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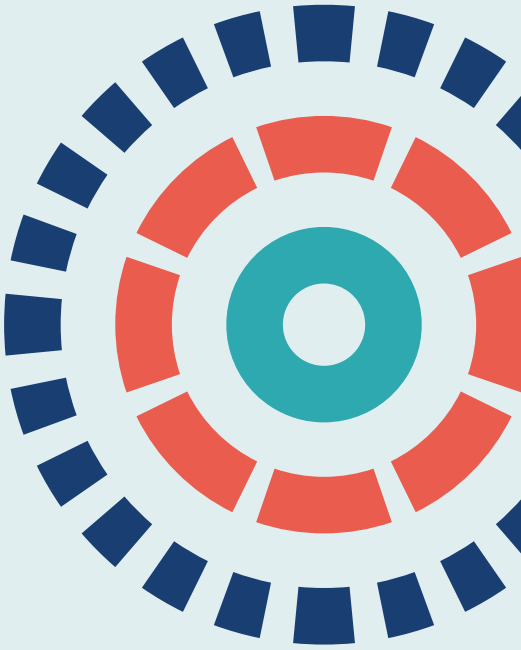

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Abstract

Components of interventions to reduce restrictive practices with children and young people in institutional settings: the Contrast systematic mapping review

John Baker,[1*] Kathryn Berzins,[1] Krysia Canvin,[1] Sarah Kendal,[1] Stella Branthonne-Foster,[2] Judy Wright,[3] Tim McDougall,[4] Barry Goldson,[5] Ian Kellar[6] and Joy Duxbury[7]

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Background: Incidents in which children or young people experience severe distress or harm or cause distress or harm to others occur frequently in children and young people's institutional settings. These incidents are often managed using restrictive practices, such as restraint, seclusion, sedation or constant observation; however, these also present significant risks of physical and psychological harm to children and young people as well as staff. Numerous interventions aim to reduce the use of restrictive techniques, but research is hampered by limited attention to specific intervention components. The behavior change technique taxonomy may improve reporting by providing a common language for specifying the content and mechanisms of behaviour change. This study aimed to identify, standardise and report the effectiveness of components of interventions to reduce restrictive practices in children and young people's institutional settings.

Objectives: To map interventions aimed at reducing restrictive practices in children and young people's institutional settings internationally, to conduct behaviour change technique analysis of intervention components, to identify process elements, and to explore effectiveness evidence to identify promising behaviour change techniques and compare the results with those found in adult psychiatric inpatient settings in a companion review.

Design: Systematic mapping review with programme content coding using the behavior change technique taxonomy.

Review methods: Eleven relevant English-language health and social care research databases 1989–2019 [including Applied Social Sciences Index (ASSIA), Criminal Justice Abstracts, Educational Resources Information Center (ERIC), MEDLINE and PsycInfo®], grey literature and social media were searched during 2019 (updated January 2020). Data extraction, guided by Workgroup for Intervention Development and Evaluation Research (WIDER), Cochrane Library and theory coding scheme recommendations, included intervention characteristics and study design and reporting. Screening and quality appraisal used the Mixed Methods Appraisal Tool. The behavior change technique taxonomy was applied systematically, and interventions were coded for behaviour change technique components. Outcomes data were then related back to these components.

Results: There were 121 records, including 76 evaluations. Eighty-two interventions, mostly multicomponent, were identified. Evaluation approaches commonly used a non-randomised design. There were no randomised controlled trials. Behaviour change techniques from 14 out of a possible 16 clusters were detected. Four clusters (i.e. goals and planning, antecedents, shaping knowledge, and feedback and monitoring) contained the majority of identified behaviour change techniques and were detected in over half of all interventions. Two clusters (i.e. self-belief and covert learning) contained no identified behaviour change techniques. The most common setting in which behaviour change techniques were found was 'mental health'. The most common procedure focused on staff training. The two most common behaviour change techniques were instruction on how to perform the behaviour and restructuring the social environment. Promising behaviour change techniques included instruction on how to perform the behaviour, restructuring the social environment, feedback on outcomes of behaviour and problem-solving. Compared with the companion review, service user perspectives were more sparse and there was more interest in trauma-informed approaches. Effectiveness evidence, range of interventions and reporting were broadly similar.

Limitations: Poor reporting may have prevented detection of some behaviour change techniques. The finding that the evidence was weak restricted the feasibility of examining behaviour change technique effectiveness. Literature searches were restricted to English-language sources.

Conclusions: This study generated, to our knowledge, the first review of evidence on the content and effectiveness of interventions to reduce restrictive practices in children and young people's institutional settings. Interventions tend to be complex, reporting is inconsistent and robust evaluation data are limited, but some behaviour change techniques seem promising.

Future work: Promising behaviour change techniques could be further explored. Better evidence could help address the urgent need for effective strategies.

Study registration: This study is registered as PROSPERO CRD42019124730.

Funding: This project was funded by the National Institute for Health and Care Research (NIHR) Health and Social Care Delivery Research programme and will be published in full in *Health and Social Care Delivery Research*; Vol. 10, No. 8. See the NIHR Journals Library website for further project information.

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Glossary

Behaviour change technique A specific, irreducible, active component of an intervention designed to change behaviour, for example providing 'information about health consequences'.

Behavior change technique taxonomy A list of 93 behaviour change techniques organised into 16 clusters for standardised reporting of behaviour change interventions. Note that the taxonomy was published in US English and, therefore, US spelling is used here when referring to behavior change technique taxonomy terms.

Behaviour Change Wheel A model produced from a synthesis of frameworks of behaviour change research literature. It is based on a model of behaviour called the COM-B, which attempts to describe how Capability, Opportunity and Motivation can change Behaviour. For comparison, the theoretical domains framework, which is used to explore changing clinical practice, can be viewed as a variant of the COM-B model; the components of COM-B have similar domains. The behaviour change wheel contains the higher-order categories of behaviour change techniques at its hub, for example social or reflective. The next level includes intervention functions, such as training or incentivisation, and the third, outer, level contains policy categories, such as legislation or regulation.

Chemical restraint The use of medication that is intended to prevent, restrict or subdue movement of any part of the service user's body.

Children In this report, the term is used to mean children and/or young people.

Evaluations Evaluations of interventions are reported in research articles and anecdotal reports. Replication studies and follow-up studies are counted as separate evaluations, and reports of different analyses from the same study are counted as a single evaluation.

Instructions Instructions for the performance of an intervention.

Intervention Any documented approach that seeks to reduce the use of restrictive practices through behaviour change techniques. They are action or actions intended to address restrictive practices in adult mental health acute settings, for example a staff training initiative with or without organisational change. Some interventions are developed within and for an individual setting. Others may be well-known interventions that have been developed previously and are applied across several time periods or settings.

Isolation Any seclusion or segregation that is imposed on a service user.

Manual restraint A hands-on method of physical restraint.

Mechanical restraint A method of physical intervention involving the use of equipment.

Mixed Methods Appraisal Tool A tool suitable for appraising studies with diverse designs.

Pro re nata medication Medication given when needed, rather than at regular times.

Procedures Actions taken as part of intervention, for example a training session.

Restrictive practices Deliberate actions undertaken with the aim of restricting an individual's movement, liberty and/or freedom to act independently. The intervention is intended to take rapid control of a dangerous situation in which there is a real possibility of harm to the person or others.

Seclusion The confinement of a service user in a room, which may be locked.

List of abbreviations

6CS	Six Core Strategies
BCT	behaviour change technique
CPS	Collaborative Problem-Solving
CYP	children and young people
MMAT	Mixed Methods Appraisal Tool
MMPR	Managing and Minimising Physical Restraint
M-PBIS	Modified Positive Behavioral Interventions and Supports
MRC	Medical Research Council
NICE	National Institute for Health and Care Excellence
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
p.r.n.	pro re nata
RCT	randomised controlled trial
SPA	Devereux's Safe and Positive Approach
TARGET	Trauma Affect Regulation: Guide for Education and Therapy
TCI	Therapeutic Crisis Intervention
WIDER	Workgroup for Intervention Development and Evaluation Research

Plain English summary

Children and young people in institutions can become upset and aggressive. Staff may respond by holding them or putting them in a room on their own, which is called 'restrictive practice' and can be harmful for service users and staff. Many interventions exist for reducing the use of restrictive practices, but we do not know which ones work or why. Staff training could reduce the use of restrictive practices by encouraging staff to behave differently, for example by learning better ways of talking to somebody who has become upset or aggressive.

We knew about a list of 93 techniques for changing behaviour. This list is used like a dictionary to look up terms that best describe parts of an intervention to make it easier to describe and compare them. We wanted to see how many different interventions we could find and to describe these interventions using this list.

We identified all the interventions that we could find across institutional settings for children and young people, and recorded information such as participants, location and how success was measured. We looked in detail at the interventions and described the techniques using the list. We also assessed the quality of research about the interventions.

We found 82 different interventions, mostly in mental health settings. Techniques involving staff training; changing the environment to prevent incidents; setting goals for staff to work towards, such as reducing how often they use a restrictive practice; and giving staff feedback about incidents were commonly found as part of the most successful interventions and may be worth investigating further.

This study is, to our knowledge, the first to describe these interventions in a standard way. It may help researchers, policy-makers and clinicians describe and understand interventions to reduce restrictive practices in children and young people's institutional settings.

Scientific summary

Background

Incidents involving distress, aggression and violence, in which children and young people (CYP) experience harm to themselves or cause harm to others, are a frequent occurrence in CYP's institutional settings in health, social care, education and criminal justice contexts. These incidents are often managed by the use of restrictive practices, such as restraint, seclusion, injection of sedating drugs and constant observation. The use of these practices carries significant risks, including the risk of physical and psychological harm to CYP and staff. Numerous staff training interventions have been developed to try to reduce the use of restrictive practices by seeking to modify practice using a variety of behaviour change techniques (BCTs). Research in this area is limited by a lack of attention to their specific components. The Medical Research Council has supported work to develop a taxonomy of BCTs to improve the reporting of such interventions by providing a common language with which to specify the content and mechanisms by which behaviour is changed.

The BCT taxonomy is a list of 93 BCTs organised into 16 thematic clusters for standardised reporting of behaviour change intervention. It was developed to improve the reporting of interventions. It provides a common language that specifies the content and mechanisms by which behaviour is changed and can be used prospectively in intervention design and retrospectively in intervention review. Interventions to reduce restrictive practices use a variety of BCTs; for example, role-playing verbal de-escalation strategies could be coded as behavioural practice/rehearsal (BCT 8.1) involving social comparison (BCT 6.2) and feedback on behaviour (BCT 2.2).

This study takes an essential first step to future intervention development in the context of CYP in institutional settings by identifying the range of interventions that have been implemented, their specific components and how they relate to outcomes.

Design

This was a systematic mapping review of published and unpublished literature, including detailed coding of programme content using the BCT taxonomy.

Aims and objectives

The aims of this study were to identify, standardise and report the effectiveness of components of interventions that seek to reduce restrictive practices in CYP's institutional settings, using the BCT taxonomy.

The study objectives were to:

- provide an overview of interventions aimed at reducing restrictive practices with CYP in institutional settings
- classify components of those interventions implemented in terms of BCTs, and determine their frequency of use
- identify the role of process elements in intervention delivery
- explore evidence of effectiveness by examining BCTs and intervention outcomes, when possible

- compare the components of interventions in CYP's settings across target populations (i.e. different professions) and policy area (i.e. health, welfare, criminal justice) with those in adult psychiatric inpatient settings [Baker J, Berzins K, Canvin K, Benson I, Keller I, Wright J, *et al.* Non-pharmacological interventions to reduce restrictive practices in adult mental health inpatient settings: the COMPARE systematic mapping review. *Health Serv Deliv Res* 2021;**9**(5)] and identify potential explanations for any differences
- identify and prioritise BCTs showing most promise of effectiveness and that may require testing in future high-quality evaluations.

Methods

This systematic mapping review and BCT analysis incorporated a broad literature search to identify relevant records and data extraction and analysis. This included the description and classification of interventions using the BCT taxonomy alongside a quality assessment of retrieved records and an exploration of the evidence of effectiveness.

Data sources

It was known that, in addition to well-known interventions reported in the academic literature, there were also reports of numerous stand-alone interventions implemented in individual services. Not all of these would appear in a search restricted to published research literature. Therefore, the search strategy was augmented by an environmental scan to include interventions and programmes that were specific to individual settings. This approach facilitated the identification of a more diverse range of records than could be identified solely from published literature.

Eleven relevant English-language health and social care research databases (including Applied Social Sciences Index and Abstracts, Criminal Justice Abstracts, Education Resources Information Center, MEDLINE and PsycInfo®), grey literature and social media were searched between August 2019 and January 2020.

Study selection

The inclusion criteria were broad: English-language records dated 1989–2019 of interventions aiming to reduce the use of restrictive practices in CYP's institutional settings. Interventions may or may not have been implemented, and there were no geographical limitations. The starting date of 1989 was decided by the date of introduction of the UK 1989 Children Act (Great Britain. *Children Act 1989*. London: The Stationery Office; 1989), which precipitated a significant shift in the orientation of children's services. Because of the research team's prior knowledge of the paucity of the evidence base, there were no restrictions on study design and no quality threshold was imposed. Searches were conducted in August 2019 and updated January 2020.

Data extraction and analysis

The following data were extracted: participants, setting, intervention type, procedures, fidelity, study design, whether or not the intervention had been evaluated and the quality of the included records.

Data extraction, guided by Workgroup for Intervention Development and Evaluation Research (WIDER), Cochrane Library and theory-coding scheme recommendations, included intervention characteristics, study design and reporting. Screening and quality appraisal used the Mixed Methods Appraisal Tool (MMAT). The BCT taxonomy was applied systematically; interventions were coded for BCT components, and the outcomes data were related back to these components.

The BCT taxonomy was applied to all interventions identified in the included records. Intervention data were examined for content, including the range and frequency of procedures, as well as overarching patterns. BCT data were analysed by reporting overall percentages of BCTs across the interventions,

then by BCT cluster, for example cluster 1 (goals and planning). Procedures used within interventions (e.g. training, audit and review, or service user involvement) were then described and classified in terms of BCTs. Outcomes were related back to BCT content.

Results

The searches identified 43,494 records in the published literature and 8796 from the grey literature and social media. After removing duplicates and irrelevant records, 363 full texts were retrieved. The final data set comprised 121 records. These 121 records varied in type (e.g. research report, journal article, slides, video).

Based on the MMAT screening questions, the included records contained 76 evaluations. The most common evaluation approach was a non-randomised design, which was reported in 41 of the evaluation records and three of the mapping records. There were no randomised controlled trials. The evaluations pertained to 67 out of 82 interventions; not all interventions had been evaluated, and others had been evaluated more than once.

A total of 47 out of 67 evaluations of interventions reported multiple outcome measures (e.g. number of restraints and use of pro re nata). The studies used 22 standardised measures in addition to non-standardised measures and routine data. Service users were involved in six interventions, with type and extent of involvement varying greatly. Twelve interventions reported some cost data.

Eighty-two unique interventions were identified. The majority aimed to reduce the use of seclusion and/or restraint. The 82 identified interventions were coded for BCT content and contained 36 out of a possible 93 BCTs. The number of BCTs identified per record ranged from 1 to 89, with an average of seven BCTs identified in an intervention. BCTs were identified on 542 occasions within the 82 interventions.

The most frequently identified BCTs were instruction on how to perform the behaviour, restructuring the social environment, problem-solving, action-planning, feedback on outcomes of behaviour and reframing. All 36 of the identified BCTs were within 14 of the BCT taxonomy's 16 clusters. Four of these clusters contained the majority of the identified BCTs and were detected in over half of all interventions:

1. Cluster 1 (goals and planning) – solving problems by identifying actions required and setting and reviewing goals. For example, this might be introduced as a collective staff activity.
2. Cluster 12 (antecedents) – includes factors that could influence whether or not restrictive practices can be avoided, typically in terms of preventing situations in which service users might become distressed and conflict could occur, by strategies such as restructuring the physical environment, adding objects to the environment, or changing the values or social culture of a service.
3. Cluster 4 (shaping knowledge) – includes instructions on performing behaviour and information about antecedents.
4. Cluster 2 (feedback and monitoring) – includes the monitoring of routinely collected data, and whether and how feedback was given. Both feedback and monitoring related primarily to outcomes such as de-escalation or reduced restrictive practices, although there was some evidence of monitoring CYP's emotional states.

Procedures within interventions were disaggregated and their BCTs identified. Most interventions comprised multiple procedures (range 0–15). The procedures were grouped by theme, and the most common procedures focused on staff training. Other procedures related to guideline or policy change, risk assessment tools, data review, milieu changes and changes to therapeutic approach (e.g. introducing trauma-informed care). This contrasted slightly with the most common procedures in the companion review focusing on interventions in adult mental health inpatient services, which found that the most commonly used procedures in those settings were training, audit and feedback, and nursing changes.

In rank order, the BCTs that showed most evidence of effectiveness on reducing restraint and seclusion were as follows: instruction on how to perform the behaviour, restructuring the social environment, feedback on outcomes of behaviour and problem-solving.

Limitations

The search strategy combined traditional search techniques for retrieving research and grey literature with a scanning approach to identify potential alternative sources of relevant material. This had the advantage of enabling the retrieval of diverse records that reported intervention content and was useful for mapping the number and range of interventions; however, the diverse quality of reporting in some records retrieved in this way presented a challenge for the meaningful assimilation of findings. For example, a lack of detailed description of interventions may have masked the presence of BCTs such that they were not detected.

The literature search was restricted to English-language records and there was limited evidence from countries outside the USA, so the findings may have limited international transferability. The finding that the evidence was weak restricted the scope of the study to examine the effectiveness of BCTs used in interventions.

Implications for policy and practice

Service providers have an urgent need for high-quality evidence regarding the effectiveness of interventions to reduce restrictive practices. At present, these findings suggest that individual providers are developing and delivering ad hoc untested interventions or inconsistently implementing known interventions. Evaluations of such interventions often report positive findings that imply that they are effective. However, the trustworthiness of such claims is undermined by poor reporting of intervention content, poor measurement of fidelity, the absence or poor reporting of any theoretical basis for the intervention and testing the intervention using the least robust methodologies. Without reliable evidence, service providers may be using scarce resources to implement ineffective intervention components.

Research recommendations

Existing evaluations reveal little about which aspects of an intervention are effective. There are commonly occurring BCTs identified across interventions. Without testing individual intervention components, it remains unclear which components – or combinations of components – might be effective and whether that effect is limited to incidence or duration of one or all restrictive practices. Rigorous, theory-driven testing of individual components is required.

The evaluations identified in this review used a variety of outcome measures reported in different ways (e.g. incidents per service user or per day). This heterogeneity makes it difficult to compare studies and prevents meta-analyses of outcome data. Despite this, one gap that remains is the underuse of service user-reported outcome measures. Development of such outcome measures could add a useful dimension that may shed further light on intervention effectiveness.

Conclusions

Despite numerous policy initiatives, there are ongoing concerns about the use of restrictive practices in children's settings and their impact on the psychological and physical welfare of service users and staff. Unlike previous reviews, this study was broad in scope, not limited to a single restrictive

practice or type of intervention. It is therefore the first, to our knowledge, to comprehensively map the procedures and effectiveness of interventions available to reduce restrictive practices in children's settings, and to describe their content in terms of BCTs. It revealed that many interventions have been implemented over the past two decades targeting multiple restrictive practices, using multiple procedures and, when they have been evaluated, multiple outcome measures. Very few interventions were theory based and most reported positive findings. The synthesis revealed that many of these interventions have clusters of BCTs in common, suggesting that these interventions have been developed based on an unstated set of assumptions of how they are intended to work and through what mechanisms. Making these assumptions explicit through the use of theory would enable the testing, measurement and refinement of interventions to maximise their effectiveness. Future interventions should test individual procedures (and their constituent components) in isolation and be thoroughly described.

Study registration

This study is registered as PROSPERO CRD42019124730.

Funding

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Chapter 1 Background

This chapter sets out the study context, explaining why it is important to enhance knowledge about restrictive practices in children and young people's (CYP's) institutional settings, and how the behavior change technique (BCT) taxonomy can contribute to the development and understanding of interventions.

Restrictive practices in children and young people's institutional settings

There are approximately 80,000 CYP living in state and privately run institutions in England alone;[1] such institutions include residential children's homes, residential schools, young offender institutions, secure training centres, secure children's homes and immigration detention centres, in addition to NHS inpatient settings through Child and Adolescent Mental Health Services (approximately 1140 beds).[2] The CYP in these disparate institutional settings share some characteristics: many have experienced trauma, abuse and loss;[3–8] some present serious risks of harm to themselves and/or others;[9,10] and some exhibit behavioural and/or psychological difficulties. The health and safety of these CYP and the staff who work with them hinges on the safe and effective avoidance and management of incidents involving violence, aggression and self-harm.

Definition of restrictive practices, rates of use

Staff responses to incidents involving violence, aggression or self-harm may involve the use of potentially harmful restrictive practices (defined by the Department of Health and Social Care as 'deliberate acts on the part of other person(s) that restrict an individual's movement, liberty and/or freedom to act independently in order to: take immediate control of a dangerous situation where there is a real possibility of harm to the person or others if no action is undertaken'[11,12]). Restrictive practices, such as restraint, seclusion and (in health settings) the use of forced medication, are a common occurrence. Rates of use are similar in psychiatric and criminal justice settings. One study calculated that one-quarter of CYP treated in psychiatric settings have had at least one seclusion episode and 29% have had at least one restraint episode,[13] whereas the level is estimated at 28% (in 2014) in custodial settings. The rate is estimated to be higher in learning disability services, with more than half of CYP experiencing seclusion, restraint or a harmful incident.[14]

Prevalence data are not available from other settings, although individual cases have attracted media attention.[15] Some studies have found that approximately 60–70% of all reported seclusions or restraints in CAMHS can be accounted for by a small minority (7–15%) of all hospitalised CYP.[16,17] Recent UK figures revealed that 17% of girls in CAMHS facilities had been physically restrained, compared with 13% of boys.[18] Face-down restraint was more commonly used on individuals < 18 years old, with > 2500 occurrences in 2014/15, and, again, in particular with girls (> 2300 occurrences), often repeatedly with the same girls.[18]

Risks and costs: physical, psychological, financial

Restrictive practices carry high risks of physical and psychological harm. In the UK, 45 CYP died in restraint-related circumstances in inpatient psychiatric facilities in the period 1993–2003[13,19,20] and two have died in youth custody in the past 15 years.[21,22] In 2015 alone, there were 429 injuries to children resulting from restraint in youth custody.[23]

Research has described the negative impact of experiencing restrictive practices in adult service users but little is known about CYP's experiences.[21,22] It is thought that, as with adults, such practices can have a profoundly detrimental effect on therapeutic relationships between care staff and CYP[24] and they are particularly counter-therapeutic for CYP with an abuse history.[25] The subsequent costs of restrictive practices to the NHS are substantial [estimated by the National Institute for Health and Care Excellence (NICE) at £20.5M per year for damage and injury, £88M per year for observations and £6.1M for restraint].[26] Evidence-based interventions to reduce the use of restrictive practices clearly have the potential to result in significant cost savings.

Concerns regarding overuse

The problem of overuse of restrictive practices within UK state-provided children's services has become a matter for serious concern. The United Nations raised specific concerns regarding the use of restrictive practices with CYP who have psychosocial disorders, and at the end of 2017 called again for the UK to end all use of restraint in the context of disability, segregation and isolation practices, and any practices that might be considered to be torture or degrading treatment (Section 73a).[27] Voluntary organisations such as Mind (London, UK),[24] Article 39 (Nottingham, UK)[1] and Agenda (London, UK)[18] have ongoing campaigns on the issue.

Legislative frameworks for the use of restrictive practices

Legal provision for restrictive practices varies across these settings. For example, in the UK, pain-inducing restraint techniques remain lawful in Ministry of Justice settings but have been made unlawful by the Departments of Education and Health. Nevertheless, the UK government has sought to reduce restrictive practices across all settings. The Ministry of Justice implemented the Minimising and Managing Physical Restraint (MMPR) programme, although this has been criticised on the grounds that the restraint techniques it authorises are life-threatening.[28] In 2014, the Department of Health and Social Care launched the *Positive and Pro-active Care* guidance,[12] aimed at phasing out face-down restraint and deeming restrictive interventions a 'last resort' across health and social care provider organisations. Since then, services' use of restraint has been subject to inspection by the Care Quality Commission.[29]

More recently, in its publication *Reducing the Need for Restraint and Restrictive Intervention with Children and Young People with Learning Disabilities, Autistic Spectrum Disorder and Mental Health Difficulties*,[30] the Department of Health and Social Care and Department for Education has set out core principles for the use of restraint: it should be used only where necessary to prevent risk of serious harm, and not as punishment; with the minimum force necessary; by appropriately trained staff; and should be documented, monitored and reviewed.[30] In 2018, The Mental Health Units (Use of Force) Bill[31] – which sought to manage the use of force in mental health services in England and Wales, requiring commitment to a reduction in the use of force and reporting on its use – became law.

Strategies to address reduction of restrictive practices

There is a growing body of research into the reduction of restrictive practices. In the UK, initiatives to reduce restrictive practices in mental health care such as 'Safewards',[32] 'Six Core Strategies'[33] (6CS) and 'No Force First'[34] have been promoted and adopted by some mental health trusts, including in CAMHS; some of these initiatives have been evaluated and reported in the literature.[32,35] There has been similar research carried out seeking to reduce the use of restraint with people with learning disabilities.[36,37] These have typically aimed to reduce violent and aggressive behaviour by changing staff behaviour to encourage use of de-escalation techniques, supported by various policy and procedural changes.

There is some evidence of interventions that are effective in reducing the use of restrictive measures specifically with CYP in mental health services; however, empirical data are limited[13,19,38–41] and often primarily use case studies of single-facility initiatives.[19,42] Although the outcomes of some of these interventions have been the subject of systematic reviews,[32] their specific content has not been examined in detail and the causal mechanisms through which they might change behaviour are not fully understood. It remains unclear which components of these interventions have contributed to their effectiveness. Furthermore, it is not known to what extent those interventions that have resulted in reductions in the use of restrictive practices (or other outcomes such as increased staff confidence) have features in common.

The research context for the current study

The existing literature on restrictive practices repeatedly calls for guidance to be based on robust, transparent studies,[43,44] and for interventions to be better described and better evaluated. Livingston *et al.*[45] reviewed training interventions to reduce restrictive practices and highlighted the difficulty of reaching conclusions, as the evaluated interventions comprised 'different types of aggression management programs, which contain a variety of approaches' and 'the focus, curriculum, and duration of the training vary substantially from one program to another'.[45] The NICE guideline on violence and aggression[46] calls for research to be carried out into the content and nature of effective de-escalation techniques, together with the most effective and efficient approaches to training professionals in their use.[46] According to the guideline, research is needed that will apply a systematic approach to the description and reporting of de-escalation techniques currently in use.[46] With specific reference to CYP, it notes the 'lack of research on the nature and efficacy of verbal and non-verbal de-escalation of seriously agitated children and young people with mental health problems' and recommends research to 'systematically describe expert practice in adults, develop and test those techniques in aroused children and young people with mental health problems, and develop and test different methods of training staff'[46] (NICE. *Violence and Aggression: Short-term Management in Mental Health, Health and Community Settings*. London: NICE; 2015. © NICE 2015 Violence and Aggression: Short-term Management in Mental Health, Health and Community Settings. Available from www.nice.org.uk/guidance/ng10. All rights reserved. Subject to Notice of Rights. NICE guidance is prepared for the National Health Service in England. All NICE guidance is subject to regular review and may be updated or withdrawn. NICE accepts no responsibility for the use of its content in this product/publication).

The current study is one of a pair addressing NICE's recommendation to systematically describe restrictive practices with adults and children. The research team's original study, COMPARE (HSDR 16/53/17),[47] fulfilled the first part of NICE's recommendation by systematically describing practice with adults in mental health inpatient settings. The current review, CONTRAST, is a companion study that took the same approach but reviewed the evidence for interventions to reduce staff use of restrictive practices in child and adolescent institutional settings, including, but not limited to, mental health contexts. It was anticipated that the features of an intervention (its content and delivery) were likely to interact with the delivery context (the target population and setting) and with the features of the target behaviour.[48] Although the target behaviour (use of restrictive practices) was the same as the original study, the context shifted to a range of institutions caring for children and adolescents with different physical, psychological and developmental abilities, employing a wide range of professions, and in which the legality and guidelines for the use of restrictive practices vary. The intention was to compare interventions across these settings to permit exploration of the relationship between intervention features (content and delivery) and context (target population and setting), together with the identification of differences in content, influences on delivery and potential implications for effectiveness.

Addressing the limitations of the evidence base using the behavior change technique taxonomy

The reporting of non-pharmacological trials is challenging because of the absence of a common language with which to describe their components.[49,50] A review[51] found that only 39% of interventions were 'adequately' described when published. In response to this lack of consensus, the Medical Research Council (MRC) supported the development of a taxonomy of BCTs that can be used across all theory-based interventions aimed at patients or professionals,[52] both prospectively in their design and/or to synthesise evidence restrospectively.[52,53] A BCT is defined as 'an observable, replicable, and irreducible component of a programme designed to alter or redirect causal processes that regulate behaviour'.[52] All interventions to reduce restrictive practices use BCTs. For example, role-playing verbal de-escalation strategies could be coded as rehearsal of relevant skills involving social comparison (BCT 6.2), monitoring of emotional consequences (BCT 5.4) and feedback on behaviour (BCT 2.2). Delivery of information by an expert about risks of restraint could involve information about health consequences delivered by a credible source (BCT 5.1). The taxonomy therefore enables reliable, precise and transparent reporting, replication and comparison of interventions,[54] along with more successful implementation with proven effectiveness.[52] It is increasingly used internationally to report interventions,[55] synthesise evidence[56,57] and reanalyse existing interventions to explore their components.[58] It is also influencing intervention design[48] and contributing to the identification of potentially effective BCTs.[52]

Chapter 2 Aim and objectives

Aim

The study aim was to identify, standardise and report the effectiveness of components of interventions that seek to reduce restrictive practices in CYP's institutional settings using the behaviour change taxonomy.

Objectives

The study objectives were to:

- provide an overview of interventions aimed at reducing restrictive practices with CYP
- classify components of those interventions in terms of BCTs and determine their frequency of use
- identify the role of process elements in intervention delivery
- explore the evidence of effectiveness by examining BCTs and intervention outcomes, where possible
- compare the components of interventions in CYP's settings with those in adult psychiatric inpatient settings[47] and identify potential explanations for any differences
- identify and prioritise BCTs that show the most promise of effectiveness and that require testing in future high-quality evaluations.

Chapter 3 Methods

This chapter describes the study design, including approaches to the literature search, data extraction and analysis.

Design overview

Design and conceptual framework

The study approach was a systematic mapping review. An 'intervention' was any documented approach that sought to reduce the use of restrictive practices through BCTs. The literature review focused on ascertaining the range and characteristics of interventions, irrespective of evidence of effectiveness, which involved systematically searching and reviewing all reports of interventions seeking to reduce the use of restrictive practices (*Figure 1*).

The study design comprised the following six objectives.

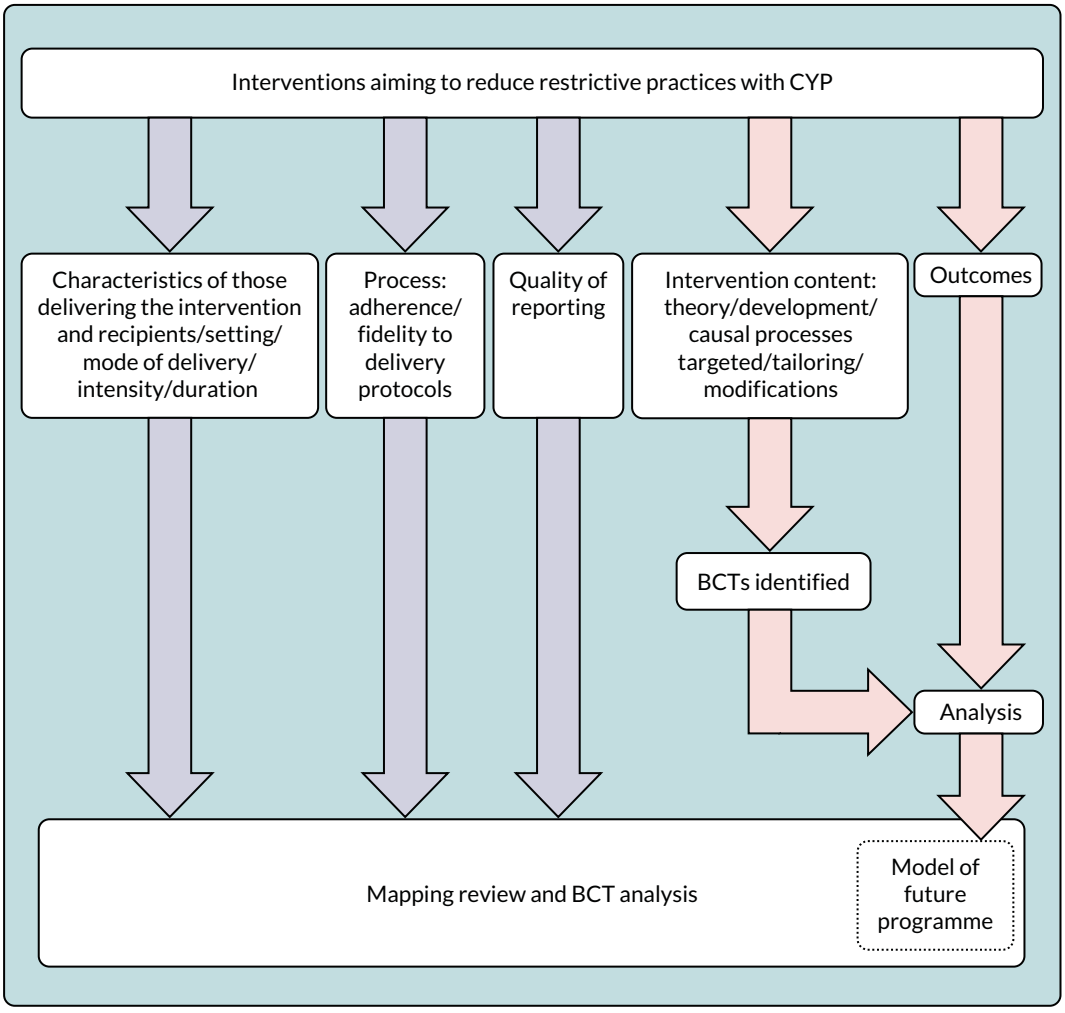

FIGURE 1 Design of systematic mapping review.

Environmental scan involving a systematic search of all English-language reports of interventions to reduce restrictive practices in children and young people's institutional settings (objective 1)

The search strategy approach drew on the increasingly used method of mapping[59–64] to inform the purpose and output of the review, but differed from the method described by Bradbury-Jones *et al.*[59] with respect to the broad scope of the search and inclusion of interventions in the current study. It was known that, in addition to a small number of well-known interventions reported in the academic literature, there were numerous small-scale, stand-alone initiatives available for implementation in services. Not all of these would appear in a search restricted to the published research literature, as they could be reported in unpublished literature or relevant sources that are not reporting research. Furthermore, the current study required the documentation from the interventions (e.g. training programmes) themselves, offering full descriptions of the interventions in addition to research studies evaluating the intervention.

Therefore, an environmental scanning approach was applied. Environmental scanning methods were developed to identify broader information about an area than that which is retrievable solely from published literature. They allow flexibility in the approach to obtaining materials. Environmental scans have been used for identifying and evaluating online resources or training and for reviews of training programmes.[65–67] In health-care settings, this method has been used to inform future-planning, to document evidence of current practice and to raise awareness of an issue.[68]

Application of the method can take a 'passive' approach in which existing data, both published and unpublished, are collected and analysed, or an 'active' approach in which additional knowledge is generated through primary data collection.[68] This study used passive environmental scanning methods to collect available descriptive or evaluative information about interventions that aim to reduce staff use of restrictive practices.

This approach fitted well with the need to search using internet search engines and social media, plus a large number and wide variety of websites, to identify training programme materials. Hence, it was an appropriate choice for expanding the scope of the search strategy.

Synthesis of the features of interventions, alongside a critical appraisal of all retrieved records (objectives 2, 4 and 6)

The study design is illustrated in *Figure 1*.

Examples included delivery to groups or individuals, the person delivering the intervention, and the setting, timing and frequency of the interventions.[49] These were recorded using WIDER (Workgroup for Intervention Development and Evaluation Research),[69] a checklist that prompts detailed recording of interventions based on the questions 'why, what, who, how, where, when and how much?'. WIDER serves as an extension to both CONSORT (Consolidated Standards of Reporting Trials) and SPIRIT (Standard Protocol Items: Recommendations for Interventional Trials).[51]

Critical appraisal was informed by the Mixed Methods Appraisal Tool (MMAT), which is an appraisal tool specifically designed for mixed-methods reviews.[70,71]

The Behaviour Change Wheel

To support the synthesis of the context of the interventions, the Behaviour Change Wheel was used. This was produced from a synthesis of frameworks of behaviour change research literature.[72] It is based on a model of behaviour called the COM-B, which attempts to describe how Capability, Opportunity and Motivation can change Behaviour. The Behaviour Change Wheel contains the higher-order categories of BCTs at its hub (e.g. 'social' or 'reflective'). The next level includes intervention functions such as 'training' or 'incentivisation', and the third, outer, level contains policy categories such as 'legislation' or 'regulation'.

The initial data extraction included the categories from the Behaviour Change Wheel. The subsequent, more detailed, BCT coding of interventions was therefore an extension to this process, focusing on the detail of the study in which it was reported, and relating it back to intervention function in the Behaviour Change Wheel. For example, providing information on consequences of restrictive practices would relate to the intervention functions of 'education' and 'persuasion'. Use of the Behaviour Change Wheel in this way facilitated reporting of all interventions in different levels of detail.

Extraction of intervention content for analysis using a validated, structured taxonomy (the behavior change technique taxonomy) to identify the content of the interventions, when possible (objective 2)

The behavior change technique taxonomy

When possible, content of the interventions was extracted using the BCT taxonomy, which is supported by the MRC.[73] The MRC BCT taxonomy consists of 93 items, each one an individual BCT, for example BCT 6.2 (social comparison) or BCT 1.2 (problem-solving). Individual BCTs are also grouped into clusters, for example cluster 1 (goals and planning). The taxonomy provides examples of these items, often related to patient behaviour, although recent studies have provided examples of health-care professionals' behaviour to inform studies such as this that seek to code health-care professionals' behaviours.[73]

The BCT taxonomy is a reliable method for extracting data regarding the content of interventions.[52] All materials available for each intervention (e.g. manuals, evaluation reports) were coded by trained coders using the taxonomy. This process identified the individual BCTs detected in each intervention and their frequency of use.

Where possible, extraction of the outcomes of coded interventions and relating of them to the behavior change technique taxonomy (objectives 3 and 4)

When an intervention was coded for BCTs, available outcome data were then extracted.

Comparison of components of interventions in children and young people's settings with those in adult psychiatric inpatient settings (objective 5)

The two settings were compared to address questions about the comparability and transferability of interventions to reduce restrictive practices and their specific BCT components, such as:

- Do interventions aimed at staff of different professions working in children's services take account of the significant differences in population?
- Are the BCT components of interventions aimed at staff in children's settings different from those in adult settings, and should they be?

It was possible that interventions in adult settings might comprise particular BCTs that were not found in interventions in children's settings. If identified as effective, these BCTs could be considered to be worth testing in children's settings (and vice versa).

Analysis of potential relationships between reduction of restrictive practices and behaviour change techniques (objective 6)

Analysis of potential relationships between reduction of restrictive practices and BCTs was carried out with the aim of generating hypotheses for future testing and developing potential causal models for future trials.

Literature search strategy

Search strategy

The approach to searching and screening was guided by the mapping and scoping literature[59–64] and provided an initial draft search. This draft search went through several iterations before a final search

was conducted. The reviewers screened some sample search results to consider the relevance of the studies. Research literature, policies and grey literature, including training manuals, were identified using comprehensive search strategies developed in collaboration with the information specialist and from consulting the known literature and database thesauri (e.g. medical subject heading).

Searches were developed for the following concepts: child or child behaviours; restraint practices or named programmes; and a variety of institutional, health-care and educational settings. The search was limited to material after 1989 because of changes in attitudes to children's rights, as reflected in the United Nations Convention on the Rights of the Child (UNCRC) 1989[74] and, in the UK, the 1989 Children Act,[75] which introduced comprehensive reforms to the law in terms of the care and protection of children.

Restraint studies relating to road safety or traffic incidents were excluded. Subject headings and free-text words were identified for use in the search concepts by the information specialist and project team members. Further terms were identified and tested from known relevant papers.

All searches were peer reviewed by an information specialist. Search strategies were adapted with the aim of producing fewer and more relevant results without missing relevant studies. Additional studies were identified via bibliographies of reviews and retrieved articles, targeted author searches, contacting international experts and forward citation searching. The project management group was asked for details of any known interventions, and authors of current and recently completed research projects were contacted directly.

In June 2019, academic databases were searched for studies looking at child restraint in a variety of settings. The searches were updated in January 2020 in all but the Education Abstracts and Scopus databases. Analysis of the studies selected for inclusion from the 2019 searches showed that none had come exclusively from these two databases. *Table 1* indicates the databases that were searched within the stated dates.

Grey literature searches were conducted in August 2019 and updated in January 2020 in the websites and databases in *Box 1*. See *Appendix 1* for full details of all searches.

TABLE 1 Academic databases used in searches

Database	Date range searched
ASSIA (ProQuest)	1987 to 24 January 2020
British Nursing Index (HDAS)	1992 to 24 January 2020
CINAHL (EBSCO*host*)	1981 to 30 January 2020
Child Development and Adolescent Studies (EBSCO*host*)	1927 to 24 January 2020
Criminal Justice Abstracts (EBSCO*host*)	1830 to 30 January 2020
Education Abstracts (H. W. Wilson) (EBSCO*host*)	1983 to present, updated 14 June 2019
EMBASE Classic and EMBASE (Ovid)	1947 to 21 January 2020
ERIC (EBSCO*host*)	1966 to 30 January 2020
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily	1946 to 20 January 2020
PsycInfo (Ovid)	1806 to week 2 January 2020
Scopus (Elsevier B. V.)	1823 to 13 June 2019

ASSIA, Applied Social Sciences Index and Abstracts; CINAHL, Cumulative Index to Nursing and Allied Health Literature; ERIC, Education Resources Information Center; HDAS, Healthcare Databases Advanced Search.

BOX 1 Grey literature and social media sources used in the searches

Agency for Healthcare Research and Quality.

AGENDA: Alliance for Women & Girls At Risk.

Article 39.

Barnardo's.

British Association of Social Workers.

British Institute of Learning Disabilities.

British Society of Criminology.

Challenging Behaviour Foundation.

Children Society.

Crisis Prevention Institute.

Foundation for Professionals in Services to Adolescents.

Google (Google Inc., Mountain View, CA, USA).

HM Inspector of Constabulary and HM Inspector of Fire & Rescue Services.

HM Inspectorate of Prisons for England and Wales.

HM Inspectorate of Probation.

Howard League.

INQUEST.

MENCAP.

National Children's Bureau.

National Police Library.

National Society for the Prevention of Cruelty to Children.

National Youth Work.

Prison Reform Trust.

Prisons and Probation Ombudsman.

ProQuest Dissertations & Theses A&I (ProQuest) 1743 to 24 January 2020.

BOX 1 Grey literature and social media sources used in the searches (*continued*)

Restraint Reduction Network.

SAFE Crisis Management.

SCIE.

Secure Children's Homes/Secure Accommodation Network.

Social Care Online (SCIE) 1980 to 28 January 2020.

Twitter (www.twitter.com; Twitter, Inc., San Francisco, CA, USA).

Young Minds.

Youth Justice Board for England and Wales.

Eligibility

In keeping with objective 1 (to provide an overview of interventions aimed at reducing restrictive practices in children's settings), the search criteria targeted diverse reports of non-pharmacological interventions aimed at changing the behaviour of service staff to reduce restrictive practices. The scope of the searches was necessarily broad to include all records of an intervention, whether it was an evaluation or a descriptive report. To include as many interventions as possible within the scope of the search, no quality threshold was imposed either indirectly (by restricting the search to high-impact journals) or directly via the search criteria or by screening. Inclusion was not restricted by study design. Interventions that solely involved policy change and those that aimed to reduce the use of one type of restrictive practice by replacing it with another were not eligible for inclusion.[59–64,68,70,71]

In addition to interventions intended to reduce or eliminate restrictive practices, reports of interventions designed to improve quality or reduce or manage violence were included if their procedures and/or outcome measures addressed restrictive practices. The search for relevant interventions records was informed by the 'environmental scanning' approach[68] described above. Eligibility criteria are shown in *Table 2*. See *Appendix 1* for full details of all searches.

TABLE 2 Eligibility criteria

Criterion	Include	Exclude
Population	Staff working in state and privately operated CYP's institutional settings [including children's homes; residential schools; boarding schools; young offender institutions; secure training centres; immigration detention centres; and inpatient child and adolescent mental health, child and adolescent hospitals (non-mental health) and learning disability services]	Interventions to reduce staff use of restrictive practices with adults (only > 18 years)
Date	Dated 1989 to date	Pre-1989
Interventions	Intervention: documented interventions aimed at reducing staff use of restrictive practices with CYP in institutional settings	Pharmacological only intervention Non-English-language interventions
Outcomes	Outcomes: reduction of restrictive practices	
Language	English	

Data management and review

All potentially eligible records were stored and managed in the reference management software EndNote™ version X9 (Clarivate Analytics, Philadelphia, PA, USA). Two reviewers screened titles. When both reviewers agreed to exclude an article, the reason for exclusion was recorded. When there was disagreement, the full text of the articles was reviewed and any unresolved disagreement was subject to third-party review. When there was agreement between the two reviewers on inclusion, the full-text article was retrieved and independently assessed against the inclusion criteria by the two reviewers and, again, any disagreement was subject to third-party review.

Quality appraisal using the Mixed Methods Appraisal Tool

Because the inclusive search criteria identified very diverse record formats, quality appraisals were used not to exclude papers but to inform the synthesis by identifying study designs and, hence, evaluations. Study quality was assessed using the MMAT. This tool is suitable for appraising studies with diverse designs.[70,71] The characteristics of the MMAT[70,71] make it the most suitable tool with which to judge study quality in the context of wide-ranging research methods.

The MMAT was developed for use in complex systematic literature reviews that include quantitative, qualitative and mixed-methods studies (*Figure 2*). It was developed from theory and a literature review and has been found to have good validity.[76] The MMAT algorithm for selecting study categories is illustrated in *Figure 3*. Using the MMAT algorithm, reports of milieu change and case studies were categorised as qualitative studies if reporting suggested a primarily qualitative approach.

Using the MMAT, quantitative and qualitative studies are judged against four criteria and mixed-methods studies are judged against three. The quantitative domain is split into three subdomains: randomised controlled, non-randomised and descriptive. As applied in the current study, surveys, case reports, descriptive cross-sectional studies and ecological studies were categorised as 'quantitative descriptive' if reporting suggested a primarily quantitative approach. The mixed-methods category included reports of milieu change with substantial quantitative analysis.

Therefore, the tool was used at two levels: (1) to identify records of interventions that had been evaluated to get a sense of the quality of the evidence using the two initial screening questions, and (2) to assess the quality of the evaluation reports. The application of the MMAT to screen and categorise all the records informed the narrative accounts provided in *Chapters 4* and *5*.

Documented interventions were identified. Data extraction was governed by a pro forma that allowed systematic collection of data relating to the interventions. Analysis of the features of interventions revealed the context of how interventions were delivered (e.g. delivery to groups or individuals; the person delivering the intervention; and the setting, timing and frequency of the interventions).[49] When available, these details were recorded using the WIDER[69] checklist. WIDER is a tool for assessing reporting quality. It contains a number of relevant categories that facilitated this process.

Content extraction

The content of interventions was extracted to allow their components to be coded using the BCT taxonomy. Extraction was carried out by two reviewers and any discrepancies were subject to third-party review. Extraction categories were developed from the WIDER[69] checklist. Data were extracted about the characteristics of each intervention, including participants, setting, intervention type, outcome measures, fidelity, acceptability, recommendations and quality. When information was available, associated costs were described in terms of training materials, delivery and staff time.

Category of study designs	Methodological quality criteria	Responses			
		Yes	No	Can't tell	Comments
Screening questions (for all types)	S1. Are there clear research questions?				
	S2. Do the collected data allow to address the research questions?				
	Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.				
1. Qualitative	1.1. Is the qualitative approach appropriate to answer the research question?				
	1.2. Are the qualitative data collection methods adequate to address the research question?				
	1.3. Are the findings adequately derived from the data?				
	1.4. Is the interpretation of results sufficiently substantiated by data?				
	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?				
2. Quantitative randomised controlled trials	2.1. Is randomisation appropriately performed?				
	2.2. Are the groups comparable at baseline?				
	2.3. Are there complete outcome data?				
	2.4. Are outcome assessors blinded to the intervention provided?				
	2.5. Did the participants adhere to the assigned intervention?				
3. Quantitative non-randomised	3.1. Are the participants representative of the target population?				
	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?				
	3.3. Are there complete outcome data?				
	3.4. Are the confounders accounted for in the design and analysis?				
	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?				
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the research question?				
	4.2. Is the sample representative of the target population?				
	4.3. Are the measurements appropriate?				
	4.4. Is the risk of nonresponse bias low?				
	4.5. Is the statistical analysis appropriate to answer the research question?				
5. Mixed methods	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?				
	5.2. Are the different components of the study effectively integrated to answer the research question?				
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?				
	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?				
	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?				

