Legislation and other approaches to reduce seclusion and restraint in adult inpatient mental health services: a systematic mapping review

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Summary of work

- Seclusion and restraint are authorised for use in mental health inpatient settings in Western Australia by the *Mental Health Act 2014.*
- Western Australia has consistently reduced the use of seclusion and restraint since the introduction of the *Mental Health Act 2014* and is the Australian jurisdiction with the lowest rates of seclusion and restraint.
- We undertook a systematic mapping study and analysis that syntheses the evidence examining the impact of different mental health legislative frameworks and other approaches on rates of seclusion and restraint in mental health services.
- The research was undertaken by a team of researchers with lived experience, legal, social work, public health and mental health nursing backgrounds.
- The study objectives were:
    - Identify legislative approaches and interventions focused on eliminating (or reducing) rates of seclusion and restraint.
    - Examine the association between legislation and rates of seclusion and restraint.
- We identified 60 studies that met our inclusion criteria.
- Around half of the studies were from the United States of America.
- Half of the included studies adopted a quasi-experimental design.
- There was a reliance on hospital administrative sources for outcome data to determine rates of restrictive practice.
    - The validity of administrative data as an accurate measure of the rate of restrictive practice has been challenged on the basis that the reported findings are based on clinicians' subjective interpretation of the patient and their situation and how it is related to their treatment or management in hospital.
- A range of different interventions were tested.
- We clustered included studies under the following intervention subheadings:
    - Legislative framework (n = 2)
    - Open door policy (n = 4)
    - Implementation of a policy or strategy (n = 5)
    - Behavioural methods (n = 1)
    - Nursing models (n = 3)
    - Multi-component interventions (n = 21)
    - Sensory modulation rooms (n = 7)
    - Ward structural design (n = 4)
    - Training (n = 3)
    - Six core strategies (n = 2)
    - Post restrictive practice review (n = 1)
- There was no clear evidence that legislative change alone impacts rates of restrictive practice in adult inpatient mental health services.
- We found a large number of pragmatic multi-component interventions.
- Most other interventions and approaches studied seemed to be extremely effective at reducing rates of restrictive practices in adult inpatient mental health services.
- The quality of included research was poor, and important sources of bias were identified for most included studies.
- We recommend that in the absence of high-quality evidence, key components of an effective restrictive practices strategy should include:

1. Strong clinical leadership focused on applying strategies toward eliminating restrictive practices
2. High quality data on use of restrictive practices
3. Open door wards
4. Staff training, with a focus on communication skills
5. Consideration of adopting a trauma informed way of working
6. A stepped approach – starting with the least restrictive intervention – to applying restrictive practices
7. Careful consideration of the ward environment particularly population density

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Acknowledgements

We are extremely grateful to Ange Johns-Hayden and Bernadette Gargan – the amazing La Trobe information scientists – who developed and ran the searches for this review. You were brilliant. And to Esther Le Couteur who kindly copy edited that report, thank you.

Background

We have undertaken a mapping review of the impact of mental health legislation and other approaches across key jurisdictions – Australia, the United Kingdom, the United States of America, Canada, and New Zealand – on rates of seclusion and restraint in mental health practice settings.

The work has been conducted by a research group from La Trobe University that includes researchers that identify as having lived experience of using mental health services. Our group has a strong track record of undertaking research into restrictive practices. For example, we are currently undertaking a funded qualitative study – led by lived experience researchers – examining how a mental health care provider has reduced restrictive practices in their services.

Seclusion and restraint are authorised for use in mental health inpatient settings in Western Australia by the *Mental Health Act 2014*. Western Australia has consistently reduced the use of seclusion and restraint since the introduction of the *Mental Health Act 2014* and is the Australian jurisdiction with the lowest rates of seclusion and restraint. Such interventions carry considerable risks, including physical and psychological harm to consumers, sometimes leading to long-lasting trauma and degradation of the trust essential to therapeutic relationships. Vicarious trauma can be experienced by other consumers who observe seclusion and restraint, family, friends, and clinicians.

Though commonly applied, seclusion and restraint are difficult to quantify. The terms 'seclusion' and 'restraint' are inconsistently defined and applied in different jurisdictions (Baker et al., 2021), making it difficult to understand the full use and impact of these interventions nationally and internationally. There have been four previous systematic reviews of interventions to reduce restrictive practices (Baker et al., 2016; Barbui et al., 2020; Dahm et al., 2017; Lan et al., 2017). However, as far as we can determine, the impact of different legislative frameworks on seclusion and restraint has not been systematically reviewed.

Methods

We undertook a systematic mapping study and analysis to examine and synthesise how different mental health legislative frameworks and other approaches impact rates of seclusion and restraint in mental health services.

The study objectives were:

1. Identify legislative approaches and interventions focused on eliminating (or reducing) rates of seclusion and restraint
2. Examine the association between legislation and rates of seclusion and restraint

We searched the following English language health and social care databases and the grey literature. The databases we searched included Cumulative Index to Nursing and Allied Health Literature (CINHAL), Cochrane Central Register of Controlled Trials (CCRCT), Cochrane Database of Systematic Reviews (CDSR), Database of Abstract of Reviews of Effects (DARE), EMBASE, Health Technology Assessment (HTA) database, HTA Canadian and International, Ovid MEDLINE, Psychinfo and Pubmed. Databases were searched from 2000 to present. We also searched relevant databases and websites to identify grey literature.

Our literature search was internationally broad. Manuscripts describing approaches to reducing and/or eliminating seclusion and restraint (broadly defined, including medication) were retrieved and subject to scrutiny of content to identify approaches (with a focus on legislation) and actions focused on reducing seclusion and restraint.

Eligibility criteria:

1. Population – Adult (including older people), mental health settings (including acute, high dependency, community)
2. Date – 2000 to present
3. Study design – Any (experimental, observational, and qualitative)
4. Interventions – Any intervention focused specifically on reducing seclusion and/or restraint that may or may not have been applied for any reason
5. Outcomes – Rates of seclusion and/or restraint
6. Language – English

Searches were developed and administered by an information specialist at La Trobe University based on our eligibility criteria.

Screening of citations (title and abstract, and full text) using Covidence, an online systematic review management platform.

From included studies, we extracted the following information: citation, population under investigation, number of participants, study setting, country, intervention/action/exposure, procedures and fidelity, and rates of seclusion and restraint.

