-month follow-up (F (1,119) = 53.454, $p < .001$, $\eta^2 = 0.310$). The strength of evidence in these studies was weak (Figure 2, Table 1 and Table S3).

In addition, three of the four interventions in the restrictive measures category had no impact on knowledge or attitudes. The RCT study with a low risk of bias by Kontio et al. (2011) found no differences in primary outcomes. The changes in the mean scores for the subject's knowledge of coercion-related legislation were −0.11 for both the intervention and control groups ($p = .827$). For changes in the means on knowledge on physical restraint, they were 0.77 and −0.86, ($p = .773$) and for knowledge on seclusion they were −0.08 and = 0.07 ($p = .558$).

The RCT study by Needham, Abderhalden, Halfens, Dassen et al. (2005b) and CBA study by Hahn et al. (2006) both evaluated the same intervention. Both studies showed a low risk of bias and provided strong evidence against the use of this intervention. Needham, Abderhalden, Halfens, Dassen et al. (2005b) found no statistically significant differences in the means of the variables between the intervention and control groups for: "the positive perception of aggression" ($t = 0.679$, $p = .912$), "the negative perception of aggression" ($t = 0.315$, $p = .315$), "the tolerance scale" ($t = 0.498$, $p = .614$), "the impairment of the relationship between the patient and carer" ($t = 0.469$, $p = .233$), "adverse moral emotions" ($t = 0.055$, $p = .281$) and "adverse feelings to external sources" ($t = 0.731$, $p = .953$). The study by Hahn et al. (2006) showed no differences between the groups regarding their attitudes after this training course. For the "internal model", the changes between the pre and posttests (±SD) for the intervention group were $Z = -1.114$, $p = .265$ and for the control group they were $Z = -0.054$, $p = .957$. For the "external models", they were $Z = -1.665$, $p = .96$ and $Z = -1.698$, $p = .90$ and for the "situational/interactional model" they were $Z = -1.568$, $p = .117$ and $Z = -0.744$, $p = .457$, respectively. For "the general management approach", they were $Z = -2.072$, $p = .38$ and $Z = -1.144$, $p = .253$, respectively. Björkdahl et al. (2013) found a significant change in staff attitudes regarding four of the 13 items between trained and untrained wards. The scores for "the rules for patients on the ward are good" were 76.9% pre-agreement vs. 87.3%, postagreement and 21.9% vs. 12.7% ($p = .001$), respectively. The respective scores for "the staff are calm when approaching aggressive patients" were 88.6% vs. 94.5% and 11.4% vs. 5.5%, ($p = .007$), for "the staff try to understand why a patient is acting aggressively" they were 83.8% vs. 89.4% and 16.2% vs. 10.6%, ($p = .031$) and for "the staff already approach patients at the first signs of aggression" they were 80.3% vs. 89.5% and 19.7% vs. 10.5% ($p = .001$). Patients staying on trained wards differed significantly with regard to one of the 13 statements compared with patients staying on untrained wards — the perception of violence prevention and management climate — with the respective scores being 70.5% vs. 82.6% and 29.5% vs. 17.4% ($p = .022$). The study provided weak evidence to support the use of the intervention.

The RCT study in the controlling behavioural symptoms category (Visser et al., 2008) found a significant change in the skills and knowledge subscale, with a significant interaction between group and time ($F(2,47) = 6.10$, $p < .001$, $\eta^2 = 0.21$). There was a significant improvement in the skills and knowledge scores postintervention for the education and peer support group ($F(1,16) = 20.26$, $p < .001$, $\eta^2 = 1.00$), but no significant change in these scores for the education ($F(1,8) = 2.65$, $p > .01$, $\eta^2 = 0.14$) and control ($F(1,23) = 1.33$, $p > .01$, $\eta^2 = 0.06$) groups. Results for the control and education and peer support groups at follow-up revealed a significant interaction effect, with scores improving at the follow-ups at 3 months ($F(1, 16) = 49.38$, $p < .001$, $\eta^2 = 1.00$) and 6 months ($F(1, 13) = 21.72$, $p < .001$, $\eta^2 = 0.99$) for the education and peer support group. This study provided strong evidence and an unclear risk of bias (Figure 2, Table 1 and Table S4).