FIGURE 2 Mixed Methods Appraisal Tool, version 2018. Adapted from Hong Qn, Pluye P, Fàbregues S, Bartlett G, Boardman F, Cargo M, *et al.* Mixed Methods Appraisal Tool (MMAT), version 2018.[70] Registration of Copyright (#1148552) Canadian Intellectual Property Office, Industry Canada.

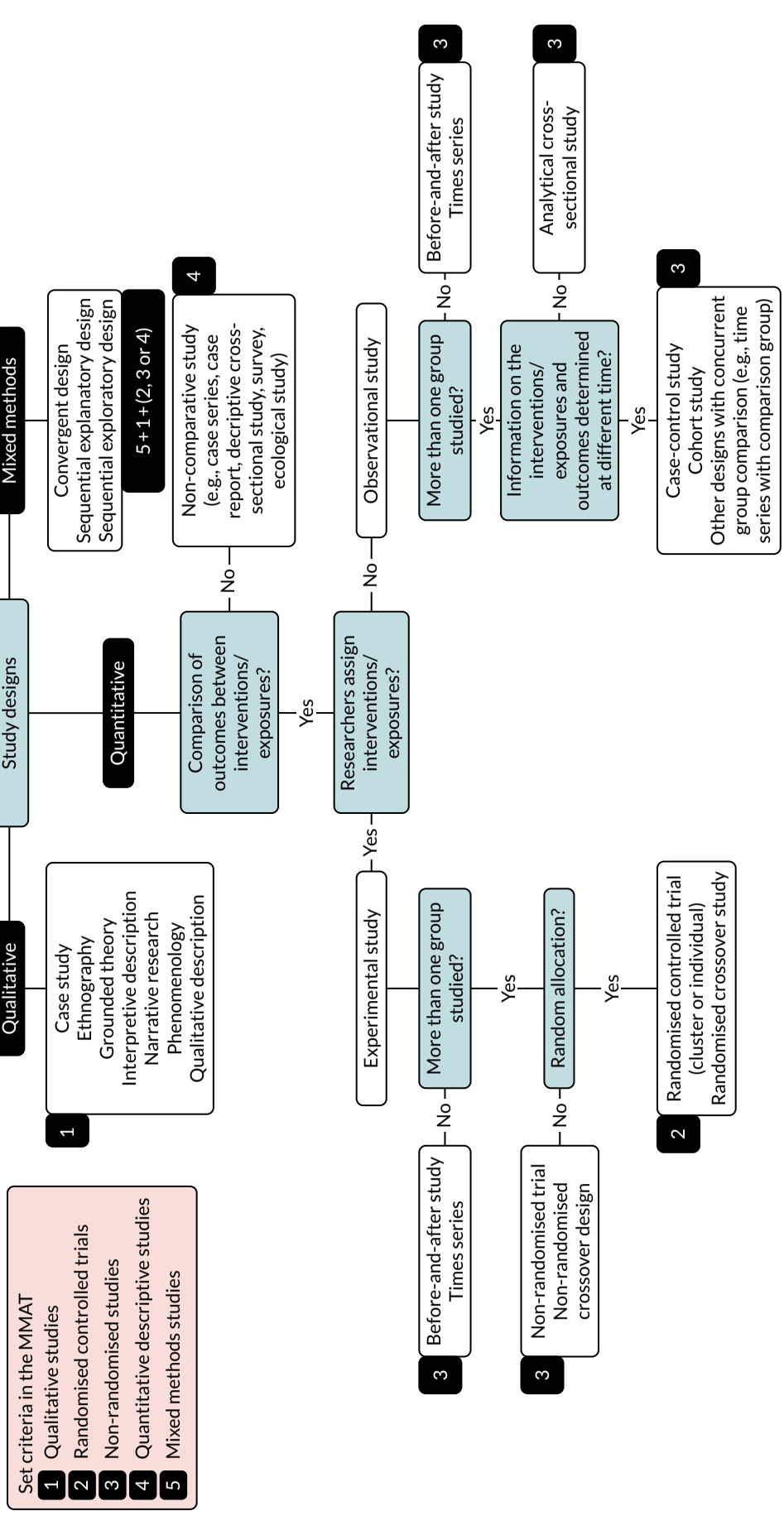

FIGURE 3 Mixed Methods Appraisal Tool algorithm for selecting study categories. Adapted with permission from Hong Qn, Pluye P, Fàbregues S, Bartlett G, Boardman F, Cargo M, *et al.* Mixed Methods Appraisal Tool (MMAT), version 2018.[70] Registration of Copyright (#1148552) Canadian Intellectual Property Office, Industry Canada.

Intervention coding

The researchers were fully trained in the application of the BCT taxonomy. Using the taxonomy and supporting examples, the researchers independently coded the selected interventions. Interventions that were coded for BCT components had information about their outcomes extracted to examine the efficacy of these techniques.

Coding was carried out by importing all intervention materials (published papers, manuals, slides, handbooks) into NVivo 12 (QSR International, Warrington, UK), a flexible qualitative software package that facilitates the coding of multimedia materials for analysis. Each of the 93 items of the BCT taxonomy was turned into a code within NVivo and considered for each intervention. The codes were applied when there was evidence of the BCT being used; for example, when a professional received information about the potentially harmful effects of restraint during a training session, this was coded as BCT 5.1 (information about health consequences). Any assumptions made by the coder were recorded, also within NVivo, in order that discrepancies could be discussed. Once the coding was complete, NVivo was used to generate individual study reports that revealed discrepancies between coders. Each discrepancy was discussed and resolved by the coders and, if necessary, further discussion took place with other expert members of the team to achieve resolution. This discussion consisted of the coder explaining their reasoning as to why they had assigned the code. The individual study reports were compiled to produce a summary of how many of the possible 93 BCTs were found in interventions, how often they occurred and whether or not they were from particular clusters. Study outcome data were extracted and used to explore whether or not there were potential relationships between study outcomes and particular BCTs.

Data synthesis

The approach to data synthesis was designed to suit the diverse set of included records. It was not relevant to apply stringent academic appraisal techniques in a conventional way because the data set included some records that were neither academic publications nor formal reports. For example, a key source of information about the 6CS intervention was a set of workshop slides.[77]

Meeting the objectives set out in this chapter involved exploring and categorising the records, identifying intervention evaluations and then conducting a detailed analysis of the available information about the interventions. The purpose of this was to identify BCTs to produce a synthesis of intervention characteristics, components in terms of BCTs, process elements, effectiveness evidence in terms of BCTs and intervention outcomes, and also to compare the results with the results of the companion COMPARE study[47] focusing on adult acute mental health settings.

Therefore, data were synthesised by a process of close scrutiny of the included records, and tailored application of the MMAT and WIDER recommendations to understand the scope and quality of the materials and meet the study objectives.

Following extraction, the records were organised into groups according to the intervention or interventions they described. This allowed for a primary focus on the evidence for each intervention, rather than the overall evidence (objectives 4 and 6) in parallel with the classification and analysis of intervention components (objective 2).

Narrative synthesis

Interventions were placed in subgroups according to the setting and type of restrictive practice that they seek to reduce [e.g. p.r.n. (pro re nata) medication, physical and seclusion]. A narrative synthesis

across and within each subgroup was carried out exploring and describing the features of the interventions including their theoretical basis, population, outcomes and conclusions. The content of the types of intervention was described in terms of the types and frequency of BCTs that could be identified [e.g. social support, skills practice and modelling (*Table 3*)]. The outcome data from the interventions were presented in relation to the BCTs present, and hypotheses were formulated around whether specific types of BCTs appeared more frequently, or not at all, in studies reporting certain outcomes.

TABLE 3 Example of BCT known to be present in interventions to reduce restrictive practices

Type of BCT	Example of how this BCT has been used in a model reducing restrictive practices
Health consequences	Information given about the potential risks of asphyxiation or cardiac events during restraint[33]

Chapter 4 Results of literature search

Introduction

The chapter provides an overview of the literature search results, including a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) figure to indicate the extraction process. The included records are listed in *Appendix 2*. In this chapter, the results are described in detail and key characteristics of the data set are highlighted. As per objective 1 and in keeping with the mapping approach, a narrative overview of interventions aimed at reducing restrictive practices with CYP is then provided. It describes the characteristics of the interventions identified within the data set of records, including their scope and common features. The description of the evaluations is informed by WIDER reporting recommendations. *Figure 4* summarises the study processes.

Search results

As illustrated in the PRISMA figure (*Figure 5*), the search of academic databases identified 43,494 records and these, as well as 8796 records found in the grey literature (including social media), were entered into Covidence (Melbourne, VIC, Australia) for further analysis. After the removal of duplicates, and accounting for records that were not available, 19,644 records were subjected to title and abstract screening. The final data set consisted of 121 records for extraction. Further details of the search strategy and results are available in *Appendices 1* and *2*.

Responses to requests for intervention materials

In addition to the processes described above, attempts were made to request further information about interventions to supplement information found in the 121 included records. This involved sending e-mails to authors and co-authors, and, when appropriate, to organisations, using contact details provided in or otherwise gleaned from the records. Seventy-one e-mail requests were sent (see *Appendix 3*), resulting in new information about six of the interventions: Six Core Strategies for Reducing Seclusion and Restraint Use,[33] Trauma Affect Regulation,[78] Neurosequential Model of Therapeutics,[79] Milieu Nurse Shift Assignments,[80] Crisis Intervention[81] and Checklist for Assessing Your Organisation's Readiness.[82]

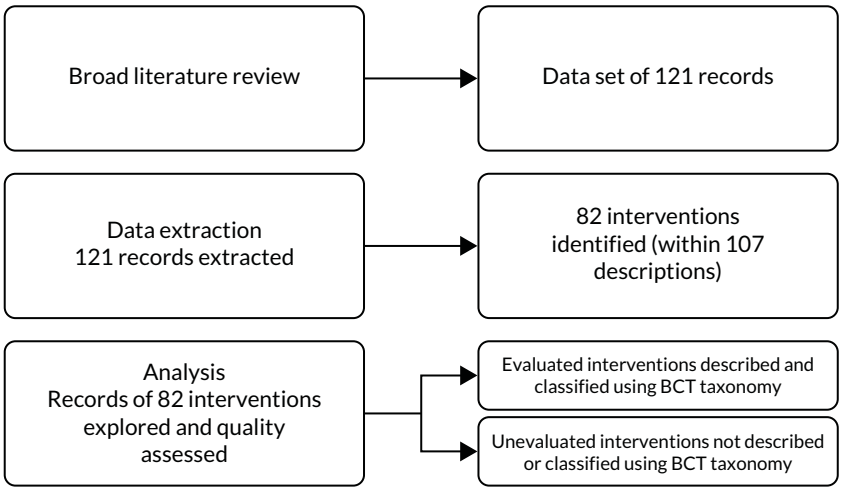

FIGURE 4 Summary of study processes.

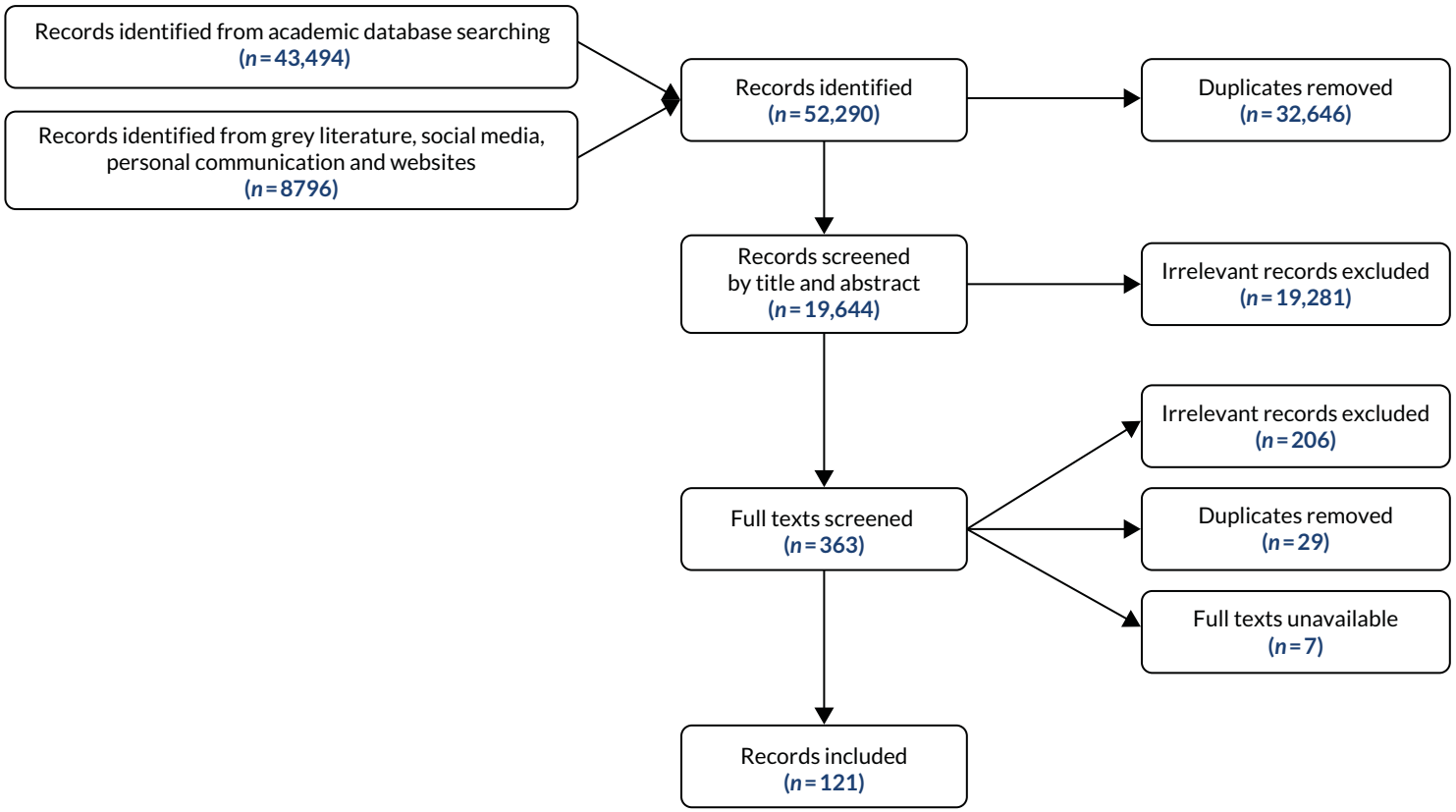

FIGURE 5 The PRISMA figure. Grey literature: non-academic databases and websites, social media and 'other' records. 'Other' records: discovered using forward citation searches and contact with authors. Excluded because not relevant: records excluded because they report not an intervention but, for instance, a generic policy change or replacement of one restrictive practice with another.

Study screening

The records were diverse in terms of format and reporting quality. The first two questions of the MMAT[70] were applied to screen the 121 records to identify those that were evaluations. In all, there were 76 records that were evaluations and 45 records that were descriptive only and did not contain evaluations. These 45 were used for mapping only and consisted of training resources, blogs, websites and almost all of the reports (e.g. reports to organisations).

Categorising the studies

Some interventions occurred in more than one record, some records reported more than one intervention and some reports were mentioned in more than one record. Overall, the data set contained 107 descriptions of interventions, referring to 82 interventions in total, of which 67 interventions had been evaluated. The data set is summarised in *Figure 6*.

Categorisation of study (evaluation) design

In view of the widely ranging literature retrieved from the searches, the MMAT was used to categorise all 121 records by study design. As reported above, 76 records were classified as evaluations; the remainder were descriptive only. The 76 evaluations were allocated, where possible, to one of the five MMAT categories:[70] qualitative description, randomised controlled trial (RCT), non-randomised trial, quantitative description or mixed-methods study. As summarised in *Table 4*, the majority of the 76 records of evaluations reported non-randomised designs. Thirty-two evaluation records lacked sufficient detail for categorisation by study design with the MMAT. None was categorised as a RCT. Only 15 of the 45 mapping records provided detail of study design; however, as indicated above, not

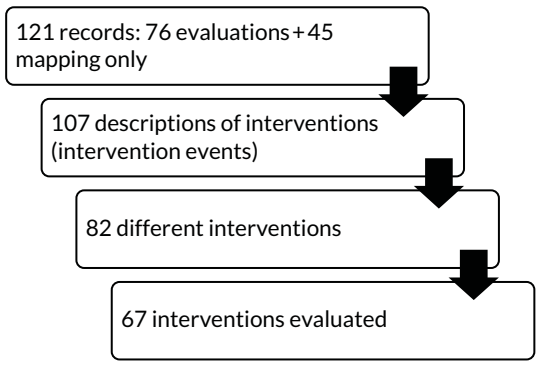

FIGURE 6 Summary of the data set.

TABLE 4 Study designs occurring in the set of 121 records

Study design	Evaluation records ($n = 76$)	Mapping records ($n = 45$)	Total
RCT	0	0	0
Non-randomised trial	41	3	44
Quantitative description	23	7	30
Qualitative description	5	3	8
Mixed-methods study	5	2	7
Insufficient detail	2	30	32
Total	76	45	121

all mapping records were research reports. Based on the MMAT screening questions, intervention study design was as follows: non randomised, $n = 41$; quantitative, $n = 21$; mixed methods, $n = 5$; qualitative, $n = 5$; no study design reported, $n = 2$.

Consistency and comprehensiveness of intervention reporting

Overall, reporting about interventions lacked consistency and comprehensiveness. The WIDER tool[69] that was used to develop the data extraction strategy also informed the appraisal of reporting quality and identified a great deal of missing information about key aspects of interventions. Within the evaluation records, intervention recipient and setting were well reported, but intervention aims and by whom the intervention was delivered were not consistently reported. Most evaluation records did not report on intervention dose, fidelity to the intervention protocol, whether or not modifications were made to the intervention, whether or not intervention protocols were used and whether or not service users were involved in the development of the intervention. Within the mapping records, reporting was weak across the WIDER categories. The detail is presented in *Table 5*. Evaluation and mapping records are reported separately because of the differing overall characteristics of each subset. The detail provided in *Table 5* reflects information as reported directly in the records, rather than inferred or extrapolated.

Publication date and format

Figure 7 illustrates the pattern of publication dates of 118 of the records. Three records were undated training resources in which the context and content indicated that they fell within the inclusion criteria. The figure shows that there was a brief increase in publications in the late 1980s and a sharp increase from the mid-2000s. The latter increase coincides with a US-wide policy response[83,84] to a series of newspaper reports published in 1998 in the *Hartford Courant* newspaper, highlighting deaths related to the use of restraint in mental health and learning disability facilities across the USA.[33,83,84]

Characteristics of records

The 121 records were organised by format type. Study designs of evaluations and mapping records are summarised in *Table 6*. Over half of the records were published in academic journals ($n = 61$). Eighty (66.1%) of the 121 records were peer reviewed. The additional peer-reviewed sources included book chapters ($n = 3$),[85–87] dissertations ($n = 11$)[88–98] and conference proceedings ($n = 5$).[99–103] The other records comprised training resources ($n = 12$); newsletters ($n = 6$); professional magazines ($n = 4$); presentation slides ($n = 4$); websites ($n = 3$) and blogs ($n = 2$); and reports ($n = 10$), of which seven were for government departments (UK, Wales, USA), two were for training organisations and one was for a US health-care service provider.[104]

Peer-reviewed sources

The 11 peer-reviewed sources that featured more than once appear in *Table 7*. The most frequently occurring single source was the *Journal of Child and Adolescent Psychiatric Nursing*.

Service setting

Just under half of the records (60/121) came from mental health settings. The other service settings were health and social care, criminal justice and education. Three evaluation records and 14 mapping records reported more than one setting within a single service and were categorised as 'generic' (*Table 8*).

TABLE 5 Comprehensiveness of reporting

		WIDER recommendation										
		Detailed description of interventions								Assumed change process and design principles		Access to manuals/protocols
						Dose						
Reporting		By whom delivered	Recipient	Setting	Mode of delivery in implementation[a]	Duration	Intensity	Modification	Fidelity	Theory informed[b]	Development[c]	Materials
***Evaluation records* (N = *76*)**												
R	*n*	42	72	76	22	22	15	3	12	43	10	10
	%	55.26	94.73	100	28.95	28.95	19.74	3.95	15.79	56.58	13.16	13.16
NR	*n*	34	4	0	54	54	60	64	64	33	66	66
	%	44.74	5.26	0	71.05	71.05	78.95	84.21	84.21	43.42	86.84	86.84
N/A	*n*	0	0	0	0	0	1	9	0	0	0	0
	%	0	0	0	0	0	1.32	11.84	0	0	0	0
***Mapping records* (N = *45*)**												
R	*n*	8	11	15		4	0	2	2	2	1	4
	%	17.78	24.44	13.33		8.89	0	4.44	4.44	4.44	2.22	8.89
NR	*n*	7	4	0		11	15	13	13	13	14	11
	%	15.56	8.89	0		24.44	33.33	28.89	28.89	28.89	31.1	24.44
N/A	*n*	30	30	30		30	30	30	30	30	30	30
	%	66.67	66.67	66.67		66.67	66.67	66.67	66.67	66.67	66.67	66.67

N/A, not applicable; NR, not reported; R, reported (including partial reporting).
a Mode of delivery (e.g. online or face-to-face training, manual, milieu change).
b Theory informed: indicates whether or not record reports a theoretical basis for the intervention.
c Development: indicates whether or not record reports service user involvement in the development of the intervention.

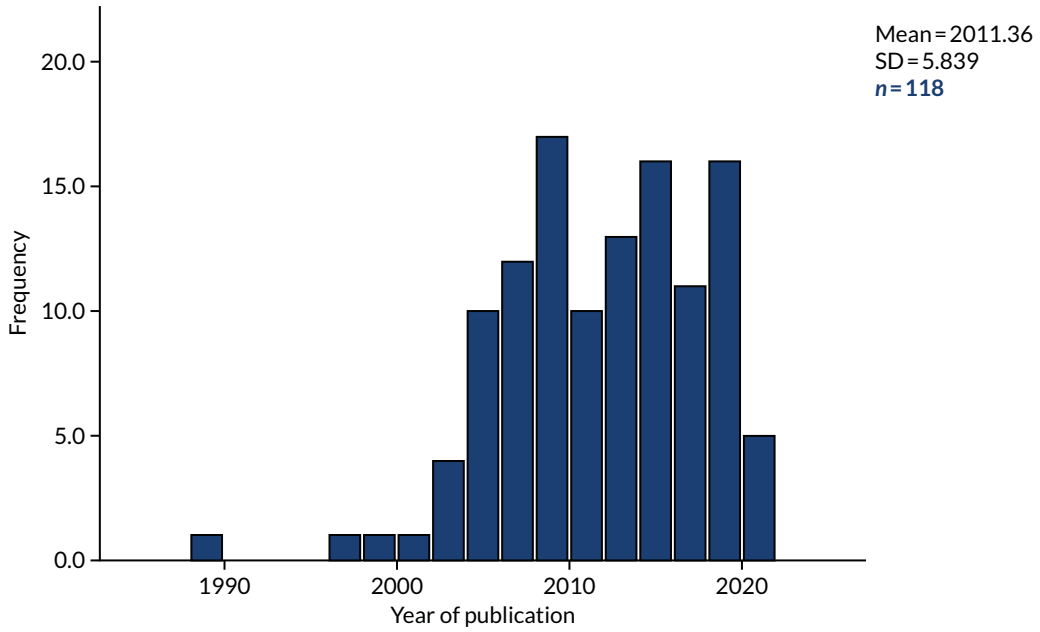

FIGURE 7 Publication dates.

TABLE 6 Characteristics of records

Record type	Number of records (*N* = 121), *n*	Percentage
Peer reviewed		
Academic journals	61	50.4
Book chapters	3	2.5
Dissertations	11	9.1
Conference proceedings	5	4.1
Other		
Training resources	12	9.9
Newsletters	6	5.0
Professional magazines	4	3.3
Presentation slides	4	3.3
Websites	3	2.5
Blogs	2	1.7
Reports	10	8.3
Total	121	100.0

Records and interventions by geographical setting

Records by geographical setting

The majority of records (87/121) reported evaluations or projects conducted in the USA. A further 21 were conducted in Europe and the remainder were conducted in Canada, Australia, Singapore or in more than one country. Three records did not report a location. The spread of geographical settings by record is detailed in *Table 9*.

TABLE 7 Sources and frequencies of peer-reviewed records that featured more than once

Peer-reviewed source	Frequency
Journal of Child and Adolescent Psychiatric Nursing	9
Psychiatric Services	7
Residential Group Care Quarterly	6
Residential Treatment for Children & Youth	6
Dissertation Abstracts International	5
Journal of the American Academy of Child and Adolescent Psychiatry	4
Chapters from same book	3
Dissertation unpublished/other	3
Journal of Family Violence	2
Journal of Psychiatric Practice	2
Research on Social Work Practice	2

TABLE 8 Service setting

Setting	Frequency	Percentage
Mental health	60	49.6
Health and social care	23	19.0
Generic[a]	17	14.0
Criminal justice	11	9.1
Education	10	8.3
Total	121	100.0

a More than one setting within a single service, for example a combination of social, educational and health.

TABLE 9 Geographical settings by record

Country	Frequency	Percentage
USA	87	71.9
UK	18	14.9
Canada	4	3.3
New Zealand	1	0.8
Australia	3	2.5
Finland	1	0.8
Netherlands	1	0.8
France	1	0.8
Singapore	1	0.8
International	1	0.8
Total	118	97.5
Missing	3	2.5
Total	121	100.0

Interventions by geographical setting

Only 2 of the 82 interventions had been applied in more than one country: Therapeutic Crisis Intervention (TCI) [UK, USA and one other intervention event (i.e. separate occurrences of the specific intervention) with an unreported location] and Modified Positive Behavioral Interventions and Supports (M-PBIS) (UK, Wales and USA). All other interventions that were applied more than once were implemented in the USA. These were the 6CS ($n = 11$ events), Collaborative Problem-Solving (CPS) ($n = 7$ events), comfort versus control ($n = 2$ events), the Grafton program ($n = 2$ events), Trauma Affect Regulation: Guide for Education and Therapy (TARGET) ($n = 2$ events), and Devereux's Safe and Positive Approach (SPA) ($n = 2$ events).

There were 74 'stand-alone' interventions (i.e. were applied in a single event). They were often developed within and for a specific setting and were not necessarily given a name. Of these, 51 were delivered in the USA, seven in the UK, three in Canada, three in Wales (UK), three in Australia, two in international projects and one each in Finland, New Zealand, Singapore, the Netherlands and France. Therefore, in both range and quantity, the vast majority of interventions were applied in the USA.

Reporting of interventions

An 'intervention event' indicates an occasion on which an intervention was implemented. For example, an intervention implemented on two separate occasions generated two 'intervention events'. The same intervention implemented on a single occasion generated one 'intervention event', regardless of the number of records reporting it.

Two records seemed to pertain to an ongoing programme,[38,105] but there were no other follow-up or replication studies. Several interventions were reported in more than one record, for example Craig[88] and Canady,[106] including some instances in which the same intervention evaluation was reported in different formats, such as a dissertation and a published paper (e.g. CPS[89,107] and the Grafton program[88,108]).

The intervention for which the most records were identified was the 6CS [$n = 12$ records, including five evaluations (journal articles) and seven mapping records, comprising one journal article, one magazine, one training resource, one set of presentation slides, two blogs and one implementation tool]. The next largest group of records ($n = 9$) pertained to CPS. This group consisted of evaluations only, and comprised four dissertations,[90–93] one publication from a dissertation[107] and four journal articles.[109–112]

The eight remaining interventions were comfort versus control (two events), TCI (three events), the Grafton program (two events), CPS (seven events), M-PBIS (three events), TARGET (two events) and SPA (two events). Those interventions that featured more than once are shown in *Table 10*. All records of interventions in evaluation studies and mapping studies are listed by author in *Appendix 4*, and further details are given in *Appendix 5*.

Intervention aims

All interventions aimed to reduce restrictive practices, and most focused on achieving that by changing staff behaviour.

Intervention recipient

When the recipient was reported, all interventions were delivered to staff, with some also aimed at service users and/or introduced within a wider organisation or as milieu change. Seventy-nine intervention events targeted staff only, 13 targeted staff and service users, and two included staff and/or service users in the context of change in milieu (*Table 11*).

TABLE 10 Interventions used in more than one intervention event

Intervention	Intervention events (*n*)	Where delivered	Evaluation records (*n*)	Mapping records (*n*)	Number of records
6CS	12	USA	5[38,77,104,113,114]	7[33,105,115–119]	12
CPS	9	USA	9[89,91–93,107,109–112]	0	9
Comfort vs. control	2	USA	2[88,120]	0	2
TCI	3	UK, USA	1[81]	4[121–124]	5
Grafton program	2	USA	2[88,108]	0	2
M-PBIS	3	UK, USA	2[100,125]	2[126,127]	4
TARGET	2	USA	2[128,129]	1[130]	3
SPA	2	USA	1[131]	1[132]	2
Total	32				

TABLE 11 Intervention recipient ($n = 107$ intervention events)

Delivered to	Frequency	Percentage
Staff	79	73.8
Staff and service users	13	12.1
Staff, service users and milieu	1	0.9
Staff and milieu	1	0.9
Total (excluding missing data)	94	87.9
Missing data (i.e. not reported)	13	12.1
Total	107	100.0

Outcomes reporting

The 82 interventions described in the records reported a total of 228 outcome measures, with the number of measures described per record ranging from 0 to 11. The number of occasions when restraint was used was reported in 63 of the records, and the number of times seclusion was used was reported in 36 of the records. Other outcomes were reported in ≤ 11 records. Outcome measures are listed in *Table 12*.

Outcomes categories

Outcomes reported were in four broad categories: staff development and activity, use of restrictive methods, resource implications, and patient progression and satisfaction (see *Table 12*).

Use of standardised outcomes measures

The reporting of standardised measures is shown in *Tables 13* and *14*. The range of measures reported per record was 0 to 7. In 106 of the records, no standardised measures were reported. One record[129] reported the use of seven standardised measures to evaluate an intervention. In total, 22 different standardised outcome measures were reported across the 121 records.

TABLE 12 Categories of reported outcomes

Outcome category	Outcome
Staff development and activity	Number of interventions
	Intervention duration
	Number of behaviour plans in place
	Staff trained
	Staff knowledge/perceptions/attitude
Use of restrictive methods	Mechanical restraint
	Documentation of restraint
	Use of force
Resource implications (financial and human)	Worker compensation
	Injuries to all
Patient progression and satisfaction	Patient satisfaction
	Recidivism
	Number of elopements
	Client goal mastery
	Frequency of rule violation

TABLE 13 Number of standardised measures reported per record

Number of standardised measures reported per record	Number of records
0	106
1	7
2	6
3	1
7	1

Assumed change process and design principles

Fifty-two records reported mandatory participation in the interventions, including 31 records that described interventions involving a whole system, either across a whole organisation (e.g. a hospital) or in a self-contained unit (e.g. a section of a residential school). Nine records reported voluntary engagement in interventions, and in the remaining 60 records it was unclear whether engagement in the intervention was mandatory or voluntary.

Many studies lacked internal congruence, in that the relationships between the aims, intervention, mechanisms of change and reported outcomes were not necessarily clear. For example, reductions in restraint data occurring after a staff education intervention might be interpreted as an effect of the intervention, with little attention to potential confounding factors or fidelity. This point is noted in the literature.[40,112]

Mandatory changes

Mandatory changes to services were reported in 50 out of 107 (47%) records of interventions, and a permanent change was described in 40 out of 107 (38%) (e.g. revised policies or protocols, changes to the care approach or changes to the physical environment). This was consistent with the tendency for records to report on changes to practice that were made and evaluated within a particular organisation, in contrast to introducing an intervention specifically to test it.

TABLE 14 Frequency of use of the 22 standardised measures

Measure	Number of times used in 121 records
CAFAS[133]	3
CBCL[134]	2
Global Assessment of Functioning[135]	2
ADR[92]	1
BASC-2[136]	1
UCLA PTSD Reaction Index[137]	2
CECI[138]	1
Children's Global Assessment Scale[139]	1
CAPE[140]	1
Devereux Scales of Mental Disorder Manual[141]	1
Freemantle Acute Arousal Scale[142]	1
MAYSI-2[143]	1
MFQ[143,144]	1
Perceived Stress Scale[145]	1
QOC measure[146]	1
Self-report BDI[147]	1
Self-report for Childhood Anxiety Related Disorders[148]	1
Suicidal Ideation Questionnaire[149]	1
The Generalised Expectancies for Negative Mood Regulation[150]	1
The Ohio Scales[151]	1
Toronto Mindfulness Scale[152]	1
Trauma Events Screening Inventory[153]	1

ADR, Administrative Discipline Referral; BASC-2, Behavior Assessment for Children, Second edition; BDI, Beck Depression Inventory; CAFAS, Child and Adolescent Functional Assessment Scale; CAPE, Combined Assessment of Psychiatric Environments; CBCL, Child Behaviour Checklist; CECI, Child Ecology Check-in; MAYSI-2, Massachusetts Youth Screening Instrument; MFQ, Mood and Feelings Questionnaire; PTSD, post-traumatic stress disorder; QOC, quality of care; UCLA, University of California, Los Angeles.

Reference to theory

There was some indication of the theory informing the intervention in 44 out of 107 records of interventions (41%), but without further details about what the intervention was, how it had been developed and how it was tested and refined. Many of the 'quality improvement' interventions used a 'plan, do, study, act' cycle, a mechanism to repeat and adjust interventions until they achieve the desired effect.

Some interventions made explicit reference to programme-level theories that had informed their intervention procedures, such as sensory modulation or trauma-informed care. Other programme-level theories cited sought to explain staff behaviour, service user behaviour, therapeutic relationships and organisational change. These studies often sought to test or modify not the actual theory, but rather the impact of using interventions based on the theories in relation to the reduction of restrictive practices.

The most frequently cited theory related to staff behaviour was social learning theory, used to support training interventions that sought to improve the self-efficacy of individual staff and staff teams.

Mode of delivery: intervention procedures

The intervention procedures are set out by theme in *Table 15*. The most common procedures focused on staff training. Other procedures related to guideline or policy change, risk assessment tools, data review, milieu changes and changes to therapeutic approach (e.g. introducing trauma-informed care, and staff involvement in intervention development).

Staff-focused procedures

Staff-focused procedures were those that were aimed at and undertaken solely by staff, with a view to influencing staff use of restrictive practices. One dominant procedure was training, which could cover, among other topics, the use of a newly introduced resource (e.g. the 'feelings thermometer',[154] aromatherapy[155] or a sensory modulation room[156]); a strategy or therapy such as 'restraint reduction meetings',[157] 'deactivation therapy'[158] or 'milieu therapy';[159] or skills such as verbal communication.[160] Another staff-focused procedure was role modelling, which could involve supervision or mentoring (e.g. Health Sciences Centre Winnipeg[104]), and was seen in complex interventions that were encouraging changes to the culture, structure and/or values of a setting (e.g. Verret *et al.*,[161] Eblin[162] and Dean *et al.*[163]).

Alternative approaches

Compared with the companion review focused on adult mental health settings,[47] there were more interventions involving non-medical or psychological approaches to reducing restrictive practices. These included sensory modulation via the installation of sensory or comfort rooms,[156,164,165] aromatherapy[155] and activities.[166,167]

Incident-focused procedures

Other procedures were incident-focused, that is they were responses to incidents of restrictive practices.[89,105] These included incident review procedures, in which organisations (staff and managers) collected and monitored their incident data to establish baseline and progress rates to identify patterns for targeted intervention or to conduct retrospective audits.[23,115,117,168,169] In contrast to this whole-system review, debriefing was conducted immediately or soon after an incident (e.g. Magnowski and Cleveland[80] and Leitch[94]).

Organisation-focused procedures

In addition, several organisation-focused procedures were identified. These were system-wide structural and cultural changes including making changes to staffing levels[85,109,132,170] or the way staffing was organised.[80] Another procedure involved changing therapeutic approaches (e.g. to a trauma-informed approach[78,171,172]). This theme also included improvements to communication (e.g. Ercole-Fricke *et al.*[89] and Kalogjera *et al.*[173]), community meetings[102] and de-escalation.[161] Further procedures focused on policy change[115,174] and leadership, in which senior management tended to be directly involved in meetings and made statements of commitment.[38,78,175]

TABLE 15 Intervention procedures by theme

Theme	*n*	Percentage
Staff training	16	57.1
Guidelines or policy change	3	10.7
Risk assessment tools	3	10.7
Data review	3	10.7
Milieu changes	1	3.6
Changed approach (TCI)	1	3.6
Staff involvement	1	3.6
Total	28	100.0

The extraction process highlighted the procedures used by each intervention to address restrictive practices. The maximum number of procedures found in a single intervention was 15. A total of 16 unique procedures were identified from the analyses (*Figure 8*). The average number of unique procedures reported per record was 4.28 (mean) and 3 (median).

Twenty interventions (24%) used a single procedure only, and the most common single procedure was staff training (*Table 16*). However, many interventions ($n = 62$) used more than one procedure.

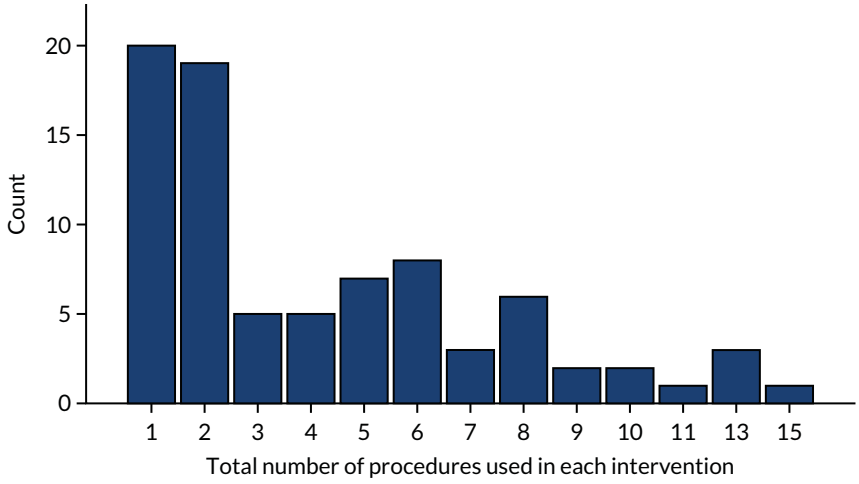

FIGURE 8 Count of unique procedures per intervention. Unique procedures across interventions, $n = 16$. Maximum number of unique procedures per intervention, $n = 15$.

TABLE 16 Procedures (frequency)

Procedure	*n*	Percentage
Training	88	19.3
Changed approach (e.g. TIC)	58	12.7
Guidelines or policy change	44	9.6
Data review	36	7.9
Care planning changes	33	7.2
Debriefing	33	7.2
Enhanced leadership	30	6.6
Risk assessment tools	21	4.6
Milieu changes	20	4.4
Environmental changes	17	3.7
Staff involvement	17	3.7
CYP involvement	15	3.3
Family involvement	14	3.1
Enhanced staffing	13	2.9
Activities	9	2.0
Sensory approaches	8	1.8
Total procedures reported	456	100.0

TIC, trauma-informed care.

Procedures used in interventions

The reporting on the procedures used in interventions was inconsistent and at times limited.

Reporting on procedures

Staff training was the most widely reported procedure, although reporting of details could be brief. In 84 out of 107 records of interventions, the total hours of training were not reported. Few reported the content, mode of delivery or training provider in any detail.

Staff training occurred in 88 procedures, making it the most frequently used intervention procedure across all interventions (including those using a single procedure and those using multiple procedures). The least often used procedures were activities ($n = 9$) and sensory approaches ($n = 8$). One intervention incorporated visits to other units.[94]

Delivery of training

Where training was used it was delivered in house in 40 interventions (37%). Training providers were not reported in 58 of the records. Although 23 records reported that it was delivered by an external provider, there was little further detail. It appeared that where an intervention was a commercially available or copyrighted product, such as the 6CS, training was likely to be brought in as part of the package.

Table 17 illustrates the total number of hours of training provided. This varied widely, from 1 to 35 hours.

TABLE 17 Hours of training reported

Hours of training reported	Number of records reporting training time	Percentage
1.0	1	0.9
1.5	1	0.9
2.0	2	1.9
3.0	4	3.7
4.0	1	0.9
7.0	1	0.9
8.0	1	0.9
15.0	2	1.9
16.0	1	0.9
19.0	1	0.9
21.0	2	1.9
24.0	1	0.9
28.0	1	0.9
30.0	1	0.9
35.0	3	2.8
Total reported	23	21.5
Not reported	84	78.5
Total	107	100.0

Service user involvement in interventions

Service user involvement in interventions development is recommended in the literature, but involvement was reported in only 16 records, and CYP's involvement was reported in only 15 records. Service user involvement in interventions development was reported in only 9 of the 107 evaluation records. Across the records, this aspect of the intervention reporting lacked detail and so it was unclear as to the type and extent of the involvement (*Table 18*).

Service user or family involvement was reported as an intervention component in the 6CS,[38,105] and several stand-alone interventions, for example HM Government,[30] Fralick[176] and Nunno *et al.*[177]

Intervention dose, duration and intensity

Many evaluations did not report details about the duration and intensity of the intervention. Partial details (e.g. overall duration of the intervention or of an individual component, usually training) were sometimes, but not always, provided. Often, the evaluation period and the duration of intervention implementation were not distinguishable. Similarly, the duration of individual intervention components was often not reported. With this proviso, interventions ranged in length from 3 months[98,129] to 13 years.[120] Some interventions described providing stand-alone training sessions, whereas others were conducted over a short period of time (e.g. 1 week) or longer (e.g. several months). Some evaluations, for example that by Fralick,[176] described ongoing training including refresher sessions or supervision.

Intervention materials

Interventions reported using various materials in the implementation of the intervention, including training materials, guidelines, multimedia resources, tools, posters, slides, and policies. Some referred to materials that are publicly available on the internet, such as:

- Collaborative Problem Solving (CPS)
- Cognitive milieu therapy
- Modified Positive Behavioral Intervention Support (M-PBIS)
- Six Core Strategies © (6Cs)
- Therapeutic Crisis Intervention (TCI)
- Trauma Affect Regulation: Guide for Education and Therapy (TARGET)
- Trauma Systems Therapy (TST).

Intervention evaluation

Evaluations were identified by scrutinising each report using the screening questions of the MMAT to ascertain whether or not a research question was described and whether or not the data required to answer the question had been collected. Those reports that passed the screening were then appraised, again using the MMAT. The MMAT prompts an appraisal of if qualitative methods are appropriate; if the data collection methods are adequate, and the findings and their subsequent interpretations are sufficiently reported; and if the study has overall coherence. Evaluations are detailed in *Appendix 5*.

As seen in *Appendix 5*, there are more evaluation data about the 6CS and CPS than about any of the other interventions reported or described in the 121 retrieved records. Although the 6CS is more

TABLE 18 Service user involvement in interventions development

Involvement	Number of records	Percentage
Involvement reported	9	8.4
Involvement not reported	98	91.6
Total	107	100.0

frequently reported, only 5 of the 12 6CS records are evaluations, as defined by the WIDER criteria. In comparison, there are nine separate implementations of CPS, all evaluated. The 6CS evaluations span 10 years, from 2007 to 2017, and the CPS evaluations span 8 years, from 2008 to 2016. Therefore, over a similar timespan, 6CS has been used more but evaluated less than CPS. This suggests that intervention use is not routinely generating evaluation data, and that intervention choice may not be informed by evaluation data.

Reporting on the design of evaluation studies

Evaluation design was often not described, and when it was reported a variety of terms were used. Accordingly, design had to be inferred from other study details in some cases. When study design was described, no RCTs were identified, and only around one-third of the records (36/121) reported quantitative data. Details of evaluation study design are provided in *Appendix 6*.

As reported in *Table 7* and *Appendix 6*, most evaluations were non-randomised studies. Only eight were controlled. Twenty-two generated quantitative data only, and five generated both quantitative and qualitative data. The great majority of the quantitative studies compared counts or rates of restrictive practices before and after a period of intervention implementation.

All evaluations were considered to have recruited participants who were representative of the target population and used suitable outcome measures. Several were not considered to have reported complete outcome data and few discussed confounders, with some exceptions that were principally reflections on the challenges of evaluating complex interventions, for example the evaluation by LeBel *et al.*[40] There was very little reporting of modifications and fidelity to the intervention protocol, with only 12 evaluations reporting this.

Twenty-one quantitative studies were identified. There were several evaluations of cultural or organisational change that took a systems approach and presented qualitative data. Some of these focused on process (e.g. Fralick[176] and Elwyn *et al.*[178]) and others focused on outcomes (e.g. Eblin[162]). A number of stand-alone interventions incorporating system change were presented as case studies (e.g. Thompson *et al.*[87] and Fralick[176]).

A common approach to evaluation was to compare counts or rates of restrictive practices before and after an intervention (e.g. Huckshorn[77]). However, causal links were rarely explored in the reports despite the prevalence of multicomponent interventions.

Reporting on setting size and sample size

There were two main approaches to describing the size of the setting in which the intervention was conducted. Some reported setting size in terms of the number of beds ($n = 25$) and others in terms of the size of the service user population ($n = 15$). The size of the setting varied greatly in both cases, from 7 to 925 beds (mean 65.32) and from 27 to 5600 service users (mean 475.53).

Likewise, sample size was reported in diverse ways, including numbers of service users, patient-days, admissions, beds and staff. Number of service users was the most common ($n = 30$) way to report sample size, and service user-days ($n = 2$) and beds (for health settings) ($n = 2$) were the least common (*Table 19*).

Year of evaluation

As seen in *Figure 9*, starting in the mid-1990s, the number of evaluations that were commenced suddenly increased compared with the previous decade. Evaluations published prior to 1989 were not eligible for inclusion in the review. The commencement of evaluations appeared to then decrease steadily from the mid-2000s.

TABLE 19 Sample size

Basis of sample size calculation	Number of studies	Sample size		
		Minimum	Maximum	Mean
Patient-days	2	279	1000	639.50
Admissions	5	65	1485	621.20
Beds	2	23	52	37.50
Staff	10	13	340	93.20
Service user-days	30	3	6361	486.97

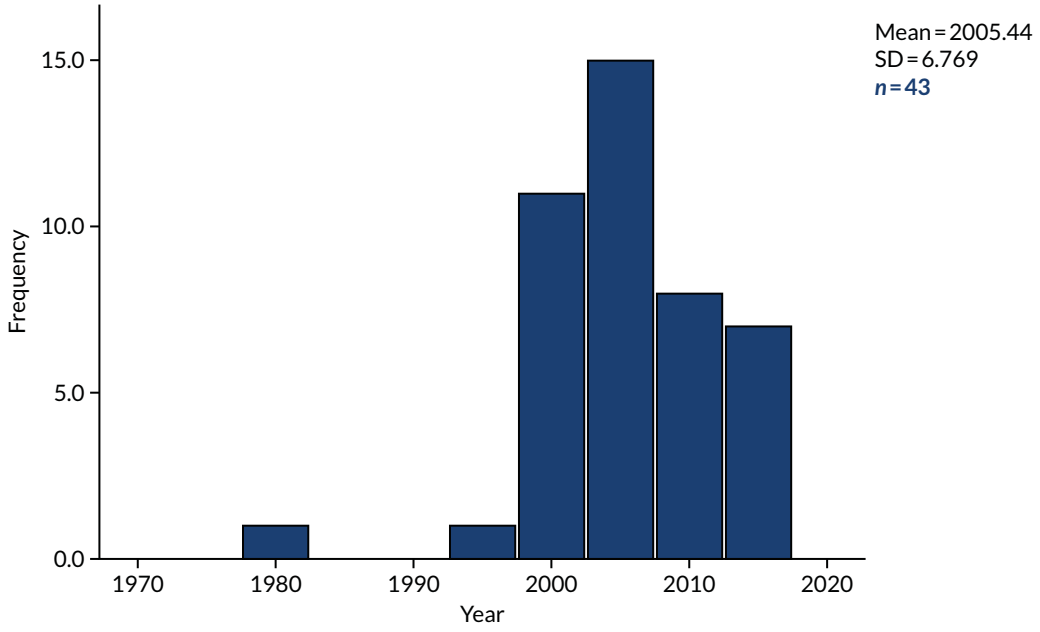

FIGURE 9 Year evaluation commenced.

Outcome measures in evaluations

Seventy-one outcome measures were reported (mean 3, range 0–9 outcome measures). The most common outcome measure was the number of restraints, followed by duration of restraint, number and duration of seclusions, number of injuries, number of incidents and length of stay. Injuries to staff was an outcome measure in three evaluations and injuries to all was an outcome measure in eight. No evaluation specifically used injuries to service users as an outcome measure, although two counted the service users involved in an incident (*Table 20*). For standardised outcome measures identified in the evaluation, see *Table 14*.

Several interventions used existing routinely collected data for their evaluations, such as archived data and incident reports. Some evaluations developed measures for the purposes of their evaluation, whereas others developed or adapted tools to collect data.

Reporting on use of measures in interventions

Standardised outcome measures were reported to have been used in 14 interventions, with a minimum of one and maximum of seven per evaluation (details are provided in *Table 15*). The measures used more than once were the Child and Adolescent Functional Assessment Scale[133] and Global Assessment of Functioning.[135]

TABLE 20 Number and category of outcome measures

Outcome measure	Number of studies	Percentage	Percentage of studies
Number of staff trained	1	0.6	1.6
Patient satisfaction	1	0.6	1.6
Number of care plans in place	1	0.6	1.6
Service user goal mastery	1	0.6	1.6
Staff compensation	1	0.6	1.6
Rule violation	1	0.6	1.6
Use of force	1	0.6	1.6
Number of observations	1	0.6	1.6
Use of sensory room	1	0.6	1.6
Discharge of placement	1	0.6	1.6
Quality of restraint	1	0.6	1.6
Number of accidents	1	0.6	1.6
Number of errors	1	0.6	1.6
Staff sick leave	1	0.6	1.6
Security use	1	0.6	1.6
Service user mood	1	0.6	1.6
Staff knowledge	2	1.2	3.1
Use of mechanical restraint	2	1.2	3.1
Duration of interventions	2	1.2	3.1
Number of service users involved in incident	2	1.2	3.1
Staff turnover	2	1.2	3.1
Number of interventions	3	1.8	4.7
Staff injury	3	1.8	4.7
Culture change	3	1.8	4.7
p.r.n.	4	2.5	6.3
Length of stay	6	3.7	9.4
Duration of seclusion	7	4.3	10.9
Injuries all	8	4.9	12.5
Incidents	9	5.5	14.1
Duration of restraints	10	6.1	15.6
Number of seclusions	30	18.4	46.9
Number of restraints	53	32.5	82.8
Total	163	100.0	254.7

Reporting on evaluation findings

Ninety-six per cent of evaluations reported findings; however, there was very wide variation between the 82 interventions, as described above. This presented considerable challenges for the assessment of intervention effectiveness.

