Staff training and physical intervention

STAFF TRAINING IN PHYSICAL INTERVENTIONS:
A SYSTEMATIC LITERATURE REVIEW

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Abstract

Physical restraint training is a billion dollar industry worldwide with hundreds of companies providing almost as many different approaches to dealing with aggression in care environments. Despite this there is an extremely limited evidence base for the efficacy of such training and a systematic literature review of existing research has not yet been conducted. This paper aims to review all published data on staff training research which contained physical interventions, to highlight the most scientifically rigorous of these papers and to make recommendations based on the findings. Electronic literature searches were conducted using Web of Science ©, Cochrane Database of Systematic Reviews ©, Medline ©, Social Science Citation Index © and Psychlit © and from websites of leading international training organizations. Out of 60+ papers only fourteen studies were identified as experimental or quasi-experimental. Studies showed evidence of effectiveness of training including decreases in client incidents, reductions in restraint use, increased use of appropriate restraint, increases in staff confidence, increased patient satisfaction and decreases in staff fear. Three studies found no significant effects of training. Future research should (a) simplify course content and use empirical methods to determine course content; (b) use multiple reliable and valid outcome measures and adequate experimental designs; (c) make greater use of behavioural skills training, including modelling, rehearsal and feedback in live situations; and (d) evaluate follow-up and staff support mechanisms after initial training.

Declaration of interests

The first author Andrew McDonnell is a Director of Studio3 Training Systems. Peter Sturmey, Amy Gould and Tamsin Adams are employees of Studio3.
INTRODUCTION

Physical restraint of a human being is a controversial and emotional experience for all parties involved (McDonnell 2010) and should therefore be a last resort to dealing with any form of challenging behaviour in care environments. However all too often physical restraint has become the first choice (Deveau & McDonnell, 2008) and it is painfully clear that abuse of such procedures occur in care environments across the country (Winterbourne view in Bristol being the most recently publicised case). The highly emotive and potentially fatal nature of physical restraint procedures means the need for an evidence based approach is paramount. Despite this the literature is relatively sparse. This paper aims to review all published data on staff training research which contained physical interventions, to highlight the most scientifically rigorous of these papers and to make recommendations based on the findings.

Physical interventions are described as “any methods of responding to challenging behaviour which involves some degree of physical force to limit or restrict movement or mobility” (Harris et al. 2000). The two most common categories are breakaway skills and physical restraint. Breakaway skills can be defined as “physical strategies which assists a person to break free of an aggressor, where actual physical contact has taken place” (McDonnell, 2004). Physical restraint has been defined as “actions or procedures which are designed to suppress movement or mobility” (Harris 1996, p100).

The application of physical restraint has inherent risks and there are many documented cases of fatalities. David “Rock” Bennett died in 1998 whilst being restrained in a prone position for 25 minutes on a psychiatric setting, restricting his ability to inhale sufficient oxygen. (http://www.irr.org.uk/pdf/bennett_inquiry.pdf ). Gareth Myatt died aged only 15 whilst being restrained in a Young Offenders establishment in 2004 after being held by three adults resulting in him choking on his own vomit. Paterson et al (2003) identified 12 here. Monitoring these deaths in the UK is not a straightforward task. Sudden and premature deaths of people with intellectual disabilities have also been related to poor health monitoring (Heslop et al., 2013). This is primarily because the causes of death are not always clarified. In the US Norwod, Ciccome, Kennedy, Moy, Allrich, Naiditch (2001) reviewed 61 restraint related deaths that occurred in
North America. They reported that three quarters of those who died were male, 75% had a psychiatric history but only 26% of these tragedies occurred in psychiatric settings and that over one third of the deaths occurred to people over the age of 65.

Organisational culture and leadership is clearly an important variable in staff’s response to violence (Deveau & McDonnell, 2008; Colton, 2004) and the message that organisations are given will often be disseminated through policies and national guidance and the medium of staff training (Deveau & McGill, 2008) however Deveau and McGill have identified gaps in policy and delivery of organisational response to physical interventions. The effects of direct staff training per se may well be limited (Deveau & McDonnell, in press). Evidence has demonstrated that the monitoring of use of physical interventions by management can lead to reductions in their use (Sturmey & Palen McGlynn, 2002) while there is limited evidence that certain organisational cultures may actually increase service user vulnerability to abuse (White, Holland, Marsland & Oakes, 2003). A recent study in the UK reported that better service quality outcomes for people with a learning disability appeared to be more commonplace in services with a more positive organisational culture (Gillett & Stenfert-Kroese, 2003). Norway has recently implemented legal instruments regulating the use of ‘coercive’ procedures for people with intellectual disabilities which have reportedly led to considerable reductions in the use of restrictive interventions for people with learning disabilities (Roed & Syse, 2002).