3.4.2 | Rates of violent incidents

Weak evidence was found that training interventions reduced violent incident rates. Two interventions in the communication category significantly reduced the number of violent incidents and the evidence provided in these ITS studies was weak, with a low risk of bias. A statistically significant decline in the patient aggression scores was found by Swain and Gale (2014). The perception of patient aggression scale (POPAS) showed a decline in reported aggression at each time period. There was a statistically significant difference in aggression scores, $\chi^2(2) = 21.7$, $p < .01$. The median scores on the POPAS were 5, 4, 2 and 1, respectively. There were no significant differences between the baseline and postintervention scores

(Z = −1.5, p = .12) immediately after intervention, but there were statistically significant reductions between baseline and 1 month and baseline and 2 months after the intervention, respectively (Z = 3.7, p < .000 and Z = 4.0, p < .000).

Furthermore, an intervention in the controlling behavioural symptoms category reduced violent incidents by 77% and the average monthly incident rate per client was 0.015. The strength of the evidence provided by Narevic et al. (2011) was weak. Despite the significant change in staff attitudes, the intervention evaluated by Visser et al. (2008) in the controlling behavioural symptoms category showed no significant difference in scores across time and group for incident rates. Thereafter, the evidence provided by this study was not strong enough not to favour the use of the intervention for reducing dementia-related challenging behaviour (Figure 2, Table S4).

3.4.3 | Use of restraints

The use of restraints was evaluated in one RCT study by Testad et al. (2005). At 7 months follow-up, the use of restraint was significantly lower in the intervention group compared with the control group (U = 1 778 000; p = .017) and there was strong evidence for the use of the intervention (Figure 2, Table S4).

4 | DISCUSSION

This review updates and reinforces the knowledge from previous reviews (Heckemann et al., 2015; Kynoch et al., 2011; Nelstrop et al., 2006; Wassell, 2009) since the studies (N = 17) included in this review were not included in previous systematic reviews. The first research question dealt with training interventions designed to enhance the competence of nursing staff to manage challenging behaviour. They were classified into four categories: disengagement skills, communication skills, controlling behavioural symptoms and restrictive measures. The training interventions in this review were similar to the training interventions in previous reviews. Most of the interventions decided that the important aspects of the content were preventing violence, communication skills and de-escalation techniques. One intervention only consisted of physical disengagement skills, with no theoretical or communicational content (Lamont et al., 2012), while five interventions included the use of restrictive measures. The accuracy of the depictions of the training interventions varied between the studies, which made it difficult to build up a full picture of their goals, their content and the emphasis of the interventions. Systematic and fuller descriptions of the interventions we evaluated might make it easier to compare these interventions in the future.

According to the previous literature (Moylan, 2009; Nelstrop et al., 2006) and the current guidelines (National Institute for Health and Care Excellence, 2015, Department of Health, 2014, British Institute for Learning Disabilities (BILD), 2010), competence to manage challenging behaviour includes ethical decision-making and professional communication skills (National Institute for Health and Care Excellence, 2015), which are based on treating patients with respect and dignity (BILD 2010, Department of Health, 2014, Moylan, 2009; Nelstrop et al., 2006). Understanding the reasons for patients' behaviour, including the precipitating factors for violence (British Institute for Learning Disabilities, 2010, Duxbury, 2002), is important if staff hope to prevent aggressive situations (British Institute for Learning Disabilities, 2010, National Institute for Health and Care Excellence, 2015). Staff need to have de-escalation skills (Nau, Halfens, Needham, & Dassen, 2009; Nelstrop et al., 2006) to defuse escalating behaviour. If communication is not sufficient to defuse that challenging behaviour, then the staff need to know how to use safe and evidence-based skills to physically restrain the patient and prevent harm to the people involved (BILD 2010, NICE 2015).

During any physical restraint, staff must still maintain a therapeutic relationship with the patient, while they observe the patient's vital signs and ensure patient safety. Staff should also work as a team (Nelstrop et al., 2006; National Institute for Health and Care Excellence, 2015). Postincident support is offered to the patient, whenever possible, to maintain the therapeutic relationship and enable all participants to learn from the situation. (National Institute for Health and Care Excellence, 2015, British Institute for Learning Disabilities, 2010.) If there is a need for long-term behaviour management, behaviour plans should be constructed to prevent any restrictive practices (British Institute for Learning Disabilities, 2010, Department of Health, 2014).