The finding that most of the studies reported some positive outcomes in relation to reducing restrictive practices may be related to publication bias, especially in the grey literature. Many of the studies that reported evaluations contained anecdotal findings (i.e. did not present full figures), and these were excluded from this assessment. Evaluations published in journals or via academic conferences were examined in more detail. Some evaluations[104,120,179] were not considered to have reported findings that could be used as evidence of effectiveness related to the reduction of restrictive practices.

At least one positive finding in relation to reducing restrictive practices was reported in all of the evaluations; however, 42 did not report statistical significance. All findings reported that the intervention successfully addressed the use of restrictive practices, directly (e.g. reducing frequency, intensity or duration of seclusion and/or restraint) or indirectly (e.g. improvements to the social milieu), although this could be qualified with additional information. Qualifiers varied, such as reporting that the effect of the intervention on the use of restrictive practices could appear deleterious initially but prove beneficial after a period of settling in (e.g. Kalogjera *et al.*[173]). A more frequently reported qualifier was identifying specific areas that were affected positively or otherwise (e.g. reduction in seclusion and restraint within a juvenile justice setting but less clear evidence of whether or not the intervention had an impact on recidivism rates,[128] reductions in seclusion but not restraint[171] or differential impact between sites within a study, e.g. Glew[92]).

The majority of these evaluations reported interventions using more than one procedure (e.g. training with data review and policy changes). As these procedure categories are themselves broad, there is little to be learnt from relating positive or negative outcomes back to their use. Interventions using a single procedure may be more useful in determining what type of procedures might reduce the use of restrictive practices. Twenty-two evaluations reported interventions using a single procedure. Of these, 14 also reported significant results (*Table 21*), although the numbers are too modest to suggest a pattern here. The remainder used a variety of strategies, and all reported positive findings.

Significant findings were also reported in four of the mapping records, which were a discussion paper,[175] conference paper,[127] training consultancy website[126] and a Welsh government document.[180]

Controlled trials

Although there were no RCTs, 10 evaluation studies used a control for comparison purposes. As seen in *Table 22*, nine reported significant findings in relation to the decrease in use of a restrictive practice.[89,95,107,128,129,164,171,181,182] However, as illustrated in *Table 22*, they did not all use the same definition for the restrictive practices. *Table 22* also shows whether or not fidelity was reported and the number of outcome measures used in these nine evaluations.

TABLE 21 Detail of evaluations of interventions with single procedures

	Procedure evaluation detail					
Results	**Training**	**Data review**	**Milieu change**	**Policy or guidelines change**	**New therapeutic approach**	**Risk assessment**
Single procedure reported (number of evaluations)	12	3	2	3	1	1
Significant results reported (number of evaluations)	8	1	2	2	1	0

TABLE 22 Detail of controlled evaluations reporting significant outcomes

Evaluation study	Procedure introduced	Definition of restrictive practice	Fidelity reported	Outcome measures (*n*)
Boel-Studt[171]	Trauma-informed approach	Restraint and seclusion	Reported informally	6
Borckardt *et al.*[181]	Engagement model	Restraint and seclusion	No	4
Ercole-Fricke[89]	CPS	Restraint and seclusion	No	1
Ercole-Fricke *et al.*[107]	CPS	Seclusion and loss of privilege	No	5
Ford and Hawke[128]	TARGET	Various punitive sanctions	Yes	2
Magnowski[95]	Milieu nurse	Restraint	No	4
Marrow *et al.*[129]	TARGET	Restraint and seclusion	No	8
Miller *et al.*[182]	Organisational intervention	Restraint	No	3
West *et al.*[164]	Sensory room	N/A: focus on distress reduction	No	3

Costs reported

Twelve evaluations reported financial costs, eight of which provided some detail. This differed considerably between studies in terms of the cost unit, time period and accounting period. For instance, Craig[88] reported savings to the organisation of between US$12,236,934 and US$1,538,027. LeBel and Goldstein[39] reported a 92% reduction in restraint costs, with some detail regarding how this figure was calculated, and Nunno *et al.*[81] reported that the intervention was provided free of charge in return for evaluation period by a university. Sanders[108] compared 'salary and replacement costs for employee lost time pre- and post-intervention and described this as a 93% reduction in expenses from client induced employee injuries'. Paccione-Dyszlewski *et al.*[170] compared the costs of initial staff training, US$340,000, with savings, calculated to be 'approximately $470,000 across the 2-year post-project period (or approximately $130,000 when cost of implementation is considered)'.

Modification of and fidelity to intervention protocols

Twelve of the evaluations reported whether or not they tailored or modified the intervention protocol. One referred to possible unintended 'drift' from the model,[79] and three reported modifying a tool.[109,129,170] Others reported tailoring the intervention to meet service user needs, making modifications as the intervention proceeded and allowing wards to choose the intervention.

Fifteen evaluations[81,86,92,94,100,128,170,172,183–185] reported fidelity, but in contrast with this study's companion review focusing on adult mental health settings, it was not possible to identify trends in fidelity reporting. The dates of publications reporting fidelity ranged from 2003 to 2019.

Chapter 5 Results of the behaviour change technique synthesis: the presence and frequency of behaviour change techniques in interventions

This chapter provides a narrative account of the presence and frequency of BCTs identified in interventions.

Individual behaviour change techniques identified across all interventions

The result of the search strategy was a data set of 121 records, which on analysis was found to report a total of 82 interventions. All 121 records were examined for BCT content. Descriptions of intervention content were usually found within the methods sections of studies, although additional details were occasionally provided in the results or discussion sections.

Thirty-six out of a possible 93 BCTs (39%) were identified across the 121 records. At least one BCT was detected in 78 of the interventions (95%). BCTs were not detected in four interventions because of a lack of content to code: two from mental health settings,[103,158] one from a generic setting[186] and one from the criminal justice system.[187]

Behaviour change techniques found at least once across the interventions are shown in *Figure 10*. *Figure 10* indicates the proportion of interventions in which each BCT was detected. For example, BCT 4.1 (instruction on how to perform the behaviour) was detected in the majority (71%) of interventions, whereas BCT 10.10 [reward (outcome) of the behaviour] was detected in only 1% of interventions. *Figure 10* also illustrates which BCTs were the most and the least often detected across interventions. Seven were identified in $> 20\%$ of interventions (range 28–71%) and 11 were identified in $\leq 2\%$ of interventions (range 1–2%).

Identification of individual behaviour change techniques by setting

Table 23 illustrates the distribution of individual BCTs across interventions in different children's settings in the order of frequency identified. Six BCTs (17% of BCTs detected) were detected in interventions from only one setting: four in mental health settings {BCT 14.10 [remove punishment], BCT 2.4 [self-monitoring of outcome(s) of behaviour], BCT 10.10 [reward (outcome)] and BCT 1.1 [goal setting (behaviour)]} and two in health and social care {BCT 1.7 [review outcome goal(s)] and BCT 5.1 [information about emotional consequences]}. These BCTs came from five clusters in total (36% of clusters detected).

Seven BCTs (19% of BCTs detected) were identified in interventions from all five settings. As seen in *Figure 11*, these BCTs came from five clusters in total (36% of clusters detected). Of these, BCT 4.1 (instruction on how to perform the behaviour) was the most often detected, although at lower rates in criminal justice and generic settings. This BCT was the only one to be detected in all interventions from a single setting (education). BCT 12.2 (restructuring the social environment) and BCT 1.4 (action-planning) were among the most often detected BCTs in all settings except the criminal justice system; both were detected in smaller percentage of interventions from generic settings. Similarly, BCT 13.2 (framing/reframing) was among the most often detected BCTs in all settings except education. BCT 2.7 [feedback on outcome(s) of behaviour] was among the most often detected BCT in three settings and BCT 1.2 (problem-solving) in two settings. BCT 13.1 (identification of self as role model) was among the most often detected BCTs in generic settings only.

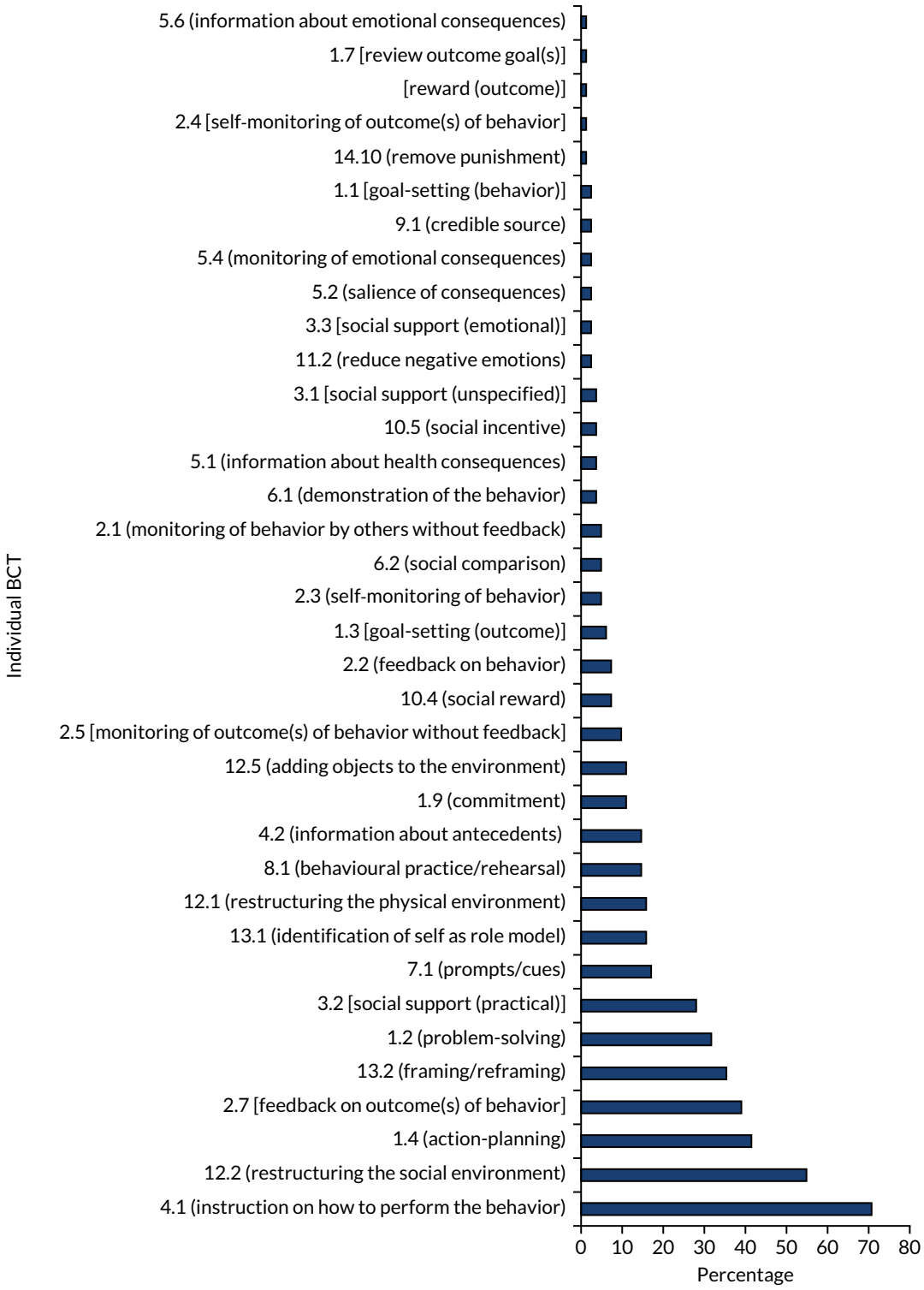

FIGURE 10 Individual BCTs identified in 82 interventions (% of interventions).

Although BCT 2.1 (monitoring of behaviour by others without feedback) was detected in interventions from four settings, it was among the top detected BCTs in criminal justice settings only. Similarly, BCT 7.1 (prompts or cues) was detected in interventions from three settings but was among the top detected BCTs in criminal justice settings only. BCT 2.3 (self-monitoring of behaviour) was another outlier, identified in three settings but among the top detected BCTs in education settings only (*Figure 12*).

TABLE 23 Individual BCTs identified in interventions by setting (%)

Individual BCTs identified, ranked by number of settings in which they were detected	Mental health		Health and social care		Education		Criminal justice		Generic	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
***Identified in one setting* (N = *6, 17%*)[a]**										
14.10 Remove punishment	1	2	0	0	0	0	0	0	0	0
2.4 Self-monitoring of outcome(s) of behaviour	1	2	0	0	0	0	0	0	0	0
10.10 Reward (outcome)	1	2	0	0	0	0	0	0	0	0
1.7 Review outcome goal(s)	0	0	1	7	0	0	0	0	0	0
5.6 Information about emotional consequences	0	0	1	7	0	0	0	0	0	0
1.1 Goal setting (behaviour)	2	0	0	0	0	0	0	0	0	0
***Identified in two settings* (N = *14, 39%*)**										
9.1 Credible source	1	2	0	0	0	0	1	11	0	0
2.1 Monitoring of behaviour by others without feedback	2	5	0	0	0	0	2	22	0	0
11.2 Reduce negative emotions	1	2	1	7	0	0	0	0	0	0
3.3 Social support (emotional)	1	2	1	7	0	0	0	0	0	0
5.2 Salience of consequences	1	2	1	7	0	0	0	0	0	0
5.4 Monitoring of emotional consequences	1	2	0	0	0	0	1	11	0	0
6.1 Demonstration of the behaviour	2	5	0	0	0	0	1	11	0	0
5.1 Information about health consequences	1	2	2	14	0	0	0	0	0	0
10.5 Social incentive	0	0	2	14	0	0	1	11	0	0
3.1 Social support (unspecified)	0	0	2	14	0	0	1	11	0	0
6.2 Social comparison	3	7	1	7	0	0	0	0	0	0
2.2 Feedback on behaviour	3	7	3	21	0	0	0	0	0	0
12.5 Adding objects to the environment	8	20	0	0	0	0	1	11	0	0
4.2 Information about antecedents	8	20	4	29	0	0	0	0	0	0
***Identified in three settings* (N = *5, 14%*)**										
2.3 Self-monitoring of behaviour	1	2	1	7	2	29	0	0	0	0
1.3 Goal setting (outcome)	3	7	1	7	0	0	0	0	1	9
10.4 Social reward	2	5	3	21	0	0	1	11	0	0
1.9 Commitment	4	10	4	29	1	14	0	0	0	0
7.1 Prompts or cues	9	22	2	14	0	0	3	33	0	0
***Identified in four settings* (N = *4, 11%*)**										
2.5 Monitoring of outcome(s) of behaviour without feedback	4	10	1	7	2	29	0	0	1	9
8.1 Behavioural practice or rehearsal	4	10	2	14	4	57	2	22	0	0
12.1 Restructuring the physical environment	8	20	3	21	0	0	1	11	1	9
3.2 Social support (practical)	12	29	4	29	4	57	3	33	0	0

continued

TABLE 23 Individual BCTs identified in interventions by setting (%) (*continued*)

Individual BCTs identified, ranked by number of settings in which they were detected	Mental health		Health and social care		Education		Criminal justice		Generic	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
***Identified in five settings* (N = 7, 19%)**										
13.1 Identification of self as role model	6	15	3	21	1	14	1	11	2	18
1.2 Problem-solving (identify triggers, influences, strategies)	18	44	5	36	1	14	1	11	1	9
13.2 Framing or reframing perspective	16	39	6	43	2	29	2	22	3	27
2.7 Feedback on outcome(s) of behaviour	20	49	8	57	1	14	1	11	2	18
1.4 Action-planning	21	51	6	43	4	57	1	11	2	18
12.2 Restructuring the social environment	26	63	12	86	3	43	2	22	2	18
4.1 Instruction on how to perform the behaviour	32	78	12	86	7	100	4	44	3	27

a Indicates that six BCTs were detected in one setting, that is 17% of the total detected BCTs (*n* = 36) were detected in one setting (i.e. 6/36).

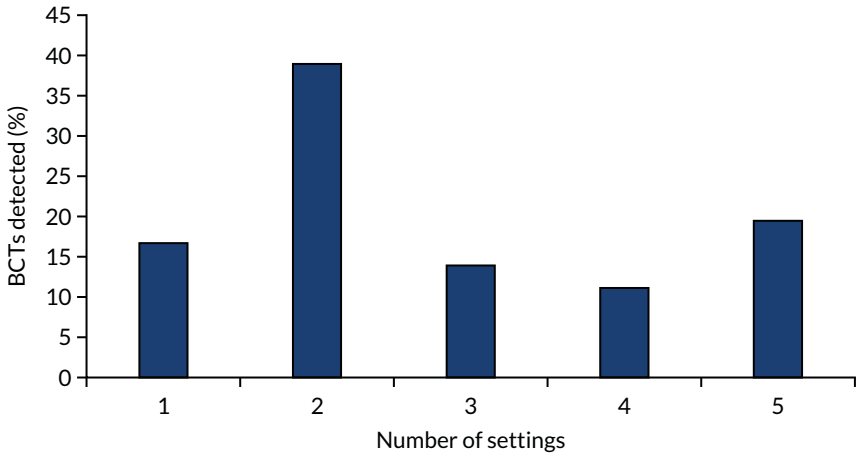

FIGURE 11 Percentage of BCTs detected in multiple settings (*n* = 36).

Individual BCTs detected in one or more settings were not necessarily detected in all settings, as detailed in *Appendix 7*. Four (11%) BCTs detected elsewhere were not identified in mental health settings, nine (25%) were undetected in health and social care, 24 (67%) in education, 17 (47%) in criminal justice and 26 (72%) in generic settings.

Clusters of behaviour change techniques identified in interventions

The BCT taxonomy[52] organises BCTs into 16 clusters; for example, BCT 4.1 (instruction on how to perform the behaviour) belongs to cluster 4 (shaping knowledge). The BCT number preceding the name indicates the cluster. The 36 BCTs identified in the interventions came from 14 of the possible 16 clusters within the BCT taxonomy. The 14 clusters, the content that was coded to BCTs within them and the BCTs that were not identified are described below.

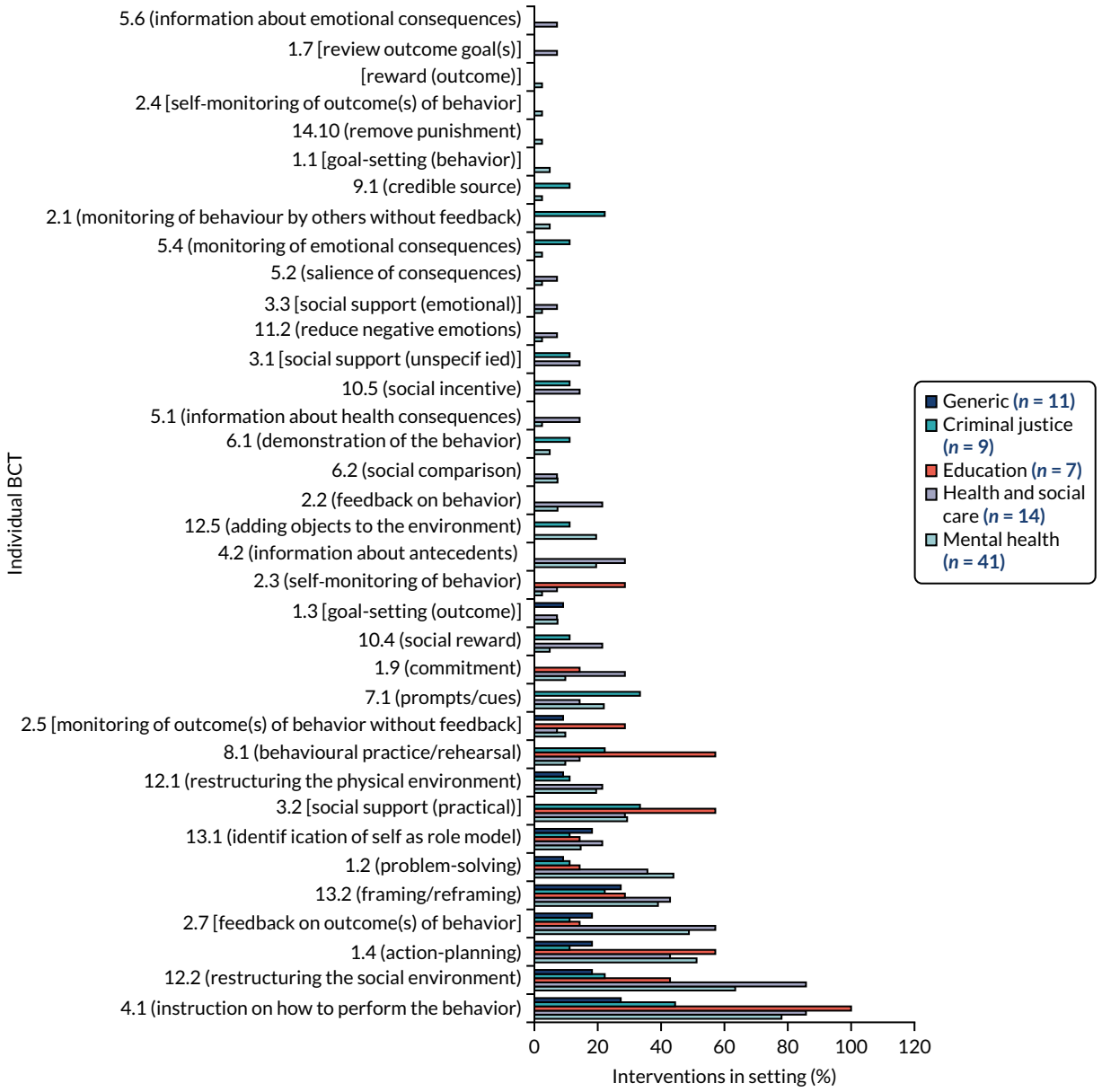

FIGURE 12 Individual BCTS by setting (% of interventions in that setting).

Figure 13 shows BCTs identified in interventions by cluster (%). The majority of the BCTs identified belonged to four clusters and were detected in over half of all interventions: cluster 1 (goals and planning), cluster 12 (antecedents), cluster 4 (shaping knowledge) and cluster 2 (feedback and monitoring). Less than 1% of identified BCTs came from two clusters and were detected in less than 2% of interventions [cluster 9 (comparison of outcomes) and cluster 14 (scheduled consequences)].

Five clusters featured only by virtue of one BCT being coded:

1. cluster 7 (associations) – BCT 7.1 (prompts/cues)
2. cluster 8 (repetition and substitution) – BCT 8.1 (behavioural practice/rehearsal)
3. cluster 9 (comparison of outcomes) – BCT 9.1 (credible source)
4. cluster 11 (regulation) – BCT 11.2 (reduce negative emotions)
5. cluster 14 (scheduled consequences) – BCT 14.1 (remove punishment).

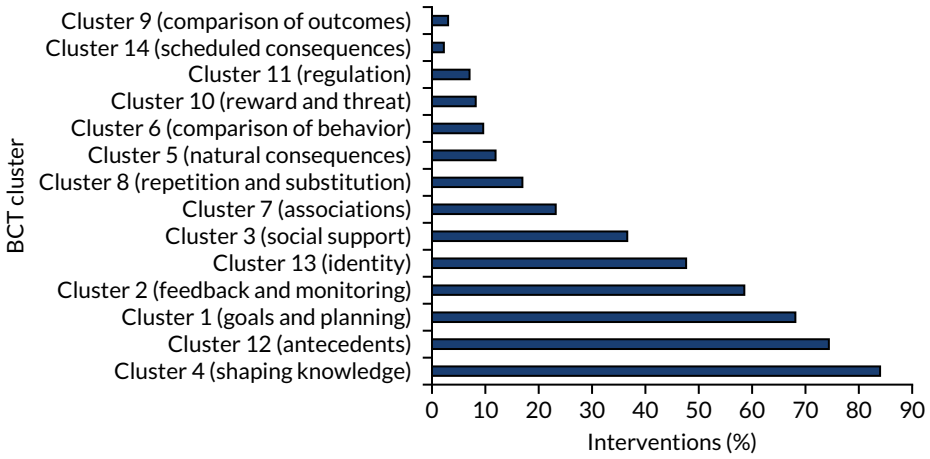

FIGURE 13 Behavior change technique clusters identified (% of interventions).

Clusters of behaviour change techniques by setting

Figure 14 shows the distribution of BCT clusters across interventions in different children's settings. Eleven out of the 14 clusters detected were identified in four or five settings. Only one cluster was detected in a single setting [cluster 9 (comparison of outcomes) in the criminal justice setting], one in two settings [cluster 8 (repetition and substitution) in mental health and health and social care settings] and one in three settings [cluster 3 (social support) in mental health, health and social care, and criminal justice settings].

Interventions from mental health settings were coded with BCTs from all clusters except cluster 9 (comparison of outcomes). Interventions from health and social care settings were coded with BCTs from all clusters except cluster 9 (comparison of outcomes) and cluster 14 (scheduled consequences). Interventions from criminal justice settings were coded with BCTs from all clusters except cluster 11 (regulation) and cluster 14 (scheduled consequences). Interventions from educational settings were identified in seven clusters, and interventions from generic settings from nine clusters (*Figure 15*).

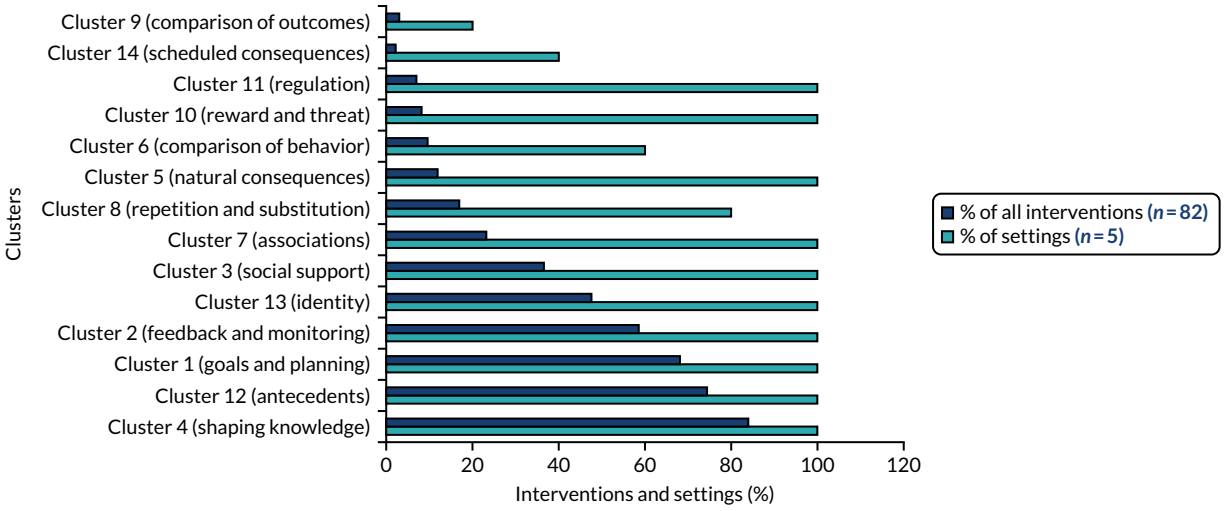

FIGURE 14 Behavior change technique clusters as percentages of settings and interventions.

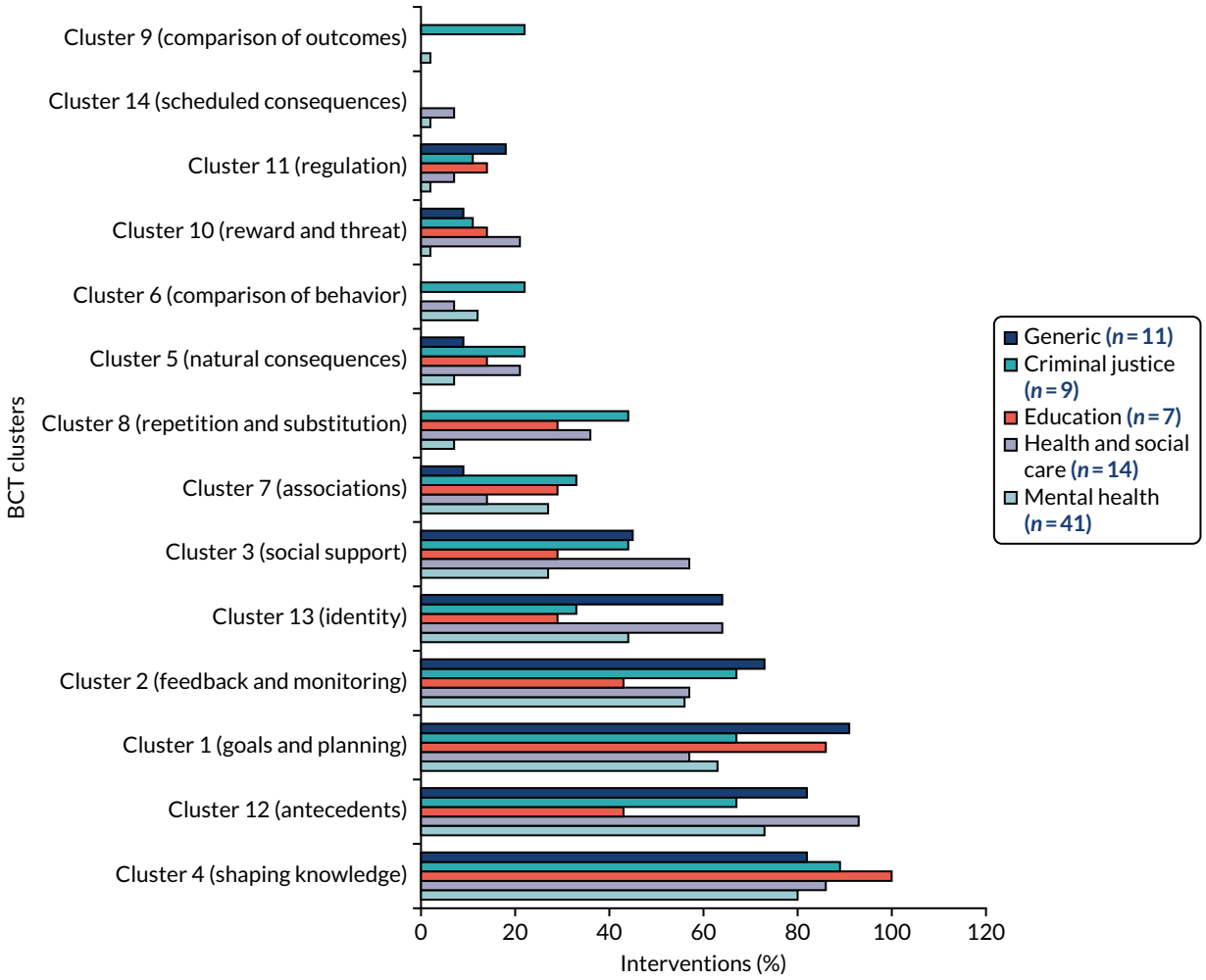

FIGURE 15 Behaviour change technique cluster by settings (percentages of interventions in each setting, containing BCTs from each cluster).

Description of behavior change techniques and behavior change technique clusters identified

The BCTs and BCT clusters identified in the interventions are summarised in *Figure 16*.

Cluster 1 (goals and planning)

Six out of the nine BCTs in cluster 1 (goals and planning) were identified: BCT 1.4 (action-planning), BCT 1.2 (problem-solving), BCT 1.9 (commitment), BCT 1.1 [goal setting (behaviour)], BCT 1.3 [goal setting (outcome)] and BCT 1.7 [review outcome goal(s)]. These six BCTs accounted for 17% of all identified BCTs ($n = 36$). BCTs from this cluster were identified in 68% of interventions overall ($n = 82$) from all five settings. Almost all interventions (91%) from generic settings were coded with BCTs from this cluster, compared with around half (57%) from health and social care settings (*Figure 17*).

Action-planning (behavior change technique 1.4)

> *Prompt, detailed planning of performance of the behavior (must include at least one of context, frequency, duration and intensity). Context may be environmental (physical or social) or internal (physical, emotional or cognitive) (includes 'Implementation Intentions').*
>
> *Michie* et al.[52]

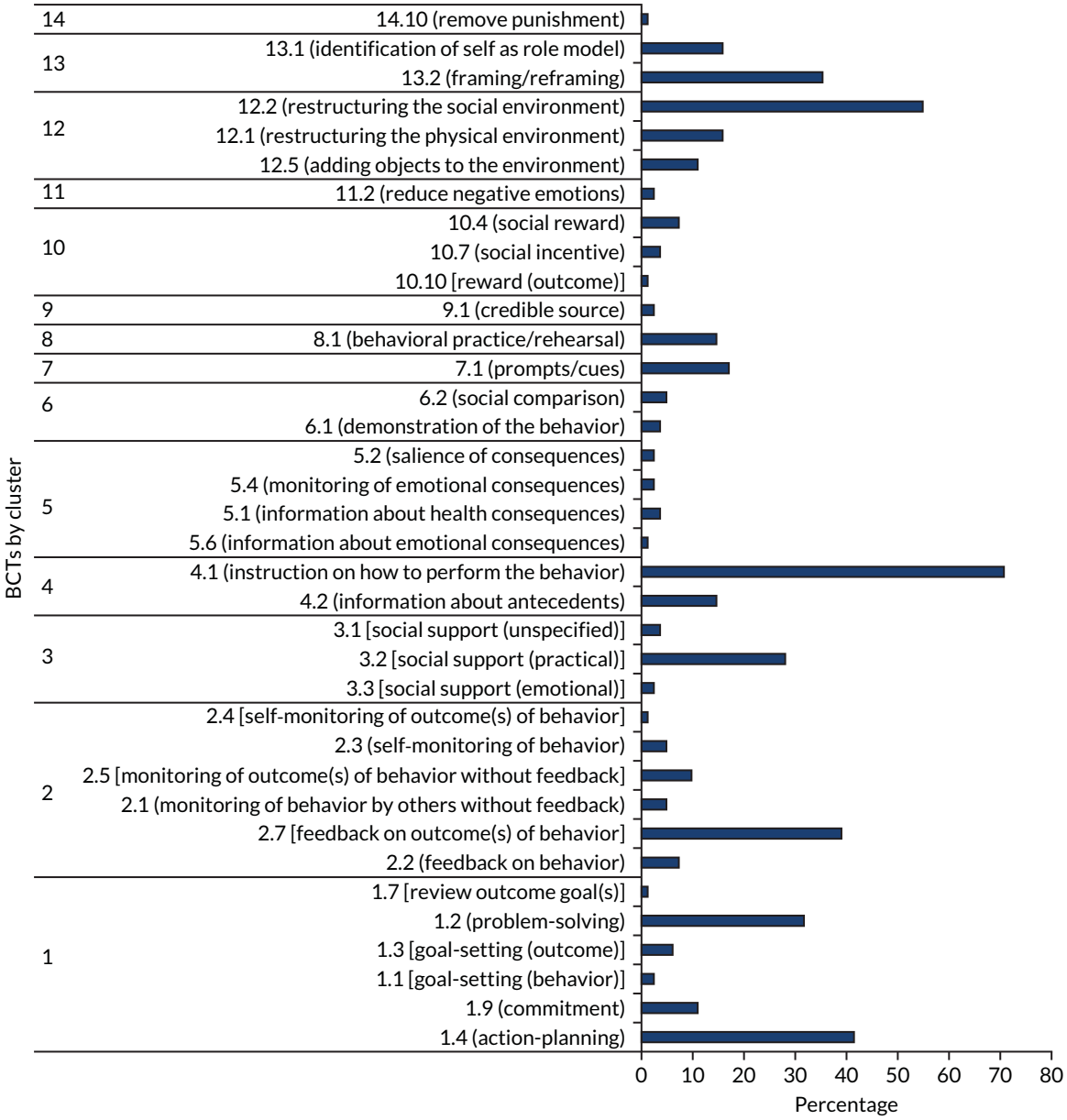

FIGURE 16 Detected BCTs by cluster (percentage of interventions).

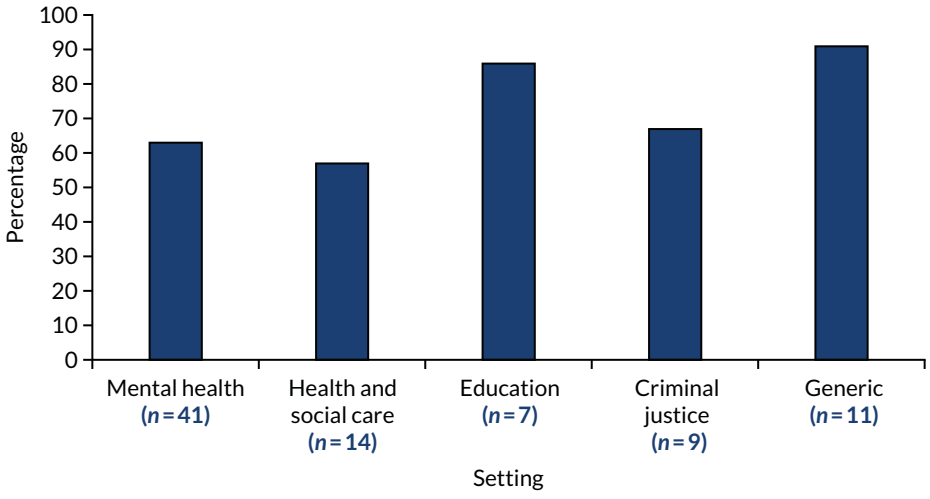

FIGURE 17 Cluster 1 (goals and planning) by setting (% of interventions in each setting containing BCTs from this cluster).

Behavior change technique 1.4 (action-planning) was one of the most often identified BCTs, found in 41% of interventions and in all five settings. Written action plans were produced for a variety of purposes, including setting out how to support or modify the behaviour of children or staff,[30,97,100,102,180,185,188] how to support recovery[33] plans for follow-up[33,77,113,189] and how to prevent or respond to crises,[85,122] as illustrated in Lebel *et al.*:[40]

> *Using the tool, a patient, family member (as appropriate), and staff person collaboratively develop a plan . . . that identifies preferred strategies for de-escalation . . . and restraint preferences to consider if restraint becomes necessary.*
>
> *Lebel* et al.[40]

In some interventions such planning formed, or was incorporated into, individuals' treatment plans:[82,95,105,160,162,172,188,190,191]

> *The interdisciplinary treatment team (IDT) met to review the treatment plan, conduct additional assessments (e.g., antecedent analyses and functional analyses), and determine possible etiological factors associated with the patient's frequent crises. Behavioral and pharmacological treatments were then re-evaluated for possible modification.*
>
> *Schreiner* et al.[41]

Plans could be aimed at individuals, but could also require teams or organisations to perform incident reviews or implement restraint reduction plans.[33,77,182,188,193] Foci included crises, behaviour, treatment, restraint reduction,[179] incidents requiring the use of restrictive practices[23,86,192] and safety:

> *The action plan was developed by the Executive Director of the region taking into account the feedback gathered by employees with particular focus on providing employees support and reassurance that safety would be the top priority. The action plan was reviewed with employees by the Executive Director.*
>
> *Sanders*[108]

Plans were often proactive, detailing actions or strategies to prevent scenarios with the potential to lead to restrictive practices[162,193] to 'proactively respond in stressful situations'[171] and to 'proactively identify and address problems in a more productive manner'[78] before the situation escalates.[194] Action plans could also detail the steps required in specific situations, for example 'situations in which the youth is likely to exhibit disruptive or oppositional behaviors',[112] or during crisis and emergency situations, as described by Schreiner *et al.*:[41]

> *Staff members were trained . . . to provide patients with concrete de-escalation steps. Rather than telling a patient to calm down . . . staff might tell a patient to go to his room, sit on his bed, take five deep breaths, and think about a pleasant event.*
>
> *Schreiner* et al.[41]

Other situations might include single incidents of violence and/or restrictive practices,[101,115,122,174,194,195] children exhibiting particular characteristics or patterns of behaviour[156,196] or a pattern of restrictive practice use.[197] A checklist from the National Association of State Mental Health Program Directors (NASMHPD)[33] suggests that the S/R reduction team could develop a policy to clarify how this level of review would be triggered, for example a child who receives more than three holds in a single week, an event resulting in an injury or an unusual pattern of use of S/R.

Some action plans were developed with the involvement of children.[171,181,188,192] For example, Finnie[91] refers to working collaboratively with children to find mutually satisfactory solutions by 'articulating the problem to be solved . . . associated concerns, the possible solutions and likely outcomes, and whether outcomes are feasible and will be mutually satisfying'.

Problem-solving (behavior change technique 1.2)

> *Analyse, or prompt the person to analyse, factors influencing the behavior and generate or select strategies that include overcoming barriers and/or increasing facilitators (includes 'Relapse Prevention' and 'Coping Planning').*
>
> *Michie* et al.[52]

Behavior change technique 1.2 (problem-solving) was another commonly identified BCT and was identified in 32% of interventions from all five settings. As illustrated in Greene *et al.*,[110] some interventions[93,111,125,132,161,162,178,193] explicitly referred to 'problem-solving':

> *In its focus on facilitating adult–child problem-solving . . . the CPS approach differs from models typically employed in many restrictive facilities. [. . .] The manner in which the CPS model teaches adults to solve problems collaboratively with patients also has important implications for staff interactions with each other.*
>
> *Greene* et al.[110]

The process of 'problem-solving' involved identifying problems and solutions[41,174,188] (e.g. Thomann[98] and Kaltiala-Heino *et al.*[198]) and identifying barriers to these plans.[115,193] Analyses were conducted in clinical reviews,[182,193] debriefings or incident reviews,[122,162,192] regular meetings and risk assessments.[77] The purpose was to identify factors that influenced the behaviour of staff and children, including existing plans, strategies and values.[116,190] Just one intervention[178] referred to organisational 'problem-solving'. Often organisational problem-solving involved the analysis of triggers, for example for challenging behaviour:[33,77,89,105,110,115,154,165,174,189,193,199]

> *. . . using CPS with a youth . . . generates a list of specific unmet expectations and triggers . . . in which the youth is likely to exhibit disruptive or oppositional behaviors. [For example] . . . unmet academic expectations (e.g., turning in homework), . . . safety expectations (e.g., staying sober), or social triggers (e.g., exclusion during playground games).*
>
> *Pollastri* et al.[112]

Behavior change technique 1.2 (problem-solving) was mostly concerned with the individual behaviour (of children), but there were examples that were concerned with broader influences. For instance, the Youth Justice Board for England and Wales stated that assessment should not be limited to describing facts but should aim to understand the situation and behaviour of a young person, including factors relating to diversity.[199]

Other examples included risk assessment,[77] strategies for 'stressful situations' and 'red flags',[171] 'warning signs'[30] and redesigning environmental conditions:

> *[A functional behavioral assessment] is used to analyze environmental factors, including any history of trauma (e.g., physical abuse), that contribute to a child's inappropriate (e.g., disrespect, noncompliance, insubordination, out-of-seat) behaviors.*
>
> *[These data inform] positive behavioral strategies that emphasize redesigning environmental conditions, which may include changes in staff approaches.*
>
> *US Department of Education.[197] Reproduced with permission from US Department of Education,* Restraint and Seclusion: Resource Document, *Washington, DC, 2012*

Problem-solving activities resulted in the generation of 'lessons learned'[199] that inform future strategies,[88,174,194] the development of (potential) solutions[78,120] and improvements in practice.[168,192]

Commitment (behavior change technique 1.9)

> *Ask the person to affirm or reaffirm statements indicating commitment to change the behavior.*
>
> *Michie* et al.[52]

As shown in *Figure 17*, 18% of interventions described organisational-level 'commitment' (BCT 1.9) to reduce restrictive practices. For example, Caldwell *et al.*[115] emphasised the role of leadership in prioritising the reduction of restraint and seclusion within the organisation, with a focus on assessing its use.

This took various forms including a mandate issued by the Chief Executive Officer,[108] a 'statement of beliefs'[182] or a declaration as a 'unit priority'.[41] Reynolds *et al.*[100] described requiring individual staff to make a commitment to reducing restrictive practices:

> *Tier 1 strategies included establishing commitment from the staff (of note, 100% of the unit staff voted to implement the program), defined set of positively worded expectations (i.e. be safe, be responsible, be respectful).*
>
> *Reynolds* et al.[100]

Goal setting for behaviour (behavior change technique 1.1) and outcome (behavior change technique 1.3)

> *Set or agree on a goal defined in terms of the behavior to be achieved.*
>
> *Michie* et al.[52]

> *Set or agree on a goal defined in terms of a positive outcome of wanted behavior.*
>
> *Michie* et al.[52]

Seven per cent of interventions described 'goal setting for outcome' and 2% described 'goal setting for behaviour' (see *Figure 17*). BCT 1.1 [goal setting (behaviour)] was identified in mental health settings only. Considerably fewer interventions described setting goals (BCT 1.1)[33,40,81,179,190,191,193] than BCT 1.4 (action-planning). BCT 1.4 (action-planning) requires mention of context, frequency, duration or intensity within the plan. In the case of those that specified the goal,[179,191] the goal was a reduction in or the prevention of the use of restrictive practices:

> *Specific patterns of restraint use were reviewed by the team each meeting, and goals for restraint prevention/reduction were set.*
>
> *Holstead* et al.[191]

There was some variation in whether these goals were set for teams, individual staff or children. In Plant[179] the goals were set for teams, and in Azeem *et al.*[193] the goals were set for teams and individual staff, whereas in Holstead *et al.*[191] the goals were set for staff and children. Both interventions describing goal setting in relation to behaviour (BCTs 1.1 and 1.3) referred to the joint goal setting between staff and youth[171] and by staff in collaboration with children and families.[163]

Review outcome goal(s) (behavior change technique 1.7)

> *Review outcome goal(s) jointly with the person and consider modifying goal(s) in light of achievement. This may lead to resetting the same goal, a small change in that goal or setting a new goal instead of, or in addition to the first.*
>
> *Michie* et al.[52]

Behaviour change technique 1.7 [review outcome goal(s)] was detected in health and social care settings only. Just 5% of interventions (see *Figure 17*) described reviewing or evaluating outcome goals:

> *Progress towards the goals was evaluated monthly and ideas to further reduce restraints were discussed.*
>
> *Holstead* et al.[191]

As described, the aim of review was to ensure that goals remained 'fit for purpose'[180] and were revised when necessary.[33]

Cluster 2 (feedback and monitoring)

Behaviour change techniques from cluster 2 (feedback and monitoring) accounted for 17% of all identified BCTs. All but one BCT [BCT 2.6 (biofeedback)] from this cluster were identified: BCT 2.1 (monitoring of behavior by others without feedback), BCT 2.5 [monitoring of outcome(s) of behavior without feedback], BCT 2.3 (self-monitoring of behavior), BCT 2.2 (feedback on behavior) and BCT 2.4 [self-monitoring of outcome(s) of behavior]. Feedback and monitoring were detected in relation to both outcomes and behaviour. Monitoring was either self-monitoring or monitoring by others, for example at an organisational level. BCTs from cluster 2 were identified in 52% of interventions overall and at similar proportions across settings, except for generic settings where they were detected in 71% of interventions (*Figure 18*).

Self-monitoring of outcome(s) of behaviour (behavior change technique 2.4)

> *Establish a method for the person to monitor and record the outcome(s) of their behavior as part of a behavior change strategy.*
>
> *Michie* et al.[52]

Behavior change technique 2.4 [self-monitoring of outcome(s) of behavior] was identified in 1% of interventions, and all identifications came from mental health settings (see *Figure 18*). Here, 'self' refers to the staff-monitoring incidents that occurred in their area {distinct from the centralised system described under BCT 2.5 [monitoring of outcome(s) of behaviour]}. Facilities can be encouraged to participate in setting goals and monitoring changes.[33]

Monitoring could also take the form of supervision[174] or debriefing[23,82,174,192] but both of these were aimed at generating reflection following incidents. A positive staff debrief would involve active discussion about what happened, what went well, what might be done better, the possible effect on the child and how to avoid restraining the child in the future.[200]

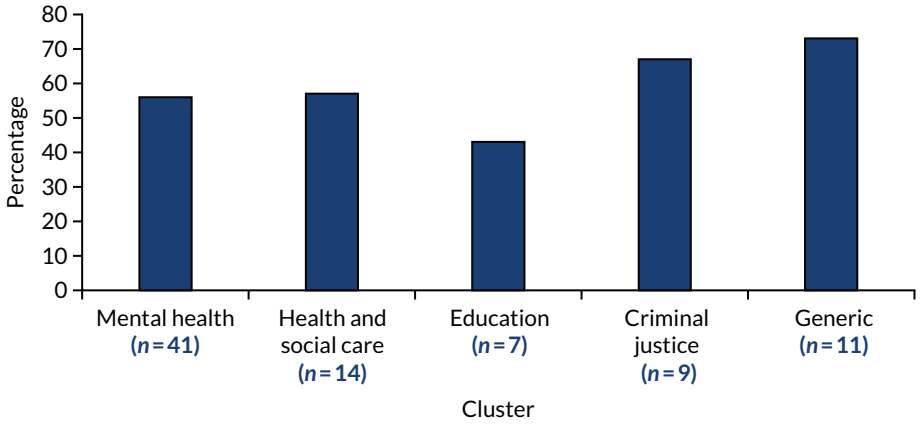

FIGURE 18 Cluster 2 (feedback and monitoring) by setting (% of interventions in each setting containing BCTs from this cluster).