In the U.K. many staff would appear to be trained in a whole variety of training programmes that involve the application of physical interventions. The evidence base for these programmes would appear to be very limited (McDonnell, 2008, Stubbs, Leadbetter, Paterson, Yorston, Knight & Davis, 2009, Allen, 2001). Goodness of fit of training is also a clear component. Beech and Leather (2006) reviewed the literature and illustrated this problem by maintaining that aggression management training is an established health and safety response in most organisations. In contrast they also acknowledged the limitations of such training: ‘Although aggression management training is now widely available it is often inappropriate for the needs of different staff groups.’ (pp. 41).
Staff training is clearly not a panacea for reducing the use of restraint in care environments; it should be viewed as necessary but not sufficient for change to occur (Cullen, 1987). Despite this caveat there is a need to train staff in the frontline appropriate strategies for managing violence and these should be have a good evidence base. A recent Cochrane review examined issues of restraint in elderly care (Möhler et al., 2011). There was insufficient evidence to endorse the effectiveness of educational interventions aimed at preventing or reducing the use of physical restraints in geriatric long-term care.

This review will examine the published literature to date in order to establish whether there is an evidence base for staff training in physical intervention.

**Literature search**

The literature search was conducted using the Web of Science © search engine (1945 – May 2013, The Cochrane Database © (2001-May 2013), Medline © (1966-May 2013), Social Science Citation Index © 1956-May 2013 and PsychINFO © (1967 – May 2013). The following keywords were used: aggression, violence training mental retardation, learning disability, mental handicap, elderly, care staff, education, psychiatry, mental health, disruptive behavior, psychiatric. Staff training was used as the major keyword in all comparisons.

Websites of twelve training organizations approved to deliver training in UK services for people with a learning disability (up until May 2013) were examined for evidence of published research in staff training in physical interventions. All training papers selected for the review had their reference sections examined in an attempt to discover any articles that may have been missed in the electronic searches. This process
produced no new studies.

Each paper was coded on twenty-two variables. Theses were participants and settings; experimental design; training systems; duration of training courses; statistical analysis; reliability of measures; outcomes; staff knowledge based measures; staff confidence measures; the use of physical restraint; incident reporting; staff/service user injury data; staff assault rate; staff sickness; acquisition of physical interventions; course content; description of teaching methods; teaching methods; physical interventions, breakaway skills; descriptions of physical restraint procedures.

A second person independently coded all of the papers. Inter-rater reliabilities for specific categories were calculated by dividing the number of agreements by the number of agreements plus the number of disagreements and multiplying by 100%. The median inter-rater agreement was 100% (range 95.6-100%) for all coding categories.

**Inclusion and exclusion criteria**

The aim of the review was to identify empirical articles that had taught physical intervention skills to staff in any broadly defined mental health service. Therefore articles were included if: (1) they were published in a peer reviewed journal; (2) there was evidence that staff training, rather than service audit had occurred; (3) physical interventions were a component of the training and (4) the study utilized a control or a comparison group to assess effect of training. Studies which only taught defusion skills and unpublished articles were excluded. A total of eighty-four articles were excluded, four because they did not appear in peer-reviewed journals (Bell & Mollison, 1995; Bell & Stark, 1998; Brookes, 1988; Judd, 1996). Nineteen were excluded because they contained no physical interventions training (Shah & De, 1998; Colenda, & Hamer,
Four papers did not state that physical interventions were taught to their staff as part of their programmes: (Mentes & Ferrario, 1989; Feldt & Ryden, 1992; Collins, 1994; Maxfield, Lewis & Cannon, 1996.) One paper was excluded because it focused on non-physical post incident interventions to reduce violence (Flannery, Hansen, Pennell et al., 1998) and two papers were excluded because they focused on staff training in longer-term positive behaviour interventions (Berryman, Evans & Kalbag, 1994; Grey, McClean, & Barnes-Holmes, 2002). Fifty-four were excluded as they did not have a control or comparison group in their designs.

RESULTS
Fourteen articles were included in the final review. Table 1 reports the setting and participants.

Participants and settings
All studies took place in services for various kinds of adults. Nine were in adult psychiatric settings (2, 3, 5, 7, 8, 9, 10, 11, 13), two took place in services for adults with learning disabilities (1, 14), one took place in older adults services (12) and one
took place in services for adults with an autistic spectrum disorder (6). One (22) took place with a non-specified population. The studies took place in the USA (6 studies), Switzerland (3 studies), United Kingdom (2 studies), Canada (1), Australia (1) and Norway (1).