The second research question dealt with the evaluation of staff competence and the studies used 11 scales that were mostly developed for those studies. They measured various elements of competence unilaterally: staff attitudes and perceptions of violence and the reasons for violence, the staff member's confidence when it came to coping with challenging behaviour and their knowledge of good practice in the management of challenging behaviour. The use of diverse scales made the comprehensive evaluation of competence more difficult. The development of a comprehensive scale to measure staff competence for managing challenging behaviour remains a challenge for the future.

The third research question dealt with the effects of training interventions. The results of this review indicated that training interventions were more likely to increase staff confidence (Cahill, 2008; Davies et al., 2015; Killick & Allen, 2005; Lamont et al., 2012; Oostrom & Van Mierlo, 2008) than change staff attitudes (Björkdahl et al., 2013) or increase their knowledge. Overall, the evidence from this review was mostly weak. Only four of the studies provided strong evidence and only two provided moderate evidence. Based on this review, the use of interventions in the communication and control behavioural symptoms are recommended because they were more likely to increase staff confidence than the other interventions. However, it was not possible to make precise assumptions about the overall effectiveness or benefits from any of the training interventions examined in this review, due to the unilateral focus of their measurements. Only

the results by Hahn et al. (2006) and Gerdtz et al. (2013) were comparable because they were based on the same measurements.

In addition to elements of staff competence, the effectiveness of four training interventions (Narevic et al., 2011; Swain & Gale, 2014; Visser et al., 2008; Wakefield Gillam, 2014) was also measured using violent incident rates and the use of restraints. In three studies, a decrease in incident rates was found (Narevic et al., 2011; Swain & Gale, 2014; Wakefield Gillam, 2014), in contrast to the results of the review by Heckemann et al. (2015). The use of restraints reduced significantly in the study by Testad et al. (2005). Therefore, it seems justifiable to argue that training interventions that enhance staff communication skills do decrease violent incident rates. The findings also indicate that shorter training interventions, namely a maximum length of 1 day, were more likely to produce a significant increase in elements of competence and a decrease in incident rates, rather than those interventions that last more than 2 days.

Using confidence as an indication of the effectiveness of training interventions to manage challenging behaviour is somewhat contentious. Confidence is related to how sure or unsure a staff member is when facing an aggressor, but what is the optimal amount of confidence needed for the management of challenging behaviour? Confidence and competence are not necessarily the same thing, which raises the question of whether training creates false confidence, or whether actual competence has, or has not, increased (Stubbs, 2009). Self-confidence is not a reliable predictor of performance (Nau, Dassen, Needham, & Halfens, 2011). In one study, unqualified staff evaluated themselves at baseline as being significantly more competent than qualified staff (Davies et al., 2015). Despite the significant increase in confidence in the study by Killick and Allen (2005), confidence levels returned to baseline levels 12 months later.

Previous research has highlighted the need for still more rigorous research, especially the need for randomized controlled trials, as they can produce the strongest research evidence. Four RCT studies were included in this review, but apart from these, the variety of study designs was similar to previous reviews. It should also be noted that there are challenges when studying training interventions that are highly influenced by existing clinical practices (Grove, Burns, & Gray, 2013), for example staff attitudes. This challenge when trying to influence staff attitudes was also noticed in previous reviews (Heckemann et al., 2015; Wassell, 2009). Little attention was paid to the cost effectiveness of the staff training being evaluated in one of the studies (Wakefield Gillam 2014).

Surprisingly, patient safety was not evaluated in any of these studies. Managing challenging behaviour involves interventions to which an individual does not, or cannot, consent (National Institute for Health and Care Excellence, 2015). The physical management of challenging behaviour may cause risks to patient safety and restraint-related injuries and deaths have occurred (Barnett et al., 2012; Hollins & Stubbs, 2011; Stubbs, Leadbetter, Paterson, Yorston, Knight, & Davis, 2009; Stubbs & Alderman, 2008). Physical interventions should, therefore, be avoided if possible and the level of force applied must be justifiable and proportionate to the specific situation and be applied for the minimum amount of time possible. The deliberate application of pain can only be justified for the immediate rescue of staff, patients and/or others. Patient safety should be considered in the future when evaluating the effectiveness of any interventions being used to manage challenging behaviour (National Institute for Health and Care Excellence, 2015). That evaluation should include the role of the range of physical interventions being taught to staff (Nelstrop et al., 2006), in addition to ethical, legal and safety issues. In any corrupted cultures of care, physical interventions can also include the possibility of potential misuse or overuse (Stubbs et al., 2009).