Included studies were critically appraised using the relevant Joanna Briggs critical appraisal tool, which can be found at: https://jbi.global/critical-appraisal-tools

Our review was pre-registered with the Open Science Framework (https://osf.io/rhwge)

Search Strategy

Concept 1	Concept 2	Concept 3	Concept 4
• Restraint, Physical/ (MeSH) • Restrain* • Antipsychotic agents/ (MeSH) • Tranquilizing agents (MeSH) • "hypnotics and sedatives"/ (MeSH) • Seclusion OR seclude* • ((coercive or restrictive) ADJ2 (practice* OR measure* OR treatment* OR intervention*)) • Coercion (MeSH) • coercion • ((forc* OR rapid* OR PRN OR "pro re nata") ADJ2 (medicat* OR tranquil* oR prescri*)) • Crisis intervention • (Involuntary ADJ1 (admission OR treatment))	• Mental disorders/exp. (MeSH) • ((mental* OR psychiatric) ADJ1 (ill* OR disorder*)) • Schizophreni* • psychosis • Personality disorder* • Bipolar OR "bi polar" • suicidal	• Psychiatric department, Hospital/ (MeSH) • Hospitals, Psychiatric/ (MeSH) • ((Psychiatric or "mental health" OR "mental illness*" OR "mental disorder*") ADJ1 (patient* OR inpatient* OR "in patient*" OR ward* OR department* OR service* OR hospital* OR context* OR setting* OR facility)) • "Psychiatric intensive care" OR "psychiatric ICU" • High depend#nc* unit • Commitment of mentally ill (MeSH)	• Legislation/ (MeSH) • Legislation, Nursing/ (MeSH) • Legislation, Medical/ (MeSH) • Legislation, Hospital/ (MeSH) • Legislation as Topic (MeSH) • Legislation, Drug (MeSH) • Lj.fs • Legislat* • Policy making/ (MeSH) • Organizational policy/ (MeSH) • Health policy/ (MeSH) • Policy/ (MeSH) • Policy • Policies • Liability, Legal/ (MeSH) • Legal*

Medline Search Strategy

Search ID#	Search Terms	Search Notes	Results
S1	Restraint, Physical/	MeSH	12489
S2	Restrain*		56978
S3	“Hypnotics and Sedatives”/	MeSH	31179
S4	Tranquilizing Agents/	MeSH	11934
S5	Antipsychotic Agents/	MeSH	57851
S6	Seclusion or seclude*		1981
S7	((coercive OR Restrictive) ADJ2 (practice* OR measure OR treatment* OR intervention*))		2312
S8	Coercion/	MeSH	4954
S9	Coercion		4534
S10	((forc* OR rapid* OR PRN OR “pro re nata”) ADJ2 (medicat* OR tranquil* OR prescri*))		1061
S11	“crisis intervention”		6829
S12	(involuntary ADJ1 (admission OR treatment*))		979
S13	OR/1-12		172017
S14	Exp Mental Disorders/	MeSH exploded	1380296
S15	((mental* OR psychiatric) ADJ1 (ill* OR disorder*))		280891
S16	Schizophreni		160138
S17	Psychosis		43676
S18	“personality disorder*”		48488
S19	Bipolar OR “bi polar”		87048
S20	Suicidal		36265
S21	OR/14-20		1514345
S22	Psychiatric department, Hospital/	MeSH	6973
S23	Hospitals, Psychiatric/	MeSH	25876
S24	((psychiatric OR “mental health” OR “mental illness*” OR “mental disorder”) ADJ1 (patient* OR inpatient* OR “in patient*” OR ward* OR service* OR hospital* OR context* OR setting* OR facility))		123072
S25	“psychiatric intensive care” OR “psychiatric ICU”		199
S26	“high depend#nc* unit*”		681
S27	“Commitment of Mentally ill”/	MeSH	6950
S28	OR/22-27		130859
S29	13 AND 21 AND 28		7300
S30	**Limit 29 to yr=”2000-Current”**	**Search 1 complete**	**4971**
S31	Legislation, Nursing/ OR Legislation as Topic/ OR Legislation, Hospital/ OR Legislation/ OR Legislation, Drug/ OR Legislation, Medical/	MeSH	48919

S32	Lj.fs		260318
S33	Legislat*		331763
S34	Policy Making/	MeSH	17596
S35	Organizational Policy/	MeSH	14498
S36	Health Policy/	MeSH	71133
S37	Policy/	MeSH	6411
S38	Policy		328576
S39	Policies		124453
S40	Liability, Legal/	MeSH	15947
S41	Legal*		135014
S42	OR/31-41		746951
S43	29 AND 42		1552
S44	**Limit 43 to yr="2000-Current"**	**Search 2 complete**	**1088**

PsycINFO Search Strategy

Search ID#	Search Terms	Search Notes	Results
S1	Exp Physical Restraint/	MeSH	2280
S2	Restrain*		18808
S3	Sedatives/	MeSH	1710
S4	Hypnotic Drugs/	MeSH	1432
S5	Tranquilizing Drugs/	MeSH	3132
S6	Neuroleptic Drugs/	MeSH	22263
S7	Exp Patient Seclusion/	MeSH	590
S8	Seclusion OR seclude*		1854
S9	((coercive OR restrictive) ADJ2 (practice* OR measure* OR treatment* OR intervention*))		1552
S10	Exp Coercion/	MeSH	2719
S11	Coercion		7312
S12	((forc* OR rapid* OR PRN OR “pro re nata”) ADJ2 (medicat* OR tranquil* OR prescri*))		575
S13	“crisis intervention”		8575
S14	(involuntary ADJ1 (admission or treatment*))		2122
S15	OR/1-14		65103
S16	Exp Mental Disorders/	MeSH	936810
S17	((mental* OR psychiatric) ADJ1 (ill* OR disorder*))		245664
S18	Schizophreni*		146158
S19	Psychosis		59796
S20	“personality disorder*”		58304
S21	Bipolar OR “bi polar”		52327
S22	Suicidal		36885
S23	OR/16-22		1078676
S24	Exp Psychiatric units/	MeSH	2195
S25	Exp psychiatric hospitalization/ OR exp Psychiatric hospitals/	MeSH	20204
S26	((psychiatric or "mental health" or "mental illness*" or "mental illness*") adj1 (patient* or inpatient* or "in patient*" or ward* or service* or hospital* or context* or setting* or facility))		140682
S27	"psychiatric intensive care" or "psychiatric ICU"		381
S28	"high depend#nc* unit"		28
S29	exp "Commitment (Psychiatric)"/	MeSH	1958
S30	OR/24-29		142178
S31	15 AND 23 AND 30		5437
S32	**Limit 31 to yr=”2000-current”**	**Search 1 complete**	**3635**
S33	Exp Legal processes/ or exp Legislative processes/	MeSH	93655