Self-monitoring of behaviour (behavior change technique 2.3)

> *Establish a method for the person to monitor and record their behavior(s) as part of a behavior change strategy.*
>
> *Michie* et al.[52]

Behavior change technique 2.3 (self-monitoring of behaviour) (rather than outcomes) was identified in five interventions from three settings. BCT 2.3 (self-monitoring of behaviour) was coded when staff monitored and reflected on 'near misses'[174,193] and 'what worked'[193] when restrictive practices were successfully avoided:

> *These sessions were expected to provide staff with an opportunity to reflect on practices and offer peer support through encouragement and critical feedback [. . .] while also affording an opportunity for trainers to assess the efficiency of the process and make adjustments as necessary.*
>
> *Glew*[92]

Holstead *et al.*[191] actively trained staff 'to recognize and be more aware of their own internal experiences during these critical moments.'[191] Sanders[108] emphasised that the purpose of debriefs was to be supportive of staff and not critical.

Feedback on behaviour (behavior change technique 2.2)

> *Monitor and provide informative or evaluative feedback on performance of the behavior (e.g. form, frequency, duration, intensity).*
>
> *Michie* et al.[52]

Behavior change technique 2.2 (feedback on behaviour) was identified in 7% of interventions from two settings. BCT 2.2 (feedback on behaviour) was provided in the same ways as self-monitoring, such as debriefing and supervision, but specifically involved providing feedback to staff. Feedback had a number of functions including helping staff to develop awareness of 'common precipitants' and how effective they have been in the past[190] and 'to role model how to identify reactive behaviors'.[128] Jones and Timbers[201] described the involvement of children in contributing to evaluations of staff performance.

Feedback on outcome(s) of behaviour (behavior change technique 2.7)

> *Monitor and provide feedback on the outcome of performance of the behavior.*
>
> *Michie* et al.[52]

Behavior change technique 2.7 (feedback on outcomes of behaviour) was one of the most frequently identified BCTs, detectable in 39% of interventions across from all five settings. Interventions monitored data and incidents and gave feedback with a view to understanding what could have been done differently[108,114,180,192,193] as well as identifying 'critical success factors'.[202]

Sanders[108] described how every restraint incident was carefully scrutinised by an executive team that established whether or not the restraint had been necessary, offered feedback such as recommendations for changes to the environment and reported to a regional body.

Some interventions described having data monitoring systems in place through which rates of restrictive practices could be fed back to staff[41,125,127,185] to help identify trends and inform change,[180] including 'when staff members had high rates of using restraint and seclusion'.[114]

Feedback could also involve children:[101,188,194]

> *Following each hands-on incident, the patient is asked his or her interpretation of the incident. . . . Recommendations or individual preferences offered by the patient at this or any other time are communicated to the treatment team . . . The treatment plan then is reviewed and/or updated.*
>
> *Visalli* et al.[188]

Monitoring of behavior by others without feedback (behavior change technique 2.1)

> *Observe or record behavior with the person's knowledge as part of a behavior change strategy.*
>
> *Michie* et al.[52]

Feedback was not always provided following monitoring. BCT 2.1 (monitoring of behaviour by others without feedback) was detected in 5% of interventions. These interventions, which came from mental health and criminal justice settings, described monitoring behaviour using, for example, ward-based registers,[163] video- and audio-recorded footage and information from the debriefing of young people and staff.[192] They also described the collection of a variety of data, as in Finnie,[91] in which it was reported that data were collected on an ongoing basis for each variable that had been identified [i.e. counts of episodes of four-point restraint, locked seclusion, staff and patient injuries, involvement of security staff to assist with managing a child's 'explosive' episode' and the use of p.r.n. medication for agitation].

The behaviours being monitored included aggressive incidents, security support and restraint;[163] individual incidents;[199] and the use of force.[192] Rather than for providing feedback, the purpose of monitoring was described by the Youth Justice Board for England and Wales as providing a 'total picture' of restrictive interventions over a period of time[199] and acting as an 'accurate record': a way of verifying whether or not correct restraint techniques have been used and to permit investigation of antecedents.[192]

Monitoring of outcome(s) of behavior without feedback (behavior change technique 2.5)

> *Observe or record outcomes of behavior with the person's knowledge as part of a behaviour change strategy.*
>
> *Michie* et al.[52]

Similarly, where monitoring of outcomes of behavior was described, feedback was not always provided as the end point. Indeed, BCT 2.5 (monitoring of outcomes of behaviour without feedback) was more common. It was detected in 10% of interventions (see *Figure 18*) and in all settings except criminal justice. This type of monitoring was usually undertaken at an organisational level with the systems in place to ensure the central collection and analysis of data:

> *All seclusion and restraint events were chart audited through the hospital's EMR [electronic medical record] system. The documented nursing note on each patient placed in seclusion and restraint was reviewed to determine if staff followed the decision making algorithm.*
>
> *Eblin*[162]

> *. . . establishments should collect the following information about incidents involving the use of restraint and analyse this information at least monthly: reason for restraint . . . emerging patterns of restraint; restraint 'hotspots', for example . . . locations; time restraint incidents occur; which staff . . . were involved; risks in restraint techniques; training gaps identified.*
>
> *Youth Justice Board for England and Wales*[199]

The Youth Justice Board for England and Wales[199] stated that institutions should, at least monthly, collect and analyse restraint data concerning why restraint had been used and any patterns of restraint use, such as locations, timing, staff involved, risks arising from restraint techniques and implications for training needs.

These data might be reviewed internally by medical, nursing or operational directors or others at an executive level[105,120] or the data may be made available outside the individual institution to an overarching governing body such as the Youth Justice Board for England and Wales[199] or the National Offender Management System.[23]

In some interventions, all incidents were recorded[161,192] but not necessarily reviewed. Elsewhere, reviews occurred either as the incidents happened[87,105] or on a regular basis.[90,120] Two interventions described specific features, such as an individual experiencing multiple incidents in a given period that triggered notification for review by the medical director.[105,203]

Cluster 3 (social support)

There was evidence for all three BCTs – that is emotional, practical and unspecified social support – from cluster 3 (social support). These three BCTs amounted to 8% of all BCTs identified ($n = 36$) and were detected in 37% of interventions overall, but slightly more often in health and social care settings (57%) (*Figure 19*).

Social support (practical) (behavior change technique 3.2)

> *Advise on, arrange, or provide practical help (e.g. from friends, relatives, colleagues, 'buddies' or staff) for performance of the behavior.*
>
> *Michie* et al.[52]

Behavior change technique 3.2 [social support (practical)] was detected in 28% of interventions from all settings except those that were 'generic'. It was also one of the most often detected BCTs in education and criminal justice settings. Various forms of practical (as opposed to emotional or unspecified) support were described. Several interventions deployed response teams to provide additional support following incidents[115] or during incidents to assist with, for example, conflict resolution or de-escalation to prevent escalation of an incident.[99,105,194,198] This support might be provided via coaching[191] or modelling.[108] Another approach evolved organically:

> *Staff began briefly consulting with each other prior to approaching a patient in crisis. This practice enabled staff to focus on the individual's treatment plan, brainstorm creative alternatives in the choices offered to patients in crisis, and provide consistent, professional interactions with an individual in crisis.*
>
> *Witte*[160]

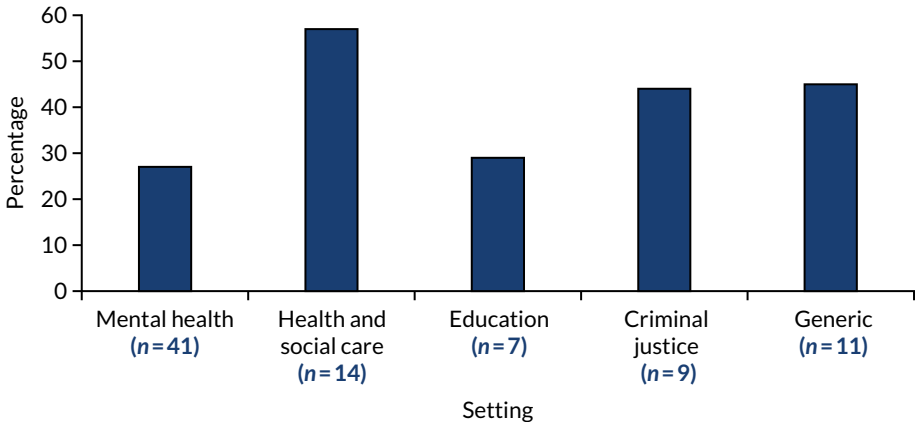

FIGURE 19 Cluster 3 (social support) by setting (% of interventions in each setting containing BCTs from this cluster).

Other types of practical support were also identified, including coaching,[108,114,119,174,180,204] staff forums and meetings,[40,122,175] peer support and the use of peers and buddies,[92,160,174,205] mentoring and modelling,[114,180] and supervision.[178,182,183,206]

Some interventions set up a committee specifically to perform these functions.[41,125] These functions could also be provided by an external party, such as the intervention developer or trainer:[40,111,128,129,178]

> *Each facility was assigned a trainer-mentor to provide on-going consultation, modeling, and coaching in PARS concepts, techniques, and methods.*
>
> *Wisdom* et al.[114]

Social support (emotional) (behavior change technique 3.3)

> *Advise on, arrange, or provide emotional social support (e.g. from friends, relatives, colleagues, 'buddies' or staff) for performance of the behavior.*
>
> *Michie* et al.[52]

Less often, BCT 3.3 [social support (emotional)] was detected (in 2% of interventions from two settings). These interventions described offering emotional (as distinct from practical) social support[193] via events for the purpose of reinforcing staff 'well-being through self-care',[105] culture change[183] and debriefing.[30,122,180] Advice from Holden *et al.*[122] was to ensure a positive outcome from a crisis. This could be facilitated by recognising its emotional impact on staff, and allowing them to process that by conducting an incident review once the urgent safety concerns had been dealt with.

Provision of emotional support was also an item in two intervention checklists.[33,207]

Social support unspecified (behavior change technique 3.1)

> *Advise on, arrange or provide social support (e.g. from friends, relatives, colleagues,' buddies' or staff) or noncontingent praise or reward for performance of the behavior. It includes encouragement and counselling, but only when it is directed at the behavior.*
>
> *Michie* et al.[52]

Behavior change technique 3.1 [social support (unspecified)] was also identified, but in just 4% of interventions from two settings.[201,204,208,209]

Cluster 4 (shaping knowledge)

Two out of four possible BCTs were identified from cluster 4 (shaping knowledge). These were BCT 4.2 (information about antecedents) and BCT 4.1 (instruction on how to perform the behaviour). These two BCTs amounted to 6% of all BCTs identified ($n = 36$). This cluster was detected in 84% of interventions overall, but was present in all interventions from the education setting (*Figure 20*).

Instruction on how to perform the behaviour (behavior change technique 4.1)

> *Advise or agree on how to perform the behaviour (includes 'Skills training').*
>
> *Michie* et al.[52]

Behavior change technique 4.1 (instruction on how to perform the behaviour) was the most common BCT, detectable in 71% of interventions. This BCT was usually evident when interventions described training of some sort. The type and duration of training varied widely, as did descriptions of its content and delivery. Some interventions described a training curriculum, whereby training was ongoing,

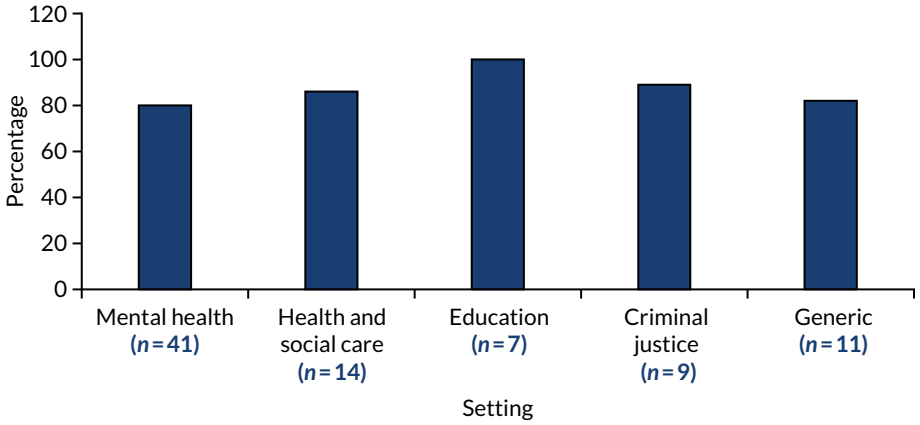

FIGURE 20 Cluster 4 (shaping knowledge) by setting (% of interventions in each setting containing BCTs from this cluster).

substantial and multifaceted.[30,33,82,92,100,107,113,114,125,175,178–180,191,207,210] In one children's centre, a training department was set up with two professional staff trainers who were employed full time.[211]

> *The RRCs [Restraint Reduction Committee] implemented staff training that was centered on less restrictive interventions (LRIs) for aggressiveness and covered assessment of the client and situation, behavior management, and verbal de-escalation strategies. Although training included quarterly refresher courses, training was not limited to single, discrete sessions.*
>
> *Miller* et al.[182]

These were in contrast to one-off or time-limited training sessions (which also ranged in depth and duration) described by others.[93,161,172,177] Several referred to training resulting in accreditation.[169,170,174] Some interventions specified that training was aimed at all staff in the setting:[128,159,183]

> *All detention center personnel (including food service, clerical, maintenance and janitorial, educator, administrator, and clinician staff) received an introductory training and periodic refresher trainings from one of two TARGET consultants.*
>
> *Ford* et al.[128]

This BCT was also coded when instructions were provided in a manual[89,165,209] or multimedia sources:[79,89]

> *A comprehensive training manual was supplied to all participants. The training manual . . . mirrored the training.*
>
> *Bobier* et al.[165]

Training content included how to implement the intervention,[91,125,193,204] how to use a tool,[154,165] how to perform a specific skill such as de-escalation,[23,92,101,105,115,119,159,202] and models and theories underpinning interventions such as trauma-informed care[105,115,120,129,183] or sensory modulation.[155,156,164] In a Crisis Prevention Institute blog, Rettmann[119] explained that Nonviolent Crisis training was delivered to staff involved in direct care and supervisors. Although, in most cases, the staff had received the training previously, on this occasion there was greater emphasis on the importance of developing professional relationships with the young people, and proper use of the Nonviolent Crisis Intervention de-escalation techniques.

Information about antecedents (behavior change technique 4.2)

> *Provide information about antecedents (e.g. social and environmental situations and events, emotions, cognitions) that reliably predict performance of the behaviour.*
>
> *Michie* et al.[52]

Evidence of BCT 4.2 (information about antecedents) could be found in 15% of interventions from two settings. Several interventions made specific reference to antecedents:[85,111,182,191,194,197,199,202,207]

> *CPS seeks to identify pertinent social and cognitive pathway impairments and precipitating antecedent events.*
>
> *Martin* et al.[111]

Antecedents were also referred to as 'warning signs'.[30,114,174,194] Familiarity with an individual's early warning signs, for example pacing, avoiding eye contact or going silent, was identified as important knowledge that would help practitioners in preventing service users from becoming over-agitated.[174]

This BCT was also detected when interventions provide information about triggers in debriefings, on admission (from children and families), risk assessment or in training:[85,98,114,115,122,132,163,164,189,191,194,198,202,203]

> *All staff, including a number of non-agency temporary staff during the first two years, received skills-oriented, criteria-based training in the GBT [Girls and Boys Town] Psychoeducational Treatment Model, including teaching youth behavioral and cognitive techniques for recognizing antecedents and triggers.*
>
> *O'Brien*[202]

Cluster 5 (natural consequences)

The four BCTs [i.e. BCT 5.6 (information about emotional consequences), BCT 5.1 (information about health consequences), BCT 5.4 (monitoring of emotional consequences) and BCT 5.2 (salience of consequences)] from cluster 5 (natural consequences) accounted for just 8% of identified BCTs. BCTs from this cluster were identified in 12% of interventions overall. As illustrated in *Figure 21*, BCTs from this cluster were detected at varying rates in each setting.

Information about health consequences (behavior change technique 5.1)

> *Provide information (e.g. written, verbal, visual) about health consequences of performing the behavior.*
>
> *Michie* et al.[52]

Behavior change technique 5.1 (information about health consequences) was detected in 4% of interventions from two settings. Interventions provided staff with information about the high-risk

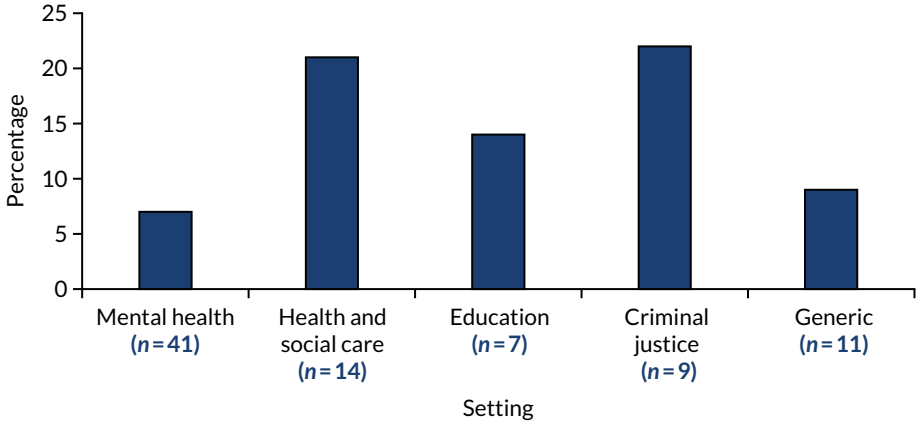

FIGURE 21 Cluster 5 (natural consequences) by setting (% of interventions in each setting containing BCTs from this cluster).

nature of restrictive practices as well as the negative impact on the physical health of staff and children, which may include injury and death:[33,122,170,194]

> *Investigations have shown that the causes of restraint- or seclusion-related death include suffocation, heart complications, drug overdoses or interactions, blunt trauma, strangulation or choking, fire or smoke inhalation, and aspiration.*
>
> *World Health Organization (WHO).[194] Reproduced with permission. © World Health Organization 2019. Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; https://creativecommons.org/licenses/by-nc-sa/3.0/igo)*

> *Staff are taught and acknowledge that emergency physical interventions are risky for both the child and the staff and that such techniques should be used only when the risk of intervening is outweighed by the risk of not intervening.*
>
> *Paccione-Dyszleski* et al.[170]

Salience of consequences (behavior change technique 5.2)

> *Use methods specifically designed to emphasise the consequences of performing the behaviour with the aim of making them more memorable (goes beyond informing about consequences).*
>
> *Michie* et al.[52]

Behavior change technique 5.2 (salience of consequences) was detected in 2% of interventions from two settings in the representation of the seriousness of restrictive practices as 'human rights violations' and 'violent adverse events',[194] and in the form of testimonies of staff and children who had experienced the consequences of restrictive practices:[115,174,191,211]

> *Training content should include contributions from people with lived experience of having restraint or other restrictive practices used on them. It is important that practitioners who apply restraint have an understanding of the personal and often traumatic impact it can have.*
>
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Monitoring of emotional consequences (behavior change technique 5.4)

> *Prompt assessment of feelings after attempts at performing the behavior.*
>
> *Michie* et al.[52]

This BCT was detected in recommendations for immediate post-incident review,[33,199] apparent in just 2% of interventions from two settings.

Information about emotional consequences (behavior change technique 5.6)

> *Provide information (e.g. written, verbal, visual) about emotional consequences of performing the behaviour. Note: consequences can be related to emotional health disorders (e.g. depression, anxiety) and/or states of mind (e.g. low mood, stress).*
>
> *Michie* et al.[52]

Just 1% of interventions provided information about the emotional consequences (BCT 5.6) of restrictive practices, which may include trauma.[122,180,194] This BCT was detected in health and social care settings only.

Cluster 6 (comparison of behavior)

Two BCTs [i.e. BCT 6.1 (demonstration of the behaviour) and BCT 6.2 (social comparison)] out of the three BCTs in cluster 6 (comparison of behavior) were identified. This constituted just 6% of all identified BCTs. Cluster 6 was identified in 10% of all interventions but at varying rates (range 7–22%) in the different settings. It was not identified at all in education or generic settings (*Figure 22*).

Demonstration of the behavior (behavior change technique 6.1)

> *Provide an observable sample of the performance of the behaviour, directly in person or indirectly e.g. via film, pictures, for the person to aspire to or imitate (includes 'Modelling').*
>
> *Michie* et al.[52]

The BCT demonstration of the behavior (BCT 6.1) was identified in 4% of interventions from two settings. Examples included interventions demonstrating the desired skills or a tool to staff[204] or providing example scripts of interactions.[91] For example, one training programme explained that a skill should be modelled in a way that illustrates the behavioral steps clearly and unambiguously, and, furthermore, than the skill will be viewed as important and effective where the trainer is viewed as having high-level skills, competence and relatable experience, and as friendly, helpful and successful in their career.[122]

Social comparison (behavior change technique 6.2)

> *Draw attention to others' performance to allow comparison with the person's own performance.*
>
> *Michie* et al.[52]

Social comparison (BCT 6.2) was identified in 6% of interventions (see *Figure 22*), for example where they recommended or implemented visits or contact with other organisations,[105,116] attending presentations,[40] field trips or conferences.[102] The purpose of these was to make comparisons,[175] foster healthy competition[33,193] and to learn from the successful implementation of an intervention.[116] BCT 6.2 (social comparison) could be identified within[183] or across organisations[105,116] or both.[33]

Cluster 7 (associations)

Behavior change technique 7.1 (prompts or cues) was the only BCT from a possible eight to be identified from cluster 7 (associations). This amounted to 3% of total BCTs identified. Nevertheless, this BCT (and, therefore, the cluster) was identified in 23% of interventions overall. Rates of detection varied across settings, from 9% in generic settings to 33% in criminal justice (*Figure 23*).

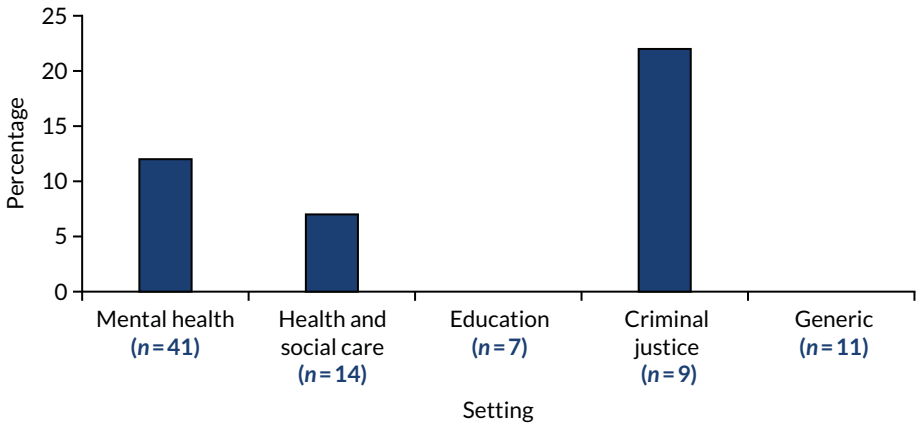

FIGURE 22 Behavior change techniques in cluster 6 (comparison of behavior) by setting (% of interventions in each setting containing BCTs from this cluster).

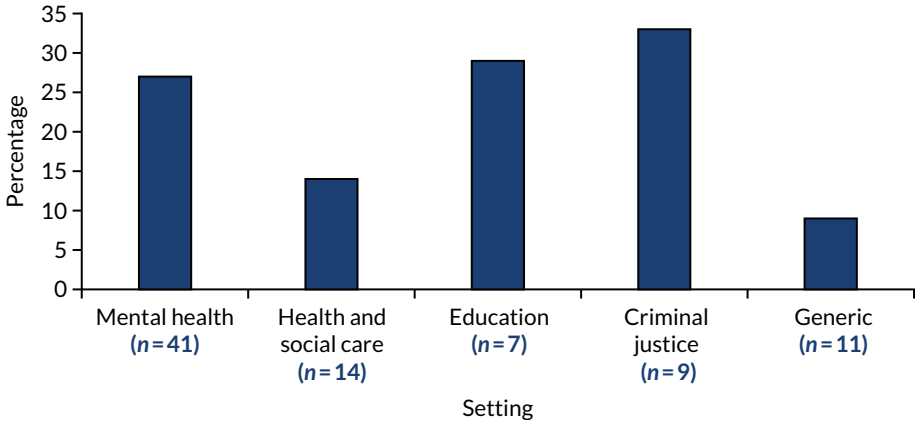

FIGURE 23 Cluster 7 (associations) by setting (% of interventions in each setting containing BCTs from this cluster).

Prompts or cues (behavior change technique 7.1)

> *Introduce or define environmental or social stimulus with the purpose of prompting or cueing the behavior. The prompt or cue would normally occur at the time or place of performance.*
>
> *Michie* et al.[52]

The BCT prompts or cues (BCT 7.1) was identified in 23% of interventions from all settings except generic (see *Figure 23*). It was also one of the most often detected BCTs in education and criminal justice settings. A prompt or cue could take the form of a tool (i.e. a safety planning tool, a risk assessment tool, prevention tools or a risk management tool[33,77,114,156]). Examples of such tools included the personal safety assessment tool[165] and the 'moment by moment assessment' tool.[78] Tools could be used to prompt preventative behaviour (i.e. through assessment and planning) to assist advanced decision-making and advance directives[30,33,77] or to aid responsive decision-making:

> *The decision-making algorithm with an agitated patient was to be used before the initiation of seclusion and restraints and included the following steps: verbal de-escalation, assessing effectiveness, notifying the physician for emergency medication, then assessing again for effectiveness.*
>
> *Eblin*[162]

Moments in time were also coded as prompts or cues. For example, in several interventions a specific process, such as carrying out risk assessments[30,77,162,169,176] or person-centred assessments[180] or the formulation of crisis management strategies,[189,198] would be prompted by preadmission, admission or an incident. Prompts or cues also appeared in visual displays (i.e. signs, posters and displays):[183,184]

> *One program created an 'On Track Action' wall . . . to reinforce positive steps that each client could take . . . The goal of the wall was to provide clients with weekly and monthly incentives for positive behaviors and to provide staff members with a systematic tool for consistently giving praise.*
>
> *Hodgdon* et al.[183]

In some interventions, prompts or cues occurred in the form of cards to be carried or t-shirts displaying the curriculum logo to be worn:[183,184]

> *They also had all staff and residents make safety plan cards (written plans of how to handle triggers and other safety measures) and made sure that everyone wore them.*
>
> *Elwyn* et al.[178]

> *Staff members were also instructed to carry a pocket-sized tool step guide (i.e., that listed all of the steps for each tool) at all times.*
>
> *Crosland* et al.[204]

Cluster 8 (repetition and substitution)

Just one BCT, behavioral practice/rehearsal (BCT 8.1), was identified from the seven available BCTs in cluster 8 (repetition and substitution), representing 3% of all identified BCTs; however, this BCT was detected in 17% of all interventions. It was not detected in generic settings, and rates of detection ranged from 7% in mental health settings to 44% in criminal justice settings (*Figure 24*).

Behavioral practice/rehearsal (behavior change technique 8.1)

> *Prompt practice or rehearsal of the performance of the behavior one or more times in a context or at a time when the performance may not be necessary, in order to increase habit and skill.*
>
> *Michie* et al.[52]

From cluster 8 (repetition and substitution), the single BCT behavioral practice/rehearsal (BCT 8.1) was identified. This BCT was detected in 17% of interventions from all settings except generic (see *Figure 24*). It was also one of the most often detected BCTs in education and criminal justice settings. This BCT involved practising various techniques,[92,93,108,122,128,183,204] sometimes with supervision. For example, a resource document from the US Department of Education[197] specified that, with regard to the prevention of restrictive practices, staff should practise and review their approaches regularly and frequently, under supervision, as they would a fire drill.

Techniques reported included role-play[40,85,107,174] and other exercises:[184]

> *All staff members practiced and rehearsed the procedures in the training sessions. The program concluded with the staff members applying the material learned in situational role plays and discussing post intervention techniques.*
>
> *Ryan and Rigby*[212]

> *Skill practice exercises for monitoring and enhancing appropriate staff-to-youth communication in areas such as body language, voice tone, facial expressions.*
>
> *O'Brien*[202]

Cluster 9 (comparison of outcomes)

The single BCT credible source (BCT 9.1) was identified from cluster 9 (comparison of outcomes) and constituted < 3% of all identified BCTs. This cluster was one of the least often detected, appearing in only 3% of interventions. This BCT was detected in 22% of criminal justice setting interventions but only 2% of mental health settings (*Figure 25*).

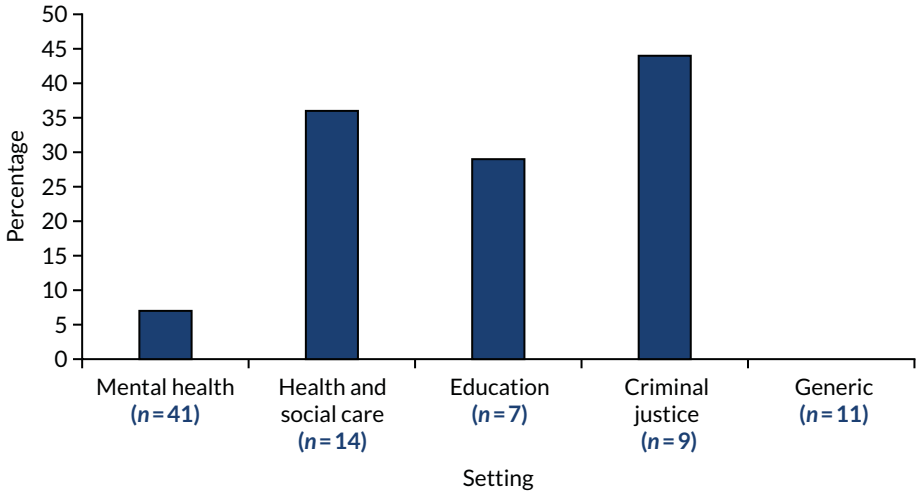

FIGURE 24 Cluster 8 (repetition and substitution) by setting (% of interventions in each setting containing BCTs from this cluster).

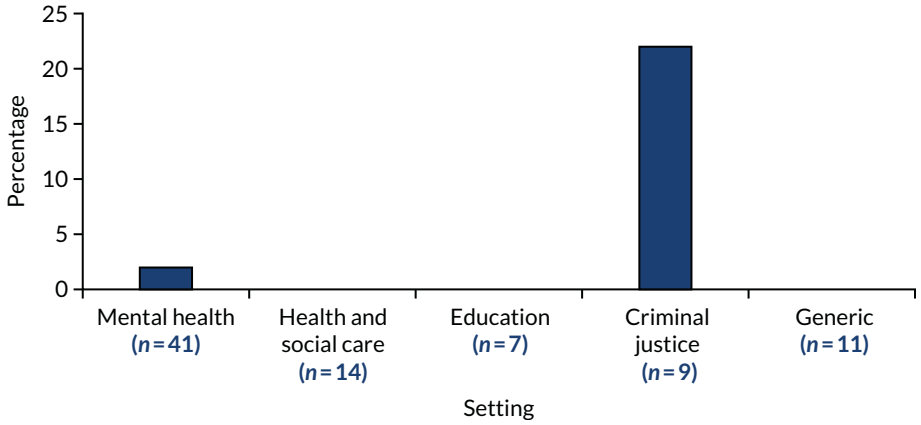

FIGURE 25 Cluster 9 (comparison of outcomes) by setting (% of interventions in each setting containing BCTs from this cluster).

Credible source (behavior change technique 9.1)

> *Present verbal or visual communication from a credible source in favour of or against the behavior.*
>
> *Michie* et al.[52]

Behavior change technique 9.1 (credible source) was identified in criminal justice settings[204] and mental health settings.[122] Crosland *et al.*[204] described training being given by certified behaviour analysts, whereas in Holden *et al.*'s study[122] staff were asked to provide credibility by describing their experience of working with CYP.

Cluster 10 (reward and threat)

Three BCTs out of a possible 11 from cluster 10 (reward and threat) were identified {BCT 10.10 [reward (outcome)], BCT 10.5 [social incentive] and BCT 10.4 [social reward]}. These three BCTs accounted for 8% of all identified BCTs and were detected in 8% of all interventions, but at a rate of only 2% in mental health settings, compared with 22% in health and social care settings (*Figure 26*).

Social incentive (behavior change technique 10.5)

> *Inform that a verbal or non-verbal reward will be delivered if and only if there has been effort and/or progress in performing the behavior (includes 'Positive reinforcement').*
>
> *Michie* et al.[52]

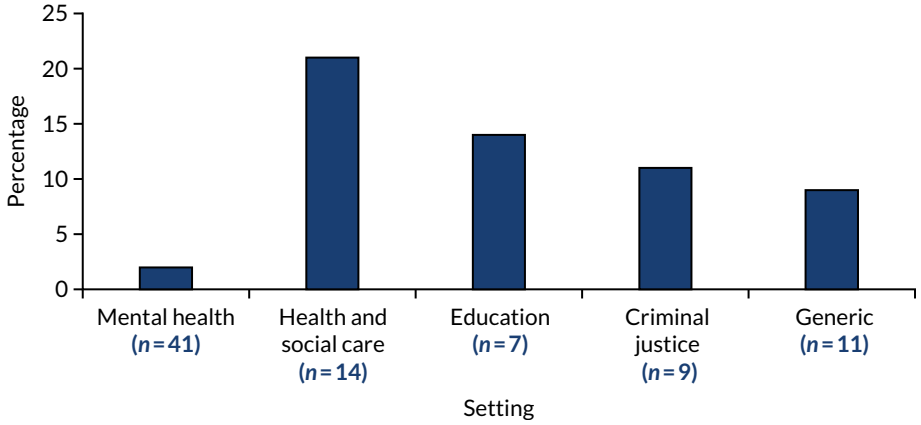

FIGURE 26 Cluster 10 (reward and threat) by setting (% of interventions in each setting containing BCTs from this cluster).

The BCT social incentive (BCT 10.5) was identified in 4% of interventions (see *Figure 26*). Although social incentive for staff could take the form of individual recognition,[178] for Schreiner *et al.*[41] the incentive was the potential improvement to the workplace:

> *Staff were enticed to participate in the project through potential benefits (e.g., a more pleasant patient living environment, a more pleasant work environment for staff, and decreased risk of patient and staff injuries).*
>
> *Schreiner* et al.[41]

Social reward (behavior change technique 10.4)

> *Arrange verbal or non-verbal reward if and only if there has been effort and/or progress in performing the behavior (includes 'Positive reinforcement').*
>
> *Michie* et al.[52]

The BCT social reward (BCT 10.4) was detected in all settings except generic, amounting to 8% of interventions (see *Figure 26*). Examples included recognition of best practices, celebration of successes,[180,193] awards,[119] weekly peer nominations[100,125] and praise.[41,185] The example below from Hodgdon *et al.*[183] illustrates how social incentives and rewards could be identified in conjunction:

> *[Staff] encouraged each other . . . by providing reinforcement (giving a fellow staff member a chip) when they observed a skill being used with a client. At the end of a 2-week period, the staff with the most chips was recognized in staff meeting and also earned an incentive.*
>
> *Hodgdon* et al.[183]

Reward (outcome) (behavior change technique 10.10)

> *Arrange for the delivery of a reward if and only if there has been effort and/or progress in achieving the behavioral outcome (includes 'Positive reinforcement').*
>
> *Michie* et al.[52]

Similarly, reward (outcome) (BCT 10.10) was manifested as staff recognition[164] in just 1% of interventions (see *Figure 26*). This BCT was detected in mental health settings only.

Cluster 11 (regulation)

The only BCT (of four possible) identified from cluster 11 (regulation) was BCT 11.2 (reduce negative emotions). This amounted to 3% of all BCTs identified. This BCT (and, therefore, cluster) was detected in 7% of interventions, but rates varied from 2% in mental health settings to 18% in generic settings (*Figure 27*).

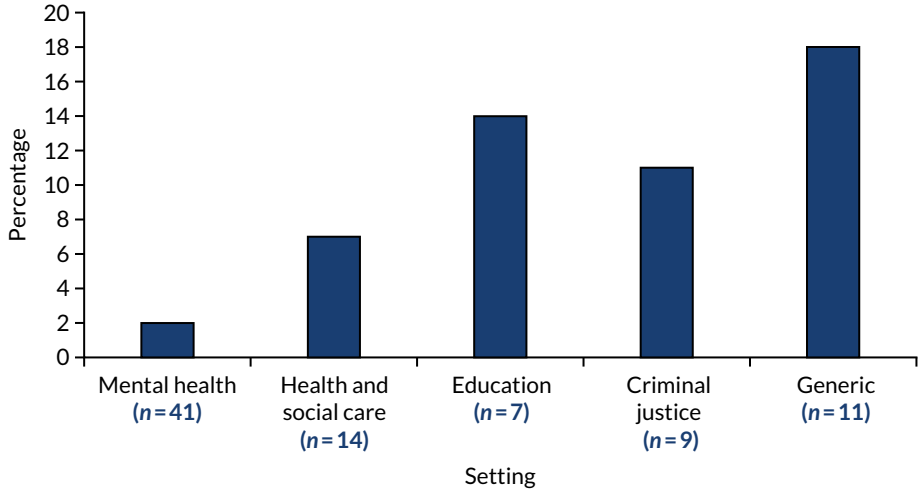

FIGURE 27 Cluster 11 (regulation) by setting (% of interventions in each setting containing BCTs from this cluster).

Reduce negative emotions (behavior change technique 11.2)

> *Advise on ways of reducing negative emotions to facilitate performance of the behavior (includes 'Stress Management').*
>
> *Michie* et al.[52]

The BCT reduce negative emotions (BCT 11.2) was detected in 7% of interventions (*Figure 27*). Interventions offering post-incident support to involved staff and witnesses to reduce trauma and other negative outcomes were coded with this BCT:[105,122,180,207]

> *Organisations should have a person-centred policy for providing both immediate and longer-term support after any use of restrictive practices. The policy should indicate future options for accessing longer term support or counselling if needed. This may include individual and/or group supervision/debriefing and individual psychological therapy delivered by trained professionals.*
>
> *Welsh Government.[180] Reproduced with permission. © Crown copyright. Contains public sector information licensed under the Open Government Licence v3.0*

This BCT was identified where interventions encouraged reflection[30,122] and self-regulation.[122,183] A secondary purpose of reducing negative emotions was preventing 'workplace stress' from adversely affecting practice.[180]

Cluster 12 (antecedents)

Behaviour change techniques identified from cluster 12 (antecedents) accounted for 16% of all BCTs identified. Three BCTs were identified from this cluster: BCT 12.5 (adding objects to the environment), BCT 12.1 (restructuring the physical environment) and BCT 12.2 (restructuring the social environment). This cluster was the second most commonly detected across all settings, at a rate of 74%. BCTs from this cluster were identified in almost all interventions (93%) from the health and social care setting but in less than half (43%) in the education settings (*Figure 28*).

Restructuring the physical environment (behavior change technique 12.1)

> *Change, or advise to change the physical environment in order to facilitate performance of the wanted behavior or create barriers to the unwanted behavior (other than prompts/cues, rewards and punishments).*
>
> *Michie* et al.[52]

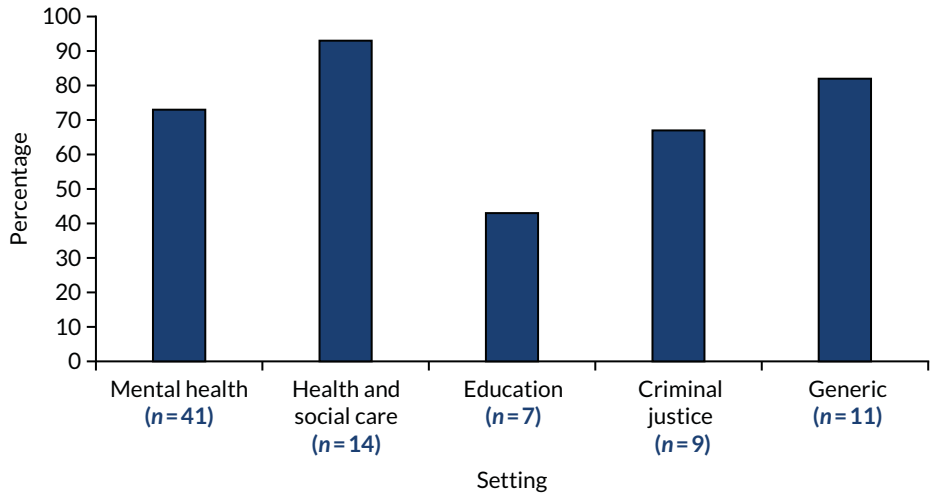

FIGURE 28 Cluster 12 (antecedents) by setting (% of interventions in each setting containing BCTs from this cluster).

Examples of restructuring the physical environment were found in 23% of interventions (see *Figure 28*). Multiple examples of changes to the physical environment were detected, many of which involved the installation of a sensory or comfort room or zone:[33,77,114,129,156,164,165,183,194]

> *The Unit's sensory room contained a variety of sensory equipment, including a rocking chair, weighted blankets, fidget toys, scented oils, candy and teas, pictograph cards (i.e. flashcards depicting pleasant or calming images), music and projected images (e.g. bubbles floating or rivers running).*
>
> *West* et al.[164]

The introduction or improvement of recreational spaces, such as playgrounds, was another physical change.[114,166] Some interventions also reported making physical changes to create a low-stimulation environment (i.e. with low noise and lighting)[85,122] and decorative changes to improve the appearance and maintenance of the setting[82,102,122,168,181,202] and personal spaces, such as bedrooms:[122,172]

> *The therapeutic environment intervention involved making inexpensive physical changes, including repainting walls with warm colors, placement of decorative throw rugs and plants, and rearrangement of furniture [. . .] The second intervention included replacing worn-out furniture.*
>
> *Borckardt* et al.[181]

Others removed locks and improved free access to outdoor spaces to facilitate independence.[168,174,180]

Restructuring the social environment (behavior change technique 12.2)

> *Change, or advise to change the social environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour (other than prompts/cues, rewards and punishments).*
>
> *Michie* et al.[52]

Restructuring the social environment (BCT 12.2) was the second most common BCT detected, appearing in 69% of interventions (see *Figure 28*) and in three out of the five settings. The frequency with which this BCT was detected is partly attributable to its broad definition and how it was operationalised. The social environment was conceptualised in three ways: (1) milieu and culture, (2) communication and social interaction and (3) staffing and peer support.

Various interventions referred to changing the culture,[89,120,174] for example 'creating a culture of caring',[116] organisational culture change[82,116] and creating a supportive and therapeutic milieu:[82,110,183]

> *Assessing for distress or threat within the therapeutic milieu of residential programs is [an important innovation]. Residential-based TST teams now have a system and format for regularly discussing [team functioning] and ascertaining whether individual team members (or the team as a whole) are effecting a distressed or threatening environment.*
>
> *Brown* et al.[78]

These broad changes often included revising rules,[82,178,181] clarifying expected behaviours,[163,168,199] increasing freedoms[33,89,176,203] and introducing restrictive practice reduction policies:[210]

> *The rules and language intervention included the establishment of a team for each unit that was tasked with reviewing and modifying unit rules and policies to be less restrictive to patients or eliminating unit rules that were too restrictive.*
>
> *Borckardt* et al.[181]

This BCT was also coded where interventions described making changes to improve communication or social interaction. Some changes involved opportunities for children to socialise with each other[89] or with their families:[105,115]

> *Youth and family commitment was a key to [. . .] success [. . .] The hospital has implemented many youth and family activities, which have enhanced their participation together at the facility. Many families were reimbursed for . . . travel to family meetings, or medical cabs were accessed. Visitation by families has been encouraged.*
>
> *Azeem* et al.[105]

Others involved opportunities for staff to socialise with children, such as at mealtimes.[89,105,115,168] Often in conjunction with such social opportunities were improvements to communications with children and their families, such as via meetings or information-sharing:[82,89,105,168,174,178,181]

> *Other Sanctuary Model tools such as community meetings, where the 'community' of staff and girls would gather regularly, and red-flag meetings, arranged to defuse a potentially serious incident, were held consistently. Sanctuary was also incorporated into after-care planning and in work with the girls' families.*
>
> *Elwyn* et al.[178]

Azeem *et al.*[105] also mentioned providing access to interpreters.

A key aspect of improved communication as a form of restructuring of the social environment was the active involvement of children and their families in planning and setting goals in meetings,[82,85,115,168,176,193,207] training sessions and evaluations.[89,116] Similarly, the involvement of front-line staff by management in planning and achieving change was coded to this BCT:[89,116,178,211]

> *Involve staff. Staff asked to make this change must be part of the process; otherwise early buy-in and support for the new direction will be compromised. Staff often know far better where the operational obstacles lie and have pragmatic ideas about how to address them.*
>
> *Caldwell and LeBel*[116]

Staffing changes, such as increased staffing during critical periods, and task-sharing were also coded as restructuring the social environment.[82,85,168,178,207] Colton[82] reported that it was possible for organisations to influence the implementation of seclusion and restraint measures, provided that staffing levels were adequate at critical points in the day such as transitions, shift changes and evenings.

Changes to staffing and organisational culture were reinforced by managerial support and leadership,[30,82,88,105,115,116,178,207] peer support,[105,178] team building[115] and the establishment of working groups, task forces and implementation teams:[85,168,183]

> *Development of strategies to improve interdisciplinary communication. A subcommittee of the task force set up multidisciplinary mini-meetings, where the work of the aggression-free task was discussed and feedback was encouraged.*
>
> *Goren* et al.[168]

Adding objects to the environment (behavior change technique 12.5)

> *Add objects to the environment in order to facilitate performance of the behavior.*
>
> *Michie* et al.[52]

Adding objects to the environment (BCT 12.5) was detected in 11% of interventions (see *Figure 28*), such as where sensory equipment[33,39,105,114,129,156,164,165,194] and recreational/occupational equipment[105,114,115] were provided as part of the intervention. Kaltiala-Heino *et al.*[198] also described the requirement for staff to carry an alarm device.

Cluster 13 (identity)

Two out of the five BCTs in cluster 13 (identity) were identified, accounting for 6% of all BCTs identified. These BCTs were BCT 13.1 (framing or reframing) and BCT 13.2 (identification of self as role model) and they were identified in 48% of interventions overall (although the rate ranged from 29% to 64%) (*Figure 29*).

Identification of self as role model (behavior change technique 13.1)

> *Inform that one's own behavior may be an example to others.*
>
> *Michie* et al.[52]

The BCT identification of self as role model (BCT 13.1) was detected in 24% of the interventions (see *Figure 29*). Several interventions used the concept of a role model or role modelling by managers,[108,160,178] team leaders[174] and other key staff:[41,183]

> *Managers modelled responses to challenging situations in ways that did not include the use of physical restraints.*
>
> *Sanders*[108]

In some interventions, trained staff took on the role of internal expert, trainer or champion:[115,168–170,178,194]

> *Develop a cadre of staff who can share their expertise by providing training to their colleagues, thus expanding our still-limited training resources.*
>
> *Girelli*[210]

Often this drew on a train-the-trainer model[79,118,172,176,183] or mentoring.[128,180,213]

Framing/reframing (behavior change technique 13.2)

> *Suggest the deliberate adoption of a perspective or new perspective on behavior (e.g. its purpose) in order to change cognitions or emotions about performing the behavior (includes 'Cognitive structuring').*
>
> *Michie* et al.[52]

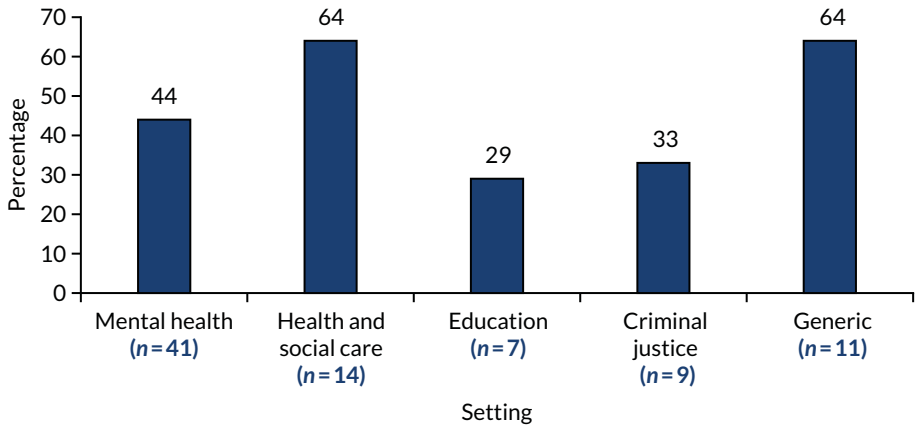

FIGURE 29 Cluster 13: Identity by setting (% of interventions in each setting containing BCTs from this cluster).