4.1 | Strengths and limitations

A search of five electronic databases was conducted, with the help of an academic library information retrieval expert, to enhance the validity of this systematic review even further. The titles and abstracts of all the identified papers were initially screened against the inclusion criteria by three reviewers (ST, PP, ALH) and the full texts were independently assessed by two reviewers (ST, RK). The co-authors used their expertise during the writing process by reviewing the analysis and the results, which is a process that supports the reliability of this review.

Nevertheless, this review has certain limitations that need to be considered. First limitation was the lack of grey or unpublished literature, for example professional publications and national guidelines. Therefore, it is likely that certain interventions and evaluations are missing from this review. Second, the 17 studies that were reviewed featured disparate aims, study designs and scales and the interventions varied in terms of their length and delivery methods. The effectiveness of an intervention was often locally evaluated using just a small sample sizes. These variations in characteristics hampered a direct comparison of their effectiveness and the synthesis of data.

5 | CONCLUSION

The evidence we found in this review varied from strong to weak, with the majority of the papers providing weak evidence for the interventions they assessed. However, the evidence does support the conclusion that interventions that enhance staff communication skills and use care plans to control behavioural symptoms, may have a greater positive impact when care providers are intent on pursuing restraint-free practices in health care.

The authors agree with the previous suggestions that more high-quality research is needed in this area. Structured and comprehensive tools to evaluate the competence to manage challenging behaviour are needed to produce comparable measurements. It might be useful to include the incidents and/or the rates for the use of restraints in such evaluations, to ensure the most valid comparisons. Patient safety should be noted in future evaluations and patients' experiences with regard to the management of challenging behaviour. These patient experiences should clearly be heard. Behaviour

management should also be considered as a significant quality measure of care, especially in psychiatric nursing, residential homes and long-term care. It may also be useful to evaluate recent, established training interventions, using structured scales instead of developing new interventions. Finally, the professional competence to manage challenging behaviour is both complex and multidimensional, which should remain closely connected to patients' overall needs.

CONFLICTS OF INTEREST

No conflict of interest has been declared by the authors.

AUTHORS' CONTRIBUTION

All authors agreed on the final version and met at least one of the following criteria recommended by the ICMJE (http://www.icmje.org/recommendations/):

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

REFERENCES

Barnett, R., Stirling, C., & Pandyan, A. D. (2012). A review of the scientific literature related to the adverse impact of physical restraint: Gaining a clearer understanding of the physiological factors involved in cases of restraint-related death. *Medicine, Science and the Law*, *52*(3), 137–142.

Björkdahl, A., Hansebo, G., & Palmstierna, T. (2013). The influence of staff training on the violence prevention and management climate in psychiatric inpatient units. *Journal of Psychiatric & Mental Health Nursing*, *20*(5), 396–404.

Bovers, L., Nijman, H., Allan, T., Simpson, A., Warren, J., & Turner, L. (2006). Prevention and management of aggression training and violent Incidents on U.K. Acute psychiatric wards. *Psychiatric Services*, *57*(7), 1022–1026.

British Institute for Learning Disabilities. (2010). *Code of practice for the use and reduction of restrictive physical interventions*. 3rd Edn. Plymouth. UK: Latimer Trend & Company Ltd. www.bild.org.uk

Cahill, D. (2008). The effect of ACT-SMART on nurses' perceived level of confidence toward managing the aggressive and violent patient. *Advanced Emergency Nursing Journal*, *30*(3), 252–270.

Centre for Reviews and Dissemination. (2008). Systematic Reviews. CRD's guidance for undertaking reviews in health care. Centre for Reviews and Dissemination. Published by CRD, University of York. Retrieved from https://www.york.ac.uk/media/crd/Systematic_Reviews.pdf

Davies, B., Griffiths, J., Liddiard, K., Lowe, K., & Stead, L. (2015). Changes in staff confidence and attributions for challenging behaviour after training in positive behavioural support within a forensic medium secure service. *Journal of Forensic Psychiatry and Psychology*, *26*(6), 847–861.

Department of Health. (2014). Positive and proactive care: Reducing the need for restrictive interventions. Prepared by Department of Health. Retrieved from www.official-documents.gov.uk

Duxbury, J. (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. *Journal of Psychiatric and Mental Health Nursing*, *9*(3), 325–337.

Duxbury, J. (2003). Testing a new tool: The Management of Aggression and Violence Attitude Scale (MAVAS). *Nurse Researcher*, *10*(4), 39–52.