S34	Legislat*		26906
S35	Exp Health Care Policy/ or exp Policy Making/	MeSH	92213
S36	Exp Government Policy Making/	MeSH	56356
S37	Policy OR policies		201716
S38	Legal liability		318
S39	Legal*		77017
S40	OR/33-39		341250
S41	15 AND 23 AND 30 AND 40		1343
S42	**Limit 41 to yr="2000-current"**	**Search 2 complete**	**1006**

CINAHL Search Strategy

Search ID#	Search Terms	Search Notes	Results
S1	(MH "Restraint, Physical")	MeSH	4570
S2	(MH "Restraint, Chemical")	MeSH	386
S3	Restrain*		11869
S4	(MH "Hypnotics and Sedatives")	MeSH	7262
S5	(MH "Tranquilizing Agents")	MeSH	414
S6	(MH "Antipsychotic Agents")	MeSH	15451
S7	Seclusion OR seclude*		1319
S8	((coercive OR restrictive) N2 (practice* OR measure* OR treatment* OR intervention*))		689
S9	(MH "Coercion")	MeSH	2433
S10	Coercion		3579
S11	((forc* OR rapid* OR PRN OR "pro re nata") N2 (medicat* OR tranquil* OR prescri*))		689
S12	“crisis intervention”		4508
S13	(involuntary N1 (admission OR treatment*))		470
S14	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13		44258
S15	(MH "Mental Disorders+")	MeSH exploded	627227
S16	((mental* or psychiatric) N1 (ill* or disorder*))		105833
S17	Schizophreni*		36470
S18	Psychosis		19183
S19	“personality disorder*”		13477
S20	Bipolar OR “bi polar”		20918
S21	Suicidal		17691
S22	S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21		665497
S23	(MH "Psychiatric Units") OR (MH "Psychiatric Patients") OR (MH "Psychiatric Emergencies")	MeSH	16914
S24	(MH "Hospitals, Psychiatric")	MeSH	6503
S25	((psychiatric or "mental health" or "mental illness*" or "mental disorder*") N1 (patient* or inpatient* or "in patient*" or ward* or service* or hospital* or context* or setting* or facility))		173322
S26	"psychiatric intensive care" or "psychiatric ICU"		217
S27	"high depend*nc* unit"		327
S28	(MH "Involuntary Commitment")	MeSH	2050
S29	S23 OR S24 OR S25 OR S26 OR S27 OR S28		174582
S30	S14 AND S22 AND S29		5089

S31	S14 AND S22 AND S29	Published date: 20000101-20221231	4834
S32	**S14 AND S22 AND S29**	**Peer reviewed Search 1 complete**	**4437**
S33	(MH "Legislation") OR (MH "Legislation, Hospital") OR (MH "Legislation, Nursing") OR (MH "Legislation, Medical") OR (MH "Legislation, Drug")	MeSH	25306
S34	Legislat*		174667
S35	(MH "Policy Making") OR (MH "Health Policy") OR (MH "Hospital Policies")		78661
S36	policy OR policies		232500
S37	(MH "Liability, Legal")		14564
S38	Legal*		70686
S39	S33 OR S34 OR S35 OR S36 OR S37 OR S38		414746
S40	S14 AND S22 AND S29 AND S39		731
S41	**S14 AND S22 AND S29 AND S39**	**Limiters - Peer Reviewed; Published Date: 20000101-20231231** **Search 2 complete**	**626**

Social Science Premium Collection (ProQuest), Search Strategy

Search ID#	Search Terms	Search Notes	Results
S1	Noft(restrain* OR “antipsychotic agents” OR “tranquilizing agents” OR “hypnotics and sedatives” OR seclusion OR seclude* OR (coercive NEAR/2 (practice* OR measure* OR treatment* OR intervention*)) OR coercion OR ((forc* OR rapid* OR PRN OR “pro re nata”) NEAR/2 (medicat* OR tranquil* OR prescribe*)) OR “crisis intervention” OR (involuntary NEAR/1 (admission OR treatment)))	Details about search	74765
S2	Noft(“mental disorders” OR ((mental* OR psychiatric) NEAR/1 (ill* OR disorder*)) OR schizopreni* OR psychosis OR “personality disorder*” OR bipolar OR “bi polar” OR suicidal)		230309
S3	Noft(((psychiatric OR “mental health” OR “mental illness*” OR “mental disorder*”) NEAR/1 (patient* OR inpatient* OR “in patient*” OR ward* OR department* OR service* OR hospital* OR context* OR setting* OR facility OR unit*)) OR “psychiatric intensive care” OR “psychiatric ICU” OR “high depend*nc* unit*” OR “commitment of mentally ill”)		88113
S4	1 AND 2 AND 3		1390
S5	**4 – filters applied – 2000-2029, journals, theses reports and books included**	**Search 1 complete**	**1058**
S6	Noft(legislat* OR policy OR policies OR liability OR legal*)		4391391
S7	1 AND 2 AND 3 AND 6		468
S8	**7- filters applied - 4 – filters applied – 2000-2029, journals, theses reports and books included**	**Search 2 complete**	**355**

Search Strategy:

Search ID#	Search Terms	Search Notes	Results
S1	Restrain*	All fields	1629
S2	hypnotic*	All fields	29
S4	(sedative* OR sedate)	All fields	2
S5	(tranquilise* OR tranquilize*)	All fields	6
S6	antipsychotic*	All fields	4
S7	((coercive OR Restrictive) AND (practice* OR measure OR treatment* OR intervention*))	All fields	14078
S8	coercion	All fields	762
S9	((forc* OR rapid* OR PRN OR "pro re nata") AND (medicat* OR tranquil* OR prescri*))	All fields	212
S10	"crisis intervention"	All fields	44
S11	(involuntary AND (admission OR treatment*))	All fields	158
S12	Restrain* OR hypnotic* OR (sedative* OR sedate) OR (tranquilise* OR tranquilize*) OR antipsychotic* OR ((coercive OR Restrictive) AND (practice* OR measure OR treatment* OR intervention*)) OR coercion OR ((forc* OR rapid* OR PRN OR "pro re nata") AND (medicat* OR tranquil* OR prescri*)) OR "crisis intervention" OR (involuntary AND (admission OR treatment*))	Can't combine searches in AGIS, so each search for concept 1 added in manually and separated with OR.	16408
S13	"mental disorder*"	All fields	102
S14	((mental* OR psychiatric) AND (ill* OR disorder*))	All fields	2900
S15	Schizophreni*	All fields	86
S16	(Psychosis OR psychotic)	All fields	79
S17	"personality disorder*"	All fields	59
S18	Bipolar OR "bi polar" OR bi-polar	All fields	395
S19	Suicidal	All fields	812
S20	"mental disorder*" OR ((mental* OR psychiatric) AND (ill* OR disorder*)) OR Schizophreni* OR (Psychosis OR psychotic) OR "personality disorder*" OR (Bipolar OR "bi polar" OR bi-polar) OR Suicidal	Can't combine searches in AGIS, so each search for concept 2 added in manually and separated with OR.	4021
S21	hospital* AND psychiatric*	All fields	175
S22	((psychiatric OR "mental health" OR "mental illness*" OR "mental disorder") AND (patient* OR inpatient* OR "in patient*" OR ward* OR	All fields	2227