Framing/reframing (BCT 13.2) was another commonly identified BCT, detectable in 42% of interventions (see *Figure 29*). Many interventions sought to encourage staff using framing/reframing and often this was informed by a specified model or approach, such as strengths-based care,[40,105,116,214] trauma-informed care,[78,85,105,114,116,120,122,171,172,177,178,181,183,190,193,207] recovery-oriented care,[77,99,188,193] CPS[92,112] and positive behavioural support:[100,126]

> *For trauma-informed care, all unit staff attended a half-day standardized training seminar on the nature of trauma and its effects on patients' experiences, physiology, and psychological processes, along with instructions on how to minimize engaging in behaviors that could exacerbate trauma related reactions from patients.*
>
> *Borckardt* et al.[181]

Within or in addition to these approaches, staff were encouraged to reframe their views of the children they worked with, such as the origins of their challenging behaviour[174] or their expectations of their abilities:

> *Through debriefings, case processing, and team meetings, we found that staff interventions were based on the patient's chronological and/or physical age rather than on the patient's cognitive/social/emotional age. [. . .] We educated staff . . . for assessing and reassessing a patient's developmental ages and discussed appropriate developmental age expectations and interventions.*
>
> *Fralick*[176]

Similarly, interventions encouraged framing/reframing of staff views of children's behaviour and its meaning.[110,168,180] Finally, staff were encouraged to reframe their beliefs about restraint, for example as a 'last resort'[33] and as harmful and not therapeutic.[194] They were also encouraged to view their relationships with the children as a therapeutic tool.[170,210] Framing/reframing was usually initiated through training.[33,39,111] At the organisational level, framing/reframing could be detected in descriptions of culture change[89,108,193] and paradigm shifts.[91,115]

Cluster 14 (scheduled consequences)

The single BCT identified from the 10 in cluster 14 (scheduled consequences) accounted for < 3% of all BCTs identified. Cluster 14 was the least often detected (2% of interventions). It was not detected at all in education, criminal justice or generic settings, and at very low rates in mental health and health and social care settings (*Figure 30*).

Remove punishment (behavior change technique 14.10)

> *Arrange for removal of an unpleasant consequence contingent on performance of the wanted behavior (includes 'Negative reinforcement').*
>
> *Michie* et al.[52]

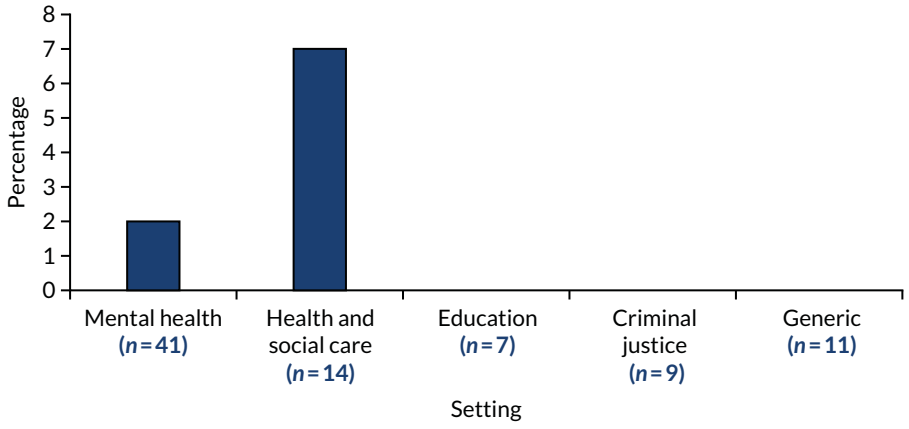

FIGURE 30 Cluster 14 (scheduled consequences) by setting (% of interventions in each setting containing BCTs from this cluster).

Only one BCT from cluster 14 (scheduled consequences) was identified: remove punishment (BCT 14.10). This BCT was detected in interventions from mental health settings only, amounting to 2% of all interventions (see *Figure 30*). This BCT captures the avoidance of undesirable consequences if the desired behaviour is performed. Three interventions described creating a non-punitive environment and debriefing sessions being conducted in a non-punitive and supportive manner, without attributing blame.[33,174,193]

Undetected behavior change techniques and behavior change technique clusters in interventions

Behavior change techniques from cluster 15 (self-belief) and cluster 16 (covert learning) were not detected in any of the interventions.

A total of 56 (60%) individual BCTs were not identified in any of the interventions (see *Appendix 7*). It should be noted that for a BCT to be identified in an intervention, evidence of its presence needed to be documented in the intervention materials. Therefore, there may be instances in which a BCT remained unidentified because of a lack of evidence.

Conclusion

Application of the BCT taxonomy to 82 interventions that sought to reduce restrictive practices in children's settings identified 36 out of a possible 93 BCTs. The most frequently BCT identified was BCT 4.1 (instruction on how to perform the behaviour), reflecting the high use of training within interventions.

Chapter 6 Results of the behaviour change technique synthesis: behaviour change techniques related to intervention procedures, outcomes and mechanisms of action

This chapter presents further detail about how the BCTs identified related to the different intervention procedures, intervention outcomes and the mechanisms of action theorised to be at work.

Intervention procedures

The majority of the interventions used more than one procedure (e.g. staff training and data review), and, as such, it was not possible to identify which BCTs were found within individual procedures. However, 20 of the interventions used only one procedure (six different procedures were used only once); therefore, it was possible to look at what BCTs were used in relation to these six procedures. The six different procedures and the number of interventions they were used in are shown in *Table 24*.

Training was the most frequently used single procedure and was used in nine interventions. The most frequently identified BCTs were BCT 4.1 (instruction on how to perform the behaviour), BCT 12.2 (restructuring the social environment), BCT 1.1 (problem-solving), BCT 1.4 (action-planning), BCT 2.7 (feedback on outcomes of behaviour) and BCT 13.2 framing/reframing.

The rest of the procedures were used in only a small number of interventions. Data review, risk assessment and guidelines or policy change were all identified as lone procedures in three interventions each. The most frequently identified BCTs in data review studies were BCT 4.1 (instruction on how to perform the behavior), BCT 12.2 (restructuring the social environment), BCT 2.7 [feedback on outcome(s) of behavior], BCT 1.4 (action-planning) and BCT 1.2 (problem-solving). The BCTs associated with the introduction of risk assessment were BCT 4.1 (instruction on how to perform the behavior), BCT 12.2 (restructuring the social environment), BCT 2.7 [feedback on outcome(s) of behavior], BCT 1.4 (action-planning), BCT 1.2 (problem-solving) and BCT 13.2 (framing/reframing). Three studies used guidelines and policy change as a lone procedure. The BCTs most frequently identified in these three studies were BCT 2.7 [feedback on outcome(s) of behaviour], BCT 1.4 (action-planning), BCT 1.2 (problem-solving) and BCT 13.2 (framing/reframing).

TABLE 24 Procedures used by interventions containing only one procedure

	Responses	
Intervention procedure	Number	Percentage
Training	9	45
Data review	3	15
Risk assessment tools	3	15
Guidelines or policy change	3	15
Staff involvement	1	5
Milieu changes	1	5
Total	20	100

Milieu changes and staff involvement alone were used in one study each. Apart from the restructuring and instruction, the most frequent BCT related to milieu change was BCT 13.2 (framing/reframing). The BCTs related to staff involvement were BCT 13.1 (identification of self as role model), BCT 3.2 [social support (practical)], BCT 1.4 (action-planning), BCT 2.7 [feedback on outcome(s)] and BCT 13.2 (framing/reframing).

When BCTs used in all interventions, regardless of the number of procedures, were collected, all had BCT 4.1 (instruction on how to perform the behavior) and BCT 12.2 (restructuring the social environment) as the two most commonly identified. When the remainder of the interventions are looked at by the procedures, some differences can be seen. (It was not possible to disaggregate any of these procedures from the others used simultaneously, so these BCTs must be viewed in that context.)

Figure 31 shows the BCTs identified in ≥ 50% of the interventions according to the procedures they contained. The only other BCT used in > 50% of interventions using sensory approaches was BCT 7.1 (prompts/cues). Similarly, only BCT 13.2 (framing/reframing) was commonly used in interventions using milieu changes. Over half of interventions using staffing changes used BCT 13.2 (framing/reframing) and BCT 13.1 (identification of self as role model). BCT 1.4 (action-planning) was found across all the interventions except these three. The interventions that used environmental changes and promoted involvement of CYP and their families used a higher number of BCTs than those that did not.

Behaviour change techniques and outcomes

One objective of the study was to identify and prioritise BCTs that show promise of effectiveness for testing in future interventions. Sixty-seven of the interventions had been subject to evaluation and, of these, 29 had reported statistically significant positive findings and 38 had not. *Table 25* shows the different BCT content of interventions that had reported positive findings and those that did not.

The ranking of the BCTs is very similar. The two most frequent are the same, although the percentage of interventions with positive outcomes is higher for BCT 4.1 (instruction on how to perform the behavior) than for BCT 12.2 (restructuring the social environment), both found in > 60% of all interventions. Those interventions without positive findings featured BCT 1.4 (action-planning) third most frequently, used in 66% of those without positive findings compared with only 33% of those with positive findings. In those interventions with positive findings, the most frequent BCTs were BCT 2.7 [feedback on outcome(s) of behavior] and BCT 1.2 (problem-solving). Eighteen per cent more of the unsuccessful interventions used BCT 2.7 than those reporting positive outcomes.

The evaluations used a broad range of outcome measures, as described in Chapter 4. This makes it difficult to compare interventions on their specific outcomes. However, the two most frequently reported outcomes were (1) a reduction in the number of incidents of restraint (used by 30% of interventions; $n = 20$) and (2) a reduction in the number of incidents of seclusion (used by 14% of interventions, $n = 9$). Eighteen evaluated interventions reported a significant reduction in incidents of restraint and six reported a significant reduction in incidents seclusion. The BCTs identified in > 20% of these interventions are shown in *Figure 32*.

As seen in *Table 26*, the two most frequently identified BCTs are again BCT 4.1 (instruction on how to perform the behavior) and BCT 12.2 (restructuring the social environment), with BCT 2.7 [feedback on outcome(s) of behavior] ranking third for both outcomes. BCT 13.2 (framing/reframing), BCT 13.2 [social support (practical)], BCT 1.4 (action-planning) and BCT 1.2 (problem-solving) were identified in higher percentages of interventions that reduced incidents of seclusion, as well as BCT 2.2 (feedback on behavior), BCT 2.3 (self-monitoring of behavior) and BCT 1.9 (commitment), which were absent from > 20% of the interventions that reduced incidents of restraint.

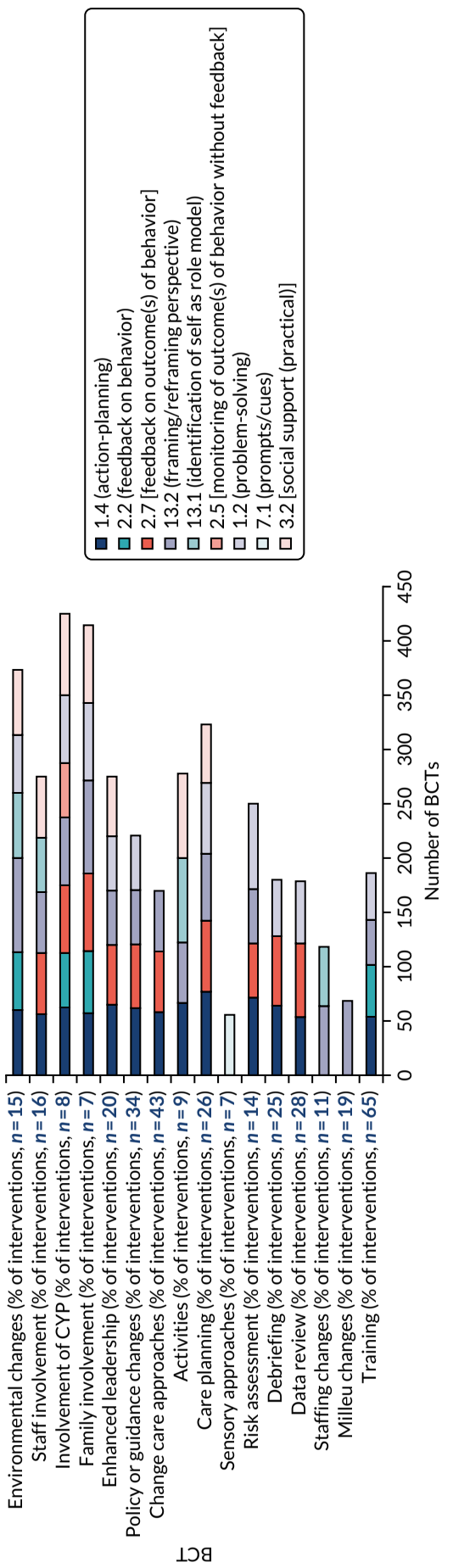

FIGURE 31 Different BCTs identified in interventions using specific procedures.

TABLE 25 The BCT content of evaluations that reported significant positive findings and those that did not

BCT	Percentage of interventions with positive findings in which BCT was detected	Percentage of interventions without positive findings in which BCT was detected	Difference (%)
4.1 (instruction on how to perform the behavior)	87 (rank 1)	71 (rank 1)	16
12.2 (restructuring the social environment)	63 (rank 2)	68 (rank 2)	−5
2.7 [feedback on outcome(s) of behavior]	40 (rank 4)	58 (rank 4)	−18
1.2 (problem-solving)	40 (rank 4)	42 (rank 5)	−2
13.2 (framing/reframing)	37 (rank 5)	37 (rank 7)	0
1.4 (action-planning)	33 (rank 6)	66 (rank 3)	−32
4.2 (information about antecedents)	30 (rank 7)	16	14
13.2 [social support (practical)]	20 (rank 10)	39 (rank 6)	−19
12.1 (restructuring the physical environment)	20 (rank 10)	24 (rank 8)	−4
13.1 (identification of self as role model)	20 (rank 10)	21 (rank 9)	−1
7.1 (prompts/cues)	21	20 (rank 10)	−1
8.1 (behavioral practice or rehearsal)	16	17	1
1.9 (commitment)	21	13	−8
2.5 [monitoring of outcome(s) of behavior without feedback]	13	13	0
12.5 (adding objects to the environment)	11	10	−1
10.4 (social reward)	8	10	2
2.2 (feedback on behavior)	8	10	2
6.2 (social comparison)	5	10	5
3.1 [social support (unspecified)]	3	10	7
3.3 [social support (emotional)]	3	10	7
2.3 (self-monitoring of behavior)	13	7	−6
1.3 [goal setting (outcome)]	11	7	−4
5.1 (information about health consequences)	8	7	−1
11.2 (reduce negative emotions)	3	7	4
1.1 [goal setting (behavior)]	0	7	7
2.1 (monitoring of behavior by others without feedback)	0	7	7
2.4 [self-monitoring of outcome(s) of behavior]	8	3	−5
10.5 (social incentive)	5	3	−2
5.2 (salience of consequences)	5	3	−2
6.1 (demonstration of the behavior)	5	3	−2
1.7 [review outcome goal(s)]	3	3	1
10.10 [reward (outcome)]	0	3	3
14.10 (remove punishment)	0	3	3
5.4 (monitoring of emotional consequences)	0	3	3
5.6 (information about emotional consequences)	5	0	−5
9.1 (credible source)	5	0	−5

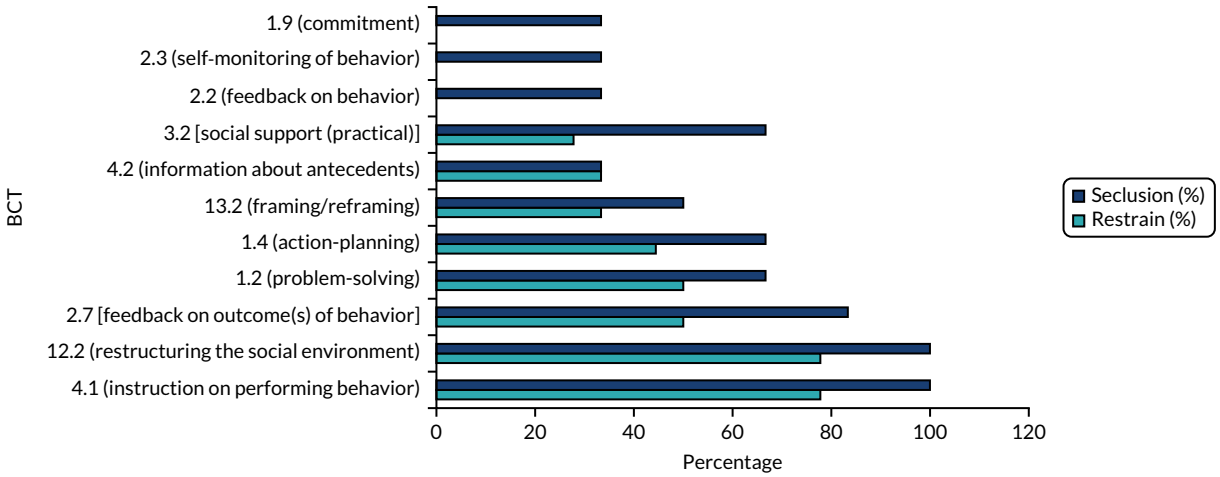

FIGURE 32 The BCTs identified in > 20% of interventions that successfully reduced incidents of restraint and seclusion.

TABLE 26 Ranked order of BCTs significantly reducing restraint and seclusion

All interventions	Interventions that significantly reduced restraint	Interventions that significantly reduced seclusion
4.1 (instruction on how to perform the behavior)	4.1 (instruction on how to perform the behavior)	4.1 (instruction on how to perform the behavior)
12.2 (restructuring the social environment)	12.2 (restructuring the social environment)	12.2 (restructuring the social environment)
1.4 (action-planning)	2.7 [feedback on outcome(s) of behavior]	2.7 [feedback on outcome(s) of behavior]
2.7 [feedback on outcome(s) of behavior]	1.2 (problem-solving)	1.2 (problem-solving)
1.2 (problem-solving)	1.4 (action-planning)	1.4 (action-planning)
13.2 (framing/reframing)	13.2 (framing/reframing)	3.2 [social support (practical)]
3.2 [social support (practical)]	4.2 (information about antecedents)	13.2 (framing/reframing)
4.2 (information about antecedents)	3.2 [social support (practical)]	4.2 (information about antecedents)

The list of identified BCTs does not account for the multiple procedures within these interventions, nor does it account for the small number of studies that reported significant reduction in incidents of seclusion ($n = 6$). When these are compared with all interventions, BCT 1.4 (action-planning) drops rank from third to fifth with both groups of interventions that reduced restraint and seclusion and BCT 2.7 [feedback on outcome(s) of behavior] and BCT 1.2 (problem-solving) are ranked third and fourth. The ranking of the two most frequent BCTs remains unchanged.

The intervention evaluations were implemented in different settings. Those that reported significant positive findings were separated by setting and the BCTs were examined (criminal justice was excluded from this analysis as there was only one case). Mental health and social care settings were both dominated by BCTs 4.1 (instruction on how to perform the behaviours) and 12.2 (restructuring the social environment).

The interventions designed for use in generic settings used the most BCTs. Notably, all used BCT 2.7 [feedback on outcome(s) of behavior]. Educational settings were the only setting where over half of the interventions used BCT 7.1 (prompts/cues) to change staff behaviour (*Figure 33*).

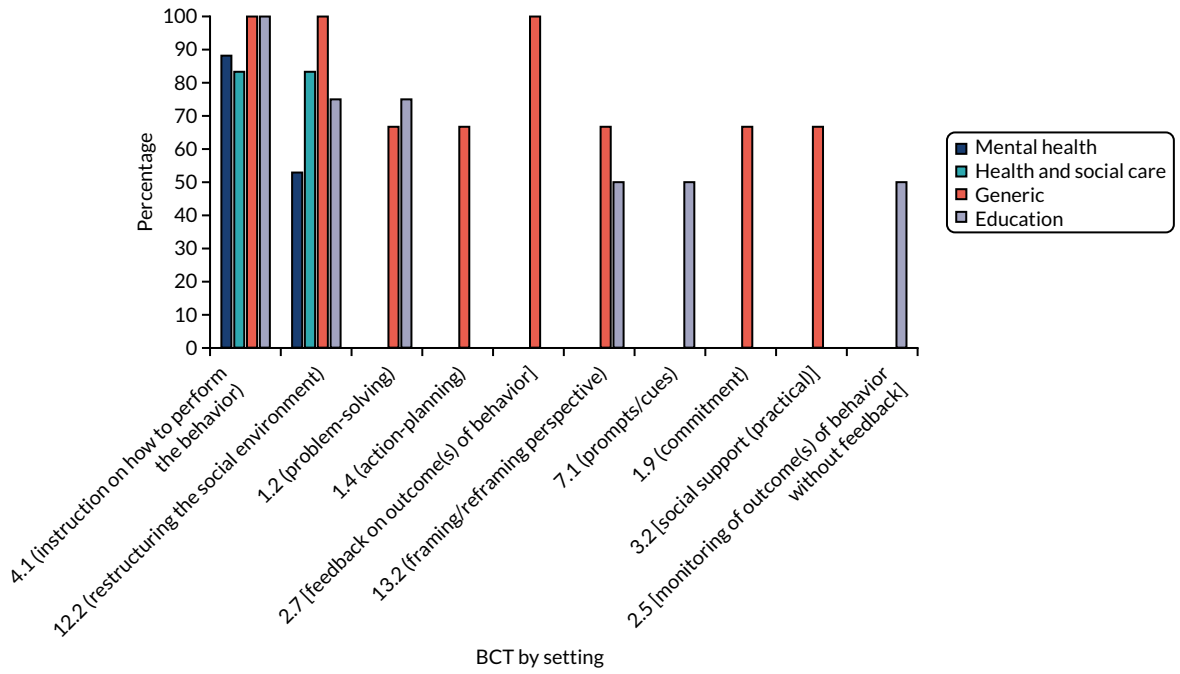

FIGURE 33 The BCTs identified in > 50% of interventions reporting significant positive findings by setting.

Mechanisms of action

Mechanisms of action are theoretical constructs that explain how BCTs affect behaviour. Twenty-six mechanisms of action, derived from both the theoretical domains framework and a systematic review of 83 behaviour change theories, have been specified. Understanding how specific BCTs change behaviour can support intervention theory development and testing and inform increasingly effective and efficient interventions. The Theory and Technique tool[215] was used to identify the mechanisms of action for which there were identified links with the BCTs most frequently identified in studies reporting positive findings. These are summarised in *Table 27* in addition to the mechanisms of actions through which they are theorised to work.

The most common mechanisms of action related to BCTs used in studies with positive significant findings was environmental control and resources. This is defined as changes to 'aspects of a person's situation or environment that discourage or encourage the behaviour'.[216] BCTs linked with this were 3.2 [social support (practical)], 7.1 (prompts/cues), 12.1 (restructuring the physical environment) and 12.2 (restructuring the social environment).

The second most frequently occurring mechanism of action was behavioural cueing, defined as the process by which a behaviour is triggered from the external environment, the emergence of ideas or the performance of another behaviour. The BCTs that were related to this mechanism were 1.4 (action-planning), 7.1 (prompts/cues) and 12.1 (restructuring the physical environment).

The third most common mechanisms of action were knowledge, behavioural regulations and belief about capabilities. Knowledge was targeted by two BCTs: BCT 4.1 (instruction on how to perform the behavior) and BCT 4.2 (information about antecedents). Behavioural regulation was targeted by BCT 4.2 (information about antecedents) and BCT 1.2 (problem-solving). Belief about capabilities included BCT 1.2 (problem-solving) and BCT 4.1 (instruction on how to perform the behavior).

This more detailed look at where different BCTs were used has shown that where procedures had been used on their own interventions they showed little variation in the two most popular BCTs, 4.1 (instruction on how to perform the behavior) and 12.2 (restructuring of the social environment).

TABLE 27 The BCTs in evaluations with positive findings and the mechanisms of actions through which they are theorised to work

Light blue, no links; dark blue, inconclusive links; orange, links; white; no evidence.
Attb, attitudes towards the behaviour; BaCa, belief about capabilities; BaCo, belief about consequences; BC, behavioural cueing; BR, behavioural regulation; ECR, environmental context and resources; Em, emotion; FP, feedback processes; GAB, general attitudes/beliefs; Go, goals; In, intention; Kn, knowledge; MADP, memory, attention and decision processes; Mo, motivation; Ne, needs; No, norms; Op, optimism; Psv, perceived susceptibility/vulnerability; Re, reinforcement; SI, social influences; Si, self-image; Sk, skill; SLI, social learning/imitation; Sn, subjective norms; SPRI, social/professional role/identity; Va, values.

After these two there was some variation by procedure. Exploration of outcomes was also hampered by the use of many different outcome measures used in interventions. When studies reporting positive findings in the two most frequently used outcomes (incidents of restraint and incidents of seclusion) were explored, these showed that the same BCTs were in most frequent use in interventions that successfully reduced incidents. The mechanisms of action related to the most frequently identified BCTs were those relating to changes to a person's broad social and physical environment to encourage desired behaviours. These relationships are summarised in *Table 27*.

Chapter 7 Discussion

Introduction

In March 2020, the UK press[217] reported that the Ministry of Justice was being challenged by Article 39, a children's charity, to release details of child restraint in prisons. The Ministry of Justice was asked to release records giving the reasons for the use of pain-inducing restraint [i.e. 'managing and minimising physical restraint' (MMPR)] had been used, on 260 occasions during 2017–18, in young offender institutions and secure training centres.[217]

The use of restrictive practices with children remains a pertinent, ongoing issue. Children who are already vulnerable may be at higher risk of being restrained. Wisdom *et al.*[114] reported that, according to the New York Office of Mental Health, children were five times more likely than adults to be put in restraint or seclusion. Restraints seem to be performed more frequently on elementary/primary students (aged 5–11 years) than their older peers.[113,218]

Overall, the literature on interventions to reduce restrictive practices in CYP's settings presents a complex picture. There is a lack of consistency and comprehensiveness in reporting. This results in an evidence base that is of limited value for informing decisions about the development, implementation and evaluation of interventions. There is a strong tendency for interventions to have multiple components, and this, combined with the poor reporting, further limits the potential of the evidence base to inform practice. The study results therefore suggest an urgent need to simplify and streamline interventions and intervention reporting.

Criminal justice

The review included records addressing the use of restrictive practices in youth justice settings.

In 2004, 14-year-old Adam Rickwood died in custody in the UK, having taken his own life after being struck by a member of staff using an approved restraint technique.[23] Concerns surrounding this event led to an independent review of restraint in juvenile secure settings,[219] which concluded that, in secure settings (secure training centres, young offender institutions and secure children's homes), if a child's behavior constitutes a high risk to themselves or others, it might on occasion be necessary to use force to restrain children.

The report[219] recommended that, when physical restraint is used, the focus should be on preventing the risk of physical or psychological harm and risk of harm to a safe environment; moreover, consistent criteria for using restraint should be introduced and adhered to, alongside other mechanisms to enhance and audit standards of care.

Subsequent UK government publications from the Youth Justice Board for England and Wales concerned guidance for secure establishments on the development of restraint minimisation strategies[199] and governance and safeguarding processes associated with MMPR.[192] In 2011, a follow-up report[187] on implementing the independent review of restraint in juvenile secure settings concluded that there had been progress towards changing the culture around the restraint used in CYP's secure settings. At the same time, the authors highlighted a concern around pain compliance (using pain to achieve compliance).

That cultural change was taking place in tandem with the continuation of potentially harmful practices raises a familiar question of whether to prioritise systemic issues or day-to-day practice in the setting. However, the current review has found that many interventions to reduce restrictive practices take a whole-systems approach intended to address problematic issues at different points within the organisation.

There is more recent government guidance on reducing the need for restraint and restrictive interventions with CYP in health, education and some residential settings (e.g. Department for Education and Department of Health and Social Care[30]). MMPR[23] is an example of the separate guidance that pertains to the youth criminal justice sector.

Minimising and managing physical restraint/pain compliance

The use of MMPR in youth justice settings was reviewed in 2015.[23] At this point in the roll-out of MMPR, the reviewers raised specific concerns about restraining children on the floor, head holds and pain-inducing techniques, but found sufficient indicators of progress to support a cautious recommendation that the programme should continue.[23] Nevertheless, concerns about MMPR techniques, including pain compliance, were acknowledged by the government,[187] the voluntary sector[220] and elsewhere.[217]

In 2018, the Ministry of Justice commissioned an independent review of the use of pain-inducing techniques in the youth secure estate.[221] The report's recommendations, including a ban on pain-inducing restraint in youth custodial settings, were all accepted by the government.[222,223] Hence, in the period since Adam Rickwood's death,[217,222,223] progress has been reported in cultural and structural dimensions. The ending of pain compliance may represent some movement away from punitive value systems.

Beyond the UK

The developments in the UK are not dissimilar to those in the USA. After the press exposé in 1998 of abuses in the US children's sector,[83] there was a rapid growth in the development of interventions to reduce restrictive practices, as this review has shown. Among these, TARGET was adopted by the Juvenile Justice System[128] and the 6CS enjoyed the support of SAMSHA (Substance Abuse and Mental Health Services Administration) and NASMHPD and was suggested as suitable for juvenile justice settings.[116] As the current review has highlighted, the strategies that emerged tended to share, first, a philosophy of trauma-informed care and, second, a preference for multifaceted interventions.

This review found evidence of a trauma-informed approach in many of the interventions, including those applied or applicable in justice settings.[105,116,119,121,128–130,178] Greene *et al.*[110] reported that CPS was effective in juvenile detention settings, and the TARGET intervention, which arguably has more complexity, demonstrated a positive correlation between trauma-informed approaches and good outcomes in justice settings.[128] When the intention was to achieve improvements via system change, this might also be trauma informed. For instance, Elwyn *et al.*[178] reported a trauma-informed organisational change model in a girls' juvenile justice setting. The 6CS also targets system change, as do many of the stand-alone interventions found in this review.

This highlights what Elwyn *et al.*[178] described as an essential contradiction between organisational goals of care and rehabilitation versus punishment and control.[178] Lipsey[224] pointed out that the evidence does not favour punitive regimens, even (or especially) in the justice system, where there is a particularly high proportion of children who have experienced trauma. WHO's position[194] is that seclusion and restraint should not be considered to be interventions of last resort, and Kaltiala-Heino *et al.*,[198] advocating for a therapeutic environment in justice settings, argued that physical restraint per se does not have therapeutic merit.

Overview of interventions

This review has generated an overview of interventions aimed at reducing restrictive practices with CYP in institutional settings, and thus meets objective 1. The environmental scanning method[68] identified useful grey literature and social media sources, including training organisation websites and videos, showing that many service providers are developing their own interventions, adapting existing ones without reporting fidelity or applying existing ones without reporting useful levels of detail about

intervention or study procedures. Therefore, an important advantage of the environmental scanning approach is that it can capture interventions that may not have been evaluated, reported or published, but which are nevertheless used in real-world settings, with real children.

The most common procedures focused on staff training. Other procedures related to guideline or policy change, risk assessment tools, data review, milieu changes and changes to therapeutic approach (e.g. introducing trauma-informed care). This contrasted slightly with the most common procedures in the earlier companion review[47] of interventions to reduce restrictive practices in adult mental health inpatient services, which found that the most commonly used procedures in those settings were training, audit and feedback, and nursing changes. This may in part be attributable to the wider variety of settings explored in the current review.

These observations should be viewed with caution. The value of a review of the literature is that it can collate and synthesise evidence to inform policy and practice decisions. In the present case, such decisions are likely to have a direct effect on the experiences of vulnerable CYP in institutional settings. It has been noted throughout the review that the reporting found in the literature is poorly aligned with the WIDER recommendations for reporting.[69] Evidence-informed decision-making relies on a sufficiently robust evidence base, yet despite the importance of the topic focused on in this review, the evidence appears to be weak.

Service user perspectives

The review found very few reported examples of service user involvement in the development of interventions, or even in their evaluation, despite the United Nations' principle of children's participation[27,225,226] Service users interviewed in a Canadian study[227] explained that restraint made them feel sad and angry; in contrast, staff interviewed for the same study described feelings of anxiety in relation to restraining service users. This suggests important differences with potentially great relevance for strategies to reduce the use of restrictive practices. The current review has identified what may be a lack of children's participation in this field. Empirical research from Norway and other countries has identified barriers to children's involvement including structural constraints,[228] lack of understanding of why children's perspectives are relevant[229] and reluctance on the child's part.[229]

Classification of intervention components

Intervention components were classified in terms of BCTs and their frequency of use was determined, thus meeting objective 2.

Multicomponent interventions

A number of records (e.g. Girelli[210]) made the argument that complex problems require multidimensional solutions but, although the components appear to work better together than in isolation, the approach defies attempts to evaluate individual strands. Multicomponent interventions may involve many process elements that cannot be evaluated separately (e.g. Ubana *et al.*[102]).

Despite a lack of effectiveness evidence, there appears to be more investment in complex interventions that use a number of mechanisms (e.g. at both individual and setting levels) than with simple interventions. It may be the case that an intervention with a single component, such as educating staff about trauma or installing a sensory room, would be sufficient to address issues with restrictive practices.

A tendency for multicomponent interventions was previously noted in the literature. Wilson *et al.*[230] observed that methodological inconsistencies in the literature limit the relevance of reported reductions in restraint, but also made the point that interventions are not necessarily designed with a view to producing evidence. To enhance the potential success of interventions development, it may be beneficial to consider participatory or collaborative approaches that are developed in partnership with both children and staff.[29]

Identification of process elements

Process elements in intervention delivery were identified to some extent and, therefore, objective 3 was partially met.

It was not necessarily clear whether or not process elements had been considered, and to what extent they may have affected outcomes. For instance, gender may affect intervention delivery: Shadili *et al.*[101] suggested that the gender of the staff may have influenced how violence was managed. The way in which interventions were introduced could also confound attempts to clarify cause and effect.[111,112,125] It is clear that this is not easily resolved. LeBel *et al.*[40] (2009), whose work routinely incorporates costing calculations, explained that it had not yet been possible to quantify the interventions that help to reduce restraint and seclusion, and thus firm conclusions could not be made.

It is unclear whether or not multicomponent interventions that combine, for example, training, a new nursing model, management changes and the introduction of a service user forum would increase benefits.

The records included a number of reports of milieu interventions that incorporated, as well as staff training, enhancements to staffing and leadership; generally, this is not clearly reflected in outcomes reporting and, therefore, it is not possible to conclude how individuals may be influencing the use of restrictive practices. It appears likely that staff are highly influential on the process of intervention delivery, yet the tendency to pool staff data masks the impact of individual staff roles. Staff were often treated as an homogeneous group for data collection, without acknowledgement of the impact of individuals and individual roles. Studies exploring differences between staff in the health and social sectors have identified that factors such as training, experience, skill mix, age, gender, job satisfaction and expectations can all have an impact on how an individual approaches their professional duties.[231,232]

Costs

Some records reported costs (e.g. LeBel and Goldstein,[39] Health Sciences Center Winnipeg[104] and Forrest *et al.*[172]), but, again, with widely varying units of calculation that prevented comparison. Arguably, it would be advisable to avoid investing financial and other resources in interventions that have not been rigorously evaluated, or else have not demonstrated effectiveness.

Restraint and seclusion as measurable outcomes

The review also identified a lack of clarity about how to achieve aims. The broad aim of all the interventions was to reduce restrictive practices: restraints, seclusions or the use of as required medication. However, there was a range of strategies to achieve the aim, reflected in outcomes reporting that was inconsistent across the records.

One study[178] reported that the introduction of a new social culture and trauma-informed practice ultimately led to the departure of individuals who did not want the change, which helped the new regime to thrive. This level of detail about individual staff was unusual in the retrieved literature, but suggests that it may be relevant to consider staff retention as an outcome measure or even a change mechanism.

Comparisons across the data set were made difficult by differences in the outcomes measured between studies, even with respect to using the same intervention. For example, although the most common measurables by far were numbers of restraint and seclusion incidents, the numbers were calculated in different ways, such as simple counts or rates (e.g. per number of service users over a time period).

A count or a rate of restrictive practices does not portray specifics: potentially, a brief, low-intensity restriction without need for a physical intervention could be included for counting alongside a lengthy, complex and high-intensity incident. Restraint and seclusion incident numbers were by far the most

common measured outcomes, and there was little reporting of other relevant factors, such as the duration of a restrictive practice, whether or not mechanical restraints were used, how many patients were involved in the incident or how many people sustained injuries as a result. It can be argued that broad, collapsed data of this type may not easily portray the realities of practice and, therefore, have limited value for informing decision-making.

Comparison of intervention components between settings

Components of interventions in CYP's settings across target populations (i.e. different professions) and policy area (i.e. health, welfare, criminal justice) were compared with those in adult acute psychiatric inpatient settings[47] (see *Comparison with the results of the COMPARE study*). Potential explanations for any differences were considered and discussed, meeting objective 5.

Effectiveness

Evidence of effectiveness was explored through the examination of BCTs and intervention outcomes, although, again, the limitations of the evidence restricted the potential of the review to meet objective 4.

There was a lack of consistency in the approaches taken to evaluation. When the study design was described, no RCTs were identified, and only around one-third of the records reported quantitative data. Hence, there is a dearth of effectiveness evidence within and across interventions. This has been highlighted in the literature; for instance, Wilson *et al.*[230] identified a need for the use of robust methodologies, such as RCTs, to evaluate effectiveness.

Such difficulties add to study-specific issues that can confound attempts to evaluate cause and effect. Although in general confounders were rarely discussed, one report[96] highlighted the possibility that the observed reduction in restraint use might be associated with a change in prescribing practice during the course of the study.

Identification of potentially effective behaviour change techniques

As discussed, the review did not find robust evidence to support the identification and prioritisation of BCTs showing most promise of effectiveness; hence, objective 6 was only partially met.

For example, staff training was a consistent component of the identified interventions, yet reporting was at best inconsistent, with limited information about how many were trained, how the training was delivered and other relevant details. This made meaningful comparisons across studies impossible. For instance, nearly half of the records did not report whether training was delivered in-house or by an external provider, and only around one-fifth reported the number of training hours involved, with even fewer reporting how it was delivered, or detailing which staff groups received it. In addition, there appeared to be a widespread assumption that staff training would lead directly to staff behaviour change. Budlong[169] pointedly summarised some of the issues with training, describing a review of training vendors that:

> *[L]ed us to realize that trainers in the area of restraint claim an expertise and display an arrogance about their programs that prevent any meaningful dialogue about the inherent risks in their methods. All claim to be safe, effective [and widely applicable] with little or no risk of injury.*
>
> *Buldong*[169]

This discussion further identified a 'guru' mentality[169] in many of the larger training programmes that impeded objective analysis of inherent risks to young people, and appeared to be associated with a lack of scrutiny from accrediting bodies. Budlong[169] further argued that training should be perceived by organisational administrators and leaders as their responsibility, rather than something that can be bought in, delivered and forgotten about, and warned against a 'separation of training from organizational goals and everyday operations'.[169]

Budlong's article appeared in a practitioner-oriented publication,[233] alongside others that showcased how children's service providers had used federal funding to address restrictive practices following the *Hartford Courant* exposé.[83,84] In the same publication, O'Brien[202] cautioned against over-reliance on training:

> *Interestingly, training data revealed that [a sub group of staff], on average, had the highest ratings on written and skill practice assessments, suggesting that training alone – independent of ongoing, consistent staff support and development – is a fairly weak intervention.*
>
> *O'Brien*[202]

This example of staff training highlights the need to avoid conflating prevalence of intervention components with effectiveness. The effectiveness evidence should be viewed with caution. Nonetheless, the BCT analysis identified BCTs that showed most promise of effectiveness and would be suitable for further exploration and testing. In ranked order, these were:

- instruction on how to perform the behavior (BCT 4.1 – frequently found in mental health and social care settings)
- restructuring the social environment (BCT 12.2)
- feedback on outcome(s) of behavior (BCT 2.7 – frequently found in generic settings)
- problem-solving (BCT 1.2).

Lack of detail in restrictive practices data

In addition to the need for consistency in outcome reporting, the evidence base would be enhanced by greater detail about the specifics of the restrictive practices. The number of staff involved in an incident was not reported at all, and neither was psychological harm. Furthermore, the fact that four records reported the number of injuries to staff and eight reported injuries to all, but no record reported both, suggests a lack of focus on injuries, especially to service users.

Recommendations from Wilson *et al.*'s[230] review remain relevant, and include a greater focus on assessing the effect of restraint and more detail about the type of restraint, including how it is defined.

It is widely accepted that some children in some settings are subjected to poor, potentially harmful, practices,[194] and that there can be difficulties with the accuracy and quality of incident reporting. The lack of service user perspectives in the evidence is therefore a concern and arguably an urgent matter for practice and research.

Comparison with the results of the COMPARE study[47]

As set out at the beginning of this report, this study is one of a pair addressing NICE's recommendation to systematically describe restrictive practices with adults and children, and is therefore linked with the research team's original study,[47] which fulfilled the first part of NICE's recommendation by systematically describing practice with adults. The current study reviewed the evidence for interventions to reduce staff use of restrictive practices in child/adolescent institutional settings. As anticipated, the results showed that the features of an intervention (its content and delivery) are likely to interact with the delivery context and with the features of the target behaviour. The intention was to compare interventions across these settings to permit exploration of the relationship between intervention features (content and delivery) and context (target population and setting), together with the identification of differences in content, influences on delivery and potential implications for effectiveness.

Analysis of the robustness of the results

As discussed (see *Effectiveness*), the review was unable to identify robust evidence of effectiveness and could only draw tentative conclusions regarding four promising BCTs. Robust conclusions may be drawn concerning the frequency of use of specific intervention components, notably staff training and

programmes that restructure the social or physical environment. Furthermore, the BCT analysis found that the most frequently occurring BCTs tended to occur in the same interventions that showed promising outcomes. Interventions are listed by study design in *Appendix 8*.

Strengths

To our knowledge, no previous reviews have looked at both the outcomes and components of interventions that aim to reduce restrictive practices in CYP's institutional settings. This study aimed to identify the most promising intervention components and recommend them to be tested within a trial setting, with a view to seeking future funding to develop and test an intervention based on the results of the review. The recommendations generated by this review are transferable, and this is one of its strengths: institutions that have children in their care could benefit from interventions that are better defined, more acceptable to children and staff, more completely and accurately implemented, and more cost-effective.

Table 28 compares and contrasts key findings from the current review of the use of restrictive practices in children's institutions settings, with key findings from the companion review of the use of restrictive practices in adult mental health settings.[46]

Limitations

The search strategy combined traditional search techniques for retrieving research and grey literature, with a scanning approach to identify potential alternative sources of relevant material. This had the advantage of enabling the retrieval of diverse records that reported intervention content and was useful for mapping the number and range of interventions; however, the diverse quality of reporting in some records retrieved in this way presented a challenge for the meaningful assimilation of findings. For example, a lack of detailed description of interventions may have masked the presence of BCTs, that consequently were not detected.

TABLE 28 Summary table: comparison of CONTRAST and COMPARE

CONTRAST: children's institutional settings	COMPARE: adult mental health inpatient settings
Multiple interventions, mostly stand alone	Multiple interventions, mostly stand alone
BCT credible source was detected in 2% of interventions from all children's settings	BCT credible source was detected in 18% of interventions
The (potential) contribution of the behaviour of individual staff was acknowledged in the interventions examined in CONTRAST	The (potential) contribution of the behaviour of individual staff was not addressed in the interventions examined in CONTRAST
Aspects of interventions coded with the BCTs action-planning (BCT 1.4), goal setting (BCT 1.1), monitoring of outcome(s) of behavior without feedback (BCT 2.5) and feedback on outcomes of behavior (BCT 2.7) included examples of interventions seeking, monitoring and planning for individual staff with high or unusual rates of restrictive practice use, or with training needs identified following involvement in an incident[33,114,162,193,199]	No such examples of targeting individual staff were found
Very little evidence of service user perspectives	Little evidence of service user perspectives
Interest in interventions involving non-medical or psychological approaches to reducing restrictive practices	Relatively little evidence of interest in non-medical or psychological approaches
Interest in trauma-informed approaches	Little evidence of interest in trauma-informed approaches

The adoption of a broad approach to searching and inclusion criteria led to the inclusion of a wide range of interventions in diverse formats. No criteria for exclusion on the basis of quality were developed. This is substantially different from normal systematic reviews of evidence. However, current practice in this area is of adopted interventions without a clear evidence base. There may remain some institutional settings/interventions which were not captured in our search as a result of databases searched.

The literature search was restricted to English-language records and there was limited evidence from countries outside the USA, so the findings may have limited international transferability. As noted in one of the included studies, there was a:

> *[C]lear divide between the numbers of published studies coming out of America compared to the rest of the world [which was] likely to change in the coming years.*
>
> *Wilson* et al.[230] *Reproduced with permission under the CC BY-NC-ND 4.0 licence*

The scope of the study did not allow for detailed analysis of effectiveness by setting, population group, culture, national context, or institutional ethos. Contextual factors, for example criminal justice settings or service users with intellectual disability, are likely to be highly relevant to decision-making regarding interventions. In addition, the finding that the evidence was weak restricted the scope of the study to examine the effectiveness of BCTs used in interventions. In these terms, transferability of the tentative conclusions about effectiveness has yet to be demonstrated. These are relevant areas for future research.

Implications for policy and practice and future research

The need to reduce restrictive practices in CYP's institutional settings is ongoing: this should be considered a priority for policy-makers. However, without clarity about current use of restrictive practices in CYP's institutional settings, evaluation of interventions could remain problematic.

It is clear that some groups may experience more severe restrictive practices than others; therefore, better understanding of the influence of gender, ethnicity, disability, and institutional setting and its governance is required. Exploration of how interventions can be adapted to reduce restrictive practice for different contexts is urgently needed.

Accessible guidelines for a core outcomes set that is feasible for researchers and practitioners to use in real-world settings could be a valuable step towards improving practice in CYP's settings.

With regard to both the more widely used interventions and the stand-alone interventions, there appears to be little appetite for simplicity. Simple interventions would facilitate like-for-like comparison so that it would be more possible to identify key ingredients and understand what works and what does not work. However, practice experts may be aware of factors that suggest complex interventions are suitable; therefore, interventions developers could consider all relevant factors (i.e. theoretical, practical, contextual) to ensure optimum conditions for delivery and evaluation of effective interventions. Alternatively, if complex interventions are inevitable, recent guidance suggests better reporting of complexity considerations,[234] and better reporting of intervention development generally.[235]

Those interventions that are developed to reduce staff use of restrictive practices need to be better defined, with clear links to theory, and contain more robust and rigorous approaches to evaluation. Specifically, it may be worthwhile to address the question of why so much training is directed at staff, many of whom are likely to have been previously trained to work in the setting. It may also be worthwhile to address data-monitoring, which is a component of many of the interventions; it has the potential to activate powerful psychological mechanisms such as shame and social norms when combined with feedback, and could be a quick and straightforward means of generating useful data. Key practice, policy and research recommendations are presented in *Table 29*.

TABLE 29 Key recommendations for policy, practice and research

Policy	Practice	Future research
Support for research to develop the evidence base could be prioritised over commissioning of interventions for practice	Selection or development of interventions based on available evidence	Testing of promising BCTs, using robust designs to establish effectiveness such as RCTs
		Investigation of the most promising BCTs by type, potentially within the type of institutional settings where they are often found {e.g. BCT 4.1 [instruction on how to perform the behavior] mental health and social care settings; BCT 12.2 [restructuring the social environment]/BCT 2.7 (feedback on outcome(s) of behavior] generic settings}
		Problem-solving
	On-site interventions development, delivery, evaluation and reporting could utilise incorporation validated outcomes measures, consider potential impact of confounding factors	Focus on development of the evidence base for different settings (e.g. criminal justice, populations with intellectual disability)
Research/practice collaborations should be encouraged and facilitated to ensure (1) relevance and (2) robustness of studies	Research/practice collaborations would support the above	Researchers should work with practitioners to develop feasible, acceptable interventions that are underpinned by appropriate theory and can be evaluated using robust methods
		Adherence to reporting guidelines (e.g. WIDER recommendations)
Research funding could be directed to understand how different interventions work in different settings		Development of a core outcomes set incorporating validated outcomes measures
		Better understanding of how the effect of an intervention may vary depending on institutional setting, institutional ethos, staffing mix, service user needs and/or behaviours, political context, funding context, cultural context
		Evaluation of interventions outside the USA

Conclusion

Despite numerous enquiries, policy initiatives and recommendations, there remains ongoing concern about the use of restrictive practices in CYP's institutional settings. The impact of restrictive practices on the psychological and physical welfare of both CYP and staff should not be underestimated. The care of CYP will remain suboptimal unless there is a sustained focus on reducing these practices. Without a sustained effort, these practices will continue to occur in institutional settings worldwide.

This study has generated, to our knowledge, the first known synthesis of the evidence on the content and effectiveness of interventions to reduce restrictive practices in CYP's institutional settings. This synthesis provides a useful resource for practitioners, policy-makers and researchers aiming to implement or develop a restraint reduction intervention.

The new information generated adds to the research evidence base in the form of a comprehensive description of interventions, their components, context and outcomes, as far as can be ascertained from the limited evidence. The limitations are important because they suggest a need for caution in the use of interventions assumed to be effective.

Taken as a whole, these suggestions from our research for practice, policy and research can inform the development and testing of different models to reduce restrictive practices across a range of CYP's institutional settings. They have the potential to affect the everyday practice of professionals working with children by supporting management decision-making in children's services with regard to staff training and other interventions. The new insights generated from this study could lead to improved therapeutic outcomes, organisational efficiencies arising from reduced staff sickness and litigation costs, and better subjective experiences of children and staff. These could contribute towards improving the health and safety of vulnerable children and the staff who work with them in institutional care by protecting them from trauma, injury and death, and could thus benefit wider society.

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Data-sharing statement

All available data can be obtained from the corresponding author.

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Appendix 1 Search strategies

Includes all 2020 update search strategies and those from 2019 if they were not included in the update or where 2020 and 2019 searches used different strategies.

Academic database searches

Academic database searched	Date range searched
ASSIA ProQuest	1987 to 24 January 2020
British Nursing Index (HDAS)	1992 to 24 January 2020
CINAHL (EBSCO*host*)	1981 to 30 January 2020
Child Development and Adolescent Studies (EBSCO*host*)	1927 to 24 January 2020
Criminal Justice Abstracts (EBSCO*host*)	1830 to 30 January 2020
Education Abstracts (H.W. Wilson) (EBSCO*host*)	1983 to 14 June 2019
Embase Classic+Embase (Ovid) 1947 to 2020 January 21	1947 to 21 January 2020
ERIC	1966 to 30 January 2020
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily	1946 to 20 January 2020
PsycInfo (Ovid) 1806 to January Week 2 2020	1806 to January Week 2 2020
Scopus (Elsevier B.V.) 1823 to 13/06/19	1823 to 13 June 2019

ASSIA, Applied Social Sciences Index and Abstracts; CINAHL, Cumulative Index to Nursing and Allied Health Literature; ERIC, Education Resources Information Center; HDAS, Healthcare Databases Advanced Search.