**Experimental design**

All studies used quasi-experimental designs which included control or comparison groups.

**Training Systems**

One study involved the control and restraint system (8). One study reported data using the CPI system (11), one employed The Welsh Method (1) and one used Studio3 training (6). Two used an Aggression Management Training Programme (3, 9). Five studies reported individual studies on a range of training systems including: ‘Aggression Control Techniques (ACT) (5)’, ‘The Management of Assaultive Behaviour’ (2), ‘Safe Physical Restraint’ (7), ‘Therapeutics for Aggression’ (13) and ‘Emergency Procedures’ (14). Three studies did not specify what training they used (4, 10, 12).

**Duration**

The duration of the training courses ranged from less than one day to more than five days. Three were less than a full day (4, 10, 14), three specified one day workshops (7,
12, 13), one specified two days, (2), two specified three days (5, 6), four specified five
days or greater (3, 8, 9, 11), one training course specified either two to three days
depending on need (1). One course only offered four hours for training (4).

Statistical Analysis

One paper reported descriptive statistics only (14), six studies solely used parametric
statistics (2, 4, 6, 10, 11, 13), six studies used non-parametric statistics only (1, 3, 5, 7,
9, 12) and one study used a combination of statistical analyses (8).

Reliability of measures

Eleven studies reported reliability data for at least their main dependent measures (1, 2,
3, 6, 7, 8, 9, 10, 11, 13, 14). Three studies reported no reliability data for their main
dependent measures (4, 5, 12,).

Reported outcomes

There were eight types of outcomes reported: increases in knowledge, staff confidence,
use of physical restraint, incident reporting, staff/service user injury, staff assault rate,
skill acquisition, and staff sickness.

Staff knowledge based measures. Two studies reported increases in staff
knowledge using a variety of questionnaire measures (1, 4,) although only one study reported reliability data for these measures (1). One study reported no significant increases in knowledge based measures post training (4), but, no reliability data was reported for either of these measures.

One study (11) used a patient restraint written test with high inter rater reliability, but reported no test retest reliability measures or other measures of psychometric robustness. One study (8) used a 12-item tolerance of behaviour scale but no reliability data was reported for this measure. One study reported positive course feedback at 15-month follow up (11).

**Staff confidence.** Five studies reported increases in staff confidence (1, 6, 7, 8, 13) four of which used measures with acceptable reliability ratings (1, 6, 7, 13). One study maintained the increase in post training confidence ratings at a 15-month follow up (13). Two studies reported no increases post-training in confidence (3, 4) however one study (3) reported reliability data while the other did not (4).

**Use of physical restraint.** Two studies reported reductions in the use of physical restraint (1, 12).

**Staff/service user injuries.** No studies reported staff injuries during training courses. One study reported reductions in staff injuries following training (2)

**Staff assault rate.** Two studies reported reductions in rates of assault on trained versus untrained staff after training (5, 10). One study reported *increases* in assault rate
Staff sickness. One study reported reduction in sickness rates relating to aggression after training (11).

Acquisition of physical interventions. Two studies reported acquisition of physical interventions on training courses (10, 14). A US study conducted in a learning disability setting (14) reported data using unannounced assessments of physical skills competency in the workplace. Uniquely, this study used behavioral skills training, consisting of instructions, modeling, rehearsal and feedback to mastery criterion, and pyramidal training of trainers to teach physical interventions. This resulted in staff acquisition of restraint skills.

Course content

Defusion strategies, here defined as non-physical methods such as distraction and redirection, which focused on deescalating an incident, were taught on eleven training courses (1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 13) and three studies were either unclear about defusion skills or did not mention them at all (3, 12, 14). No studies reported a clear theoretical model for their use of defusion strategies.

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<th>Teaching Methods</th>
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Insert Table 2 about here
Table 2 describes the teaching methods used in the fourteen training courses. Nine of the training studies reported using lecture or classroom based formats (1, 2, 3, 6, 7, 8, 10, 11, 12). One study reported using group work/discussions (13). One study referred to ‘hands on training’, but no further detail was provided (3). One training course reported using audiovisual aides (11). One paper used behavioural skills training (14) and ten studies reported using role play (1, 5, 6, 7, 8, 9, 10, 11, 13, 14).

**Physical interventions**

Table 2 describes the physical interventions taught on training courses. Eight studies did not provide a specific list of the physical interventions taught on training courses (2, 3, 7, 8, 9, 11, 12, 13). Four studies referred to other source materials to describe their physical interventions (1, 6, 8, 9).