	service* OR hospital* OR context* OR setting* OR facility))		
S23	“psychiatric intensive care” OR “psychiatric ICU”	All fields	0
S24	(“high dependenc* unit*” OR “high dependanc* unit”)	All fields	0
S25	“mentally ill” AND (commit* OR compulsory OR involuntary)		102
S26	(hospital* AND psychiatric*) OR ((psychiatric OR “mental health” OR “mental illness*” OR “mental disorder”) AND (patient* OR inpatient* OR “in patient*” OR ward* OR service* OR hospital* OR context* OR setting* OR facility)) OR (“mentally ill” AND (commit* OR compulsory OR involuntary))	Can’t combine searches in AGIS, so each search for concept 3 added in manually and separated with OR. NB searches 23 and 24 not included as they didn’t produce any results.	2267
S27	(Restrain* OR hypnotic* OR (sedative* OR sedate) OR (tranquilise* OR tranquilize*) OR antipsychotic* OR ((coercive OR Restrictive) AND (practice* OR measure OR treatment* OR intervention*)) OR coercion OR ((forc* OR rapid* OR PRN OR “pro re nata”) AND (medicat* OR tranquil* OR prescri*)) OR “crisis intervention” OR (involuntary AND (admission OR treatment*))) AND (“mental disorder*” OR ((mental* OR psychiatric) AND (ill* OR disorder*)) OR Schizophreni* OR (Psychosis OR psychotic) OR “personality disorder*” OR (Bipolar OR “bi polar” OR bi-polar) OR Suicidal) AND ((hospital* AND psychiatric*) OR ((psychiatric OR “mental health” OR “mental illness*” OR “mental disorder”) AND (patient* OR inpatient* OR “in patient*” OR ward* OR service* OR hospital* OR context* OR setting* OR facility)) OR (“mentally ill” AND (commit* OR compulsory OR involuntary)))	Can’t combine searches in AGIS, so the three combined searches for the three respective concepts were manually added into the search box, couched in parenthesis and combined with AND	201
S27	**Add post search filter – date 2000 - 2022**	**Search 1 complete**	**184**
	Duplicates removed (by Endnote)		**145**

Commonwealth	NSW	QLD	SA	Tas	WA	Vic	ACT	NT
	Mental Health Act 2007 (NSW)	*Mental Health Act 2016* (QLD)	*Mental Health Act 2009* (SA)	*Mental Health Act 2013* (TAS)	*Mental Health Act 2014* (WA)	*Mental Health Act 2014* (Vic)	*Mental Health Act* 2015 (ACT)	*Mental Health and Related Services Act 1998* (NT)

Legislative review

Restraint and Seclusion – related legislation in the Australian jurisdictions
This list generated from references from *Halsbury's Laws of Australia*[i]
https://advance.lexis.com/api/permalink/90f62d75-eaee-483d-8a10-c9ab2329d378/?context=1201008&federationidp=RQX45R36264

Halsbury's Laws of Australia
Search restrain* AND (hospital* OR patient*)
Top results: Halsbury's Laws of Australia Vol 285 – Mental Health and Intellectual Disability > 2. Care and Treatment of patients
(E) Treatment for Mental Illness
Paragraph [285-355] Restraint and seclusion
Text copied:
[285-355] Restraint and seclusion

The paragraph below is current to 16 March 2021

The legislation of each State and Territory provides for the detention of persons admitted to hospital for treatment as an involuntary patient.**1**

In New South Wales,**2** there is no specific reference in the legislation concerning restraint or seclusion.

In the Australian Capital Territory, where a person is taken to an approved mental health facility**3** for emergency detention and care,**4** the person in charge of the facility may keep the person in such custody as he or she deems appropriate**5** and may subject the person to such confinement**6** or restraint**7** or seclusion**8** as is necessary and reasonable to prevent the person from causing harm to himself or herself or another person or to ensure that the person remains in custody.

In the Northern Territory, mechanical restraint**9** and seclusion**10** may only be used on a person without the person's consent where no less restrictive method of control is available or appropriate and it is necessary in order to administer medical treatment, to prevent self-injury or injury to another or to prevent property being destroyed, or to prevent the person from absconding from the facility. A person may have a mechanical restraint applied or be kept in seclusion without his or her consent.**11** The restraint and or seclusion must be approved by an authorised psychiatric practitioner or, in an emergency, it may be approved by the senior registered nurse on duty who must then notify the person-in-charge of the approved treatment facility and an authorised psychiatric practitioner as soon as is practicable.**12** Specific observations must be made of the person being restrained or under seclusion and appropriate records must be kept. A person who is admitted as a voluntary patient must not be kept in seclusion or have a mechanical restraint applied for longer than a continuous period of 6 hours.**13**

In Queensland, mechanical physical restraint**14** may only be used on an involuntary patient in an authorised mental health service if authorised by a doctor who is satisfied it is the most clinically appropriate way of preventing injury to the patient or someone else.**15** The health practitioner in charge of the unit must ensure that the restraint is applied as

authorised, that the patient's needs are met and that certain details are recorded in the patient's clinical file.**16** Physical restraint**17** may be authorised by an authorised doctor or a health practitioner in charge of a unit within an authorised mental health service, for the purpose of protecting the patient or others from physical harm, providing treatment and care to the patient, or to prevent the patient from leaving the service or causing serious harm to property.**18**

Seclusion**19** may be authorised without the patient's consent at any time on the written order of a doctor**20** or, in an emergency, by the health practitioner in charge of the unit where there is no less restrictive way of protecting the patient or others from imminent physical harm.**21** Specific observations must be made of the person under seclusion.**22** The Chief psychiatrist must formulate a policy about the use of mechanical restraint, seclusion and physical restraint and the information to be recorded.**23**