Search terms

Search terms	Number of hits
ASSIA (ProQuest) 1987 to 24 January 2020	
S16 (S8 AND S15)AND pd(19890101-20201231)	1520
S15 S9 OR S10 OR S11 OR S12 OR S13 OR S14	403,037
S14 ti,ab(asylum OR refugee OR refugees OR migrant or migrants OR immigrant OR immigrants OR immigration)	21,003
S13 ti,ab(("Health Services" or hospital or hospitals or ward or ward or inpatient or patient or forensic OR forensics OR CAMHS OR "pediatric intensive care unit" OR "paediatric intensive care unit" OR PICI OR PICU OR "Care Facility" OR "Care Facilities" OR "Rehabilitation Center" OR "rehabilitation centers" OR "Rehabilitation Centre" OR "Rehabilitation Centres"))	232,866
S12 ti,ab(((health OR medical OR medicine OR psychiatry OR psychiatric OR mental) near/1(service OR services OR centres OR centre OR Center OR centers OR department OR departments OR facility OR facilities OR ward OR wards OR units OR unit)) OR ((child OR children or young or pediatric or paediatric or adolescent or adolescents) near/2 (service OR services)))	60,895
S11 ti,ab(((pupil OR pupils OR school OR schools OR schoolchildren OR child OR children OR education) near/2 (referral OR referrals)) OR ((education OR educational) near/1 (service OR services OR facility OR facilities OR institution OR institutions)) OR (Kindergarten OR Kindergartens OR Nursery OR pre-school OR pre-schools OR classroom OR classrooms OR school OR schools))	86,446

Search terms	Number of hits
S10 ti,ab(("juvenile justice" OR incarcerate OR incarcerated OR incarceration OR detention OR Custody OR Prison OR prisons OR prisoner OR prisoners OR jail OR jails OR detain OR detained OR inmate OR inmates OR Delinquent OR delinquents OR Delinquency) OR (secure near/2 (home OR homes OR accommodation OR unit OR units OR centre OR centres OR center OR centers OR service OR services OR facility Or facilities)))	26,323
S9 ti,ab(((youth or young or juvenile) near/1 (offending OR offender OR offenders)) OR ((foster OR residential) near/2 (care OR home OR homes)) OR ((children OR childrens) near/1 (home OR homes)) OR ((foster OR fostered OR fostering OR "looked after") AND (child OR children)) OR ("Foster Care" OR "Assisted Living" OR Orphanage OR Ophanages OR "Residential Care" OR "social worker" OR "social workers" OR "Social Work" OR "social care" OR orphan OR orphans))	43,759
S8 S1 AND (S2 OR S3 OR S4 OR S5 OR S6 OR S7)	3843
S7 ti,ab(((prn OR "pro re nata") NEAR/1 (medicate OR medicated OR medication OR medications)) OR ((rapid OR rapidly) AND (tranquillise OR tranquillize OR tranquilliser OR tranquillizer OR tranquillisers OR tranquillizers)) OR (safety NEAR/1 (huddle OR huddles OR plan OR plans OR planning)) OR ((weight OR weighted OR comfort) NEAR/1 (blanket OR blankets)) OR ((comfort OR safe OR sensory) NEAR/2 (room OR rooms)) OR ((restrict OR restricts OR restrictive OR restriction OR restrictions) NEAR/2 (practice OR practices OR intervention OR interventions OR liberty)))	555
S6 ti,ab(((lock OR locked or locking) NEAR/1 (door OR doors OR ward OR wards OR room OR rooms)) OR (forced NEAR/1 (medicate OR medication OR medications OR medicated OR sedate OR sedation OR sedated OR drug OR drugs OR treatment OR treatments)) OR (involuntary NEAR/1 (medicate OR medication OR medications OR medicated OR sedate OR sedation OR sedated OR drug OR drugs OR treatment OR treatments)))	288
S5 ti,ab((violence NEAR/4 (prevent OR prevents OR prevention OR prevented OR manage OR managed OR management OR managing) NEAR/4 training) OR ((patient or patients) NEAR/1 (isolation OR segregation)) OR ((physical or physically) NEAR/1 (immobilise OR immobilize OR immobilised OR immobilized OR control)))	297
S4 ti,ab((Aggression OR Aggressive OR Aggressively) NEAR/4 (prevent OR prevents OR prevention OR prevented OR manage OR managed OR management OR managing) NEAR/4 training)	45
S3 ti,ab(holding NEAR/2 (therapeutic OR parent OR parents OR procedure OR procedures OR clinical OR physical OR treatment OR safe OR supportive)) OR (one-to-one NEAR/1 (nursing OR nurse OR nurses))	185
S2 ti,ab(pain-compliance OR "solitary confinement" OR isolation OR compulsion OR compulsivity OR "calm down" OR "soft word" OR "soft words" OR "talk down" OR de-escalat* OR deescalat* OR seclusion OR seclude OR secluded OR restrain OR restraining OR restraint OR restraints OR restrains OR coercive OR coercion OR coerced)	12,214
S1 su,ti,ab((infant OR infants OR young OR schoolchild OR schoolchildren OR childhood OR children OR child OR adolescen* OR teen OR teens OR teenager OR teenagers OR youth OR youths OR girl OR girls OR boy OR boys OR pediatric OR pediatrics OR paediatric OR paediatrics OR juvenile OR juveniles))	
British Nursing Index (HDAS) 1992 to 24 January 2020	
1 (infant OR infants OR young OR schoolchild* OR childhood OR children OR child OR adolescen* OR teen OR teens OR teenager* OR youth OR youths OR girl OR girls OR boy OR boys OR paediatric* OR pediatric* OR juvenil*).ti,ab	112,671
2 (one-to-one ADJ1 nurs*).ti,ab	35
3 (Aggress* ADJ3 (prevent* OR manag*)).ti,ab	540
4 (violence ADJ3 (prevent* OR manag*)).ti,ab	844
5 (patient* ADJ3 (isolation OR segregation)).ti,ab	269
6 (physical* ADJ2 (immobili* OR control)).ti,ab	134
7 ((lock OR locked OR locking) ADJ1 (door* OR ward* OR room*)).ti,ab	79
8 (forced ADJ1 (medic* OR sedat* OR drug* OR treatment*)).ti,ab	50
9 (involuntary ADJ1 (medic* OR sedat* OR drug* OR treatment*)).ti,ab	29
10 ((prn OR "pro re nata") ADJ1 medicat*).ti,ab	62

	Search terms	Number of hits
12	(rapid* AND tranq*).ti,ab	2
13	(safety ADJ1 (huddle* OR plan*)).ti,ab	186
14	((weight* OR comfort) ADJ1 blanket*).ti,ab	7
15	((comfort OR safe OR sensory) ADJ2 room*).ti,ab	58
16	(restric* ADJ2 (practice* OR intervention* OR liberty)).ti,ab	293
17	(pain-compliance).ti,ab	4
18	(solitary confinement).ti,ab	20
19	isolation OR compulsion OR compulsivity OR "calm down" OR "soft word*" OR "talk down" OR de-escalat* OR deescalat* OR seclusion OR seclude* OR restrain* OR coercive OR coercion OR coerced	6416
20	(2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 12 OR 13 OR 14 OR 15 OR 16 OR 17 OR 18 OR 19)	8567
21	((youth OR young OR juvenile) ADJ1 offend*).ti,ab	204
22	(juvenile justice OR incarcerat* OR detention OR Custody OR Prison* OR Delinquen* OR jail* OR detain* OR inmate*).ti,ab	4670
23	(secure ADJ2 (home* OR accommodation OR unit* OR centre* OR center* OR service* OR facilit*)).ti,ab	535
24	((foster OR residential) ADJ2 (care OR home*)).ti,ab	2919
25	("Foster Care" OR Assisted Living OR Orphanage* OR "Residential Care" OR social worker* OR Social Work OR social care OR orphan*).ti,ab	25,822
26	((pupil* OR school* OR child* OR education) ADJ2 referral).ti,ab	202
27	(education* ADJ1 (service* OR facilit* OR institution*)).ti,ab	2011
28	(Kindergarten* OR Nursery OR pre-school* OR classroom* OR school*).ti,ab	27650
29	((health OR medic* OR psychiatr* OR mental) ADJ1 (service* OR centre* OR center* OR department* OR facilit* OR Unit OR Units OR ward*)).ti,ab	46,408
30	((child* OR young OR pediatric OR paediatric OR adolescent*) ADJ2 services).ti,ab	2635
31	(Health Services OR hospital* OR ward* OR inpatient OR patient OR forensic* OR CAMHS OR "pediatric intensive care unit" OR "paediatric intensive care unit" OR PICI OR PICU OR Care Facilities OR Hospital Units OR Hospital* OR Rehabilitation Center* OR Rehabilitation Centre*).ti,ab	211,252
48	((foster* OR "looked after") AND child*).ti,ab	619
49	(children* ADJ1 home*).ti,ab	400
50	(asylum OR refugee* OR migrant* OR immigrant* OR immigration).ti,ab	6210
53	(1 AND 20)	1381
54	(21 OR 22 OR 23 OR 24 OR 25)	33,084
65	(53 AND 54)	206
66	(26 OR 27 OR 28)	29,558
67	(53 AND 66)	167
68	(29 OR 30)	47,920
70	(29 AND 53)	134
71	(30 OR 31 OR 48 OR 49 OR 50)	223,261
72	(53 AND 71)	483
73	(72 or 70 or 67 or 65)	709

Search terms	Number of hits
CINAHL (EBSCOhost) 1981 to 30 January 2020	
S99 s91 NOT s97 (Limiters – Published Date: 19890101-present)	4058
S98 s91 NOT s97	4081
S97 S92 OR S93 OR S94 OR S95 OR S96	28,045
S96 TX ((car or vehicle) N1 (restraint* or safety or crash*))	4323
S95 TX ((Road or Traffic) N1 (injur* or trauma or accident*))	16,825
S94 TX "motor vehicle*"	9321
S93 TX (seat or seats or seatbelt* or "road safety" or "passenger safety")	7252
S92 (MH "Car Safety Devices")	2199
S91 S6 AND S50 AND S90	4528
S90 S58 OR S68 OR S74 OR S86 OR S89	3,849,499
S89 S87 OR S88	25,505
S88 (MH "Emigration and Immigration") OR (MH "Immigrants+") OR (MH "Refugees")	24,180
S87 TX ((asylum OR refugee* OR migrant* OR immigrant* OR immigration) N4 (service* OR center* OR center* OR department* OR facilit* OR unit* OR reception OR accommodation))	
S86 S75 OR S76 OR S77 OR S78 OR S79 OR S80 OR S81 OR S82 OR S83 OR S84 OR S85	3,721,859
S85 TX ("pediatric intensive care unit")	3570
S84 TX ((health or medic* or psychiat* or mental) N2 (service? or center? or centre? or department? or facilit* or unit? or ward?))	1,751,717
S83 TI forensic* OR AB forensic*	8602
S82 TX CAMHS	1144
S81 TX PICU OR PICI	3210
S80 (MH "Intensive Care Units, Pediatric")	5469
S79 TX (inpatient or patient)	1,916,873
S78 TX (hospital? or ward?)	1,436,813
S77 (MH "Health Services+")	919,549
S76 TX ((child* or young or pediatric or paediatric or adolescent*) N2 services)	30,761
S75 MH "Ambulatory Care Facilities") OR ((MH "Facility Design and Construction+")) OR (MH "Hospital Units+") OR (MH "Hospitals+") OR (MH "Rehabilitation Centers+")	202,905
S74 S69 OR S70 OR S71 OR S72 OR S73	204,058
S73 TX (Kindergarten* or Nursery or pre-school*)	8278
S72 TX ((pupil* or school* or child or children* or education) and (referral N1 (unit* or centre* or center* or facilit* or service*))	3870
S71 TX classroom* or school*	165,640
S70 TX (education* N1 (service* or facilit* or institution*))	13,625
S69 (MH "Schools+")	66,167
S68 S59 OR S60 OR S61 OR S62 OR S63 OR S64 OR S65 OR S66 OR S67	72,499
S67 TX "social worker*"	17,419
S66 (MH "Social Work+")	11,905
S65 TX "social care"	19,152
S64 TX orphan*	5977

Search terms	Number of hits
S63 TX ((foster* or "looked after") and child*)	13,637
S62 TX (children* N1 home*)	2035
S61 TX ((foster or residential) N (care or home*))	147
S60 TX (secure N3 (home* or accommodation or unit* or centre* or center* or service* or facilit*))	1353
S59 (MH "Foster Home Care") OR (MH "Assisted Living") OR ((MH "Orphans and Orphanages")) OR (MH "Residential Care")	13,437
S58 S51 OR S52 OR S53 OR S54 OR S55 OR S56 OR S57	28,060
S57 TX "juvenile justice"	1460
S56 TX (incarcerat* or detention or custody or prison* or jail* or detain* or inmate*)	20,875
S55 (MH "Involuntary Commitment")	1846
S54 (MH "Child Custody")	1326
S53 (MH "Prisoners")	8319
S52 (MH "Juvenile Offenders") OR (MH "Juvenile Delinquency") OR (MH "Correctional Facilities")	9821
S51 TX ((youth or young or juvenile*) N2 offend*)	2610
S50 S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49	24,840
S49 "Br#set Violence Checklist*"	19
S48 TX "Proactive Management of Integrated Service* and Environment*"	303
S47 TX ("Positive and Safe" N1 (team? or plan?))	1
S46 TX "ReSTRAIN YOURSELF"	2
S45 TX "manag* of actual or potential aggress*"	3
S44 TX (MAPA N5 (aggress* or cris#s))	7
S43 TX (MAPA N1 (training or intervention or program*))	1
S42 TX (CALM N1 (training or intervention or program*))	37
S41 TX (CALM and (cris#s N6 manag*))	10
S40 TX "crisis and aggression limitation and management"	1
S39 TX ("Creating Safety" N5 training)	460
S38 TX "People are and feel safe"	3
S37 TX "Roadmap to seclusion"	1
S36 TX "no force first"	3
S35 TX safewards	23
S34 S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33	24,764
S33 (isolation n3 (booth* or room*)	268
S32 TX pain-compliance	12
S31 TX (holding N3 (therapeutic or parent* or procedure* or clinical or physical or treatment or safe or supportive))	278
S30 TX (one-to-one N2 nurs*)	371
S29 TX (Aggress* N5 (prevent* or manag*) N5 training)	98
S28 TX (Violence N5 (prevent* or manag*) N5 training)	195

Search terms	Number of hits
S27 TX (patient? N3 (isolation or segregation))	3541
S26 TX (physical* N1 (immobili* or control))	668
S25 (lock or locked or locking) N3 (door* or ward? or room?)	200
S24 TX "solitary confinement"	56
S23 TX forced N3 (medic* OR sedat* or drug? or treatment?)	839
S22 TX (involuntary N3 (medic* OR sedat* or drug? or treatment?)	331
S21 TX compulsion or compulsivity	991
S20 TX ((prn or "pro re nata") N1 medicat*)	190
S19 TX (rapid* N2 tranq*)	63
S18 TX safety N2 (huddle? OR plan?)	513
S17 TX ((weight* or comfort) N1 blanket*)	30
S16 TX ((comfort or safe or sensory) N2 room?)	145
S15 TX "calm down" or "soft word?" or "talk down"	92
S14 TX (de-escalat* or deescalat*)	1156
S13 TX restric* N2 (practice* or intervention* or liberty)	1456
S12 TX seclusion or seclude*	1178
S11 TX restrain*	10,414
S10 TX coercive or coercion or coerced	3697
S9 (MH "Coercion") or (MH "Involuntary Treatment")	1965
S8 (MH "Patient Seclusion")	596
S7 (MH "Restraint, Physical")	3975
S6 S1 OR S2 OR S3 OR S4 OR S5	1,181,600
S5 TX (infant or infants or "young people" or "young person" or "young adult" or " young m?n" or "young wom?n" or "schoolchild*")	527,514
S4 (MH "Adolescent Health") OR (MH "Child Health")	18,820
S3 (MH "Adolescence+") OR (MH "Child+")	876,348
S2 (MH "Adolescent Behavior") OR (MH "Child Behavior") OR (MH "Infant Behavior")	25,822
S1 TI ((child or childhood or children or adolescen* or teen or teens or teenager* or youth or youths or girl or girls or boy or boys or paediatric or pediatric or juvenil*)) OR AB ((child or childhood or children or adolescen* or teen or teens or teenager* or youth or youths or girl or girls or boy or boys or paediatric or pediatric or juvenil*)) (580,951)	580,951
Child Development and Adolescent Studies (EBSCOhost) 1927 to 24 January 2020	
Same strategy as Criminal Justice Abstracts	
Criminal Justice Abstracts (EBSCOhost) 1830 to 30 January 2020	
S65 S58 NOT S63 (Limiters – Published Date: 19890101-present)	863
S64 S58 NOT S63	900
S63 S59 OR S60 OR S61 OR S62	8401
S62 TX ((car or vehicle) N1 (restraint* or safety or crash*))	2999
S61 TX ((Road or Traffic) N1 (injur* or trauma or accident*))	5235
S60 TX "motor vehicle*"	5765
S59 TX (seat or seats or seatbelt* or "road safety" or "passenger safety")	1956

Search terms	Number of hits
S58 S3 and s31 and s57	1030
S57 S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 OR S54 OR S55 OR S56	237,211
S56 TX ((asylum OR refugee* OR migrant* OR immigrant* OR immigration) N4 (service* OR center* OR center* OR department* OR facilit* OR unit* OR reception OR accommodation))	2393
S55 TX ("pediatric intensive care unit" or "paediatric intensive care unit" or PICI or PICU)	20
S54 TX ((health or medic* or psychiat* or mental) N2 (service? or center? or centre? or department? or facilit* or unit? or ward?))	63,333
S53 TI forensic* OR AB forensic*	20,560
S52 TX CAMHS	152
S51 TX hospital? or ward? or inpatient? or patient?	53,547
S50 TX "Health Services"	17,612
S49 TX ((child* or young or pediatric or paediatric or adolescent*) N2 services)	7573
S48 TX "Care Facilit*" OR "Hospital Unit*" OR Hospital? OR "Rehabilitation Center?" or "Rehabilitation Centre?"	38,956
S47 TX (Kindergarten* or Nursery or pre-school*)	1336
S46 TX ((pupil* or school* or child* or education) and (referral N1 (unit* or centre* or center* or facilit* or service*)))	125
S45 TX classroom* or school*	108,421
S44 TX (education* N1 (service* or facilit* or institution*))	8177
S43 TX "social work" OR "social worker*"	27,435
S42 TX "social care"	856
S41 TX orphan*	290
S40 TX (((foster* or "looked after") and child*))	3299
S39 TX (children* N1 home*)	939
S38 TX (((foster or residential) N1 (care or home*)))	9340
S37 TX ((secure N3 (home* or accommodation or unit* or centre* or center* or service* or facilit*)))	1157
S36 TX ("Foster Care" OR "Assisted Living" OR Orphanage? OR "Residential Care")	9276
S35 TX (Involuntary N1 (Commitment or hospitali*))	206
S34 TX (prison* or custody or incarcerat* or detention or jail* or detain* or inmate*)	48,786
S33 TX ("Juvenile Delinquen*" or "juvenile justice")	11,230
S32 TX (((youth or young or juvenile) N2 offend*))	5701
S31 S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30	7631
S30 TX (isolation n3 (booth* or room*)	4
S29 TX (((violence or aggression) N5 (prevent* or manag*) N5 training))	52
S28 TX (patient? N3 (isolation or segregat*))	11
S27 TX ("Br#set Violence Checklist*")	4
S26 TX "ReSTRAIN YOURSELF"	4
S25 TX "manag* of actual or potential aggress*"	0
S24 TX (MAPA N5 (aggress* or cris#s))	0

Search terms	Number of hits
S23 TX (MAPA N1 (training or intervention or program*))	2
S22 TX (CALM N1 (training or intervention or program*))	2
S21 TX (CALM and (cris#s N6 manag*))	5
S20 TX "crisis and aggression limitation and management"	554
S19 TX ("Creating Safety" N5 training)	1005
S18 TX (pain-compliance or safewards or "six core strategies" or "Roadmap to seclusion" or "People are and feel safe")	6
S17 TX ((holding N3 (therapeutic or parent* or procedure* or clinical or physical or treatment or safe or supportive)))	41
S16 TX (one-to-one N2 nurs*)	1
S15 TX ((physical* N1 (immobili* or control)))	90
S14 TX ((lock or locked or locking) N3 (door* or ward? or room?))	116
S13 TX "solitary confinement"	484
S12 TX ((involuntary or forced) N3 (medic* OR sedat* or drug? or treatment?))	368
S11 TX ((prn or "pro re nata") N1 medicat*)	3
S10 TX (rapid* N2 tranq*)	2
S9 TX (safety N1 (huddle? OR plan?))	87
S8 TX ((weight* or comfort) N1 blanket*)	569
S7 TX (((comfort or safe or sensory) N2 room?))	19
S6 TX ("calm down" or "soft word?" or "talk down")	8
S5 TX (restric* N2 (practice* or intervention* or liberty))	196
S4 TX ((coercive or coercion or coerced or restrain* or seclude* or seclusion or de-escalat* or deescalat*)))	6417
S3 S1 OR S2	93,170
S2 TX (infant or infants or "young people" or "young person" or "young adult" or " young m?n" or "young wom?n" or "schoolchild*")	12,547
S1 TI (child OR childhood or children or adolescen* or teen or teens or teenager* or youth or youths or girl or girls or boy or boys or p?ediatric? or juvenil*) OR AB (child OR childhood or children or adolescen* or teen or teens or teenager* or youth or youths or girl or girls or boy or boys or p?ediatric? or juvenil*)	87,778
Education Abstracts (H.W. Wilson) (EBSCOhost) 1983 to 14 June 2019	
# Query Results	
S97 S94 OR S95 (Limiters – Published Date: 19890101-present)	
Limiters - Published Date: 19890101	968
S96 S94 OR S95	991
S95 DE "Physical restraint & seclusion of students"	25
S94 S88 NOT S93	975
S93 S89 OR S90 OR S91 OR S92	7997
S92 TX ((car or vehicle) N1 (restraint* or safety or crash*))	834
S91 TX ((Road or Traffic) N1 (injur* or trauma or accident*))	1108
S90 TX "motor vehicle*"	3177
S89 TX (seat or seats or seatbelt* or "road safety" or "passenger safety")	4429

Search terms	Number of hits
S88 S5 AND S48 AND S87	1003
S87 S56 OR S67 OR S72 OR S83 OR S86	778,463
S86 S84 OR S85	7512
S85 DE "Alien detention centers" OR DE "Immigrants"	2450
S84 TX ((asylum OR refugee* OR migrant* OR immigrant* OR immigration) N4 (service* OR center* OR center* OR department* OR facilit* OR unit* OR reception OR accommodation))	5525
S83 S73 OR S74 OR S75 OR S76 OR S77 OR S78 OR S79 OR S80 OR S81 OR S82	113,796
S82 DE "Mental health services" OR DE "Crisis intervention (Mental health services)" OR DE "Psychotherapy" OR DE "School mental health services"	3727
S81 TX ("pediatric intensive care unit")	8
S80 TX ((health or medic* or psychiat* or mental) N2 (service? or center? or centre? or department? or facilit* or unit? or ward?))	53,279
S79 TI forensic* OR AB forensic*	1228
S78 TX PICU OR PICI	56
S77 TX CAMHS	71
S76 TX (inpatient or patient)	42,895
S75 TX (hospital? or ward?)	24,996
S74 TX ((child* or young or pediatric or paediatric or adolescent*) N2 services)	18,435
S73 TX "Care Facilit*" OR Hospital? OR "Rehabilitation Center?" or "Rehabilitation Centre?"	23,519
S72 S68 OR S69 OR S70 OR S71	680,566
S71 TX (Kindergarten* or Nursery or pre-school*)	21,503
S70 TX ((pupil* or school* or child or children* or education) and (referral N1 (unit* or centre* or center* or facilit* or service*))	287
S69 DE "Schools" OR DE "Adult education facilities" OR DE "Alternative schools" OR DE "American schools abroad" OR DE "Art schools" OR DE "Bilingual schools" OR DE "Boarding schools" OR DE "British schools" OR DE "Business schools" OR DE "Cathedral schools" OR DE "Charity-schools" OR DE "Charter schools" OR DE "Coeducational schools" OR DE "Commercialism in schools" OR DE "Community & school" OR DE "Computer programming schools" OR DE "Cooking schools" OR DE "Cooperative schools" OR DE "Correspondence schools & courses" OR DE "Cosmetology schools" OR DE "Court reporting schools" OR DE "Dance schools" OR DE "Day schools" OR DE "Disadvantaged schools" OR DE "Effective schools" OR DE "Elementary schools" OR DE "Ethnic schools" OR DE "European schools" OR DE "Evening & continuation schools" OR DE "Failing schools" OR DE "Film schools" OR DE "Fishery schools" OR DE "Flight schools" OR DE "Forestry schools" OR DE "Grant-maintained schools" OR DE "Gymnasiums (Educational institutions)" OR DE "Gülen movement schools" OR DE "Harassment in schools" OR DE "Health occupations schools" OR DE "Heterosexism in schools" OR DE "Homophobia in schools" OR DE "Hospital schools" OR DE "Institutional schools" OR DE "Instructional materials centers" OR DE "International schools" OR DE "Irish Gaelic language schools" OR DE "Jewish religious schools" OR DE "Laboratory schools" OR DE "Landscape architecture schools" OR DE "Language schools" OR DE "Libraries & schools" OR DE "Library schools" OR DE "Manual training" OR DE "Military post schools" OR DE "Mining schools" OR DE "Mission schools" OR DE "Mobile schools" OR DE "Montessori schools" OR DE "Museums & schools" OR DE "Music conservatories" OR DE "Naturopathic schools" OR DE "Open-air schools" OR DE "Platoon schools" OR DE "Preschools" OR DE "Primary schools" OR DE "Private schools" OR DE "Professional schools" OR DE "Public schools" OR DE "Refugee camp schools" OR DE "Religious schools" OR DE "Rural schools" OR DE "School bullying" OR DE "School closings" OR DE "School districts" OR DE "School enrollment" OR DE "Schools of architecture" OR DE "Secondary schools" OR DE "Secretary schools" OR DE "Singing schools" OR DE "Single sex schools" OR DE "Small schools" OR DE "Special education schools" OR DE "Suburban schools" OR DE "Summer schools" OR DE "Sunday schools" OR DE "Textile schools" OR DE "Theater schools" OR DE "Traditional schools" OR DE "Universities & colleges" OR DE "Urban schools" OR DE "Vacation schools" OR DE "Virtual schools" OR DE "Vocational schools" OR DE "Year-round schools"	65,275

Search terms	Number of hits
S68 TX classroom* or school*	670,431
S67 S57 OR S58 OR S59 OR S60 OR S61 OR S62 OR S63 OR S64 OR S65 OR S66	17,537
S66 DE "Social workers" OR DE "Child welfare workers" OR DE "Psychiatric social workers" OR DE "Social workers as teachers" OR DE "Social workers in education"	1744
S65 TX "social worker*"	4758
S64 TX orphan*	1382
S63 DE "Foster home care" OR DE "Adoption" OR DE "Foster children"	2531
S62 TX ((foster* or "looked after") and child*)	8307
S61 TX (children* N1 home*)	1683
S60 TX ((foster or residential) N (care or home*))	78
S59 TX (secure N3 (home* or accommodation or unit* or centre* or center* or service* or facilit*))	237
S58 DE "Group homes" OR DE "Foster home care" OR DE "Institutional care"	1792
S57 TX "Foster Care" OR "Assisted Living" OR Orphanage? OR "Residential Care"	4574
S56 S49 OR S50 OR S51 OR S52 OR S53 OR S54 OR S55	20,032
S55 TX incarcerat* or detention	5259
S54 TX (prison* OR custody OR jail* OR detain* OR inmate*)	14,019
S53 TX "Juvenile Delinquen*"	3663
S52 TX "juvenile justice"	1096
S51 ((ZU "juvenile prisoners")) or ((ZU "prisoners"))	852
S50 DE "Problem youth" OR DE "Juvenile delinquents" OR DE "Gangs" OR DE "Juvenile detention homes" OR DE "Detention facilities"	1645
S49 ((youth or young or juvenile) N2 offend*)	1648
S48 S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47	6440
S47 DE "Timeout method"	85
S46 TX (isolation n3 (booth* or room*)	12
S45 TX "Br#set Violence Checklist*"	2
S44 TX "Proactive Management of Integrated Service* and Environment*"	1166
S43 TX ("Positive and Safe" N1 (team? or plan?))	1108
S42 TX "manag* of actual or potential aggress*"	5
S41 TX (MAPA N5 (aggress* or cris#s))	2
S40 TX (MAPA N1 (training or intervention or program*))	7
S39 TX (CALM N1 (training or intervention or program*))	5
S38 TX (CALM and (cris#s N6 manag*))	3
S37 TX "crisis and aggression limitation and management"	634
S36 TX ("Creating Safety" N5 training)	1231
S35 TX "People are and feel safe"	498
S34 TX "Roadmap to seclusion"	2
S33 TX "no force first"	855

Search terms	Number of hits
S32 TX "six core strategies"	570
S31 TX safewards	0
S30 TX pain-compliance	55
S29 TX (holding N3 (therapeutic or parent* or procedure* or clinical or physical or treatment or safe or supportive))	99
S28 TX (one-to-one N2 nurs*)	8
S27 TX (Aggress* N5 (prevent* or manag*) N5 training)	14
S26 TX (Violence N5 (prevent* or manag*) N5 training)	24
S25 TX (patient? N3 (isolation or segregation))	10
S24 TX (physical* N1 (immobili* or control))	72
S23 (lock or locked or locking) N3 (door* or ward? or room?)	93
S22 TX "solitary confinement"	112
S21 TX forced N3 (medic* OR sedat* or drug? or treatment?)	30
S20 TX (involuntary N3 (medic* OR sedat* or drug? or treatment?)	25
S19 TX compulsion or compulsivity	778
S18 TX ((prn or "pro re nata") N1 medicat*)	3
S17 TX (rapid* N2 tranq*)	726
S16 TX (rapid* N2 tranq*)	726
S15 TX safety N2 (huddle? OR plan?)	123
S14 TX ((weight* or comfort) N1 blanket*)	7
S13 TX ((comfort or safe or sensory) N2 room?)	31
S12 TX "calm down" or "soft word?" or "talk down"	59
S11 TX (de-escalat* or deescalat*)	71
S10 TX restric* N2 (practice* or intervention* or liberty)	177
S9 ((ZU "restraint of patients")) or ((ZU "seclusion of psychiatric hospital patients"))	122
S8 TX seclusion or seclude*	276
S7 TX restrain*	3059
S6 TX coercive or coercion or coerced	1582
S5 S1 OR S2 OR S3 OR S4	279,420
S4 TX (infant or infants or "young people" or "young person" or "young adult" or " young m?n" or "young wom?n" or "schoolchild*")	48,659
S3 DE "Youth" OR DE "At-risk youth" OR DE "Bisexual youth" OR DE "Black youth" OR DE "Juvenile delinquents" OR DE "LGBT youth" OR DE "Mentally ill youth" OR DE "Minority youth" OR DE "Problem youth" OR DE "Religious education of young people" OR DE "School dropouts" OR DE "Teenagers" OR DE "Urban youth" OR DE "Young adults" OR DE "Youth with disabilities" OR DE "Adolescence" OR DE "Children"	27,931
S2 (((ZU "children")) or ((ZU "adolescence"))) or ((ZU "teenagers"))	15,456
S1 TI (child or childhood or children or adolescen* or teen or teens or teenager* or youth or youths or girl or girls or boy or boys or p?ediatric? or juvenil*) OR AB (child or childhood or children or adolescen* or teen or teens or teenager* or youth or youths or girl or girls or boy or boys or p?ediatric? or juvenil*)	246,211

	Search terms	Number of hits
	Embase Classic+Embase (Ovid) 1947 to 21 January 2020	
1	child Restraint system/	556
2	Patient Isolation/	634
3	aggression/pc	10
4	(coercive or coercion or coerced).tw,kw.	6984
5	restrain*.tw,kw.	53,917
6	(seclusion or seclude*).tw,kw.	2135
7	(restric* adj2 (practice* or intervention* or liberty)).tw,kw.	1743
8	(de-escalat* or deescalat*).tw,kw.	4838
9	("calm down" or "soft word?" or "talk down").tw,kw.	148
10	((comfort or safe or sensory) adj2 room?).tw,kw.	170
11	((weight* or comfort) adj1 blanket*).tw,kw.	19
12	safety huddle?.tw,kw.	93
13	safety plan?.tw,kw.	468
14	(rapid* adj2 tranq*).tw,kw.	205
15	((prn or "pro re nata") adj1 medicat*).tw,kw.	339
16	(compulsion or compulsivity).tw,kw.	3426
17	(involuntary adj3 medic*).tw,kw.	209
18	(involuntary adj3 sedat*).tw,kw.	13
19	(involuntary adj3 drug?).tw,kw.	82
20	(forced adj3 medic?).tw,kw.	1
21	(forced adj3 drug?).tw,kw.	283
22	(forced adj3 treatment?).tw,kw.	760
23	(forced adj3 sedat*).tw,kw.	15
24	solitary confinement.tw.	122
25	(lock* adj3 door*).tw,kw.	267
26	(lock* adj3 ward?).tw,kw.	184
27	((lock* or locked or locks or locking) adj3 room?).tw,kw.	170
28	(physical* adj (immobili* or control)).tw,kw.	476
29	(patient? adj3 (isolation or segregation)).tw,kw.	5393
30	(Violence adj5 (prevent* or manag*) adj5 training).tw,kw.	144
31	(Aggress* adj5 (prevent* or manag*) adj5 training).tw,kw.	114
32	(one-to-one adj2 nurs*).tw,kw.	223
33	(holding adj3 (therapeutic or parent* or procedure* or clinical or physical or treatment or safe or supportive)).tw,kw.	687
34	pain-compliance.tw,kw.	28
35	(isolation adj3 (booth* or room*)).tw,kw.	878
36	or/1-35 [Restraint Coercion or de escalation Practices]	82,615

	Search terms	Number of hits
37	safewards.tw.	22
38	"no force first".tw.	2
39	"six core strategies".tw.	20
40	"Roadmap to seclusion".tw.	0
41	"People are and feel safe".tw.	0
42	("Creating Safety" adj5 training).tw.	1
43	"crisis and aggression limitation and management".tw.	0
44	(CALM and (cris#s adj6 manag*)).tw.	10
45	(CALM adj (training or intervention or program*)).tw.	29
46	(MAPA adj (training or intervention or program*)).tw.	0
47	(MAPA adj5 (aggress* or cris#s)).tw.	0
48	"manag* of actual or potential aggress*".tw,kw.	0
49	"ReSTRAIN YOURSELF".tw.	6
50	("Positive and Safe" adj (team? or plan?)).tw.	0
51	"Proactive Management of Integrated Service* and Environment*".tw.	1
52	"Br#set Violence Checklist*".tw.	36
53	or/37-52 [Restraint reduction programmes]	124
54	36 or 53 [Restraint practices or programmes]	82,690
55	(childhood or children or child or adolescen* or teen or teens or teenager* or youth or youths or girl or girls or boy or boys or p?ediatric? or juvenil*).tw.	2,453,890
56	(infant or infants or "young people" or "young person" or "young adult" or " young m?n" or "young wom?n" or "schoolchild*").tw.	630,354
57	adolescent behavior/	9381
58	Infant Behavio?r.tw.	870
59	child behavior/	44,482
60	exp child/	2,957,728
61	infant/	689,598
62	child, preschool/	432,377
63	adolescent health/or child health/	33,875
64	Adolescent/or juvenile/	1,652,678
65	or/55-64 [Children]	4,540,974
66	((youth or young) adj2 offend*).tw,kw.	971
67	((child or childhood or children or adolescen* or teen* or girl? or boy? or p?ediatric* or juvenil*) adj offend*).tw,kw.	1259
68	Juvenile Delinquency/	9010
69	prison/or detention/	18,606
70	prisoner/or criminal/	31,240
71	(police* or custody or prison* or jail* or detain* or inmate*).tw,kw.	50,266
72	incarcerat*.tw,kw.	14,559

	Search terms	Number of hits
73	detention.tw,kw.	4321
74	juvenile justice.tw,kw.	1352
75	or/66-74 [Criminal Justice Setting]	91,676
76	foster care/	4889
77	residential home/or assisted living facility/or orphanage/(10630)	10,630
78	(secure adj3 (home* or accommodation or unit* or centre* or center* or service* or facilit*)).tw,kw.	1579
79	((foster or residential) adj (care or home*)).tw,kw.	8408
80	(Children* adj home*).tw,kw.	1244
81	((foster* or "looked after") and child*).tw,kw.	7840
82	orphan*.tw,kw.	23,197
83	social care.tw,kw.	7842
84	exp Social Work/	26,382
85	social worker*.tw,kw.	16,739
86	or/76-85 [Social or residential care]	94,533
87	exp School/	380,991
88	(education* adj (service* or facilit* or institution*)).tw,kw.	6817
89	classroom*.tw,kw.	20,247
90	school*.tw,kw.	362,284
91	((pupil* or school* or child* or education) and (referral adj1 (unit* or centre* or center* or facilit* or service*))).tw,kw.	5796
92	(Kindergarten* or Nursery or pre-school*).tw,kw.	25,560
93	or/87-92 [Educational institutions]	650,724
94	((exp ambulatory care/or exp healthcare facility/or exp hospital subdivisions/) and components/) or exp hospital/or exp rehabilitation center/	1,205,943
95	((child* or young or p?ediatric or adolescent*) adj2 services).tw. (13648)	13,648
96	exp health service/	5,458,744
97	(hospital? or ward?).tw,kw.	1,764,428
98	(inpatient or patient).tw,kw.	3,534,702
99	Intensive Care/	123,003
100	CAMHS.tw,kw.	773
101	forensic*.tw,kw.	65,695
102	((health or medic* or psychiat* or mental) adj2 (service? or center? or centre? or department? or facilit*or ward? or unit?)).tw,kw.	467,131
103	("pediatric intensive care unit" or PICI or PICU).tw,kw.	14,371
104	or/94-103 [Health care setting]	8,790,988
105	immigrant/or exp refugee/	28,528
106	migration/or immigration/	45,846
107	((asylum or refugee* or migrant* or immigrant* or immigration) adj4 (service* or center* or center* or department* or facilit* or unit* or reception or accommodation)).tw,kw.	4551

Search terms		Number of hits
108	or/105-107 [refugee settings]	71,154
109	75 or 86 or 93 or 104 or 108 [Settings]	9,264,068
110	54 and 65 and 109	6269
111	(seat or seats or seatbelt* or "road safety" or "passenger safety").tw,kw.	16,071
112	motor vehicle*.tw,kw.	19,048
113	((Road or Traffic) adj (injur* or trauma or accident*)).tw,kw.	19,582
114	((car or vehicle) adj (restraint* or safety or crash*)).tw,kw.	5532
115	or/111-114 [seat belts]	51,659
116	110 not 115	5684
117	exp animals/not exp human/	5,366,155
118	exp nonhuman/not exp human/	4,544,080
119	exp experimental animal/	689,337
120	exp veterinary medicine/	46,916
121	animal experiment/	2,478,525
122	or/117-121 [animal studies]	7,591,696
123	116 not 122	5584
124	limit 123 to yr = "1989 -Current" (5120)	5120
ERIC 1966 to 30 January 2020		
Same strategy as Criminal Justice Abstracts		
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily 1946 to 20 January 2020		
1	Restraint, Physical/	11,724
2	Patient Isolation/or involuntary treatment/or involuntary treatment, psychiatric/	3880
3	coercion/	4528
4	(coercive or coercion or coerced).tw,kw.	6212
5	restrain*.tw,kw.	43,001
6	(seclusion or seclude*).tw,kw.	1707
7	(restric* adj2 (practice* or intervention* or liberty)).tw,kw.	1309
8	(de-escalat* or deescalat*).tw,kw.	2309
9	("calm down" or "soft word?" or "talk down").tw,kw.	91
10	((comfort or safe or sensory) adj2 room?).tw,kw.	116
11	((weight* or comfort) adj1 blanket*).tw,kw.	14
12	safety huddle?.tw,kw.	32
13	safety plan?.tw,kw.	339
14	(rapid* adj2 tranq*).tw,kw.	132
15	((prn or "pro re nata") adj1 medicat*).tw,kw.	201
16	(compulsion or compulsivity).tw,kw.	1957
17	(involuntary adj3 medic*).tw,kw.	154
18	(involuntary adj3 sedat*).tw,kw.	12

	Search terms	Number of hits
19	(involuntary adj3 drug?).tw,kw.	62
20	(forced adj3 medic?).tw,kw.	2
21	(forced adj3 drug?).tw,kw.	176
22	(forced adj3 treatment?).tw,kw.	520
23	(forced adj3 sedat*).tw,kw.	11
24	solitary confinement.tw.	110
25	(lock* adj3 door*).tw,kw.	187
26	(lock* adj3 ward?).tw,kw.	136
27	((lock* or locked or locks or locking) adj3 room?).tw,kw.	122
28	(physical* adj (immobili* or control)).tw,kw.	375
29	(patient? adj3 (isolation or segregation)).tw,kw.	3120
30	(Violence adj5 (prevent* or manag*) adj5 training).tw,kw.	122
31	(Aggress* adj5 (prevent* or manag*) adj5 training).tw,kw.	91
32	(one-to-one adj2 nurs*).tw,kw.	153
33	(holding adj3 (therapeutic or parent* or procedure* or clinical or physical or treatment or safe or supportive)).tw,kf.	473
34	pain-compliance.tw,kw.	13
35	(isolation adj3 (booth* or room*)).tw,kw.	518
36	or/1-35 [Restraint Coercion or de escalation Practices]	72,310
37	safewards.tw.	23
38	“no force first”.tw.	2
39	“six core strategies”.tw.	19
40	“Roadmap to seclusion”.tw.	0
41	“People are and feel safe”.tw.	0
42	(“Creating Safety” adj5 training).tw.	1
43	“crisis and aggression limitation and management”.tw.	1
44	(CALM and (cris#s adj6 manag*)).tw.	6
45	(CALM adj (training or intervention or program*)).tw.	25
46	(MAPA adj (training or intervention or program*)).tw.	0
47	(MAPA adj5 (aggress* or cris#s)).tw.	0
48	“manag* of actual or potential aggress*”.tw,kw.	0
49	“ReSTRAIN YOURSELF”.tw.	6
50	(“Positive and Safe” adj (team? or plan?)).tw.	0
51	“Proactive Management of Integrated Service* and Environment*”.tw.	2
52	“Br#set Violence Checklist*”.tw.	31
53	or/37-52 [Restraint reduction programmes]	111
54	36 or 53 [Restraint practices or programmes]	72,376
55	(child* or adolescen* or teen or teens or teenager* or youth or youths or girl or girls or boy or boys or p?ediatric* or juvenil*).tw.	1,824,786

	Search terms	Number of hits
56	(infant or infants or "young people" or "young person" or "young adult" or " young m?n" or "young wom?n" or "schoolchild*").tw.	473,184
57	adolescent behavior/	29,867
58	Infant Behavior/	3395
59	child behavior/	18,044
60	child/	1,655,935
61	infant/	777,831
62	child, preschool/	901,017
63	adolescent health/or child health/or infant health/	3654
64	Adolescent/	1,985,884
65	or/55-64 [Children]	3,905,593
66	((youth or young) adj2 offend*).tw,kf.	717
67	((child or childhood or children or adolescen* or teen* or girl? or boy? or p?ediatric* or juvenil*) adj offend*).tw,kf.	1020
68	Juvenile Delinquency/	8479
69	prisons/	9404
70	prisoners/or criminals/	20,252
71	(police* or custody or prison* or jail* or detain* or inmate*).tw,kf.	38,215
72	incarcerat*.tw,kw.	11,201
73	detention.tw,kw.	2897
74	juvenile justice.tw,kw.	1074
75	or/66-74 [Criminal Justice Setting]	66,001
76	foster home care/	3568
77	residential facilities/or assisted living facilities/or group homes/or orphanages/	7995
78	(secure adj3 (home* or accommodation or unit* or centre* or center* or service* or facilit*)).tw,kw.	996
79	((foster or residential) adj (care or home*)).tw,kf.	6673
80	(Children* adj home*).tw,kw.	984
81	orphan*.tw,kf.	16,689
82	((foster* or "looked after") and child*).tw,kw.	6054
83	social care.tw,kf.	5965
84	exp Social Work/	17,378
85	social worker*.tw,kf.	9541
86	or/76-85 [Social or residential care]	64,880
87	exp Schools/	115,264
88	(education* adj (service* or facilit* or institution*)).tw,kf.	5194
89	classroom*.tw,kf.	16,539
90	school*.tw,kf.	276,091
91	((pupil* or school* or child* or education) and (referral adj1 (unit* or centre* or center* or facilit* or service*))).tw,kf.	3537

	Search terms	Number of hits
92	(Kindergarten* or Nursery or pre-school*).tw,kf.	19,781
93	or/87-92 [Educational institutions]	362,644
94	exp ambulatory care facilities/or exp "facility design and construction"/or exp hospital units/or exp hospitals/or exp rehabilitation centers/	437,574
95	((child* or young or p?ediatric or adolescent*) adj2 services).tw.	9902
96	exp health services/	2,083,410
97	(hospital? or ward?).tw,kf.	1,130,394
98	(inpatient or patient).tw,kf.	2,215,426
99	Intensive Care Units, Pediatric/	7380
100	CAMHS.tw,kf.	361
101	forensic*.tw,kf.	44,153
102	((health or medic* or psychiat* or mental) adj2 (service? or center? or centre? or department? or facilit*or ward? or unit?)).tw,kf.	337,422
103	("pediatric intensive care unit" or PICI or PICU).tw,kw.	7535
104	or/94-103 [Health care setting]	4,846,730
105	Refugees/or "Emigration and Immigration"/or exp "Emigrants and Immigrants"/	43,513
106	((asylum or refugee* or migrant* or immigrant* or immigration) adj4 (service* or center* or center* or department* or facilit* or unit* or reception or accommodation)).tw,kw.	4607
107	or/105-106 [refugee setting]	45,132
108	75 or 86 or 93 or 104 or 107 [Settings]	5,190,254
109	54 and 65 and 108	5376
110	Seat Belts/	3789
111	(seat or seats or seatbelt* or "road safety" or "passenger safety").tw,kw.	12,177
112	motor vehicle*.tw,kw.	14,164
113	((Road or Traffic) adj (injur* or trauma or accident*)).tw,kw.	14,192
114	((car or vehicle) adj (restraint* or safety or crash*)).tw,kw.	4600
115	or/110-114 [seatbelts]	39,265
116	109 not 115	4855
117	exp Animals/not exp Humans/	4,665,657
118	116 not 117	4846
119	limit 118 to yr = "1989 -Current"	4290
PsycInfo (Ovid) 1806 to January Week 2 2020		
22-0 1	Physical Restraint	2080
2	Patient seclusion	500
3	coercion/or exp Involuntary Treatment/	3369
4	(coercive or coercion or coerced).tw,id.	9212
5	restrain*.tw,id.	14,924
6	(seclusion or seclude*).tw,id.	1619
7	(restric* adj2 (practice* or intervention* or liberty)).tw,id.	603
8	(de-escalat* or deescalat*).tw,id. (629)	629

	Search terms	Number of hits
9	("calm down" or "soft word?" or "talk down").tw,id.	122
10	((comfort or safe or sensory) adj2 room?).tw,id.	67
11	((weight* or comfort) adj1 blanket*).tw,id.	11
12	safety huddle?.tw,id.	2
13	safety plan?.tw,id.	226
14	(rapid* adj2 tranq*).tw,id.	123
15	((prn or "pro re nata") adj1 medicat*).tw,id.	142
16	(compulsion or compulsivity).tw,id.	4013
17	(involuntary adj3 medic*).tw,id.	194
18	(involuntary adj3 sedat*).tw,id.	6
19	(involuntary adj3 drug?).tw,id.	44
20	(forced adj3 medic?).tw,id.	0
21	(forced adj3 drug?).tw,id.	73
22	(forced adj3 treatment?).tw,id.	206
23	(forced adj3 sedat*).tw,id.	5
24	"solitary confinement".tw.	203
25	((lock or locked) adj3 door*).tw,id.	170
26	((lock or locked) adj3 ward*).tw,id.	183
27	((lock* or locked or locks or locking) adj3 room?).tw,id.	119
28	(physical* adj (immobili* or control)).tw,id.	140
29	(patient? adj3 (isolation or segregation)).tw,id.	290
30	(Violence adj5 (prevent* or manag*) adj5 training).tw,id.	160
31	(Aggress* adj5 (prevent* or manag*) adj5 training).tw,id.	131
32	(one-to-one adj2 nurs*).tw,id.	36
33	(holding adj3 (therapeutic or parent* or procedure* or clinical or physical or treatment or safe or supportive)).tw,id.	378
34	pain-compliance.tw,id.	6
35	(isolation adj3 (booth* or room*)).tw,id.	53
36	or/1-35 [Restraint Coercion or de escalation Practices]	33,345
37	safewards.tw.	15
38	"no force first".tw.	1
39	"six core strategies".tw.	19
40	"Roadmap to seclusion".tw.	0
41	"People are and feel safe".tw.	0
42	("Creating Safety" adj5 training).tw.	1
43	"crisis and aggression limitation and management".tw.	0
44	(CALM and (cris#s adj6 manag*)).tw.	6
45	(CALM adj (training or intervention or program*)).tw.	23
46	(MAPA adj (training or intervention or program*)).tw.	0