**Breakaway skills**

The term ‘breakaway skills’ describes physical intervention’s that enable staff to escape or disengage from a person, such as removing one’s arm from a client’s grasp. Three studies used the term ‘breakaway skills’ (3, 4, 9). Two studies used the term ‘control and restraint’ to describe their training (8, 9). These studies of break away skills and C & R did not operationalize these terms. Four studies provided topographical descriptions of the breakaway skills taught to staff (4, 5, 10, 14). Two studies described physical interventions operationally so that they could be independently replicated (10, 14).
Three studies reported teaching disengagement strategies from hair pulling (4, 5, 6). Three reported physical disengagement techniques for escaping from choking/strangulation (4, 6, 10). Four types of physical techniques categories appeared in five studies: punching (5, 10, 14), wrist grabs (4, 6), biting (4, 6) and one study reported teaching defences against kicking (5). Unusual techniques included defences from headlocks (5). The topographies described above may be similar, however, there is no way to discern the physical techniques taught on these training courses from the published articles.

**Descriptions of Physical Restraint Procedures**

Physical restraint techniques were difficult to discern from the majority of articles in the review. No detailed descriptions could be compiled from the published articles to describe the physical restraint methods employed on training courses. One study did report using a chair restraint method, which was operationalized (6).

**DISCUSSION**

The purpose of this literature review was to examine the outcomes of staff training in physical intervention. Despite being a multi-million pound industry, a systematic review of staff training in care environments has never been carried out. Ninety eight papers were identified as relevant but only 14 utilised some form of control or comparison group. This would be a damning statistic in any field of applied research.
This review raises a number of subtle measurement issues around the evaluation of staff training courses in physical intervention. In reality most staff training consists of a combination of educational elements rather than one specific entity. Descriptions of training courses were often not explicit or clear. The methods of delivery (role play, didactic) in their goals and aims ranged widely and included increasing staff skill, knowledge, and confidence and reducing staff fear, reducing the use of physical intervention, increasing the use of appropriate forms of interventions, reducing assault rates, reducing service user and staff injuries and associated costs and reducing staff use of sick days. Each of these aims implies difference measures, as well as the use of multiple measures. Thus, a course which results in acquisition of staff skills and reduction in client incidents may still not be judged adequate if it also results in increases in staff and service user injuries, staff turnover and associated costs. Likewise, a course that does not impact client incidents may still have benefits, such as reduced staff injuries associated with increased use of appropriate safe forms of restraint. No studies addressed the issue of the validity of measures and the importance of going beyond statistical significance to address clinical and educational significance. Explicit rationales for staff training should guide the choice of outcome measures. The use of more intrusive interventions that involve the application of joint locks may function as positive punishment, then their contingent application should result in reduced frequency of service user incidents toward staff. Staff training methods should include empirically validated methods, such as minimizing verbal methods of staff training and focusing on behavioural skills training. Some training courses were effective in teaching skills to staff, however, there was an absence of follow-up. Future research could begin to evaluate feedback systems and problem solving protocols as adjuncts to initial staff training.
Many courses did not clearly operationalize the knowledge and skills taught to staff. Few papers operationally described the physical disengagement (breakaway) skills and restraint procedures in sufficient detail. However, two papers did provide task analyses of restraint procedures (10, 14). These papers can be used as models for future work. Future developments should use both task analyses and video models of restraint methods in order to ensure that the physical interventions procedures are accurately specified. A related observation is that courses did not specify clear minimum knowledge and skill criteria to pass the courses. Future research should develop such criteria. Courses used a wide range of teaching methods including lectures, discussion and classroom based verbal formats, video-modelling and role play. No courses used practice with clients in actual service settings. These methods may be effective in giving staff knowledge and improving staff confidence. However, there is no data demonstrating that these methods are effective in leading to accurate use of skills in the workplace with clients.

Behavioural skills training, consisting of instructions, modelling, rehearsal and feedback to mastery criterion, is a promising approach (Sturmey, 1999). It has been successful in teaching many skills to staff and family members in a wide range of populations and settings (Seaman, Greene, & Watson-Perczel, 1986; Sturmey, 1999) as well as restraint skills (14). However, courses should be supplemented with behavioural skills training in actual work place settings and should include sufficient exemplars to promote generalization of staff skills to novel unstrained situations and clients (Stokes & Baer, 1977.) Surprisingly, no studies reported data on skill retention after training. Evidence from other fields would indicate the importance of this variable. There is a
literature in Cardio Pulmonary Resuscitation which does demonstrate deterioration in skills over time, especially where individuals have not practiced the skill in situ. Future research should also address this issue (Anderson, Gaetz, Statz & Kin, 2012). It is possible that in many cases staff who are trained in physical interventions will struggle to recall them in situ.