The guiding principles of the South Australian mental health legislation stipulate that mechanical body restraints and seclusion should be used only as a last resort for safety reasons and not as a punishment or for the convenience of others.**24** One of the functions of the Chief Psychiatrist is to monitor the use of mechanical body restraints and seclusion in relation to patients.**25**

In Tasmania, an involuntary patient may be placed under bodily restraint or seclusion**26** if it is authorised by the Chief Psychiatrist, a medical practitioner or an approved nurse and it is necessary for the treatment of the patient or to prevent his or her self-injury or injury to another or the destruction of property.**27** Specific observations must be made of the person under seclusion or restraint.**28** Records of patient restraint and seclusion must be kept and copies provided to the Mental Health Tribunal or Chief Psychiatrist.**29**

In Victoria, bodily restraint of a person may only be applied in order to administer treatment, to prevent self-injury or injury to another person.**30** A person may only be kept in seclusion**31** for the protection and safety of the person or another.**32** The use and form of restraint or seclusion may only be used after all reasonable and less restrictive options have been considered and deemed unsuitable.**33** An authorised psychiatrist must ensure that the patient’s guardian, carer, and nominated person are notified as soon as practicable after commencement of use of restrictive measures**34** The Chief Psychiatrist also must be notified in writing.**35** Seclusion and restraint must be authorised by an authorised psychiatrist or if unavailable by registered medical practitioner or the senior registered nurse on duty, who must then notify the authorised psychiatrist as soon as practicable.**36** In case of an emergency, a registered nurse may approve the use of a physical bodily restraint only to prevent imminent and serious harm to the person or another person where an authorised psychiatrist, a registered medical practitioner or the senior registered nurse on duty is not immediately available.**37** Specific observations must be made of a person who is restrained or under seclusion, and appropriate basic needs must be provided for.**38** In Western Australia, a patient of an authorised hospital may be placed under bodily restraint or seclusion**39** with the oral authorisation or a seclusion order made by a medical practitioner or, in an emergency, a mental health practitioner**40** if it is necessary for the protection, safety or wellbeing of the patient or another person.**41** Restraint may also be used in order to prevent the patient from persistently destroying property.**42** A senior mental health

practitioner who authorises restraint or seclusion must notify a medical practitioner without delay.**43** Records must be kept of each authorisation.**44** Specific observations must be made of a person under seclusion.**45** The treating psychiatrist is to ensure that a report of the use of restraint or seclusion is made as soon as practicable to the Chief Pyschiatrist.**46**

Notes

- **1** As to general powers of detention see [285-240]. As to involuntary admission see [285-230], [285-235].
- **2** Note, however that the objects of the (NSW) Mental Health Act 2007 specifically state that restriction on the liberty of patients is to be kept to a necessary minimum: ibid s 68(f).
- **3** (ACT) Mental Health Act 2015 ss 2, 261, Dictionary (definition of 'approved mental health facility').
- **4** As to emergency detention see ibid Ch 6.
- **5** Ibid ss 85, 88(1)(a).
- **6** Ibid s 88(1)(b).
- **7** Ibid s 88(1)(b).
- **8** Ibid s 88(1)(c).
- **9** 'Mechanical restraint' in the (NT) Mental Health and Related Services Act 1998 s 61(1) means the application of a device (including a belt, harness, manacle, sheet and strap) on a person's body to restrict the person's movement but does not include the use of furniture (including a bed with cot sides and a chair with a table fitted on its arms) that restricts the person's capacity to get off the furniture. The form of restraint and its duration must be determined by the authorised psychiatric practitioner or senior registered nurse who approves it and if the mechanical restraint has been approved by the senior registered nurse on duty, it must be reviewed and, if necessary, re-determined by an authorised psychiatric practitioner as soon as practicable after it has been approved: ibid s 61(6).
- **10** 'Seclusion', of a person, means the confinement of the person at any time of the day or night alone in a room or area from which free exit is prevented: ibid s 62(16).
- **11** Ibid ss 61(3), 61(7), 62(3), 62(7).
- **12** Ibid ss 61(4), 61(5), 62(4), 62(5). For the meaning of 'authorised psychiatric practitioner' see ibid s 22. The 'person-in-charge' is defined in ibid s 21.
- **13** Ibid ss 61(8), 61(10), 62(8), 62(10). The person being restrained must also be provided with food and drink at appropriate times, have access to adequate toilet facilities and be provided with any other psychological and physical care appropriate to the person's needs: ibid ss 61(8), 62(8). A record of the restraint or seclusion must be kept (ibid ss 61(12), 62(12)) and a copy of the record must be placed on the person's medical records: ibid ss 61(13), 62(13). The principal community visitor must ensure that such records are inspected by a community visitor at intervals not longer than 6 months: ibid ss 61(14), 62(14).
- **14** (QLD) Mental Health Act 2016 s 24, Ch 8 Pt 2. 'Mechanical restraint' in ibid s 244 means restraint of a person by the application of a device to body or limb to restrict the person's movement other than the use of a surgical or medical appliance for the proper treatment of physical disease or injury.
- **15** Ibid s 250.

- **16** Ibid s 251.
- **17** Physical restraint involves the use by a person of his or her body to restrict the patient's movement but does not include giving of reasonably necessary physical support or assistance to the patient to carry out activities of daily life or redirection of a disoriented patient or where physical restraint required in urgent circumstances: ibid s 268.
- **18** Ibid s 270.
- **19** 'Seclusion' means the confinement of the patient at any time of the day or night alone in a room or area from which free exit is prevented other than the overnight confinement of a patient in a high security unit or an in-patient unit for security purposes: ibid s 254.
- **20** Ibid s 258.
- **21** Ibid s 263.
- **22** Ibid s 260. The health practitioner in charge of the unit must ensure that the patient's reasonable needs are met while in seclusion: ibid s 260(b).
- **23** Ibid s 273.
- **24** (SA) Mental Health Act 2009 s 7(h).
- **25** Ibid s 90(1)(b).
- **26** 'Restraint' is defined in the (TAS) Mental Health Act 2013 s 3 as a form of physical, mechanical or chemical restraint. 'Seclusion' means confinement alone, in an area or room that a patient cannot exit freely: ibid s 3.
- **27** Ibid ss 56, 57. The restraint or seclusion must not exceed the authorised period or must be in accordance with clinical guidelines: ibid ss 56(1)(d), 56(1)(e), 57(1)(d), 57(1)(e).
- **28** Ibid ss 56(2), 57(2). The patient must be supplied with sustenance, clean clothing and bedding, adequate toilet and sanitary arrangements, ventilation and lighting, and a method of summoning assistance: ibid s 56(2)(g), 57(2)(g).
- **29** Ibid s 58.
- **30** (VIC) Mental Health Act 2014 s 113. 'Bodily restraint' is defined as physical or mechanical restraint that 'prevents a person having free movement of his or her limbs, but does not include the use of furniture (including beds with cot sides and chairs with tables fitted on their arms) that restricts the person's ability to get off the furniture': ibid s 3.
- **31** Ibid s 3 ('seclusion' is defined as the sole confinement of a person in a room or other enclosed space from which it is not within the control of the person confined to leave).
- **32** Ibid s 110.
- **33** Ibid s 105.
- **34** Ibid s 107.
- **35** Ibid s 108.
- **36** Ibid ss 111, 114.
- **37** Ibid s 115.
- **38** Ibid ss 106, 112, 116.
- **39** For the definition of 'bodily restraint', 'physical restraint', and 'mechanical restraint' see (WA) Mental Health Act 2014 s 227. 'Seclusion' is defined as the confinement of a person being treated at an authorised hospital by leaving him or her alone in a room or area from which it is not within that person's control to leave