Effective Practice and Organisation of Care (EPOC). (2013). Synthesising results when it does not make sense to do a meta-analysis. EPOC Resources for review authors. Oslo: Norwegian Knowledge Centre for the Health Services; 2013. Retreived from http://epoc.cochrane.org/epoc-specific-resources-review-authors

Effective Practice and Organisation of Care (EPOC). (2015). EPOC Resources for review authors. Oslo: Norwegian Knowledge Centre for the Health Services. Retrieved from http://epoc.cochrane.org/epoc-specific-resources-review-authors

Estryn-Behar, M., Van der Heijden, B., Camerino, D., Fry, C., Le Nezet, O., Conway, P. M., & Hasselhorn, H. M. & NEXT Study group. (2008). Violence risks in nursing–results from the European 'NEXT' Study. *Occupational medicine (Oxford, England)*, *58*(2), 107–114.

Foster, C., Bowers, L., & Nijman, H. (2007). Aggressive behaviour on acute psychiatric wards: Prevalence, severity and management. *Journal of Advanced Nursing*, *58*(2), 140–149.

Gacki-Smith, J., Juarez, A. M., Boyett, L., Homeyer, C., Robinson, L., & MacLean, S. L. (2009). Violence against nurses working in U.S. emergency departments. *Journal of Nursing Administration*, *39*(7–8), 340–349.

Gates, D. M., Gillespie, G. L., & Succop, P. (2011). Violence against nurses and its impact on stress and productivity. *Nursing Economics*, *29*(2), 59–66.

Gerdtz, M. F., Daniel, C., Dearie, V., Prematunga, R., Bamert, M., & Duxbury, J. (2013). The outcome of a rapid training program on nurses' attitudes regarding the prevention of aggression in emergency departments: A multi-site evaluation. *International Journal of Nursing Studies*, *50*(11), 1434–1445.

Gillespie, G. L., Farra, S. L., & Gates, D. M. (2014). A workplace violence educational program: A repeated measures study. *Nurse Education in Practice*, *14*(5), 468–472.

Graneheim, U. H., Hornsten, A., & Isaksson, U. (2012). Female caregivers' perceptions of reasons for violent behaviour among nursing home residents. *Journal of Psychiatric and Mental Health Nursing*, *19*(2), 154–161.

Grove, S. K., Burns, N., & Gray, J. (2013). *The practice of nursing research: Appraisal, synthesis and generation of evidence*. 7th Ed. St. Louis, Missouri: Elsevier.

Hahn, S., Needham, I., Abderhalden, C., Duxbury, J. A. D., & Halfens, R. J. G. (2006). The effect of a training course on mental health nurses' attitudes on the reasons of patient aggression and its management. *Journal of Psychiatric and Mental Health Nursing*, *13*(2), 197–204.

Heckemann, B., Zeller, A., Hahn, S., Dassen, T., Schols, J. M. G. A., & Halfens, R. J. G. (2015). The effect of aggression management training programmes for nursing staff and students' working in an acute hospital setting. A narrative review of current literature. *Nurse Education Today*, *35*(1), 212–219.

Hollins, L. P., & Stubbs, P. (2011). The shoulder: Taking the strain during restraint. *Journal of Psychiatric and Mental Health Nursing*, *18*, 177–184.

Killick, S., & Allen, D. (2005). Training staff in an adolescent inpatient psychiatric unit in positive approaches to managing aggressive and harmful behaviour: Does it improve confidence and knowledge? *Child Care in Practice*, *11*(3), 323–339.

Kontio, R., Lahti, M., Pitkänen, A., Joffe, G., Putkonen, H., Hätönen, H., … Välimäki, M. (2011). Impact of eLearning course on nurses' professional competence in seclusion and restraint practices: A randomized controlled study (ISRCTN32869544). *Journal of Psychiatric & Mental Health Nursing*, *18*(9), 813–821.

Kowalenko, T., Gates, D., Gillespie, G. L., Succop, P., & Mentzel, T. K. (2013). Prospective study of violence against ED workers. *The American Journal of Emergency Medicine*, *31*(1), 197–205.

Kynoch, K., Wu, C., & Chang, A. M. (2011). Interventions for preventing and managing aggressive patients admitted to an acute hospital setting: A systematic review. *Worldviews on Evidence-Based Nursing*, *8*(2), 76–86.