	Search terms	Number of hits
47	(MAPA adj5 (aggress* or cris#s)).tw.	0
48	"manag* of actual or potential aggress*".tw,id.	0
49	"ReSTRAIN YOURSELF".tw.	4
50	("Positive and Safe" adj (team? or plan?)).tw.	0
51	"Proactive Management of Integrated Service* and Environment*".tw.	1
52	"Br#set Violence Checklist*".tw.	32
53	or/37-52 [Restraint reduction programmes]	100
54	36 or 53 [Restraint practices or programmes]	33,403
55	(child* or adolescen*).ag.	773,653
56	(child or childhood or children or adolescen* or teen or teens or teenager* or youth or youths or girl or girls or boy or boys or p?ediatric* or juvenil*).tw.	901,563
57	(infant or infants or "young people" or "young person" or "young adult" or " young m?n" or "young wom?n" or "schoolchild*").tw.	132,121
58	adolescent attitudes/	19,619
59	child attitudes/	7212
60	preschool students/	10,874
61	or/55-60 [Children]	1,169,277
62	((youth or young) adj2 offend*).tw,id.	2216
63	((child or childhood or children or adolescen* or teen* or girl? or boy? or p?ediatric* or juvenil*) adj offend*).tw,id.	3636
64	Juvenile Delinquency/or juvenile justice/	18,531
65	prisons/or exp correctional institutions/or incarceration/	13,537
66	prisoners/or criminal behavior/or legal detention/	19,679
67	(police* or custody or prison* or jail* or inmate* or detain*).tw,id.	56,775
68	incarcerat*.tw,id.	12,556
69	detention.tw,id.	3511
70	juvenile justice.tw,id.	3756
71	or/62-70 [Criminal Justice Setting]	88,635
72	foster care/	5842
73	residential care institutions/or assisted living/or group homes/or orphanages/	12,198
74	(secure adj3 (home* or accommodation or unit* or centre* or center* or service* or facilit*)).tw.	1435
75	((foster or residential) adj (care or home*)).tw,id.	11,091
76	(Children* adj home*).tw,id.	1040
77	((foster* or "looked after") and child*).tw,id.	15,649
78	orphan*.tw,id.	3314
79	social care.tw,id.	4166
80	exp Social Work/	17,911
81	social worker*.tw,id.	24,405
82	or/72-81 [Social or residential care]	72,388
83	exp Schools/	67,633

	Search terms	Number of hits
84	(education* adj (service* or facilit* or institution*)).tw,id.	10,781
85	classroom*.tw,id.	89,044
86	school*.tw,id.	398,015
87	((pupil* or children or child or education) and (referral adj1 (unit* or centre* or center* or facilit* or service*))).tw,id.	354
88	(Kindergarten* or Nursery or pre-school*).tw,id.	25,141
89	or/83-88 [Educational institutions]	470,238
90	exp healthcare facilities/or exp hospital environment/or exp hospitals/or exp rehabilitation centers/	26,176
91	((child* or young or p?ediatric or adolescent*) adj2 services).tw.	10,093
92	exp health services/	0
93	(hospital? or ward?).tw,id.	131,559
94	(inpatient or patient).tw,id.	264,410
95	Intensive Care/	4132
96	CAMHS.tw,id.	590
97	forensic*.tw,id.	19,051
98	((health or medic* or psychiat* or mental) adj2 (service? or center? or centre? or department? or facilit* or ward? or unit?)).tw,id.	117,231
99	("pediatric intensive care unit" or PICI or PICU).tw,id.	506
100	or/90-99 [Health care setting]	458,342
101	refugees/or immigration/or Asylum Seeking/	26,542
102	((asylum or refugee* or migrant* or immigrant* or immigration) adj4 (service* or center* or center* or department* or facilit* or unit* or reception or accommodation)).tw,id.	4247
103	or/101-102 [refugee settings]	27,552
104	71 or 82 or 89 or 100 or 103 [Settings]	1,041,327
105	54 and 61 and 104	3126
106	(seat or seats or seatbelt* or "road safety" or "passenger safety").tw,id.	5169
107	exp Safety Belts/	581
108	motor vehicle*.tw,id.	3785
109	((Road or Traffic) adj (injur* or trauma or accident*)).tw,id.	2904
110	((car or vehicle) adj (restraint* or safety or crash*)).tw,id.	1460
111	or/106-110 [seatbelts]	11,495
112	105 not 111	3056
113	limit 112 to yr = "1989 -Current"	2624
	Scopus (Elsevier B.V.) 1823 to 13 June 2019	
	((TITLE-ABS ((infant OR infants OR young OR schoolchild* OR child OR childhood OR children OR adolescen* OR teen OR teens OR teenager* OR youth OR youths OR girl OR girls OR boy OR boys OR pediatric* OR paediatric* OR juvenil*))) AND ((TITLE-ABS ((holding W/2 (therapeutic OR parent* OR procedure* OR clinical OR physical OR treatment OR safe OR supportive)))) OR (TITLE-ABS ((aggress* W/4 (prevent* OR manag*) W/4 training))) OR (TITLE-ABS ((violence W/4 (prevent* OR manag*) W/4 training))) OR (TITLE-ABS (one-to-one W/1 nurs*)) OR (TITLE-ABS ((patient* W/1 (isolation OR segregation)))) OR (TITLE-ABS ((physical* W/1 (immobili* OR control)))) OR (TITLE-ABS ((lock OR locked OR locking) W/1 (door* OR ward* OR room*))) OR (TITLE-ABS (forced W/1 (medic* OR sedat* OR drug* OR treatment*))) OR (TITLE-ABS (involuntary W/1 (medic* OR sedat* OR drug* OR treatment*))) OR (TITLE-ABS ((prn OR "pro re nata") W/1 medicat*)) OR (TITLE-ABS ((rapid* AND	3292

Search terms	Number of hits
tranq*))) OR (TITLE-ABS (safety W/1 (huddle* OR plan*))) OR (TITLE-ABS (((weight* OR comfort) W/1 blanket*))) OR (TITLE-ABS (((comfort OR safe OR sensory) W/2 room*))) OR (TITLE-ABS (restric* W/2 (practice* OR intervention* OR liberty))) OR (TITLE-ABS (isolation OR "calm down" OR "soft word*" OR "talk down" OR de-escalat* OR deescalat* OR seclusion OR seclude* OR restrain*))) AND ((TITLE-ABS ((youth OR young OR juvenile) W/1 offend*)) OR (TITLE-ABS ("juvenile justice" OR incarcerat* OR detention OR custody OR prison* OR jail* OR inmate* OR detain* OR "juvenile delinquen*")) OR (TITLE-ABS ((secure W/2 (home* OR accommodation OR unit* OR centre* OR center* OR service* OR facilit*))) OR (TITLE-ABS (((foster OR residential) W/2 (care OR home*)))) OR (TITLE-ABS ((children* W/1 home*))) OR (TITLE-ABS (((foster OR "looked after") W/2 child*)))) OR (TITLE-ABS ("Foster Care" OR "assisted living" OR orphanage* OR "Residential Care" OR "social worker*" OR "social work" OR "social care" OR orphan*)) OR (TITLE-ABS ((pupil* OR school* OR child* OR education) W/2 referral)) OR (TITLE-ABS ((education* W/1 (service* OR facilit* OR institution*)))) OR (TITLE-ABS (kindergarten* OR nursery OR pre-school* OR classroom* OR school*)) OR (TITLE-ABS ((asylum OR refugee* OR migrant* OR immigrant* OR immigration) W/4 (service* OR center* OR center* OR department* OR facilit* OR unit*))) OR (TITLE-ABS (((health OR medic* OR psychiatr* OR mental) W/1 (service* OR center* OR center* OR department* OR facilit* OR unit* OR Ward*)))) OR (TITLE-ABS ((child* OR young OR pediatric OR paediatric OR Adolescent*) W/2 services)))) AND NOT ((seat or seats or seatbelt* or "road safety" or "passenger safety") or (((Road or Traffic) W/1 (injur* or trauma or accident*))) or (((car or vehicle) W/1 (restraint* or safety or crash*)))) AND (EXCLUDE (SUBJAREA,"IMMU") OR EXCLUDE (SUBJAREA,"BIOC") OR EXCLUDE (SUBJAREA,"AGRI") OR EXCLUDE (SUBJAREA,"ENGI") OR EXCLUDE (SUBJAREA,"VETE") OR EXCLUDE (SUBJAREA,"MATE") OR EXCLUDE (SUBJAREA,"PHYS") OR EXCLUDE (SUBJAREA,"CHEM") OR EXCLUDE (SUBJAREA,"CENG")) AND (LIMIT-TO (PUBYEAR,2019) OR LIMIT-TO (PUBYEAR,2018) OR LIMIT-TO (PUBYEAR,2017) OR LIMIT-TO (PUBYEAR,2016) OR LIMIT-TO (PUBYEAR,2015) OR LIMIT-TO (PUBYEAR,2014) OR LIMIT-TO (PUBYEAR,2013) OR LIMIT-TO (PUBYEAR,2012) OR LIMIT-TO (PUBYEAR,2011) OR LIMIT-TO (PUBYEAR,2010) OR LIMIT-TO (PUBYEAR,2009) OR LIMIT-TO (PUBYEAR,2008) OR LIMIT-TO (PUBYEAR,2007) OR LIMIT-TO (PUBYEAR,2006) OR LIMIT-TO (PUBYEAR,2005) OR LIMIT-TO (PUBYEAR,2004) OR LIMIT-TO (PUBYEAR,2003) OR LIMIT-TO (PUBYEAR,2002) OR LIMIT-TO (PUBYEAR,2001) OR LIMIT-TO (PUBYEAR,2000) OR LIMIT-TO (PUBYEAR,1999) OR LIMIT-TO (PUBYEAR,1998) OR LIMIT-TO (PUBYEAR,1997) OR LIMIT-TO (PUBYEAR,1996) OR LIMIT-TO (PUBYEAR,1995) OR LIMIT-TO (PUBYEAR,1994) OR LIMIT-TO (PUBYEAR,1993) OR LIMIT-TO (PUBYEAR,1992) OR LIMIT-TO (PUBYEAR,1991) OR LIMIT-TO (PUBYEAR,1990) OR LIMIT-TO (PUBYEAR,1989))	

ASSIA, Applied Social Sciences Index and Abstracts; CINAHL, Cumulative Index to Nursing and Allied Health Literature; ERIC, Education Resources Information Center.

Grey literature sources including social media

Agency for Healthcare Research and Quality.

AGENDA: Alliance for Women & Girls At Risk.

Article 39.

Barnardo's.

British Association of Social Workers.

British Institute of Learning Disabilities.

British Society of Criminology.

Challenging Behaviour Foundation.

Children's Society.

Crisis Prevention Institute (CPI).

Foundation for Professionals in Services to Adolescents.

Google.

HM Inspector of Constabulary and HM Inspector of Fire & Rescue Services.

HM Inspectorate of Prisons for England and Wales.

HM Inspectorate of Probation.

Howard League.

INQUEST.

MENCAP.

National Children's Bureau.

National Police Library.

National Society for the Prevention of Cruelty to Children.

National Youth Work.

Prison Reform Trust.

Prisons and Probation Ombudsman.

ProQuest Dissertations & Theses A&I (Proquest) 1743 to 24 January 2020.

Restraint reduction network.

SAFE crisis management.

SCIE.

Secure Children's Homes/Secure accommodation network.

Social Care Online (SCIE) 1980 – 28 January 2020.

Twitter.

Young Minds.

Youth Justice Board for England and Wales.

Note that the number of records listed for the website searches include duplicates found during the update search.

Source	Website	Date searched	Searches	Total number of records
Agency for Healthcare Research and Quality	www.ahrq.gov/	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	21
		28 January 2020	Used advanced search field 'Results with a least one of the words'. Searched for string: restraint coercive coercion restrict de-escalate de-escalation restrictive restraints restrained coerced restricted. In TI only	
Agenda, the alliance for women & girls at risk	https://weareagenda.org/	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour. Browsed publications	17
		28 January 2020	Browsed all research articles. Also searched for term 'Restraint'	
Article 39	https://article39.org.uk	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour. Browsed publications	20
		28 January 2020	Browed all publications in publications library	
Barnardo's	www.barnardos.org.uk/	31 July 2019	No search function. All sections browsed	26
		28 January 2020	Browsed all reports in publications www.barnardos.org.uk/get-involved/campaign-with-us/publications	
The British Association of Social Workers (BASW)	www.basw.co.uk/	31 July 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour (in resources section)	85
		28 January 2020	Searched as a string in Resources section: restraint coerce de-escalate de-escalation restrained seclusion restrictive coercion coercive. Refined to Specialism Children and Families	
British Institute of Learning Disabilities	www.bild.org.uk/	6 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	96
		28 January 2020	In webpage search box searched as one string: restraint restraints restrain restrict coercive coerce coercion de-escalate de-escalation restrictive	

Source	Website	Date searched	Searches	Total number of records
British Society of Criminology (BSC)	www.britsoccrim.org/	1 August 2019	No search function. Browsed publications, and conference sections	1
		28 January 2020	Browsed publications and conference sections	
The Challenging Behaviour Foundation	www.challengingbehaviour.org.uk/	6 August 2019	No search functionally. Browsed website	33
		28 January 2020	Searched 'restraint' and 'child' in webpage search box	
The Children's Society	www.childrenssociety.org.uk/	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	5
		28 January 2020	Navigated website from What we do > Publications library then searched above terms	
Crisis Prevention Institute (CPI)	www.crisisprevention.com/	6 August 2019	No search functionally. Browsed website	20
		28 January 2020	Browsed Resources > Topic = restraint reduction	
Foundation for Professionals in Services to Adolescents	www.foundationpsa.org.uk/	31 July 2019	No search function. Browsed Resources, Reports and News sections	2
		28 January 2020	Browsed Resources, Reports and News sections	
Google		8 August 2019	Searched the 1st 25 countries in the Legatum Prosperity Index (ranked for Health) www.prosperity.com/rankings	1825
			Norway, Netherlands, USA, New Zealand, Ireland, Slovenia, Finland, Iceland, Malta, Switzerland, Luxembourg, France, Denmark, Australia, Singapore, Sweden, Germany, Hong Kong, UK, Austria, Japan, Canada, Belgium, Portugal, Spain	
			Google Advanced Search interface	
			For each country searched	
			allintitle: restraint site:.no filetype:pdf	
			allintitle: seclusion site:.no filetype:pdf	
			allintitle: coercion site:.no filetype:pdf	
			Note, in this example the site:.no refers to the country domain.no for Norway	

Source	Website	Date searched	Searches	Total number of records
		29 January 2020	Searched the 25 country domains as above but limited to content added to Google in last 12 months. Also, used a search string for seclusion restraint coercion For each country searched: any of the words: restraint seclusion coercion last update: upto a year ago site or domain:.no terms appearing: allintitle file type: pdf	124
HM Inspector of Constabulary and HM Inspector of Fire & Rescue Services	www.justiceinspectorates.gov.uk/hmicfrs/	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	38
		28 January 2020	Entered into webpage search box: (restraint restraints restrictive coercive coerce coercion de-escalate de-escalation) AND (child adolescent juvenille youth). Then limited to 2020 or dates since July 2019 using date filters	
HM Inspectorate of Prisons for England and Wales	www.justiceinspectorates.gov.uk/hmiprisons	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	16
		28 January 2020	Used search string: Search string: restraint restraints coercion coerce coercive de-escalation de-escalate behaviour restrictive. Then limited to 2020 or dates since July 2019 using date filters	
HM Inspectorate of Probation	www.justiceinspectorates.gov.uk/hmiprobation/	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	31
		28 January 2020	Used search string: Search string: restraint restraints coercion coerce coercive de-escalation de-escalate behaviour restrictive. Then limited to 2020 or dates since July 2019 using date filters	

Source	Website	Date searched	Searches	Total number of records
The Howard League for Penal Reform	https://howardleague.org/	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour. Browsed publications and research	33
		28 January 2020	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour. Browsed publications and research	
INQUEST	www.inquest.org.uk/	1 August 2019	No search function. Browsed research and policy section	4
		28 January 2020	Browsed research and policy section	
MENCAP	www.mencap.org.uk/	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	123
		28 January 2020	Used search string restraint restrict coerce coercive coercion de-escalate de-escalation behaviour	
National Children's Bureau	www.ncb.org.uk/	31 July 2019	No search function. All sections browsed	0
		28 January 2020	All sections browsed	
National Police Library	https://library.college.police.uk/HeritageScripts/Hapi.dll/search1	30 July 2019	Separate searches for restrain* or restrain* or coercive or coercion or coerced or seclude or seclusion or seclusive or de-escalat*	413
		28 January 2020	Searched in 'All Fields' for (restrict* OR restrain* OR coercive OR coercion OR coerced OR seclude OR seclusion OR seclusive OR de-escalat* OR immobili*) AND (child* OR teen* OR adolescen* OR youth* OR young* OR infant* OR juvenil*)	128
National Youth Work	https://nya.org.uk/	31 July 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	17
		28 January 2020	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	

Source	Website	Date searched	Searches	Total number of records
NSPCC	www.nspcc.org.uk/?	31 July 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour and all sections browsed	3
		28 January 2020	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, and all sections browsed	
Prisons and Probation Ombudsman	www.ppo.gov.uk/	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	18
		28 January 2020	As above but combined with child youth young	
Prison Reform Trust	www.prisonreformtrust.org.uk/	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour. Browsed publications	8
		28 January 2020	Browsed 2019–20 publications	
ProQuest Dissertations & Theses A&I (Proquest) 1743 to 24-01-2020			Date range searched: 1743 to 24 January 2020 Same search strategy as ASSIA	2473
Restraint Reduction Network	www.restraintreductionnetwork.org	6 August 2019	No search functionally. Browsed website	42
		29 January 2020	https://restraintreductionnetwork.org/toolsandresources/Tools and Resources screened	
Safe Crisis Management	www.safecrisismanagement.org/	6 August 2019	No search functionally. Browsed website	0
		28 January 2020	Browsed website	
Secure Children's Homes/ Secure Accommodation Network	www.securechildrenshomes.org.uk/	31 July 2019	No search function. All sections browsed	0
	www.securechildrenshomes.org.uk/secure-accommodation-network/	28 January 2020	All sections browsed	

Source	Website	Date searched	Searches	Total number of records
Social Care Institute for Excellence (SCIE)	www.scie.org.uk/	30 July 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation (auto truncates)	18
		28 January 2020	Browsed SCIE Resources and services within the SCIE websites	
Social Care Online (SCIE) 1980 to 28-01-2020		28 January 2020	Used Advanced search interface	64,325
			(1) - SubjectTerms:'"children" 'including narrower terms – OR SubjectTerms:' "young people" 'including narrower terms – OR AllFields:'child*' – OR AllFields:'teen*' – OR AllFields:'paediatric' – OR AllFields:'paediatric' – OR AllFields:'adolescent' – OR AllFields:'juvenile' – OR AllFields:'youth' – OR AllFieldsExact:'young person' – OR AllFieldsExact:'young people']	
			(2) – SubjectTerms:'"restraint" 'including this term only – OR SubjectTerms:'"physical restraint" 'including this term only – OR SubjectTerms:'"compulsory treatment" 'including this term only – OR AllFields:'restrain' – OR AllFields:'"restraint" '– OR AllFieldsExact:'restrictive' *this reduced count significantly a got rid of a lot of unrelated papers – OR AllFields:'coercive' – OR AllFields:'coercion' – OR AllFields:'coerced' – OR AllFields:'seclude' – OR AllFields:'seclusive' – OR AllFields:'seclusion' – OR AllFields:'de-escalate' – OR AllFields: 'de-escalation' – OR AllFields:'isolation booth' – OR AllFields:'clinical holding' – OR AllFields:'physical holding' – OR AllFields:'immobilisation' – OR AllFields:'immobilisation'	1842
			Child (1) AND Restraint (2) search combined	270

Source	Website	Date searched	Searches	Total number of records
Twitter		8 August 2019	#restraintReduction	5
			#training #restraint	
			#training #seclusion	
		28 January 2020	#restraintReduction	11
			#training #restraint	
			#training #seclusion	
YoungMinds	https://youngminds.org.uk/	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour. Browsed publications	58
		28 January 2020	Used search string: restraint restrict restraints restrictive coercive coerce coercion de-escalate de-escalation	
Youth Justice Board for England and Wales	www.gov.uk/government/organisations/youth-justice-board-for-england-and-wales	1 August 2019	Separate searches for restraint, restrict, coercive, coerce, coercion, de-escalate, de-escalation, behaviour	31
		28 January 2020	Browsed policies, research and guidance sections	

Appendix 2 Included records

Author(s)	Title	Journal/source	F	Year	Intervention name
Evaluations					
Azeem M, Aujla A, Rammerth M, Binsfeld G, Jones RB	Effectiveness of six core strategies based on trauma informed care in reducing seclusions and restraints at a child and adolescent psychiatric hospital	*JCAPN*	1	2017	'six core strategies based on trauma informed care'
Bobier C, Boon T, Downward M, Loomes B, Mountford H, Swadi H	Pilot investigation of the use and usefulness of a sensory modulation room in a child and adolescent psychiatric inpatient unit	*Occup Ther Ment Health*	1	2015	'sensory modulation room'
Boel-Studt SM	A quasi-experimental study of trauma-informed psychiatric residential treatment for children and adolescents	*Res Soc Work Pract*	1	2017	TI-PRC
Bonnell W, Alatishe YA, Hofner A	The effects of a changing culture on a child and adolescent psychiatric inpatient unit	*J Can Acad Child Adolesc Psychiatry*	1	2014	CPS
Borckardt JJ, Madan A, Grubaugh AL, Danielson CK, Pelic CG, Hardesty SJ, *et al.*	Systematic investigation of initiatives to reduce seclusion and restraint in a state psychiatric hospital	*Psychiatr Serv*	1	2011	engagement model (adaptation from the work of Bloom)
Campbell N	STAR project outcomes	*Resid Group Care Q*	2	2004	STAR
Craig JH, Sanders KL	Evaluation of a program model for minimizing restraint and seclusion	*Adv Neurodev Disord*	1	2018	Trauma informed approach (TIA). Comfort vs. control. 'program model for minimizing restraint and seclusion'
Craig JH	Evaluation of a program model for minimizing restraint and seclusion	*Diss Abstr B Sci Eng*	7	2015	'program model for minimizing restraint and seclusion' (Grafton model)
Crosland KA, Cigales M, Dunlap G, Neff B, Clark HB, Giddings T, *et al.*	Using staff training to decrease the use of restrictive procedures at two facilities for foster care children	*Res Soc Work Pract*	1	2008	BASP
Dean AJ, Duke SG, George M, Scott J	Behavioral management leads to reduction in aggression in a child and adolescent psychiatric inpatient unit	*JAACAP*	1	2007	'milieu-based behavioral management program'
Deveau R, Leitch S	The impact of restraint reduction meetings on the use of restrictive physical interventions in English residential services for children and young people	*Child Care Health Dev*	1	2015	RRM
Eblin A	Reducing seclusion and restraints on the inpatient child and adolescent behavioral health unit: a quality improvement study	*JCAPN*	1	2019	'quality improvement'

Author(s)	Title	Journal/source	F	Year	Intervention name
Elwyn L, Esaki N, Smith C	Importance of leadership and employee engagement in trauma-informed organizational change at a girls' juvenile justice facility	*Hum Serv Organ Manag Lead Gov*	1	2017	The Sanctuary Model
Ercole-Fricke E, Fritz P, Hill LE, Snelders J	Effects of a collaborative problem-solving approach on an inpatient adolescent psychiatric unit	*JCAPN*	1	2016	CPS
Ercole-Fricke E	Effects of a collaborative problem solving approach on an inpatient adolescent psychiatric unit	*Diss Abstr B Sci Eng*	7	2014	CPS
Farina MV	Toward reducing the utilization of seclusion and restraint: Exploring a paradigm shift and its success	*Diss Abstr B Sci Eng*	7	2007	evaluation of impact of new seclusion and restraint policy
Finnie HM	The collaborative problem-solving approach with traumatized children: Its effectiveness in the reduction of locked seclusion in an inpatient psychiatric setting	Thesis	7	2013	CPS
Ford JD, Hawke J	Trauma affect regulation psychoeducation group and milieu intervention outcomes in juvenile detention facilities	*J Aggress Maltreat Trauma*	1	2012	TARGET
Forrest S, Gervais R, Lord KA, Sposato A, Martin L, Beserra K, Spinazzola J	Building Communities of Care: a comprehensive model for trauma informed youth capacity building and behavior management in residential services	*Resid Treat Child Youth*	1	2018	BCC
Fowler NA	Aromatherapy, used as an integrative tool for crisis management by adolescents in a residential treatment center	*JCAPN*	1	2006	'aromatherapy for crisis management'
Fralick SL	A restraint utilization project	*Nurs Adm Q*	1	2007	Rapid Cycle Model for Improvement
Glew B-A	*Reducing the Use of Seclusion and Restraint in Segregated Special Education School Settings Through Implementation of the Collaborative Problem Solving Model*	Thesis	7	2012	CPS
Greene RW, Ablon JS, Hassuk B, Regan KM, Martin A.	Innovations: child & adolescent psychiatry: use of collaborative problem solving to reduce seclusion and restraint in child and adolescent inpatient units	*Psychiatr Serv*	1	2006	CPS
Hallman IS, O'Connor N, Hasenau S, Brady S	Improving the culture of safety on a high-acuity inpatient child/adolescent psychiatric unit by mindfulness-based stress reduction training of staff	*JCAPN*	1	2014	Mindfulness-based Stress Reduction training program
Hambrick EP, Brawner TW, Perry BD, Wang EY, Griffin G, DeMarco T, *et al.*	Restraint and critical incident reduction following introduction of the neurosequential model of therapeutics (NMT)	*Resid Treat Child Youth*	1	2018	NMT

Author(s)	Title	Journal/source	F	Year	Intervention name
Health Sciences Center Winnipeg	*WCB Workplace Innovation Project*	Report	4	2015	6CS
Hellerstein DJ, Staub AB, Lequesne E	Decreasing the use of restraint and seclusion among psychiatric inpatients	*J Psychiatric Pract*	1	2007	'hospital-wide effort'
Hodgdon HB, Kinniburgh K, Gabowitz D, Blaustein ME, Spinazzola J	Development and implementation of trauma-informed programming in youth residential treatment centers using the ARC framework	*J Fam Violence*	1	2013	ARC framework
Holstead J, Lamond D, Dalton J, Horne A, Crick R	Restraint reduction in children's residential facilities: implementation at Damar Services	*Resid Treat Child Youth*	1	2010	'restraint reduction initiative'
Huckshorn KA	*Preventing Violence, Trauma, and the Use of Seclusion and Restraint in Mental Health Settings: Preventing Conflict, Violence and the use of Seclusion/Restraint*	Workshop slides (unpublished)	10	2010	6CS
Jani, Knight S, Jani S	The implementation of milieu therapy training to reduce the frequency of restraints in residential treatment centers	*Adolesc Psychiatry*	1	2011	milieu therapy training and CPS
Jones RJ, Timbers GD	Minimizing the need for physical restraint and seclusion in residential youth care through skill-based treatment programming	*Fam Soc*	1	2003	Teaching-Family Model
Jonikas JA, Cook JA, Rosen C, Laris A, Kim JB	A program to reduce use of physical restraint in psychiatric inpatient facilities	*Psychiatr Serv*	1	2004	'a program to reduce the use of physical restraint'
Kalogjera IJ, Bedi A, Watson WN, Meyer AD	Impact of therapeutic management on use of seclusion and restraint with disruptive adolescent inpatients	*Hosp Community Psychiatry*	1	1989	'therapeutic management'
Kaltiala-Heino R, Berg J, Selander M, Työläjärvi M, Kahila K	Aggression management in an adolescent forensic unit	*Int J Forens Ment Health*	1	2007	'a systematic and comprehensive aggression management program'
Kilgore A	Effectiveness of collaborative problem solving model in reducing seclusion and restraint in a child psychiatric unit	*Diss Abstr B Sci Eng*	7	2012	CPS
Lebel J, Goldstein R	The economic cost of using restraint and the value added by restraint reduction or elimination	*Psychiatr Serv*	1	2005	'statewide initiative to reduce or eliminate the use of seclusion and restraint among children and adolescents'
LeBel J, Stromberg N, Duckworth K, Kerzner J, Goldstein R, Weeks M, Harper G, LaFlair L, Sudders M	Child and adolescent inpatient restraint reduction: a state initiative to promote strength-based care	*J Am Acad Child Adolesc Psychiatry*	1	2004	'systems approach'

Author(s)	Title	Journal/source	F	Year	Intervention name
Leitch S.	*The Impact of Restraint Reduction Meetings on the Use of Restrictive Physical Interventions (RPI) in Residential Services for Children and Young People*	Dissertation	7	2009	RPI
Magnowski S	*The Impact of Milieu Nurse Patient Shift Assignments on Monthly Restraint Rates on an Inpatient Child and Adolescent Psychiatric Unit*	Supplied intervention material	7	2018	'milieu nurse'
Magnowski S, Cleveland S	The impact of milieu nurse-client shift assignments on monthly restraint rates	*J Am Psychiatr Nurses Assoc*	1	2019	'cognitive milieu therapy'
Marrow MT, Knudsen KJ, Olafson E, Bucher SE	The value of implementing TARGET within a trauma-informed juvenile justice setting	*J Child Adolesc Trauma*	1	2012	'multifaceted trauma-focused intervention' including TARGET
Martin A, Krieg H, Esposito F, Stubbe D, Cardona L	Reduction of restraint and seclusion through collaborative problem solving: a five-year prospective inpatient study	*Psychiatr Serv*	1	2008	CPS
McGlinn CJ.	The effect of federal regulations on the physical restraint of children and adolescents in residential treatment with an analysis of client, staff, and environmental variables	*Diss Abstr B Sci Eng*	7	2006	federal regulations
Miguel ES	*The Dynamics and Ramifications of Severe Challenging Behaviors: Daring to Reduce Severe Challenging Behavior in Schools Without Physical Restraint and Seclusion*	Thesis	7	2016	Functional Communications Training and Systema Breathing
Miller JA, Hunt DP, Georges MA	Reduction of physical restraints in residential treatment facilities	*J Disabil Policy Stud*	1	2006	'2-phase (organizational and milieu) physical restraint reduction intervention'
Murphy CJ, Siv AM	A one year study of mode deactivation therapy: adolescent residential patients with conduct and personality disorders	*Int J Behav Consult Ther*	1	2011	(MDT
Nunno MA, Smith EG, Martin WR, Butcher S	Benefits of embedding research into practice: an agency-university collaboration	*Child Welfare*	1	2015	the CARE model
Nunno MA, Holden MJ, Leidy B	Evaluating and monitoring the impact of a crisis intervention system on a residential child care facility	*Child Youth Serv Rev*	1	2003	TCI
O'Brien C	Best practices in behavior support: preventing and reducing the use of restraint and seclusion	*Resid Group Care Q*	2	2004	'psychoeducational treatment model'
Paccione-Dyszlewski MR, Conelea CA, Heisler WC, Vilardi JC, Sachs HT	A crisis management quality improvement initiative in a children's psychiatric hospital: design, implementation, and outcome	*J Psychiatr Pract*	1	2012	QBS, Inc. SafetyCare Behavioral Safety Management program

Author(s)	Title	Journal/source	F	Year	Intervention name
Padhi A, Norcott J, Yoo E, Vakili A	Eliminating seclusion and reducing restraint: hope on an acute adolescent psychiatric ward	*Aust N Z J Psychiatry*	9	2019	'cultural transformation'
Plant R.	Courageous patience part II: lessons learned from a five-year program to reduce/eliminate restraint and seclusion	*Resid Group Care Q*	2	2004	The ABCD program including TACE staff training
Pollastri AR, Lieberman RE, Boldt SL, Ablon J	Minimizing seclusion and restraint in youth residential and day treatment through site-wide implementation of Collaborative Problem Solving	*Resid Treat Child Youth*	1	2016	CPS
Ponge L, Harris J	Reduction of seclusion and restraint in a children's psychiatric center	*Commun Nurs Res*	1	2006	multidisciplinary, multimodal approach
Reynolds EK, Grados MA, Praglowski N, Hankinson JC, Deboard-Lucas R, Goldstein L, Perry-Parrish C, Specht M, Ostrander R	Use of modified positive behavioral interventions and supports in a psychiatric inpatient unit for high-risk youths	*Psychiatr Serv*	1	2016	M-PBIS
Reynolds EK, Grados MA, Praglowski N, Hankinson JC, Parrish C, Ostrander R	Implementation of Modified Positive Behavioral Interventions and Supports in a youth psychiatric partial hospital program	*J Patient Saf Risk Manag*	1	2019b	M-PBIS
Russell M, Maher C, Dorrell M, Pitcher C, Henderson L	A comparison between users and non-users of Devereux's Safe and Positive Approaches training curricula in the reduction of injury and restraint	*Resid Treat Child Youth*	1	2009	SPA
Ryan JB, Peterson R, Tetreault G, Hagen EV	Reducing seclusion timeout and restraint procedures with at-risk youth	*J At-Risk Issues*	1	2007	CPI's Nonviolent Crisis Intervention Training
Ryan JB, Peterson RL, Tetreault G, van der Hagen E	Reducing the Use of Seclusion and Restraint in a Day School Program	Chapter in Nunno M, Day D, Bullard L. *For Our Own Safety: Examining the Safety of High-risk Interventions for Children and Young People*. New York: Child Welfare League of America; 2008	3	2008	therapeutic Intervention
Sanders K	The effects of an action plan, staff training, management support and monitoring on restraint use and costs of work-related injuries	*J Appl Res Intellect Disabil*	1	2009	Grafton program
Schreiner GM, Crafton CG, Sevin JA	Decreasing the use of mechanical restraints and locked seclusion	*Adm Policy Ment Health*	1	2004	'restraint reduction process'
Seckman A, Paun O, Heipp B, Van Stee M, Keels-Lowe V, Beel F, *et al.*	Evaluation of the use of a sensory room on an adolescent inpatient unit and its impact on restraint and seclusion prevention	*JCAPN*	1	2017	sensory room

Author(s)	Title	Journal/source	F	Year	Intervention name
Shadili G, Brocco C, De Vieille I, Piot MA, Lavergne P	Violence in an adolescent psychiatric inpatient unit: a behavioural management plan	*Eur Neuropsychopharmacol*	9	2012	behavioural management planning
Singh NN, Singh SD, Davis CM, Latham LL, Ayers JG	Reconsidering the use of seclusion and restraints in inpatient child and adult psychiatry	*J Child Fam Stud*	1	1999	unnamed
Thomann J	*Factors in Restraint Reduction in Residential Treatment Facilities for Adolescents*	Thesis	7	2009	unnamed
Thompson RW, Huefner JC, Vollmer DG, Davis JL, Daly DL	A Case Study of an Organizational Intervention to Reduce Physical Interventions: Creating Effective, Harm-free Environments	Chapter in Nunno M, Day D, Bullard L. *For Our Own Safety: Examining the Safety of High-risk Interventions for Children and Young People*. New York: Child Welfare League of America; 2008	3	2008	Components of a Harm-Free Environment
Ubana RL, Ng JWL, Tan CSM, Raj HP, Ong EY, Ang LK, *et al.*	Continued implementation of an advanced practice nurse-led multidisciplinary programme to reduce disruptive incidences in young patients with mental health conditions	*Ann Acad Med Singapore*	9	2015	'multidisciplinary programme'
Valenkamp M, Verheij F, Van De Ende J, Verhulst F	Development and evaluation of the individual proactive aggression management method for residential child psychiatry and child care	*Eur Child Adolesc Psychiatry*	9	2011	Pro-ACT
van Loan CL, Gage NA, Cullen JP	Reducing use of physical restraint: a pilot study investigating a relationship-based crisis prevention curriculum	*Resid Treat Child Youth*	1	2015	Shifting Gears
Verret C, Massé L, Lagacé-Leblanc J, Delisle G, Doyon J	The impact of a schoolwide de-escalation intervention plan on the use of seclusion and restraint in a special education school	*Emot Behav Diffic*	1	2019	schoolwide de-escalation intervention plan
West M, Melvin G, McNamara F, Gordon M	An evaluation of the use and efficacy of a sensory room within an adolescent psychiatric inpatient unit	*Aust Occup Ther J*	1	2017	guided sensory room use
Williams DE, Grossett DL	Reduction of restraint of people with intellectual disabilities: an organizational behavior management (OBM) approach	*Res Dev Disabil*	1	2011	OBM
Wisdom JP, Wenger D, Robertson D, Van Bramer J, Sederer LI	The New York State Office of Mental Health Positive Alternatives to Restraint and Seclusion (PARS) project	*Psychiatr Serv*	1	2015	6CS
Witte L.	Reducing the use of seclusion and restraint. A Michigan provider reduced its use of seclusion and restraint by 93% in one year on its child and adolescent unit	*Behav Healthc*	1	2008	Six Steps to Success

Author(s)	Title	Journal/source	F	Year	Intervention name
Witte L.	Using training in verbal skills to reduce the use of seclusion and restraint	*J Safe Manag Disruptive Assaultive Behav*	6	2007	CPI's Enhancing Verbal Skills: Applications of Life Space Crisis Intervention℠
Mapping records					
Andrassy BM	Feelings thermometer: an early intervention scale for seclusion/restraint reduction among children and adolescents in residential psychiatric care	*JCAPN*	1	2016	Feelings Thermometer Scale
Azeem MW, Reddy B, Wudarsky M, Carabetta L, Gregory F, Sarofin M	Restraint Reduction at a pediatric psychiatric hospital: a ten-year journey	*JCAPN*	1	2015	'six core strategies based on trauma informed care'
Barnett SR, dosReis S, Riddle MA, Maryland Youth Practice Improvement Committee for Mental Health	Improving the management of acute aggression in state residential and inpatient psychiatric facilities for youths	*J Am Acad Child Adolesc Psychiatry*	1	2002	'guide to improve management of client acute aggressive behaviour'
Brown AD, McCauley K, Navalta CP, Saxe GN	Trauma systems therapy in residential settings: improving emotion regulation and the social environment of traumatized children and youth in congregate care	*J Fam Violence*	1	2013	Trauma Systems Therapy (TST)
Budlong M	Lessons learned and organizational changes implemented as a result of the SAMHSA restraint and seclusion grant	*Resid Group Care Q*	2	2004	unnamed
Caldwell B, Albert C, Azeem MW, Beck S, Cocoros D, Cocoros T, *et al.*	Successful seclusion and restraint prevention effort in child and adolescent programs	*J Psychosoc Nurs Ment Health Serv*	1	2014	6CS
Caldwell B, LeBel J	Reducing restraint and seclusion: how to implement whole system change	*Children's Voice*	6	2010	6CS
Canady V.	Model-of-care effort reduces need for restraint, seclusion at BH facility	*Ment Health Wkly*	6	2018	Comfort vs. control
Care Council for Wales	*Positive Approaches – Reducing Restrictive Practices in Social Care (Version 1)*	Learning resource	5	2016	Positive Behaviour Support, Active Support and Restorative Approaches
Carter J, Jones J, Stevens K	Beyond a Crisis Management Program: How we Reduced our Restraints by Half in One Year	Chapter in Nunno M, Day D, Bullard L. *For Our Own Safety: Examining the Safety of High-risk Interventions for Children and Young People*. New York: Child Welfare League of America; 2008	3	2008	PMAB

Author(s)	Title	Journal/source	F	Year	Intervention name
Colton D	*Checklist for Assessing Your Organization's Readiness for Reducing Seclusion and Restraint*	Report (unpublished)	4	2014	Checklist for Assessing Your Organization's Readiness for Reducing Seclusion and Restraint
Colton D, Xiong H	*Reducing Seclusion and Restraint – Organizational Questionnaire*	Supplied intervention material	5	2009	unnamed
Cooper S	Use of restraint reduced by therapeutic intervention	*Children & Young People Now*	6	2008	TCI
CPI	*The Nonviolent Crisis Intervention® Training Program and the National Association of State Mental Health Program Directors: Six Core Strategies for the Reduction of Restraint and Seclusion*	CPI publication	5	2013	CPI's Nonviolent Crisis Intervention®: Six Core Strategies
Donovan A, Siegel L, Zera G, Plant R, Martin A	Seclusion and restraint reform: an initiative by a child and adolescent psychiatric hospital	*Child Adolesc Psychiatry*	1	2003	Riverview program
Ford J	*TARGET Adolescent Individual Manual Facilitator Guide Twelve-Session*	Supplied intervention material	5	2013	TARGET (FREEDOM Steps)
Girelli S	Lessons learned in the reduction of restraint and seclusion: a three-year (plus) retrospective	*Resid Group Care Q*	2	2004	unnamed
Goren S, Abraham I, Doyle N	Reducing violence in a child psychiatric hospital through planned organizational change	*JCAPN*	1	1996	unnamed
Guilfoile M	The Devereux Glenholme School	*Resid Group Care Q*	2	2004	Devereux Glenholme internal quality improvement process
Department for Education and Department for Health and Social Care	*Reducing the Need for Restraint and Restrictive Intervention: Children and Young People with Learning Disabilities, Autistic Spectrum Conditions and Mental Health Difficulties in Health and Social Care Services and Special Education Settings*	Government report	4	2019	'a positive and proactive approach to behaviour'
HM Inspectorate of Prisons	*Behaviour Management and Restraint of Children in Custody*	Report	4	2015	MMPR
Holden MJ, Turnbull AJ, Heresniak R, Ruberti M, Holden JC, Saville E	*Therapeutic Crisis Intervention Activity Guide, 7th Edition*	Supplied intervention material	5	2020	TCI
Holden MJ, Turnbull AJ, Holden JC, Heresniak R, Ruberti M, Saville E	*Therapeutic Crisis Intervention Reference Guide, 7th Edition*	Supplied intervention material	5	2020	TCI
Holden MJ, Turnbull AJ, Holden JC, Heresniak R, Ruberti M, Saville E	*Therapeutic Crisis Intervention Student Workbook, 7th Edition*	Supplied intervention material	5	2020	TCI

Author(s)	Title	Journal/source	F	Year	Intervention name
Leitch S	*The Impact of Restraint Reduction Meetings on the Use of Restrictive Physical Interventions in Services for Children and Young People*	Supplied intervention material	10	2009	unnamed
Leitch S	*'Hands off' The Impact of Restraint Reduction Meetings on the Use of Restrictive Physical Interventions in Services for Children and Young People*	Supplied intervention material	10	2009	Hands Off
Leitch S	*Together Trust 6th June 2008*	Supplied intervention material	10	2008	unnamed
Leitch S	*Training*	Supplied intervention material	5	undated	unnamed
Leitch S	*Training Plan 6th June 2008*	supplied intervention material	5	2008	unnamed
Lietzke A	*Restraint Reduction and CPI Training*	CPI blog	8	2014	CPI's Nonviolent Crisis Intervention
Magnowski S	*Restraint Implications*	Supplied intervention material	5	undated	unnamed
NASMHPD	*Six Core Strategies for Reducing Seclusion and Restraint Use*	NASMHPD	5	2006	6CS
Partnership Projects	*Neuro De-escalation*	www.partnershipprojectsuk.com/project/neuro-de-escalation/	11	2020	Neuro De-escalation
PRICE Training	*Price Training*	www.pricetraining.co.uk	11	2020	Positive Behaviour Support
Rettmann R	*Changes in Attitudes, Changes in Outcomes*	CPI blog	8	2019	CPI's Nonviolent Crisis Intervention
Reynolds EK, Praglowski N, Parrish C, Ostrander R, Grados MA	Implementation of modified positive behavioral interventions and supports (M-PBIS) in acute psychiatric care inpatient and day hospital settings: immediate and long-term gains	*J Am Acad Child Adolesc Psychiatry*	9	2019a	M-PBIS
Rowan C	*Schools Operating Safely: Ten Alternatives to Medication, Seclusion and Restraints*	www.zonein.ca	4	2010	Schools Operating Safely
Smallridge P, Williamson A.	*Report on Implementing the Independent Review of Restraint in Juvenile Secure Settings*	Report	4	2011	CRT
Studio III Training Systems and Psychological Services	*Low Arousal Training*	www.studio3.org/low-arousal-training	11	2019	LASER
US Department of Education	*Restraint and Seclusion: Resource Document*	US Department of Education	4	2012	unnamed
Visalli H, McNasser G	Reducing seclusion and restraint: meeting the organizational challenge	*J Nurs Care Qual*	1	2000	'changing criterion design'

Author(s)	Title	Journal/source	F	Year	Intervention name
Welsh Government	*Guidance on Reducing Restrictive Practices in Childcare, Education, Health and Social Care Settings*	Consultation document	4	2019	Reducing Restrictive Practices Framework
WHO	*Strategies to end seclusion and restraint. WHO Quality Rights Specialized training*	WHO	5	2019	Strategies to end seclusion and restraint
Youth Justice Board for England and Wales	*Developing a Restraint Minimisation Strategy: Guidance for Secure Establishments on the Development of Restraint Minimisation Strategies*	Welsh Youth Justice Board report	4	2009	'restraint minimisation'
Youth Justice Board for England and Wales	*Minimising and Managing Physical Restraint Safeguarding Processes, Governance Arrangements, and Roles and Responsibilities*	Welsh Youth Justice Board report	4	2012	MMPR

ABCD, Autonomy, Belonging, Competence and Doing for Others; ARC, Attachment, Regulation and Competency; BASP, Behavior Analysis Services Program; BCC, Building Communities of Care; CARE, children and residential experiences; CPI, Crisis Prevention Institute; CRT, conflict resolution training; F, format; *JAACAP, Journal of the American Child and Adolescent Psychiatry*; *JCAPN, Journal of Child and Adolescent Psychiatric Nursing*; LASER, Low Arousal Supports Educational Resilience; MDT, mode deactivation therapy; NMT, Neurosequential Model of Therapeutics; OBM, organizational behavior management; PMAB, Prevention and Management of Aggressive Behavior; Pro-ACT, Pro-active monitoring of Aggression in Children Tool; RPI, restrictive physical interventions; RRM, restraint reduction meeting; STAR, staff training and resources; TACE, therapeutic assessment, communication and education; TI-PRC, trauma-informed psychiatric residential care; TIA, trauma-informed approach;

Notes

Shaded rows, records of evaluations; unshaded rows, mapping records (i.e. not evaluations).
Format: 1, journal; 2, newsletter; 3, book chapter; 4, report; 5 training resource; 6 professional magazine; 7, dissertation; 8, blog; 9, conference abstract; 10, slides; 11, website.
Where given, proper nouns are in title case (e.g. Six Core Strategies). Where unnamed but clearly described in the text, description is in lower case, using direct phrases from the record where feasible.

Appendix 3 Request for intervention materials

Text of e-mail request for intervention materials for CONTRAST mapping review:

Dear

Re: Request for intervention materials for CONTRAST mapping review

I am contacting you on behalf of the CONTRAST research team at the University of Leeds, UK. We are conducting a review of interventions designed to reduce the use of restrictive practices in children's settings. We identified the following publication:

xxxxxxxxxxxxxxx
We would like to request copies of any materials (see examples below) that were used in this intervention. You can supply these in hard or electronic copy or via a weblink. We would be very grateful for your assistance as we are extremely keen to include your work with as much detail as possible. Any references to materials that you supply will be fully credited to their source. We would greatly appreciate any response by 28th February 2020. This project is led by Professor John Baker at the University of Leeds and is funded by the National Institute for Health Research, Health Services & Delivery Research ID NIHR127281. Further information is available at: www.crd.york.ac.uk/prospero/display_record.php?RecordID%20=%20124730.

The study is also registered with PROSPERO (ID CRD42019124730) and you can follow updates on Twitter: #BCTContrast.

Many thanks and best wishes,

MATERIALS (examples – not an exhaustive list)

- Training, education or instruction materials or resources, such as:
  - booklets
  - leaflets/handouts
  - powerpoint slides
  - DVDs, videos, YouTube
  - vignettes
  - exercises
  - workshop materials and activities
  - course objectives/curriculum/plans
  - annual training plan/requirements
  - instructions/manuals
  - posters/display items.
- Any tool or proforma (including validated tools or tools developed for the intervention/study), such as:
  - data collection/recording tools
  - safety/violence assessment tool
  - planning tools/templates
  - debriefing/feedback proformas
  - review procedure proforma
  - checklist
  - sensory room log
  - tracking spreadsheet proforma.