Courses also varied widely in the number of physical intervention methods taught. For example, Phillips and Rudestam (10) taught only two physical intervention methods and Hurlebaus and Link (4) taught at least six physical interventions in a 1 hour session. It seems unlikely that staff can acquire skills in the large number of intervention procedures that some courses attempt to teach in a short period of time available. Future research should use data based methods, such as observations of the frequency with which intervention methods are used as a basis for simplifying the number of skills taught to mastery criteria. Other less frequently used, but potentially important interventions methods should be taught on an as needs basis in service settings as the need arises (BILD, 2001.)

Future empirical research should identify the training needs that are common across many populations and settings, those that are specific to certain populations and settings and use these data to guide the content of training courses. It is also important that the effectiveness and acceptability of these different methods are evaluated. Another approach to determine the content of training is to offer a menu of course content and for trainees and organization to select those aspects they feel is most relevant.
Several papers had important strengths that could be models for future research. As mentioned above one paper used tasks analyses and videotaped models of the intervention procedures used (14). Van den Pol et al. (14) used behavioral skills training both to train staff to implement restraint procedures, taught other staff to use behavioural skills training to train other staff and used unannounced observations in the workplace to observe implementation. Several experimental evaluations of courses had strengths. For example, Rice et al (11) used multiple dependent variables, reported reliability data and used a control group and one-year follow up. Philips and Rudestam’s (10) experimental study was notable because they used role play and rehearsal and rated staff behaviour and fear.

There is now a body of research reporting the effectiveness of a wide range of courses to manage aggressive behaviour in a variety of populations and settings. These studies indicate that staff training may be effective, but not on all occasions. Future research should address the following areas. First, the courses should be explicit in their aims and use this to guide empirically identifying content of training. Second, they should simplify and limit the content of courses to focus on those areas that most important to the audience and to spend sufficient time to teach critical skills effectively to participants. Third, evaluation should use experimental designs and address measurement issues such as reliability, validity and the use of multiple outcome measures as well as follow-up, implementation, generalization and maintenance of skills after training in the workplace. The selection of measurements should be driven by some rationale for the mechanisms that may underlie staff training. For example, if redirection and defusion skills are key mechanisms in reducing client incidents and the use of restraint, then data should show that staff use these skills more frequently after
training leading to fewer client incidents and less frequent physical interventions. Alternatively, if the rationale for the use of physical interventions is that they safely reduce injuries to other service users and staff, then the data might show no change in service used incidents, but a decrease in service user and staff injuries.

The evaluation of staff training is a complex process. Our initial literature search found 98 studies on staff training that dealt with aggression in care environments. Despite these studies forming the empirical basis for a worldwide training industry that deals with millions of vulnerable and oftentimes highly distressed individuals only 14 used any form of recognised control design. There is undoubtedly a need for a series of randomised controlled trial studies. Future research needs to utilise more robust scientific design incorporating control or comparison groups if we are to identify the most successful elements of staff training.
REFERENCES


Beech, B. (1999) Sign of the times or the shape of things to come? A three day unit of instruction on aggression and violence in health settings for all students during pre-registration nurse training. Nurse Education Today, 19, 610 – 616.


Table 1. A table of the design and settings, course duration and title, description of reliability measures and outcome data for 52 staff training studies on physical interventions.

<table>
<thead>
<tr>
<th>Author</th>
<th>Design and Setting (inc. control / comparison group and statistics)</th>
<th>Duration of course and Title</th>
<th>Description and Reliability of Measures</th>
<th>Outcome Data</th>
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<tr>
<td>Allen &amp; Tynan (2000)</td>
<td>Quasi-experimental design (between subjects element: trained versus untrained staff; within subjects element: untrained group, which then received training). n=109, 51 exposed to training, 58 not exposed in UK – in community services with people with learning disabilities. Non-parametric statistics used.</td>
<td>Preventing and Responding to Aggressive Behaviour (The Welsh Method) 2 to 3 day course (1 day theory, 1-2 day physical interventions)</td>
<td>10 item confidence measure (Thackrey, 1987), (Cronbach’s Alpha = .88) A 20 item reactive strategy questionnaire (Cronbach’s Alpha = .64)</td>
<td>Trained group was significantly more confident than untrained group. Trained group scored higher on reactive strategy questionnaire. Both measures statistically increased when untrained group received training.</td>
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<td>Carmel &amp; Hunter (1990)</td>
<td>Quasi experimental design comparing staff who had received training in managing assaultive behaviour (N =392) with staff 16-hour training course California Dept. of Mental Health Training in the Management of Assaultive</td>
<td>Examined staff injury data and rates of patient aggression. No reliability data provided for either measure.</td>
<td>Staff who received aggression management training reported lower rates of injury. No relationship between CPR training and staff injury.</td>
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<th>Study Design</th>
<th>Setting</th>
<th>Training Details</th>
<th>Measurement</th>
<th>Findings</th>
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<td>Quasi-experimental pre/post design. Mental health setting (N=63 mental health nurses inc. control group; n=34 mental health nurses). Acute psychiatric ward setting in Switzerland.</td>
<td>973-bedded forensic hospital in the USA.</td>
<td>5-day aggression management training programme developed in the Netherlands (Oud 1997). The programme consisted of 24 lessons lasting 50 minutes.</td>
<td>Management of Aggression and Violence Attitude Scale (MAVAS) (Duxbury, 2002). Good stability (Pearsons $r = 0.89$) and construct validity reported. Reported Cronbach alphas for the four subscales of the MAVAS: 0.54, 0.41, 0.25, and 0.71 respectively (Duxbury, 2002).</td>
<td>No significant attitude change in the intervention group compared with the control group at post-test.</td>
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### 4. Hurlebaus & Link (1997)