but does not include where a person is alone in a room or area and the person is unable to leave due to illness, frailty, or disability: ibid s 212.

- **40** Ibid ss 213-215.
- **41** Ibid s 216. Oral authorisations must be recorded and particulars of the patient's name, room used for seclusion and the date and time of the authorisation must be included in the records: ibid ss 214(4). Seclusion orders must be in approved form and contain similar prescribed particulars such as patient's name, date, time and room used and any oral authorisations: ibid s 215(3).
- **42** Ibid s 232(1)(a)(iii).
- **43** Ibid ss 217(2), 233(2). The medical practitioner may vary or revoke the authorisation: ibid ss 218, 219(1), 234(3), 235.
- **44** Ibid ss 221, 237.
- **45** Ibid ss 222 (seclusion), 238 (bodily restraint). For seclusion, a mental health practitioner or a nurse must observe the person every 15 minutes: ibid s 222(3). A medical practitioner must examine the person at least every 2 hours: ibid s 222(4). The patient must be provided with appropriate bedding, clothing, food and drink, access to toilet facilities and any other appropriate care: ibid s 222(5). All observations must be recorded in approved form: ibid s 222.

  For bodily restraint, a mental health practitioner or a nurse must always be in physical attendance: ibid s 238(3). A medical practitioner must examine the person at least every 30 minutes: ibid s 238(4). Where a person is restrained for more than 6 hours, a psychiatrist must review the use of bodily restraint: ibid s 238(5). The patient must be provided with appropriate bedding, clothing, food and drink, access to toilet facilities and any other appropriate care: ibid s 238(6). All observations must be recorded in approved form: ibid s 238.

- **46** Ibid ss 224, 240.

Results

Study selection

The flow of manuscripts through the study is shown in figure 1. The systematic search generated 2,995 records. After duplicates were removed, we were left with 2,048 documents. After initial title and abstract screening, we were left with 82 studies. Following full text review, an additional 24 documents were excluded for the reasons listed in supplementary document 1. Fifty-eight studies met our inclusion criteria and were included in the qualitative synthesis and critical appraisal (a complete list of included studies is reported in supplementary document 1).

Study characteristics

Table 1 shows the characteristics of included studies. Most (n = 35) were experimental studies; either randomised controlled trials (n = 4) or quasi-experimental in design (n= 33). We also included 23 observational studies, most of which (n = 15) were cross-sectional in design.

Fieldwork for included studies was conducted across 12 different countries. Almost half (n = 26) of the included studies were conducted in the United States of America. There were 21 studies from European countries and eight from Australia. Most studies were conducted in common law (law created by judges and similar quasi-judicial tribunals) countries.

Half of the included studies focused on both seclusion and restraint and a third were focused solely on seclusion. There were a small number of studies where the restrictive practice under investigation was physical restraint (n = 11). Mechanical restraint was the focus of six studies.

Most study authors used data from hospital administrative sources to estimate the number of applications of restrictive practices that occurred.

Included studies tested several different interventions or exposures. There were two studies in which the effect of mental health legislation on rates of restrictive practices was examined. A third of studies (n = 18) tested some form of complex or multicomponent intervention/exposure. De-escalation techniques, open door policies, implementation of a

restrictive practice policy or strategy, training programs, introduction of a sensory modulation room, ward design/environment are interventions or exposures that were tested in more than one included study.

Risk of bias in studies

All included studies were critically appraised using the relevant JBI checklist (*Critical Appraisal Tools | JBI*, n.d.). There was considerable variability in the quality of included studies. There were substantial issues in completeness in reporting – that is to say it was common for important information about studies to be omitted and this made it difficult to rate many checklist criteria. Potential sources of bias were identified across all included studies.

Use of administrative data

Reliance on administration data on the use of restrictive practice is problematic and needs to be considered when interpreting this research. There are potential ways in which the reporting of restrictive practices may be distorted. First, it is likely that a single individual is subject to restrictive practices multiple times; a small number of individuals account for a substantial number of the applications of restrictive practices. Administrative data on restrictive practice is dependent on accurate recording by clinical staff (predominately nurses). It is plausible that the implementation of any intervention designed to reduce the level of restrictive practices will impact recording in practice. Nurses working on a ward, for example, may be less likely to record instances when restrictive interventions are applied. Staff working on wards that focus on reducing restrictive practices may record it more or less stringently than staff working on wards where restrictive practices are routinely used without critical reflection.

Randomised controlled trials

Table 2 shows the critical appraisal ratings for the four randomised controlled trials. For two of the trials, we could be confident that the authors used a true randomisation procedure. In three trials, we could not be confident that the person who was randomising participants or groups could not work out to which group they would be allocated (allocation concealment). Consequently, we cannot be confident that research teams were not – either consciously or unconsciously – selecting which trial arm participants/groups were allocated to ensure a

positive outcome. Across all included studies, we could not be confident that participants and researchers were blinded to group allocation.

Quasi-experimental studies

Ratings on the critical appraisal checklist for included quasi-experimental studies are shown in table 3. Generally, outcomes were determined in a consistent way, generally using hospital administrative data. Most (n = 25) studies did not include a comparator group. In around half of the studies, we could not be confident that participants included in any analyses were similar and receiving comparable usual care (apart from the experimental intervention). The use of administrative data to measure outcomes (e.g., rates of seclusion or restraint) is likely to not be valid or reliable.