Lamont, S., Brunero, S., Bailey, A., & Woods, K. (2012). Breakaway technique training as a means of increasing confidence in managing aggression in neuroscience nursing. *Australian Health Review*, *36*(3), 313–319.

Lowe, K., Allen, D., Jones, E., Brophy, S., Moore, K., & James, W. (2007). Challenging behaviours: Prevalence and topographies. *Journal of Intellectual Disability Research*, *51*(8), 625–636.

McCann, T., Baird, J., & Muir-Cochrane, E. C. (2015). Social climate of acute old age psychiatry inpatient units: Staff perceptions within the context of patient aggression. *Journal of Psychiatric and Mental Health Nursing*, *22*(2), 102–108.

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *British Medical Journal*, *339*, https://doi.org/10.1136/bmj.b2535\

Moylan, L. B. (2009). Physical restraint in acute care psychiatry: A humanistic and realistic nursing approach. *Journal of Psychosocial Nursing and Mental Health Services*, *47*(3), 41–47.

Narevic, E., Giles, G. M., Rajadhyaxa, R., Manageloda, E., Monisa, F., & Diamond, F. (2011). The effects of enhanced program review and staff training on the management of aggression among clients in a long-term neurobehavioral rehabilitation program. *Aging & Mental Health*, *15*(1), 103–112.

National Institute for Health and Care Excellence. (2015). Violence and aggression: Short-term management in mental health, health and community settings. NICE guideline. Published: 28 May 2015 nice.org.uk/guidance/ng10. NICE 2015

Nau, J., Dassen, T., Needham, I., & Halfens, R. (2011). Sensitivity, specificity and predictive value of the Confidence in Managing Patient Aggression Scale on de-escalating behaviour. *Journal of Clinical Nursing*, *20*(17–18), 2584–2586.

Nau, J., Halfens, R., Needham, I., & Dassen, T. (2009). The De-Escalating Aggressive Behaviour Scale: Development and psychometric testing. *Journal of Advanced Nursing*, *65*(9), 1956–1964.

Needham, I., Abderhalden, C., Halfens, R. J., Fischer, J. E., & Dassen, T. (2005a). Non-somatic effects of patient aggression on nurses: A systematic review. *Journal of Advanced Nursing*, *49*(3), 283–296.

Needham, I., Abderhalden, C., Halfens, R., Dassen, T., Haug, H. J., & Fischer, J. E. (2005b). The effect of a training course in aggression management on mental health nurses' perceptions of aggression: A cluster randomised controlled trial. *International Journal of Nursing Studies*, *42*(6), 649–655.

Nelstrop, L., Chandler-Oatts, J., Bingley, W., Bleetman, T., Corr, F., Cronin-Davis, J., … Tsuchiya, A. (2006). A systematic review of the safety and effectiveness of restraint and seclusion as interventions for the short-term management of violence in adult psychiatric inpatient settings and emergency departments. *Worldviews on Evidence-Based Nursing*, *3*(1), 8–18.

Oostrom, J. K., & Van Mierlo, H. (2008). An evaluation of an aggression management training program to cope with workplace violence in the healthcare sector. *Research in Nursing & Health*, *31*(4), 320–328.

Paterson, B., Bradley, B., Stark, C., Saddler, D., Leadbetter, D., & Allen, D. (2003). (2003), Deaths associated with restraint use in health and social care in the UK. The results of a preliminary survey. *Journal of Psychiatric and Mental Health Nursing*, *10*(1), 3–15.

Raboch, J., Kalisova, L., Nawka, A., Kitzlerova, E., Onchev, G., Karastergiou, A., … Kallert, T. W. (2010). Use of coercive measures during involuntary hospitalization: Findings from ten European countries. *Psychiatric Services (Washington, D.C.)*, *61*(10), 1012–1017.

Ridenour, M., Lanza, M., Hendricks, S., Hartley, D., Rierdan, J., Zeiss, R., & Amandus, H. (2015). Incidence and risk factors of workplace violence on psychiatric staff. *Work*, *51*(1), 19–28.

Roche, M., Diers, D., Duffield, C., & Catling-Paull, C. (2010). Violence toward nurses, the work environment and patient outcomes. *Journal of Nursing Scholarship: An Official Publication of Sigma Theta Tau International Honor Society of Nursing/Sigma Theta Tau*, *42*(1), 13–22.