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<tr>
<th>Study Design</th>
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<th>Training Details</th>
<th>Measurement</th>
<th>Findings</th>
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<tr>
<td>A pre-post design with a control group. Total N= 32 nurses based at an inner city teaching hospital in the USA, A training group (N= 22), and a control group that did not receive training (n= 10). Parametric statistics used.</td>
<td></td>
<td>A 4-hour training course, 1 hour devoted to physical skills – title of course unspecified.</td>
<td>15-item knowledge test (which consisted of 10 multiple choice and 5 true/false questions) – no reliability data provided. Two visual analogue scales used to measure safety and confidence (no reliability)</td>
<td>No significant differences found in measures of safety, confidence or knowledge in the study. Inappropriate statistical analysis makes this paper difficult to interpret.</td>
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<tr>
<td></td>
<td>Research Design</td>
<td>Data Collection</td>
<td>Findings</td>
<td>Notes</td>
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<td>5. Infantino &amp; Musingo (1985)</td>
<td>Quasi-experimental design, examining a trained (N = 31) versus untrained (N = 65) group of staff in a psychiatrics hospital in the USA with a follow-up between 9 and 24 months after training. Non-parametric statistics used.</td>
<td>Three-day training course using Aggression Control Techniques (ACT).</td>
<td>Examined rates of staff assaults, injuries and days lost from work. No reliability data reported.</td>
<td>Only one trained staff was assaulted with no injury, 37% of the untrained staff were assaulted, 79% of these resulted in injuries. Staff injuries were reported for the untrained staff.</td>
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<td>6. McDonnell, Sturmey, Oliver, et al (2007)</td>
<td>Quasi-experimental design (between subject element trained N = 43 comparison group previously received training N = 47). Pre – post test 10 month interval. Services for people with autism spectrum disorders. Analysis of within subject pretest scores – t-test. 5 dependent measures analysed through MANCOVA with experimental group as between subject factor and pre-training as covariate factor. Each dependent variable analysed using separate ANCOVA.</td>
<td>Studio 3 – 3 day course half theoretical half practical.</td>
<td>The ‘Staff support and satisfaction questionnaire’ (3SQ) Harris &amp; Rose (2002) good test-retest reliability (r=0.82), high levels internal reliability (Cronbachs alpha = 0.92). The ‘Shortened ways of coping scale’ Hatton &amp; Emerson (1995) good reliability and internal consistency (average Cronbachs alpha = 0.76). The ‘Thoughts about challenging behaviour questionnaire’ Staff training showed increases in staff confidence but not other measures of staff belief, support, coping or perceived control. No evidence of reduction in client challenging behaviour.</td>
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<td>7. McGowan, Wynaden, Harding et al (1999)</td>
<td>Quasi-experimental design with 6-month follow-up</td>
<td>7½ hour module in “Safe physical Confidence”</td>
<td>Trained group (N = 42) had higher confidence scores, than untrained</td>
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Dagnan (2007) very high internal consistency (alpha = 0.85). The ‘Challenging behaviour confidence scale’ McDonnell (1997) good internal consistency (Cronbach’s alpha = 0.95). The ‘Checklist of challenging behaviour’ Harris, Humphreys, & Thompson, 1994). Relationship between measures investigated using Pearson’s product moment correlations showed approaching significance for 3SQ and thoughts about behaviour, other correlations all non-significant therefore measures not inter-correlated.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Design</th>
<th>Sample</th>
<th>Data Collection</th>
<th>Results</th>
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<tr>
<td><strong>Needham, Abderhalden, Zeller, et al. (2005)</strong></td>
<td>Pre-post design with control group. Nursing staff (N =117) received training compared with control group of staff (N =60) who did not receive training in Switzerland. Non-parametric and parametric statistics used.</td>
<td>Training consisted of 4 days 20 x 50 minute lessons. “Curriculum Correlates Approximately to Control and Restraint Training”</td>
<td>10-item confidence scale (Thackrey, 1987) (Cronbach’s Alpha = .92), Shortened Version of Perception of Aggression Scale (POAS – S) (Reliability cited in earlier paper), two vision analogue scales (no reliability data)</td>
<td>Significant increases in confidence post training. Experimental group increase in scores in one visual analogue scale (comprehensible / purposeful). No significant difference in POAS - S.</td>
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<td><strong>Phillips &amp; Rudestam (1995)</strong></td>
<td>Between-subjects pre-post design, 2-week follow-up training programme 4</td>
<td>Hostility inventory (no reliability)</td>
<td>Judges ratings of fear in role-plays lowest for the</td>
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<tr>
<td>Study</td>
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<td>Rice, Helzel, Varney et al (1985)</td>
<td>Between-subjects pre-post design with a 15-month follow-up (N = 63) staff.</td>
<td>Five-day training course in crisis prevention and intervention</td>
<td>Assault rates (inter-rater reliability 69% - 100%), assault rates leading to days off work</td>
<td>Increases in performance in all pre-post simulations and written tests. Significant reduction in</td>
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</table>
mental health staff (N = 126) and staff in a maximum-security unit (N = 89) and compared with a control group of staff (N = 37) in Canada. Parametric statistics used.