Cohort studies

Six studies were described as cohort studies and were critically appraised. Ratings for individual studies are shown in table 4. Important sources of bias were identified across all studies. Of note, potential confounders were considered and adjusted for in the analysis of two of six cohort studies. Across all studies, we could not be confident that the outcome was measured in a valid way.

Cross sectional studies

Table 4 shows the critical appraisal ratings for cross-sectional studies. One study addressed all nine criteria (An et al., 2016). In around two-thirds of cross-sectional studies, there were issues with the identification of, and strategies to address, confounding. Reliance on the use of administrative data to measure outcomes was, again, potentially a source of bias.

Results of syntheses

Overall, most of the included studies suggest that the intervention/exposure being examined was effective at reducing rates of restrictive practices. We clustered included studies under the following intervention subheadings:

- Legislative framework (n = 2)
- Open door policy (n = 4)

- Implementation of a policy or strategy (n = 5)
- Behavioural methods (n = 1)
- Nursing models (n = 3)
- Multi-component interventions (n = 21)
- Sensory modulation rooms (n = 7)
- Ward structural design (n = 4)
- Training (n = 3)
- Six core strategies (n = 2)
- Post restrictive practice review (n = 1)

Legislative frameworks

We identified two studies that examined the impact of a legislative framework on seclusion and restraint (Keski-Valkama et al., 2007) and restraint (An et al., 2016). The authors report inconsistent findings. Keski-Valkama et al. (2007) examined rates of seclusion and restraint in Finland over a fifteen-year period (1990 through 2004) via five postal (administered in 1990, 1991 1994, 1998, 2004) surveys of psychiatric hospitals. The authors report that since 1990 there have been substantial changes in the legislative framework that have sought to reduce the use of restrictive practices. Important changes to the mental health law in Finland in 2002 meant that the use of seclusion and restraint was regulated by the legislation (previously hospital policy regulated its use). Since then, legislation has regulated the use of restrictive practice whilst people are receiving psychiatric inpatients care (Keski-Valkama et al., 2007). According to Keski-Valkama et al. (2007) the aim of the legislative reform was to ensure justification was given for limiting the rights of people detained in hospital as well as to define and standardise restrictive practices. The total number of episodes of seclusion and restraint did decline over the study period; however, the risk of being secluded or restrained remained the same over time when compared to 1990 (baseline survey) (Keski-Valkama et al., 2007). Over such a timeframe, it is not possible to isolate the contribution of legislation to change, or lack of change, in the use of restrictive practices.

An et al., (2016) examined the effect of the implementation of the National Mental Health Law of China – intended to promote rights, dignity and interests of people experiencing mental ill-health (Xiang et al., 2012) – that was introduced in 2013. The study was conducted

at a single site in an 800-bed psychiatric hospital in Beijing, China. According to the authors, the new law indicated that physical restraint could only be applied in the participating hospital if the person's family provided permission on admission.[1] The evaluation involved 789 and 575 patients, respectively, admitted to the hospital before and after the implementation of the legislation (An et al., 2016). A third of all study participants were restrained at least once during their admission. Following the implementation of mental health legislation, the authors report a 40% reduction in the odds of being restrained after adjusting for a small number of confounding variables (An et al., 2016). The authors note that in cases where families did not provide permission, chemical restraint or forced ECT was often used instead. It is unclear if the legislative changes resulted in an overall reduction in restrictive practices.

Open door policy

We identified four studies that tested the effect of an open door policy on rates of restrictive practices (Beaglehole et al., 2017; Hochstrasser et al., 2018; Jungfer et al., 2014; Schneeberger et al., 2017). All studies reported that an open-door policy was associated with lower rates of seclusion and restraint. In a study involving 17,359 people admitted for psychiatric inpatient care in Switzerland over a six-year study period between 2010 and 2015, the authors reported an 18% and 10% reduction – after adjusting for confounding – in the odds of being secluded and being forced to take medication respectively (Hochstrasser et al., 2018). Authors of a second study from Switzerland – involving 2,838 psychiatric inpatients – reported a significant reduction in rates of seclusion, but not of forced medication, following the implementation of an open door policy (Jungfer et al., 2014). Schneeberger et al., (2017) examined the difference in rates of seclusion or restraint in 17 hospitals with and four without an open-door policy. Data were extracted from 314,330 people who had received psychiatric inpatient care between 1998 and 2021. After adjusting for confounding, the authors reported a 45% reduction in the odds of seclusion or restraint in people admitted to open door wards (Schneeberger et al., 2017).

[1] The text of the law does not specifically require the permission of family in advance, only that family should be notified after the event (Chen et al., 2012). It may be that the hospital policy in which this study was conducted included the additional requirement.

Implementation of a policy or strategy

We identified five studies where the authors had examined the effect of implementing a policy or strategy on rates of restrictive practices (Ching et al., 2010; Currier & Farley-Toombs, 2002; Newton-Howes et al., 2020; Pollard et al., 2007; Qurashi et al., 2010; Vruwink et al., 2012). Overall, there was consistent evidence that policies and strategies targeted at reducing rates of restrictive practice were effective.

The use of mechanical restraint across four countries (USA, Australia, New Zealand and Japan) was examined by Newton-Howes et al. (2020) with the aim of determining if policies to reduce the use of or eliminate mechanical restraint in different countries had been effective. The authors reported no change in mechanical restraint in any country over the study period (2003 through 2017). Substantial differences between countries – determined as restraint events per million population per day – were observed with the lowest rates of mechanical restraint in 2017 in New Zealand (0.03) and the highest (98.8) Japan, a variation greater than 3000-fold. Restraint in Australia was 0.17 events per million (Newton-Howes et al., 2020).

Vruwink et al. (2012) examined the effect of a national strategy in the Netherlands that ran between 2006 and 2009 with the aim of reducing rates of seclusion by 10%. Restrictive practices in the Netherlands differ from the rest of Europe in that seclusion – rather than forced medication – is much more frequently used. Twenty million euros were awarded to 34 psychiatric hospitals with a specific plan to reduce seclusion rates. To get the grant, each hospital needed a plan that set a target for reducing seclusion, developing psychiatric intensive care, systems for monitoring restrictive practice, and strategies for enhancing competencies of clinicians. The authors reported that each hospital's plan varied considerably; for example, some hospitals closed all seclusion rooms whilst others focused on engagement strategies or aggression de-escalation training (Vruwink et al., 2012). Because all restrictive practices must be reported to the Dutch Healthcare Inspectorate, the study authors were able to use these data to estimate the impact of the strategy (Vruwink et al., 2012) and reported only modest reductions – around a 5% per year – in rates of seclusion.