Royal College of Psychiatrists. (2007). Challenging behaviour: A unified approach. Clinical and service guidelines for supporting people with learning disabilities who are at risk of receiving abusive or restrictive practices. The Royal College of Psychiatrists, British Psychological Society and Royal College of Speech and Language Therapists. College Report CR144 2007.

Sharipova, M., Hogh, A., & Borg, V. (2010). Individual and organizational risk factors of work-related violence in the Danish elder care. *Scandinavian Journal of Caring Sciences*, *24*(2), 332–340.

Spector, P. E., Zhou, Z. E., & Che, X. X. (2014). Nurse exposure to physical and nonphysical violence, bullying and sexual harassment: A quantitative review. *International Journal of Nursing Studies*, *51*(1), 72–84.

Staggs, V. S. (2015). Trends, victims and injuries in injurious patient assaults on adult, geriatric and child/adolescent psychiatric units in US hospitals, 2007–2013. *Research in Nursing and Health*, *38*(2), 115–120.

Stewart, D., Bowers, L., Simpson, A., Ryan, C., & Tziggili, M. (2009). Manual restraint of adult psychiatric inpatients: A literature review. *Journal of Psychiatric and Mental Health Nursing*, *16*, 749–757.

Stubbs, B. (2009). Physical intervention in older adult psychiatry: An audit of physical ailments identified by physiotherapists and the implications for managing aggressive behavior. *International Psychogeriatrics/IPA*, *21*(6), 1196–1197.

Stubbs, B., & Alderman, N. (2008). Physical interventions to manage patients with brain injury: An audit on its use and staff and patient injuries from the techniques. *Brain Injury*, *22*(9), 691–696.

Stubbs, B., Leadbetter, D., Paterson, B., Yorston, G., Knight, C., & Davis, S. (2009). Physical intervention: A review of the literature on its use, staff and patient views and the impact of training. *Journal of Psychiatric & Mental Health Nursing*, *16*(1), 99–105.

Swain, N., & Gale, C. (2014). A communication skills intervention for community healthcare workers reduces perceived patient aggression: A pretest-posttest study. *International Journal of Nursing Studies*, *51*(9), 1241–1245.

Testad, I., Aaslan, A. M., & Aarsland, D. (2005). The effect of staff training on the use of restraint in dementia: A single-blind randomised controlled trial. *International Journal of Geriatric Psychiatry*, *20*(6), 587–590.

Thackrey, M. (1987). Clinician confidence in coping with patient aggression: Assessment and enhancement. *Professional Psychology: Research and Practice*, *18*(1), 57–60.

Turley, R., Saith, R., Bhan, N., Doyle, J., Jones, K., & Waters, E. (2013). Slum upgrading review: Methodological challenges that arise in systematic reviews of complex interventions. Cochrane update. *Journal of Public Health*, *35*(1), 171–175.

Visser, S. M., McCabe, M. P., Hudgson, C., Buchanan, G., Davison, T. E., & George, K. (2008). Managing behavioural symptoms of dementia: Effectiveness of staff education and peer support. *Aging & Mental Health*, *12*(1), 47–55.

Wakefield Gillam, S. (2014). Nonviolent crisis intervention training and the incidence of violent events in a large hospital emergency department: An observational quality improvement study. *Advanced Emergency Nursing Journal*, *36*(2), 177–188.

Waschgler, K., Ruiz-Hernandez, J. A., Llor-Esteban, B., & Garcia-Izquierdo, M. (2013). Patients' aggressive behaviours towards nurses: Development and psychometric properties of the hospital aggressive behaviour scale- users. *Journal of Advanced Nursing*, *69*(6), 1418–1427.

Wassell, J. T. (2009). Workplace violence intervention effectiveness: A systematic literature review. *Safety Science*, *47*(8), 1049–1055.

World Health Organization (WHO). (2017). Framework guidelines addressing workplace violence in the health sector. Retrieved from http://www.who.int/violence_injury_prevention/injury/work9/en/index2.html on 4 February 2017

Zwijsen, S. A., Smalbrugge, M., Eefsting, J. A., Twisk, J. W. R., Gerritsen, D. L., Pot, A. M., & Hertogh, C. M. P. M. (2014). Coming to grips with challenging behavior: A cluster randomized controlled trial on the effects of a multidisciplinary care program for challenging behavior in Dementia. *Journal of the American Medical Directors Association*, *15*(7), 531.e1–531.e10.

SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

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