(CPI).

(INTER-rater reliability 88%). A sensitive situations skills test (INTER-rater reliability ranged from 81% - 100%), audio-taped role-play scenarios (INTER-rater reliability of 99% and 90%), physical skills test (INTER-rater reliability 98%), self defence and patient restraint written tests (INTER-rater reliability 100%), job reaction scale (items - unspecified) (Cronbach’s Alpha = 0.71 – 0.76)

workdays lost due to patient violence. Assault rates increased post training. Course feedback from course participants remained positive at 15-month follow-up.


Quasi-experimental pre-post design, data collected immediately before and after the training had taken place, looking at the effect of staff training on the use of restraint in dementia in four nursing homes in Stavanger, Norway, with a

Intervention consisted of a 6 hour seminar focusing on dementia, aggression, problem behaviour, decision making process and alternatives towards the use of restraint. Each

Demographic and clinical information was collected by interviewing the seniors. Severity of dementia was assessed using the Clinical Dementia Rating (CDR). Outcome measures were the Brief

At baseline the number of restraints and BARS scores did not differ, however on follow-up the use of restraint was significantly lower in the intervention group compared to the control group. Reducing the number of restraint by 54%.
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<tr>
<td>13. Thackrey (1987)</td>
<td>Between subjects design comparing a trained (N= 68) versus an untrained (N = 57) group at 3 time periods – pre, post and 18-month follow-up. Training took place in a community mental health centre, a state psychiatric prison, and a state psychiatric hospital in the USA. Parametric statistics used.</td>
<td>An 8-hour programme presented in 2 x 4-hour sessions one week apart entitled “Therapeutics for Aggression”.</td>
<td>A 10-item confidence in coping with patient’s aggression (Cronbach’s Alpha = .92) Trained group showed post training increases in confidence which did not decrease significantly post training follow-up. The untrained group showed no significant changes under the three time periods.</td>
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<td>14. Van Den Pol, Reed &amp; Fuqua (1983)</td>
<td>Multiple baseline design. examining three safety related skills (fire safety, emergency procedures after a person has had a seizure and physical self defence). Study took place in an 87-bedded residential service for people with a learning disability in the 3x 30 minute workshops in Emergency Procedures.</td>
<td>Role-play assessments of self defence procedures rated by 2 independent raters (average inter-rater reliability 90%). Assessments took place on an unannounced basis. 5-item self-report questionnaire (no) Trainers demonstrated competency levels post training in ‘self defence’ skills. Control trainees showed no increase in any skill acquisition. None of the trainee staff were still employed at follow-up. One trainee reported using physical intervention in the work place.</td>
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USA. Total N = 13. 4 trainees, 3 maintenance condition trainees, 4 trainers, and 2 control trainees. 23-month follow-up of staff who had received training (telephone interviews). Descriptive statistics reported. reliability), telephone follow-up of (N = not specified)
Table 2. A table of course content, description of physical interventions and description of teaching methods for 52 staff training studies on physical interventions.