Appendix 4 All records of interventions in evaluation studies and mapping studies, by author

Interventions occurring more than once across the included records

Intervention	Evaluation and mapping (*n*)	Intervention reported in evaluation records (*n*)	Intervention reported in mapping records (*n*)
6CS	12	5	7
CPS	7	7	0
Comfort vs. control	2	2	0
TCI	3	1	2
The Grafton program	2	1	1
M-PBIS	3	2	1
TARGET	2	1	1
SPA	2	1	1

Interventions evaluated in the evaluation records

Author(s) and year	INT[a]	Name/description of intervention[b]
Azeem *et al.*[38] 2017	2	six core strategies based on trauma informed care
Bobier *et al.*[165] 2015	4	sensory modulation room
Boel-Studt[171] 2017	5	TI-PRC
Bonnell *et al.*[109] 2014	6	CPS
Borckardt et al.[181] 2011	7	engagement model
Campbell[211] 2004	10	STAR
Craig and Sanders[120] 2018	11	TIA. Comfort vs. control. 'program model for minimizing restraint and seclusion'
Craig[88] 2015	17	'program model for minimizing restraint and seclusion' (Grafton model)
Crosland *et al.*[204] 2008	18	Behavior Analysis Services Program
Dean *et al.*[163] 2007	19	'milieu-based behavioral management program'
Deveau and Leitch[209] 2015	20	RRM
Eblin[162] 2019	22	'quality improvement'
Elwyn *et al.*[178] 2017	23	The Sanctuary Model
Ercole-Fricke *et al.*[107] 2016	24	CPS
Ercole[89] 2014	24	CPS
Farina[90] 2006	25	evaluation of impact of new seclusion and restraint policy
Finnie[91] 2013	24	CPS
Ford and Hawke[128] 2012	26	TARGET

Author(s) and year	INT[a]	Name/description of intervention[b]
Forrest *et al.*[172] 2018	27	BCC
Fowler[155] 2006	28	'aromatherapy for crisis management'
Fralick[176] 2007	29	Rapid Cycle Model for Improvement
Glew[92] 2012	24	CPS
Greene *et al.*[110] 2006	24	CPS
Hallman *et al.*[236] 2014	33	Mindfulness-based Stress Reduction training program
Hambrick *et al.*[79] 2018	34	NMT
Health Sciences Center Winnipeg[104] 2015	2	6CS
Hellerstein *et al.*[203] 2007	35	'a hospital-wide effort to decrease restraint and seclusion of psychiatric inpatients'
Hodgdon *et al.*[183] 2013	38	ARC Framework
Holstead *et al.*[191] 2010	39	'a restraint reduction initiative'
Huckshorn[77] 2010	2	6CS
Jani *et al.*[159] 2011	44	milieu therapy training and collaborative problem solving
Jones and Timbers[201] 2003	40	Teaching-Family Model
Jonikas *et al.*[189] 2004	41	'a program to reduce the use of physical restraint'
Kalogjera *et al.*[173] 1989	42	'therapeutic management'
Kaltiala-Heino *et al.*[198] 2007	43	'a systematic and comprehensive aggression management program'
Kilgore[93] 2018	24	CPS
Lebel and Goldstein[39] 2005	45	'statewide initiative to reduce or eliminate the use of seclusion and restraint among children and adolescents'
LeBel *et al.*[40] 2004	46	'a systems approach'
Leitch[94] 2009	47	RPI
Magnowski[95] 2018	48	'the milieu nurse'
Magnowski and Cleveland[80] 2019	48	'cognitive milieu therapy'
Marrow *et al.*[129] 2012	26	Incorporated TARGET plus other elements 'a multifaceted trauma-focused intervention'
Martin *et al.*[111] 2008	24	CPS
McGlinn[96] 2006	49	described (in title) as 'The effect of federal regulations on the physical restraint of children and adolescents in residential treatment'
Miguel[97] 2016	50	'Functional Communications Training' and 'Systema Breathing'
Miller *et al.*[182] 2006	51	'2-phase (organizational and milieu) physical restraint reduction intervention'
Murphy and Siv[158] 2011	52	MDT
Nunno *et al.*[177] 2015	53	the CARE model
Nunno *et al.*[81] 2003	16	TCI
O'Brien[202] 2004	54	key interventions including 'GBT Psychoeducational Treatment Model'
Paccione-Dyszlewski *et al.*[170] 2012	55	QBS, Inc. SafetyCare Behavioral Safety Management program
Padhi *et al.*[99] 2019	56	unnamed, described as a 'cultural transformation'

Author(s) and year	INT[a]	Name/description of intervention[b]
Plant 2004	58	The ABCD program (Autonomy, Belonging, Competence, and Doing for Others) including TACE staff training
Pollastri *et al.*[217] 2016	24	collaborative problem-solving
Ponge and Harris 2006	59	multidisciplinary, multimodal approach
Reynolds *et al.*[125] 2016	60	M-PBIS
Reynolds *et al.*[127] 2019	60	M-PBIS
Russell *et al.*[131] 2009	32	SPA
Ryan *et al.*[113] 2007	2	CPI's Nonviolent Crisis Intervention Training
Ryan *et al.*[86] 2008	62	Therapeutic Intervention
Sanders[108] 2009	17	Grafton program
Schreiner *et al.*[41] 2004	63	'restraint reduction process'
Seckman *et al.*[156] 2017	88	sensory room
Shadili *et al.*[101] 2012	65	'behavioural management plan'
Singh *et al.*[214] 1999	66	'reducing the use of seclusion and restraints'
Thomann[98] 2009	69	'restraint reduction'
Thompson *et al.*[87] 2008	70	Components of a Harm-Free Environment
Ubana *et al.*[102] 2015	71	'multidisciplinary programme'
Valenkamp *et al.*[103] 2011	73	Pro-ACT
van Loan *et al.*[184] 2015	74	Shifting Gears
Verret *et al.*[161] 2019	75	schoolwide de-escalation intervention plan
West *et al.*[164] 2017	77	guided sensory room use
Williams *et al.*[185] 2011	78	OBM
Wisdom *et al.*[114] 2015	2	6CS
Witte[167] 2008	79	Six Steps to Success
Witte[160] 2007	80	CPI's Enhancing Verbal Skills: Applications of Life Space Crisis Intervention[SM]

ABCD, Autonomy, Belonging, Competence, and Doing for Others; ARC, Attachment, Regulation and Competency; BCC, Building Communities of Care; CARE, Children and Residential Experiences; CPI, Crisis Prevention Institute; MDT, mode deactivation therapy; NMT, Neurosequential Model of Therapeutics; OBM, Organizational Behavior Management; Pro-ACT, Pro-active monitoring of Aggression in Children Tool; RPI, restrictive physical interventions; RRM, restraint reduction meeting; STAR, staff training and resources; TACE, Therapeutic Assessment, Communication, and Education; TI-PRC, Trauma Informed Psychiatric Residential Care.
a Indicates a reference number allocated to the specific intervention during analysis.
b Title case, given name; lower case, description.

Interventions described in mapping records

Author(s) and year	INT[a]	Intervention name/description[b]
Andrassy[154] 2016	1	'Feelings Thermometer Scale'
Azeem *et al.*[105] 2015	2	'six core strategies based on trauma informed care'
Barnett *et al.*[190] 2002	3	guide to improve management of client acute aggressive behaviour
Brown *et al.*[78] 2013	8	Trauma Systems Therapy (TST)

Author(s) and year	INT[a]	Intervention name/description[b]
Budlong[169] 2004	9	'model training approaches designed to reduce the use of restraint and seclusion in residential services for youth'
Caldwell *et al.*[115] 2014	2	6CS
Caldwell and LeBel[116] 2010	2	6CS
Canady[106] 2018	11	Comfort vs. control
Care Council for Wales[174] 2016	12	Positive Behaviour Support, Active Support and Restorative Approaches
Carter *et al.*[85] 2008	13	PMAB
Colton[82] 2004	14	Checklist for Assessing Your Organization's Readiness for Reducing Seclusion and Restraint
Colton and Xiong[207] 2009	15	unnamed
Cooper[121] 2008	16	TCI
CPI[117] 2013	2	Nonviolent Crisis Intervention®: Six Core Strategies
Donovan *et al.*[175] 2003	21	Riverview program, based on ABCD (Brendtro and Ryan and associates)
Ford[130] 2013	26	TARGET (FREEDOM Steps)
Girelli[210] 2004	30	reflects on a three year period of trying to reduce S/R
Goren *et al.*[168] 1996	31	'a project to reduce violence within a public child psychiatric hospital'
Guilfoile[132] 2004	32	'Devereux Glenholme internal quality improvement process'
HM Government 2019[29]	36	'a positive and proactive approach to behaviour'
HM Inspectorate of Prisons[23] 2015	37	MMPR
Holden *et al.*[122] 2020	16	TCI
Holden *et al.*[123] 2020	16	TCI
Holden *et al.*[124] 2020	16	TCI
Leitch[237] 2009	47	unnamed
Leitch[195] 2009	47	Hands Off
Leitch[238] 2008	47	unnamed
Leitch[239] (no date)	47	unnamed
Leitch[240] 2008	47	unnamed
Lietzke[118] 2014	2	Nonviolent Crisis Intervention
Magnowski[241] (no date)	48	unnamed
NASMHPD[33] 2006	2	6CS
Partnership Projects[186] 2020	57	Neuro De-escalation
PRICE Training 2020	60	Pragmatic approach to programmes
Rettmann[119] 2019	2	Nonviolent Crisis Intervention
Reynolds *et al.*[127] 2019	60	M-PBIS
Rowan[166] 2010	61	Schools Operating Safely
Smallridge and Williamson[187] 2011	67	CRT
Studio III Training Systems and Psychological Services[242] 2019	68	most relevant = LASERof educ
US Department of Education[197] 2012	72	unnamed

Author(s) and year	INT[a]	Intervention name/description[b]
Visalli and McNasser[188] 2000	76	'behavior mapping, the Anger Management Assessment and the Triangle of Choices'
Welsh Government[180]	60	PBS
World Health Organization[194] 2019	81	strategies to end seclusion and restraint
Youth Justice Board for England and Wales[199] 2009	82	'restraint minimisation strategies'
Youth Justice Board for England and Wales[192] 2012	83	MMPR

CPI, Crisis Prevention Institute; CRT, conflict resolution training; LASER, low arousal supports educational resilience; PBS, positive behaviour support; PMAB, Prevention and Management of Aggressive Behavior; TST, Trauma Systems Therapy.
a Indicates a reference number allocated to the specific intervention during analysis.
b Title case, given name; lower case, description.

Appendix 5 Records of interventions in evaluation studies and mapping studies

Comparative numbers of intervention events, evaluation records and mapping records

Intervention	Intervention events (*n*)	Mapping records by author (year)	*n*	Evaluation records by author (year)	*n*	All records (*n*)
6CS	11	Azeem *et al.*[105] 2015 Caldwell *et al.*[115] 2014 Caldwell and LeBel[116] 2010 CPI[117] 2013 Lietzke[118] 2014 NASMHPD[33] 2006 Rettmann[119] 2019	7	Azeem *et al.*[38] 2017 Health Sciences Center Winnipeg[104] 2015 Huckshorn[77] 2010 Ryan *et al.*[113] 2007 Wisdom *et al.*[114] 2015	5	12
CPS	9		0	Bonnell *et al.*[109] 2014 Ercole-Fricke *et al.*[107] 2016 Ercole-Fricke[89] 2014 Finnie[91] 2013 Glew[92] 2012 Greene *et al.*[110] 2006 Kilgore[93] 2018 Martin *et al.*[111] 2008 Pollastri *et al.*[112] 2016	9	9
CvC	2	Canady[106] 2018	1	Craig and Sanders[120] 2018	1	2
GRAFTON	2		0	Craig[88] 2015 Sanders[108] 2009	2	2
M-PBIS	3	PRICE Training[126] 2020 Reynolds *et al.*[127] 2019a Welsh Government[180] 2019	3	Reynolds *et al.*[125] 2016 Reynolds *et al.*[100] 2019b	2	5
SPA	2	Guilfoile[132] 2004	1	Russell *et al.*[131] 2009	1	2
TARGET	2	Ford[130] 2013	1	Ford and Hawke[128] 2012 Marrow *et al.*[129] 2012	2	3

Intervention	Intervention events (*n*)	Mapping records by author (year)	*n*	Evaluation records by author (year)	*n*	All records (*n*)
TCI	3	Cooper[121] 2008	4	Nunno *et al.*[81] 2003	1	5
		Holden *et al.*[122] 2020a				
		Holden *et al.*[123] 2020b				
		Holden *et al.*[124] 2020c				
Stand alone		Andrassy[124] 2016	28	Boel-Studt[171] 2017	53	
		Barnett *et al.*[190] 2002		Bobier *et al.*[167] 2015		
		Brown *et al.*[78] 2013		Borckardt *et al.*[181] 2011		
		Budlong[169] 2004		Campbell[211] 2004		
		Care Council for Wales[174] 2016		Crosland *et al.*[204] 2008		
		Carter *et al.*[85] 2008		Dean *et al.*[163] 2007		
		Colton[82] 2004		Deveau and Leitch[209] 2015		
		Colton and Xiong[207] 2009		Eblin[162] 2019		
		Donovan *et al.*[175] 2003		Elwyn *et al.*[178] 2017		
		Girelli[210] 2004		Farina[90] 2007		
		Goren *et al.*[168] 1996		Forrest *et al.*[172] 2018		
		HM Government[30] 2019		Fowler[155] 2006		
		HM Inspectorate of Prisons[23] 2015		Fralick[176] 2007		
		Leitch 2008 (unpublished)		Hallman *et al.*[236] 2014		
		Leitch 2008 (unpublished)		Hambrick *et al.*[79] 2018		
		Leitch 2009 (unpublished)		Hellerstein *et al.*[203] 2007		
		Leitch 2009 (unpublished)		Hodgdon *et al.*[183] 2013		
		Leitch (no date; unpublished)		Holstead *et al.*[191] 2010		
		Magnowski[241] nd		Jani *et al.*[159] 2011		
		Partnership Projects[186] 2020		Jones and Timbers[201] 2003		
		Rowan[166] 2010		Jonikas *et al.*[189] 2004		
		Smallridge and Williamson[187] 2011		Kalogjera *et al.*[173] 1989		
		Studio III Training Systems and Psychological Services[242] 2019		Kaltiala-Heino *et al.*[198] 2007		
		US Department of Education[197] 2012		Lebel and Goldstein[39] 2005		
		Visalli and McNasser[188] 2000		LeBel *et al.*[40] 2004		
				Leitch[94] 2009		
				Magnowski[95] 2018		

Intervention	Intervention events (*n*)	Mapping records by author (year)	*n*	Evaluation records by author (year)	*n*	All records (*n*)
		WHO[194] 2019		Magnowski and Cleveland[80] 2019		
		Youth Justice Board for England and Wales[199] 2009		McGlinn[96] 2006		
				Miguel[97] 2016		
		Youth Justice Board for England and Wales[192] 2012		Miller *et al.*[182] 2006		
				Murphy and Siv[158] 2011		
				Nunno *et al.*[177] 2015		
				O'Brien[202] 2004		
				Paccione-Dyszlewski *et al.*[170] 2012		
				Padhi *et al.*[99] 2019		
				Plant[179] 2004		
				Ponge and Harris[209] 2006		
				Ryan *et al.*[86] 2008		
				Schreiner *et al.*[41] 2004		
				Seckman *et al.*[156] 2017		
				Shadili *et al.*[101] 2012		
				Singh *et al.*[214] 1999		
				Thomann[98] 2009		
				Thompson *et al.*[87] 2008		
				Ubana *et al.*[102] 2015		
				Valenkamp *et al.*[193] 2011		
				van Loan[184] 2015		
				Verret *et al.*[161] 2019		
				West *et al.*[164] 2017		
				Williams *et al.*[193] 2011		
				Witte[160] 2007		
				Witte[167] 2008		
		Mapping records	45	Evaluation records	76	121

CPI, Crisis Prevention Institute; CvC, comfort vs. control.
Other = stand-alone interventions (i.e. implemented on a single occasion).
Interventions event = discrete implementation of an intervention (e.g. according to the retrieved records, the 6CS intervention has been implemented on 11 separate occasions; hence, although there are 12 records pertaining to the 6CS, they refer to only 11 intervention events for this intervention). Single instance of an intervention (e.g. there were two separate instances of the Grafton program, which were reported in Craig 2015 and Sanders 2009, respectively; hence, the number of intervention events is equal to the number of times the intervention is reported in the literature).

Evaluation records: interventions by author

Author(s) ($n = 76$)	Intervention number[a]	Name/description[b]
Azeem *et al.*[38] 2017	2	6CS
Bobier *et al.*[165] 2015	4	sensory modulation room
Boel-Studt[171] 2017	5	TI-PRC
Bonnell *et al.*[109] 2014	6	CPS
Borckardt *et al.*[181] 2011	7	engagement model
Campbell[211] 2004	10	STAR
Craig and Sanders[120] 2018	11	TIA. Comfort vs. control. 'program model for minimizing restraint and seclusion'
Craig[88] 2015	17	'program model for minimizing restraint and seclusion' (Grafton model)
Crosland *et al.*[204] 2008	18	Behavior Analysis Services Program
Dean *et al.*[163] 2007	19	'milieu-based behavioral management program'
Deveau and Leitch[209] 2015	20	RRM
Eblin[162] 2019	22	'quality improvement'
Elwyn *et al.*[178] 2017	23	The Sanctuary Model
Ercole-Fricke *et al.*[107] 2016	24	CPS
Ercole[89] 2014	24	CPS
Farina[90] 2007	25	evaluation of impact of new seclusion and restraint policy
Finnie[91] 2013	24	CPS
Ford and Hawke[128] 2012	26	TARGET
Forrest *et al.*[172] 2018	27	BCC
Fowler[155] 2006	28	'aromatherapy for crisis management'
Fralick[176] 2007	29	Rapid Cycle Model for Improvement
Glew[92] 2012	24	CPS
Greene *et al.*[110] 2006	24	CPS
Hallman *et al.*[236] 2014	33	Mindfulness-based Stress Reduction training program
Hambrick *et al.*[79] 2018	34	NMT
Health Sciences Center Winnipeg[104] 2015	2	6CS
Hellerstein *et al.*[203] 2007	35	'a hospital-wide effort to decrease restraint and seclusion of psychiatric inpatients'
Hodgdon *et al.*[183] 2013	38	ARC Framework
Holstead *et al.*[191] 2010	39	'a restraint reduction initiative'
Huckshorn[77] 2010	2	6CS
Jani *et al.*[159] 2011	44	milieu therapy training and collaborative problem solving
Jones and Timbers[201] 2003	40	Teaching-Family Model
Jonikas *et al.*[189] 2004	41	'a program to reduce the use of physical restraint'
Kalogjera *et al.*[173] 1989	42	'therapeutic management'

Author(s) ($n = 76$)	Intervention number[a]	Name/description[b]
Kaltiala-Heino *et al.*[198] 2007	43	'a systematic and comprehensive aggression management program'
Kilgore[93] 2018	24	CPS
Lebel and Goldstein[39] 2005	45	'statewide initiative to reduce or eliminate the use of seclusion and restraint among children and adolescents'
LeBel *et al.*[40] 2004	46	'a systems approach'
Leitch[195] 2009	47	RPI
Magnowski[95] 2018	48	'the milieu nurse'
Magnowski and Cleveland[80] 2019	48	'cognitive milieu therapy'
Marrow *et al.*[129] 2012	26	Incorporated TARGET plus other elements. 'a multifaceted trauma-focused intervention'
Martin *et al.*[111] 2008	24	CPS
McGlinn[96] 2006	49	described (in title) as 'The effect of federal regulations on the physical restraint of children and adolescents in residential treatment'
Miguel[97] 2016	50	'Functional Communications Training' and 'Systema Breathing'
Miller *et al.*[182] 2006	51	'2-phase (organizational and milieu) physical restraint reduction intervention'
Murphy and Siv[158] 2011	52	MDT
Nunno *et al.*[177] 2015	53	the CARE model
Nunno *et al.*[81] 2003	16	TCI
O'Brien[202] 2004	54	key interventions including 'GBT Psychoeducational Treatment Model'
Paccione-Dyszlewski *et al.*[170] 2012	55	QBS, Inc. SafetyCare Behavioral Safety Management program
Padhi *et al.*[99] 2019	56	unnamed, described as a 'cultural transformation'
Plant[179] 2004	58	The ABCD program including TACE staff training
Pollastri *et al.*[112] 2016	24	collaborative problem-solving
Ponge and Harris[243] 2006	59	multidisciplinary, multimodal approach
Reynolds *et al.*[125] 2016	60	M-PBIS
Reynolds *et al.*[100] 2019	60	M-PBIS
Russell *et al.*[131] 2009	32	SPA
Ryan *et al.*[113] 2007	2	CPI's Nonviolent Crisis Intervention Training
Ryan *et al.*[86] 2008	62	Therapeutic Intervention
Sanders[108] 2009	17	Grafton program
Schreiner *et al.*[41] 2004	63	'restraint reduction process'
Seckman *et al.*[156] 2017	88	sensory room
Shadili *et al.*[101] 2012	65	'behavioural management plan'
Singh *et al.*[214] 1999	66	'reducing the use of seclusion and restraints'
Thomann[98] 2010	69	'restraint reduction'

Author(s) ($n = 76$)	Intervention number[a]	Name/description[b]
Thompson *et al.*[87] 2008	70	Components of a Harm-Free Environment
Ubana *et al.*[102] 2015	71	'multidisciplinary programme'
Valenkamp *et al.*[103] 2011	73	Pro-ACT
van Loan *et al.*[184] 2015	74	Shifting Gears
Verret *et al.*[161] 2019	75	schoolwide de-escalation intervention plan
West *et al.*[164] 2017	77	guided sensory room use
Williams *et al.*[185] 2011	78	OBM
Wisdom *et al.*[164] 2015	2	6CS
Witte[167] 2008	79	Six Steps to Success
Witte[160] 2007	80	CPI's Enhancing Verbal Skills: Applications of Life Space Crisis Intervention[SM]

ABCD, Autonomy, Belonging, Competence, and Doing for Others; ARC, Attachment, Regulation and Competency; BCC, Building Communities of Care; CARE, Children and Residential Experiences; CPI, Crisis Prevention Institute; MDT, mode deactivation therapy; NMT, Neurosequential Model of Therapeutics; OBM, Organizational Behavior Management; Pro-ACT, Pro-active monitoring of Aggression in Children Tool; RPI, restrictive physical interventions; RRM, restraint reduction meeting; STAR, staff training and resources; TACE, Therapeutic Assessment, Communication, and Education; TI-PRC, Trauma Informed Psychiatric Residential Care; TIA, trauma informed approach.
a Indicates a reference number allocated to the specific intervention during analysis.
b Title case, given name; lower case, description.

Mapping records: interventions by author

Author(s)	INT[a]	Name/description[b]
Andrassy[154] 2016	1	'Feelings Thermometer Scale'
Azeem *et al.*[105] 2015	2	'six core strategies based on trauma informed care'
Barnett *et al.*[190] 2002	3	Guide to improve management of client acute aggressive behaviour
Brown *et al.*[78] 2013	8	TST
Budlong[169] 2004	9	'training approaches designed to reduce the use of restraint and seclusion in residential services for youth'
Caldwell *et al.*[115] 2014	2	6CS
Caldwell and LeBel[116] 2010	2	6CS
Canady[106] 2018	11	Comfort vs. control
Care Council for Wales[174] 2016	12	Positive Behaviour Support, Active Support and Restorative Approaches
Carter *et al.*[85] 2008	13	PMAB
Colton[78] 2014	14	Checklist for Assessing Your Organization's Readiness for Reducing Seclusion and Restraint
Colton and Xiong 2009	15	unnamed
Cooper[121] 2008	16	TCI
CPI[117] 2013	2	Nonviolent Crisis Intervention®: Six Core Strategies
Donovan *et al.*[175] 2003	21	Riverview program, based on ABCD (Brendtro and Ryan and associates)

Author(s)	INT[a]	Name/description[b]
Ford[128] 2013	26	TARGET (FREEDOM Steps)
Girelli[210] 2004	30	'comprehensive, multidimensional approach'
Goren *et al.*[168] 1996	31	'a project to reduce violence within a public child psychiatric hospital'
Guilfoile[132] 2004	32	'Devereux Glenholme internal quality improvement process'
HM Government[30] 2019	36	'a positive and proactive approach to behaviour'
HM Inspectorate of Prisons[23] 2015	37	MMPR
Holden *et al.*[122] 2020	16	TCI
Holden *et al.*[123] 2020	16	TCI
Holden *et al.*[124] 2020	16	TCI
Leitch[238] 2008	47	Hands Off
Leitch[240] 2008	47	Hands Off
Leitch[237] 2009	47	Hands Off
Leitch[195] 2009	47	Hands Off
Leitch[239] (no date)	47	Hands Off
Lietzke[118] 2014	2	Nonviolent Crisis Intervention
Magnowski[241] (no date)	48	unnamed
NASMHPD[33] 2006	2	6CS
Partnership Projects[186] 2020	57	Neuro De-escalation
PRICE Training[126] 2020	60	PRICE Training
Rettmann[119] 2019	2	Nonviolent Crisis Intervention
Reynolds *et al.*[127] 2019	60	M-PBIS
Rowan[166] 2010	61	Schools Operating Safely
Smallridge and Williamson[187] 2011	67	CRT
Studio III Training Systems and Psychological Services[242] 2019	68	Various interventions, including LASER
US Department of Education[197] 2012	72	unnamed
Visalli and McNasser[188] 2000	76	'behavior mapping, the Anger Management Assessment and the Triangle of Choices'
Welsh Government[180]	60	PBS
World Health Organization[194] 2019	81	strategies to end seclusion and restraint
Youth Justice Board for England and Wales[199] 2009	82	'restraint minimisation strategies'
Youth Justice Board for England and Wales[192] 2012	83	MMPR

ABCD, Autonomy, Belonging, Competence, and Doing for Others; CPI, Crisis Prevention Institute; LASER, low arousal supports educational resilience; PMAB, Prevention and Management of Aggressive Behavior; TST, Trauma Systems Therapy.
a Intervention number denotes a specific intervention.
b Title case, given name; lower case, description.

Appendix 6 Evaluation study design by author

Author(s)	Intervention name/brief description[a]	Intervention number	Intervention event[b]	Des	Eval?	Rand?	Contr?	Finds?	Sig? ($p \leq 0.05$)
Azeem *et al.*[38] 2017	6CS	2	2	NR	1	0	0	1	0
Bobier *et al.*[165] 2015	SM	4	14	QTD	1	0	0	1	1
Boel-Studt[171] 2017	TIC	5	15	NR	1	0	1	1	1
Bonnell *et al.*[109] 2014	CPS	6	16	NR	1	0	0	1	1
Borckardt *et al.*[181] 2011	engagement model	7	17	NR	1	0	1	1	1
Campbell[211] 2004	STAR	10	20	QTD	1	0	0	1	0
Craig and Sanders[120] 2018	TIA	11	22	QTD	1	0	0	0	0
Craig[88] 2015	Grafton program	17	30	NR	1	0	0	1	0
Crosland *et al.*[204] 2008	Behavior Analysis Services Program	18	32	NR	1	0	0	1	0
Dean e *et al.*[163] 2007	milieu-based program	19	33	QTD	1	0	0	1	1
Deveau and Leitch[209] 2015	RRM	20	34	NR	1	0	0	1	1
Eblin[162] 2019	quality improvement	22	36	QTD	1	0	0	1	0
Elwyn *et al.*[178] 2017	Sanctuary Model	23	37	QL	1	0	0	1	0
Ercole-Fricke *et al.*[107] 2016	CPS	24	38	NR	1	0	1	1	1
Ercole[89] 2014	CPS	24	38	NR	1	0	1	1	1
Farina[90] 2007	evaluation of impact	25	45	NR	1	0	0	1	1
Finnie[91] 2013	evaluation of process	24	39	MM	1	0	0	1	1
Ford and Hawke[128] 2012	TARGET	26	46	NR	1	0	1	1	1
Forrest *et al.*[172] 2018	BCC	27	48	QTD	1	0	0	1	0
Fowler[155] 2006	aromatherapy	28	49	QTD	1	0	0	1	1
Fralick[176] 2007	Rapid Cycle Model	29	50	QL	1	0	0	1	0

Author(s)	Intervention name/brief description[a]	Intervention number	Intervention event[b]	Des	Eval?	Rand?	Contr?	Finds?	Sig? ($p \leq 0.05$)
Glew[92] 2012	CPS	24	40	QTD	1	0	0	1	1
Greene[110] 2006	CPS	24	41	NR	1	0	0	1	1
Hallman *et al.*[236] 2014	Mindfulness	33	55	NR	1	0	0	1	1
Hambrick *et al.*[79] 2018	NMT	34	56	NR	1	0	0	1	1
Health Sciences Center Winnipeg[104] 2015	6CS	2	6	NR	1	0	0	0	0
Hellerstein *et al.*[203] 2007	hospital-wide initiative	35	57	NR	1	0	0	1	0
Hodgdon *et al.*[183] 2013	ARC Framework	38	60	MM	1	0	0	1	1
Holstead *et al.*[191] 2010	restraint reduction initiative	39	61	QTD	1	0	0	1	0
Huckshorn[77] 2010	6CS	2	7	NR	1	0	0	1	0
Jani *et al.*[159] 2011	milieu therapy training and CPS	44	66	QTD	1	0	0	1	1
Jones and Timbers[201] 2003	Teaching-Family Model	40	62	NR	1	0	0	1	1
Jonikas *et al.*[189] 2004	improvement programme	41	63	QTD	1	0	0	1	1
Kalogjera *et al.*[173] 1989	therapeutic management	42	64	NR	1	0	0	1	1
Kaltiala-Heino *et al.*[198] 2007	aggression management	43	65	NR	1	0	0	1	0
Kilgore[93] 2018	CPS	24	42	NR	1	0	0	1	1
Lebel and Goldstein[39] 2005	state-wide initiative	45	67	QTD	1	0	0	1	0
LeBel *et al.*[40] 2004	systems approach	46	68	NR	1	0	0	1	0
Leitch[195] 2009	RPI	47	69	QTD	1	0	0	1	1
Magnowski[95] 2018	milieu nurse	48	70	QTD	1	0	y	1	1
Magnowski and Cleveland[80] 2019	cognitive milieu therapy	48	70	QL	1	0	0	1	1

Author(s)	Intervention name/brief description[a]	Intervention number	Intervention event[b]	Des	Eval?	Rand?	Contr?	Finds?	Sig? ($p \leq 0.05$)
Marrow *et al.*[129] 2012	TARGET	26	47	QTD	1	0	y	1	1
Martin *et al.*[111] 2008	CPS	24	43	QTD	1	0	0	1	1
McGlinn[96] 2006	evaluation of federal regulations	49	71	MM	1	0	0	1	1
Miguel[97] 2016	'Functional Communications Training' and 'Systema Breathing'	50	72	QL	1	0	0	1	0
Miller *et al.*[182] 2006	organizational and milieu intervention	51	73	NR	1	0	1	1	1
Murphy and Siv[158] 2011	MDT	52	74	NR	1	0	y	1	0
Nunno *et al.*[177] 2015	CARE model	53	75	MM	1	0	0	1	1
Nunno *et al.*[81] 2003	TCI	16	29	NR	1	0	0	1	1
O'Brien[202] 2004	psychoeducation	54	76	QTD	1	0	0	1	1
Paccione-Dyszlewski *et al.*[170] 2012	safety management program	55	77	NR	1	0	0	1	1
Padhi *et al.*[99] 2019	cultural transformation	56	78	NR	1	0	0	1	0
Plant[179] 2004	ABCD program	58	80	QTD	1	0	0	0	0
Pollastri *et al.*[112] 2016	CPS	24	44	MM	1	0	0	1	1
Ponge and Harris[243] 2006	multidisciplinary, multimodal approach	59	81	NR	1	0	0	1	0
Reynolds *et al.*[125] 2016	M-PBIS	60	83	NR	1	0	0	1	1
Reynolds *et al.*[100] 2019	M-PBIS	60	83	0	1	0	0	1	1
Russell *et al.*[131] 2009	SPA	32	54	NR	1	0	0	1	1
Ryan *et al.*[113] 2007	Nonviolent Crisis Intervention Training	2	11	NR	1	0	0	1	0
Ryan *et al.*[86] 2008	Therapeutic Intervention	62	86	NR	1	0	0	1	0
Sanders[108] 2009	Grafton program	17	31	NR	1	0	0	1	0

Author(s)	Intervention name/brief description[a]	Intervention number	Intervention event[b]	Des	Eval?	Rand?	Contr?	Finds?	Sig? ($p \leq 0.05$)
Schreiner *et al.*[41] 2004	restraint reduction process	63	87	NR	1	0	0	1	0
Seckman *et al.*[156] 2017	sensory room	88	88	NR	1	0	0	1	0
Shadili *et al.*[101] 2012	behavioural management	65	89	NR	1	0	0	1	0
Singh *et al.*[214] 1999	organisational programme	66	90	NR	1	0	0	1	0
Thomann[98] 2009	restraint reduction	69	93	QD	1	0	0	1	1
Thompson *et al.*[87] 2008	Components of a Harm-Free Environment	70	94	QD	1	0	0	1	1
Ubana *et al.*[102] 2015	multidisciplinary programme"	71	95	NR	1	0	0	1	0
Valenkamp *et al.*[103] 2011	Pro-ACT	73	97	NR	1	0	0	1	0
van Loan[184] 2015	Shifting Gears	74	98	NR	1	0	0	1	0
Verret *et al.*[161] 2019	schoolwide intervention	75	99	QTD	1	0	0	1	1
West *et al.*[164] 2017	sensory room	77	101	QTD	1	0	1	1	1
Williams *et al.*[185] 2011	OBM	78	102	NR	1	0	0	1	0
Wisdom *et al.*[114] 2015	6CS	2	12	NR	1	0	0	1	1
Witte[167] 2008	'Six Steps to Success'	79	103	QL	1	0	0	1	0
Witte[160] 2007	Verbal Skills	80	104	QTD	1	0	0	1	0

ABCD, Autonomy, Belonging, Competence, and Doing for Others; ARC, Attachment, Regulation and Competency; BCC, Building Communities of Care; Control?, whether or not controlled design is used (1 indicates yes, 0 indicates no); CARE, Children and Residential Experiences; Des, study design; Eval?, whether or not record is an evaluation study (1 indicates yes, 0 indicates no); Finds?, whether or not findings are reported; MDT, Mode Deactivation Therapy; MM, mixed methods; Pro-ACT, Pro-active monitoring of Aggression in Children Tool; NMT, Neurosequential Model of Therapeutics; NR, non-randomised; OBM, organizational behavior management; QL, qualitative description; QTD, quantitative description; Rand?, whether or not a randomised design is used (1 indicates yes, 0 indicates no); RPI, Restrictive Physical Interventions; RRM, restraint reduction meeting; Sig?, whether or not significant results are reported (1 indicates yes, 0 indicates no); SM, sensory modification; TIA, trauma-informed approach; TIC, trauma-informed care.

a Title case, given name; lower case, description.

b Unique number allocated to intervention event.

Appendix 7 Behavior change techniques not detected, or rarely detected, by setting

MH ($n = 4$)	HSC ($n = 9$)	EDU ($n = 24$)	CJS ($n = 17$)	GEN ($n = 26$)
5.6 (information about emotional consequences)	12.5 (adding objects to the environment)	12.5 (adding objects to the environment)	1.9 (commitment)	12.5 (adding objects to the environment)
1.7 [review outcome goal(s)]	9.1 (credible source)	9.1 (credible source)	2.2 (feedback on behavior)	8.1 (behavioral practice/rehearsal)
10.5 (social incentive)	6.1 (demonstration of the behavior)	6.1 (demonstration of the behavior)	1.1 [goal setting (behavior)]	1.9 (commitment)
3.1 [social support (unspecified)]	1.1 [goal setting (behavior)]	2.2 (feedback on behavior)	1.3 [goal setting (outcome)]	9.1 (credible source)
	2.1 (monitoring of behaviour by others without feedback)	1.1 [goal setting (behavior)]	4.2 (information about antecedents)	6.1 (demonstration of the behavior)
	5.1 (monitoring of emotional consequences)	1.3 [goal setting (outcome)]	5.6 (information about emotional consequences)	2.2 (feedback on behavior)
	14.10 (remove punishment)	4.2 (information about antecedents)	5.1 (information about health consequences)	1.1 [goal setting (behavior)]
	10.10 [reward (outcome)]	5.6 (information about emotional consequences)	2.1 (monitoring of behaviour by others without feedback)	4.2 (information about antecedents)
	2.4 [self-monitoring of outcome(s) of behaviour]	5.1 (information about health consequences)	11.2 (reduce negative emotions)	5.1 (information about health consequences)
		2.1 (monitoring of behaviour by others without feedback)	14.10 (remove punishment)	2.1 (monitoring of behaviour by others without feedback)
		5.1 (monitoring of emotional consequences)	1.7 [review outcome goal(s)]	5.1 (monitoring of emotional consequences)
		5.7 (prompts/cues)	10.10 [reward (outcome)]	5.7 (prompts/cues)
		11.2 (reduce negative emotions)	5.2 (salience of consequences)	11.2 (reduce negative emotions)
		14.10 (remove punishment)	2.3 (self-monitoring of behaviour)	14.10 (remove punishment)
		12.1 (restructuring the physical environment)	2.4 [self-monitoring of outcome(s) of behaviour]	5.2 (salience of consequences)

MH ($n = 4$)	HSC ($n = 9$)	EDU ($n = 24$)	CJS ($n = 17$)	GEN ($n = 26$)
		1.7 [review outcome goal(s)]	6.2 (social comparison)	2.3 (self-monitoring of behaviour)
		10.10 [reward (outcome)]	3.3 [social support (emotional)]	2.4 [self-monitoring of outcome(s) of behaviour]
		5.2 (salience of consequences)		6.2 (social comparison)
		2.4 [self-monitoring of outcome(s) of behaviour]		10.5 (social incentive)
		6.2 (social comparison)		10.4 (social reward)
		10.5 (social incentive)		3.3 [social support (emotional)]
		10.4 (social reward)		[social support (practical)]
		3.3 [social support (emotional)]		3.1 [social support (unspecified)]
		3.1 [social support (unspecified)]		10.10 [reward (outcome)]
				1.7 [review outcome goal(s)]
				5.6 (information about emotional consequences)

CJS, criminal justice system; GEN, more than one of the above; EDU, education; HSC, health and social care; MH, mental health.

Clusters with one behavior change technique coded

Cluster	BCT
7 (associations)	7.1 (prompts/cues)
8 (repetition and substitution)	8.1 (behavioral practice/rehearsal)
9 (comparison of outcomes)	9.1 (credible source)
11 (regulation)	11.2 (reduce negative emotions)
14 (scheduled consequences)	14.1 (remove punishment)

Behavior change techniques not detected, by cluster

Cluster	BCT
1 (goals and planning)	1.5 [review behavior goal(s)]
	1.6 (discrepancy between current behavior and goal)
	1.8 (behavioral contract)
2 (feedback and monitoring)	2.6 (biofeedback)
4 (shaping knowledge)	4.3 (re-attribution)
	4.4 (behavioral experiments)
5 (natural consequences)	5.3 (information about social and environmental consequences)
	5.5 (anticipated regret)
6 (comparison of behavior)	6.3 (information about others' approval)
7 (associations)	7.2 (cue signalling reward)
	7.3 (reduce prompts/cues)
	7.4 (remove access to the reward)
	7.5 (remove aversive stimulus)
	7.6 (satiation)
	7.7 (exposure)
	7.8 (associative learning)
8 (repetition and substitution)	8.2 (behavior substitution)
	8.3 (habit formation)
	8.4 (habit reversal)
	8.5 (overcorrection)
	8.6 (generalisation of target behavior)
	8.7 (graded tasks)
9 (comparison of outcomes)	9.2 (pros and cons)
	9.3 (comparative imagining of future outcomes)
10 (reward and threat)	10.1 [material incentive (behavior)]
	10.2 [material reward (behavior)]
	10.3 (non-specific reward)
	10.6 (non-specific incentive)

Cluster	BCT
	10.7 (self-incentive)
	10.8 [incentive (outcome)]
	10.9 (self-reward)
	10.10 [reward (outcome)]
	10.11 (future punishment)
11 (regulation)	11.1 (pharmacological support)
	11.3 (conserving mental resources)
	11.4 (paradoxical instructions)
12 (antecedents)	12.3 (avoidance/reducing exposure to cues for the behavior)
	12.4 (distraction)
	12.6 (body changes)
13 (identity)	13.3 (incompatible beliefs)
	13.4 (valued self-identity)
	13.5 (identity associated with changed behavior)
14 (scheduled consequences)	14.1 (behavior cost)
	14.2 (punishment)
	14.3 (remove reward)
	14.4 (reward approximation)
	14.5 (rewarding completion)
	14.6 (situation-specific reward)
	14.7 (reward incompatible behavior)
	14.8 (reward alternative behavior)
	14.9 (reduce reward frequency)
15 (self-belief)	15.1 (verbal persuasion about capability)
	15.2 (mental rehearsal of successful performance)
	15.3 (focus on past success)
	15.4 (self-talk)
16 (covert learning)	16.1 (imaginary punishment)
	16.2 (imaginary reward)
	16.3 (vicarious consequences)

Appendix 8 Interventions by study design

Author	Name of intervention[a]	Intervention number[b]	Intervention event	Des?	Eval?	Rand?	Contr?	Finds?	Sig?
Azeem *et al.*[38] 2017	6CS (based on trauma informed care)	2	2	NR	1	0	0	1	0
Bobier *et al.*[165] 2015	'a sensory modulation room'	4	14	QTD	1	0	0	1	1
Boel-Studt[171] 2017	TI-PRC	5	15	NR	1	0	1	1	1
Bonnell *et al.*[109] 2014	(CPS)	6	16	NR	1	0	0	1	1
Borckardt *et al.*[181] 2011	the engagement model (an adaptation from the work of Bloom)	7	17	NR	1	0	1	1	1
Campbell[211] 2004	STAR	10	20	QTD	1	0	0	1	0
Craig and Sanders[120] 2018	TIA. Comfort vs. control. 'program model for minimizing restraint and seclusion'	11	22	QTD	1	0	0	0	0
Craig[88] 2015	Minimisation of restraint and seclusion model (Grafton 2010)	17	30	NR	1	0	0	1	0
Crosland *et al.*[204] 2008	Behavior Analysis Services Program	18	32	NR	1	0	0	1	0
Dean *et al.*[163] 2007	'a milieu-based behavioral management program'	19	33	QTD	1	0	0	1	1
Deveau and Leitch[209] 2015	RRM	20	34	NR	1	0	0	1	1
Eblin[162] 2019	'quality improvement' (title)	22	36	QTD	1	0	0	1	0
Elwyn *et al.*[178] 2017	The Sanctuary Model	23	37	QL	1	0	0	1	0
Ercole-Fricke *et al.*[107] 2016	CPS	24	38	NR	1	0	1	1	1
Ercole[89] 2014	CPS	24	38	NR	1	0	1	1	1
Farina[90] 2007	evaluation of impact of new S/R policy	25	45	NR	1	0	0	1	1
Finnie[91] 2013	N/A. CPS recently introduced but impact not measured in this study	24	39	MM	1	0	0	1	1
Ford and Hawke[128] 2012	TARGET	26	46	NR	1	0	1	1	1
Forrest *et al.*[172] 2018	BCC	27	48	QTD	1	0	0	1	0
Fowler[155] 2006	'aromatherapy for crisis management'	28	49	QTD	1	0	0	1	1
Fralick[176] 2007	Rapid Cycle Model for Improvement	29	50	QL	1	0	0	1	0

Author	Name of intervention[a]	Intervention number[b]	Intervention event	Des?	Eval?	Rand?	Contr?	Finds?	Sig?
Glew[92] 2012	CPS	24	40	QTD	1	0	0	1	1
Greene *et al.*[110] 2006	collaborative problem-solving	24	41	NR	1	0	0	1	1
Hallman *et al.*[236] 2014	Mindfulness-based Stress Reduction training program	33	55	NR	1	0	0	1	1
Hambrick *et al.*[79] 2018	NMT	34	56	NR	1	0	0	1	1
Health Sciences Center Winnipeg[104] 2015	6CS (based on trauma informed care)	2	6	NR	1	0	0	0	0
Hellerstein *et al.*[203] 2007	'a hospital-wide effort to decrease restraint and seclusion of psychiatric inpatients.'	35	57	NR	1	0	0	1	0
Hodgdon *et al.*[183] 2013	ARC Framework	38	60	mm	1	0	0	1	1
Holstead *et al.*[191] 2010	'a restraint reduction initiative'	39	61	QTD	1	0	0	1	0
Huckshorn[77] 2010	6CS (based on trauma informed care)	2	7	0	1	0	0	1	0
Jani *et al.*[159] 2011	milieu therapy training and collaborative problem-solving	44	66	QTD	1	0	0	1	1
Jones and Timbers[201] 2003	Teaching-Family Model	40	62	NR	1	0	0	1	1
Jonikas *et al.*[189] 2004	'a program to reduce the use of physical restraint'	41	63	QTD	1	0	0	1	1
Kalogjera *et al.*[173] 1989	'therapeutic management'	42	64	NR	1	0	0	1	1
Kaltiala-Heino *et al.*[198] 2007	'a systematic and comprehensive aggression management program'	43	65	NR	1	0	0	1	0
Kilgore[93] 2018	CPS	24	42	NR	1	0	0	1	1
Lebel and Goldstein[39] 2005	'statewide initiative to reduce or eliminate the use of seclusion and restraint among children and adolescents'	45	67	QTD	1	0	0	1	0
LeBel *et al.*[40] 2004	'a systems approach'	46	68	NR	1	0	0	1	0
Leitch[195] 2009	RPI	47	69	QTD	1	0	0	1	1
Magnowski[95] 2018	'the milieu nurse'	48	70	QTD	1	0	y	1	1
Magnowski and Cleveland[80] 2019	'cognitive milieu therapy'	48	70	QL	1	0	0	1	1

Author	Name of intervention[a]	Intervention number[b]	Intervention event	Des?	Eval?	Rand?	Contr?	Finds?	Sig?
Marrow *et al.*[129] 2012	Incorporated TARGET plus other elements“a multifaceted trauma-focused intervention’	26	47	QTD	1	0	y	1	1
Martin *et al.*[111] 2008	CPS	24	43	QTD	1	0	0	1	1
McGlinn[96] 2006	described (in title) as ‘The effect of federal regulations on the physical restraint of children and adolescents in residential treatment’	49	71	MM	1	0	0	1	1
Miguel[97] 2016	‘Functional Communications Training’ and ‘Systema Breathing’	50	72	QL	1	0	0	1	0
Miller *et al.*[182] 2006	‘2-phase (organizational and milieu) physical restraint reduction intervention’	51	73	NR	1	0	yes, phased design	1	1
Murphy and Siv[158] 2011	MDT	52	74	NR	1	0	y	1	0
Nunno *et al.*[177] 2015	the CARE model	53	75	MM	1	0	0	1	1
Nunno *et al.*[81] 2003	TCI	16	29	NR	1	0	0	1	1
O’Brien[202] 2004	key interventions including ‘GBT Psychoeducational Treatment Model’	54	76	QTD	1	0	0	1	1
Paccione-Dyszlewski *et al.*[170] 2012	QBS, Inc. SafetyCare Behavioral Safety Management program	55	77	NR	1	0	0	1	1
Padhi *et al.*[99] 2019	unnamed, described as a ‘cultural transformation’	56	78	NR	1	0	0	1	0
Plant[179] 2004	The ABCD program including TACE staff training	58	80	QTD	1	0	0	0	0
Pollastri *et al.*[112] 2016	collaborative problem-solving	24	44	MM	1	0	0	1	1
Ponge and Harris[243] 2006	multidisciplinary, multimodal approach	59	81	NR	1	0	0	1	0
Reynolds *et al.*[125] 2016	M-PBIS	60	83	NR	1	0	0	1	1
Reynolds *et al.*[100] 2019	M-PBIS	60	83	0	1	0	0	1	1
Russell *et al.*[131] 2009	SPA	32	54	NR	1	0	0	1	1
Ryan *et al.*[113] 2007	CPI’s Nonviolent Crisis Intervention Training	2	11	NR	1	0	0	1	0
Ryan *et al.*[86] 2008	Therapeutic Intervention	62	86	NR	1	0	0	1	0
Sanders[108] 2009	Grafton program	17	31	NR	1	0	0	1	0

Author	Name of intervention[a]	Intervention number[b]	Intervention event	Des?	Eval?	Rand?	Contr?	Finds?	Sig?
Schreiner *et al.*[41] 2004	'restraint reduction process'	63	87	NR	1	0	0	1	0
Seckman *et al.*[156] 2017	'a sensory room and its impact on R/S use, staff–patient relationships, and patients' 'aggressive behaviors.'	88	88	NR	1	0	0	1	0
Shadili *et al.*[101] 2012	'a behavioural management plan' (title)	65	89	NR	1	0	0	1	0
Singh *et al.*[214] 1999	'reducing the use of seclusion and restraints'	66	90	NR	1	0	0	1	0
Thomann[98] 2010	'restraint reduction' (abstract)	69	93	QD	1	0	0	1	1
Thompson *et al.*[87] 2008	Components of a Harm-Free Environment	70	94	QD	1	0	0	1	1
Ubana *et al.*[102] 2015	'nurse-led multidisciplinary programme'	71	95	NR	1	0	0	1	0
Valenkamp *et al.*[103] 2011	Pro-ACT	73	97	NR	1	0	0	1	0
van Loan *et al.*[184] 2015	Shifting Gears	74	98	NR	1	0	0	1	0
Verret *et al.*[161] 2019	'schoolwide de-escalation intervention plan'	75	99	QTD	1	0	0	1	1
West *et al.*[164] 2017	'guided sensory room use'	77	101	QTD	1	0	1	1	1
Williams *et al.*[185] 2011	OBM	78	102	NR	1	0	0	1	0
Wisdom *et al.*[164] 2015	6CS (based on trauma informed care)	2	12	NR	1	0	0	1	1
Witte[167] 2008	'Six Steps to Success'	79	103	QL	1	0	0	1	0
Witte[160] 2007	CPI's Enhancing Verbal Skills: Applications of Life Space Crisis Intervention	80	104	QTD	1	0	0	1	0

0, study design not clear/not applicable; ABCD, Autonomy, Belonging, Competence, and Doing for Others; ARC, Attachment, Regulation and Competency; BCC, Building Communities of Care; Control?, whether or not controlled design is used (1 indicates yes, 0 indicates no); CARE, Children and Residential Experiences; Des, study design; Eval?, whether or not record is an evaluation study (1 indicates yes, 0 indicates no); Finds?, whether or not findings are reported; MDT, Mode Deactivation Therapy; NMT, Neurosequential Model of Therapeutics; NR, non-randomised; OBM, organizational behavior management; Pro-ACT, Pro-active monitoring of Aggression in Children Tool; QL, qualitative description; QTD, quantitative description; Rand?, whether or not a randomised design is used (1 indicates yes, 0 indicates no); RPI, Restrictive Physical Interventions; RRM, restraint reduction meeting; Sig? whether or not significant results are reported (1 indicates yes, 0 indicates no); STAR, staff training and resources; TACE, Therapeutic Assessment, Communication and Education; TIA, trauma-informed approach; TIC, trauma-informed care; TI-PRC, Trauma-Informed Psychiatric Residential Care.

a Title case, given name; lower case, description.

b Intervention number denotes a specific intervention.

EME
HSDR
HTA
PGfAR
PHR

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