<table>
<thead>
<tr>
<th>Author</th>
<th>Course Content</th>
<th>Description of Physical Interventions</th>
<th>Description of Teaching Methods</th>
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</thead>
<tbody>
<tr>
<td>2. Carmel &amp; Hunter (1990)</td>
<td>16 hour training course which included: Attention to inter-personal skills and the management of violent patients.</td>
<td>None specified</td>
<td>Didactic and lecture based format and practical instruction to the management of violent patients described.</td>
</tr>
</tbody>
</table>
**Aggression, crime, verbal and non-verbal signs of agitation, identification of antecedent signs of aggression, use of body language, tone of voice and eye contact.**

**Self-defence techniques, breakaway from wrist grabs, chokes (front and rear), hair pulling, blocking kicks, “how to release from a bite”**

**Handouts, group discussions, demonstration of physical techniques.**

5. Infantino & Musingo (1985)  
**3 training phases over 3 days –
1) Policies and procedures and verbal strategies
2) Physical interventions designed to provide staff with “release and de-escalation skills”**

**Yes –limited description of getting free from hair pulling, choking, head locks, blocking punches and kicks. Restraint methods not described.**

**Case vignettes, role-play, video tapes are used to demonstrate the physical skills taught.**
<table>
<thead>
<tr>
<th></th>
<th>Title</th>
<th>Duration</th>
<th>Content</th>
<th>Methodology</th>
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<tbody>
<tr>
<td>3</td>
<td>Physical restraint and incident reporting procedures</td>
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<tr>
<td>7</td>
<td>McGowan, Wynaden, Harding et al. (1999)</td>
<td>8 ½ hr one day module in “safe physical restraint”. Including early recognition and management of antecedent behaviours, defusion skills, debriefing, team work and role assignment during the restraint process.</td>
<td>Not specified</td>
<td>Role play scenarios, lecture based methods implied but not clearly specified in paper.</td>
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<tr>
<td>8</td>
<td>Needham, Aberhalden, Zeller et al. (2005)</td>
<td>Training program consisting of 20 x 50 minute lessons in: Caution and Genesis of aggression;</td>
<td>Breakaway techniques, physical restraint not described.</td>
<td>Lecture based and role play.</td>
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<tr>
<td>9. Needham, Abderhalden, Halfens, et al. (2005)</td>
<td>Training program consisting of 20 x 50 minute lessons in: Caution and Genesis of aggression; theories on the various stages of aggressive incidents; behaviours during aggressive situations; reflection on one zone aggressive components; types of conflict management; communication and interaction; post aggression procedures; Breakaway techniques, physical restraint not described.</td>
<td>Lecture based and role play</td>
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<td></td>
<td>10. Phillips &amp; Rudestam (1995)</td>
<td>Didactic material includes: Theories of learning, dynamics of violence, warning signs of violence, non-verbal communication, intervention strategies and legal issues.</td>
<td>Yes – specific physical interventions described in a non-visual manner in the article. Physical skill – “a repel and push off to invasion skill was taught as a defence to a frontal choking attack”. A posture to block attacks calle ‘the repel’. Clear descriptions of both techniques.</td>
<td>Role play and lecture format</td>
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<td>11. Rice, Helzel, Varney et al (1985)</td>
<td>Recognition of behavioural cues; verbal techniques to be used with highly upset individuals; “self defence techniques”; Physical restraints; post incident responses</td>
<td>Not clearly specified in paper – “self defence techniques” – no indication of number of techniques taught with regard to patient restraint.</td>
<td>Lecture based including live simulation of crisis (role play); audio visual materials.</td>
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<td></td>
<td>12. Testad, Aasland &amp; Aarsland (2005)</td>
<td>A six hour seminar focusing on dementia, aggression, problem behaviour, decision making processes, and alternatives to restraint. A manual for the seminar was developed to make sure that</td>
<td>Not clearly specified in paper</td>
<td>Seminars.</td>
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<td></td>
<td>all groups were provided with the same information. Each group was then given guidance for one hour every month, for 7 months.</td>
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<tr>
<td>13. Thackrey (1987)</td>
<td>Legal, ethical issues, psychological intervention and assessment techniques, team work, communication skills and physical methods for “non-abusive self protection”</td>
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<tr>
<td></td>
<td>Not specified</td>
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<tr>
<td></td>
<td>Didactic lectures, selected readings, group discussions, experiential exercises, modelling / simulation / role-play and practice of physical manoeuvres.</td>
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<tr>
<td>14. Van Den Pol, Reed &amp; Fuqua (1983)</td>
<td>3x 30 minute workshops. Staff taught how to train new staff. In addition staff taught how to conduct the emergency procedure.</td>
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<td>Yes – blocking punches; blocking kicks; releasing clothing grab; using a ‘thumb pry’; release of a body part grab; using a chair for protection.</td>
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<td>Workshop format used with modelling procedures and role play.</td>
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