Pollard et al., (2007) examined the effect of seclusion and restraint following the implementation of the Joint Commission on the Accreditation of Healthcare Organizations

(JCAHO) standards in 2000. The authors describe the process of implementing JCAHO standards that involved discussions with clinical staff about the use of alternatives to seclusion and restraint and their concerns about the standards. Videos were also used to stimulate conversation about the risks of restraint and a commitment to a clinical environment where restraint was not used. Ward seclusion and restraint policies and procedures were also updated to the new standards. Finally, all episodes of seclusion and restraint were critically reviewed by senior nurses on the ward (Pollard et al., 2007). Administrative data were extracted from 1998 through 2002, and the authors report a reduction in the hours of seclusion and restraint per patient from an average of nine and a half to just under three (Pollard et al., 2007).

The effect of implementing, in 1999, the Health Care Financing Administration (HCFA) rules on seclusion and restraint in general and psychiatric hospitals that participate in Medicare and Medicaid was examined in a report by Currier & Farley-Toombs, (2002). The regulations require that a physician (or licensed independent practitioner) undertake a face-to-face assessment of a consumer within an hour of seclusion or restraint being applied. The authors also note that the regulation shortens the interval between mandatory renewal orders and codifies a requirement for staff training and enhanced documentation (Currier & Farley-Toombs, 2002). The authors extracted data on the number of episodes of restraint from four inpatient wards. A more than 50% reduction in rates of restraint was reported following the implementation of the new regulations (Currier & Farley-Toombs, 2002).

Forensic setting

Two studies examined policy implementation to reduce restrictive practice in forensic settings (Ching et al., 2010; Qurashi et al., 2010). Both showed a reduction in rates of seclusion. (Ching et al. (2010) examined the implementation of a new seclusion policy in a forensic psychiatric hospital in Australia. The policy involved a review of current practices and training for clinical staff in the management of violence and aggression and the introduction of alternative interventions to seclusion. A reduction in rates and duration of seclusion was reported. In a second study, strategies to reduce seclusion in a high secure hospital were examined (Qurashi et al., 2010). The authors reported that by making seclusion a managerial and clinical priority

and implementing robust performance monitoring and clinical governance, there was a 60% reduction in the rates of seclusion (Qurashi et al., 2010).

Behavioural methods

Donat (2002) describes the introduction of a behavioural approach to reducing rates of seclusion and restraint in a single psychiatric inpatient ward. The intervention was focused on the use of differential reinforcement procedures and an emphasis on using a hierarchy of progressively restrictive procedures. The author reports the average number of hours of seclusion and restraint per month in the year before and after the implementation of the behavioural program (Donat, 2002). A reduction from 1,199 to 507 hours of seclusion and restraint per month was observed.

Nursing models

Three included studies (E-Morris et al., 2010; Fletcher et al., 2017; Sullivan et al., 2004) that evaluated a nursing model – Nurse Directed Care, consumer-focused model, Safewards – focused on reducing restrictive practice.

We identified a quality improvement project that examined the effect on a range of quality indicators – including seclusion and restraint – of introducing the Nurse Directed Care Model. The model comprised two elements: primary nursing (one number that plans and provides the bulk of the nursing care to an individual) and a higher ratio of registered nurses to nursing assistants (E-Morris et al., 2010). The authors compared quality improvement outcomes between two wards, one that had implemented the nurse directed care model and one that had not. In the ward operating the nurse directed care model, there were substantially fewer recorded episodes of seclusions or restraints in 2006 (24 compared with 64).

Sullivan et al. (2004) used a simple before and after study design to test the effect of implementing a consumer-focused model of nursing care on a single inpatient ward in Australia. In total, data on rates of seclusion were extracted for 640 people admitted to the ward during the study period. In the year before the implementation of the intervention, there were 79 episodes of seclusion, which reduced to 69 in the year after.

Safewards is a nursing model that comprises 10 interventions – talk down, positive words, bad news mitigation, know each other, mutual help meeting, calm down methods, reassurance, discharge messages, clear mutual expectations and soft words – designed to reduce conflict and containment (Fletcher et al., 2017). The model was evaluated in a controlled clinical trial involving 44 (13 implementing Safewards and 31 matched control) wards in Australia. The authors state that there was a between-group difference in rates of seclusion at the end of the trial, with patients in the intervention group experiencing less seclusion overall (Fletcher et al., 2017).

Multi-component interventions

We identified 21 studies that tested a multi-component complex intervention (Ash et al., 2015; Ashcraft & Anthony, 2008; Blair et al., 2017; Borckardt et al., 2011; Boumans et al., 2014; Dewey & Brill, 2000; Donat, 2003; D'Orio et al., 2004; Espinosa et al., 2015; Goetz & Taylor-Trujillo, 2012; Gulpers et al., 2013; Hellerstein et al., 2007; Khadivi et al., 2004; Madan et al., 2014; McCue et al., n.d.; Pérez-Revuelta et al., 2021; Shields, 2022; Taxis, 2002; Trauer et al., 2010; Visalli & McNasser, 2000; Wale et al., 2011). Generally, authors' approaches to deciding which components to include in an intervention were pragmatic, as there was little evidence of a theoretical underpinning to the proposed approach. Across the included studies, we identified the following discreet components:

- Monitoring of seclusion and restraint,
- Clinician training,
- Trauma informed clinician training/working,
- Recovery focused working,
- Stakeholder consultation,
- Sensory modulation,
- Data transparency,
- Past trauma assessment of inpatients,
- Consumer preference regard effective calming measures,
- Assessment of arousal levels, escalating set of actions,
- Raising awareness,

- Communication feedback loops,
- Consumer education,
- Working with families,
- Identification of restraint-prone patients,
- Development of a crisis response team,
- Daily review of all restraints,
- Incentive system for the clinical staff,
- Changes to the therapeutic environment (for example, repainting walls with warm colours, using decorative rugs and plants, and replacing and restructuring furniture in common areas),
- Post episode debriefing,
- Early intervention,
- Ensuring compliance with hospital policies and procedures,
- Methodological work approach,
- Use of a coping questionnaire to assess patient preferences for dealing with agitation.

The authors of 19 of 21 included studies that tested a multi-component intervention reported reductions in rates of restrictive practices (Ash et al., 2015; Blair et al., 2017; Borckardt et al., 2011; Boumans et al., 2014; Dewey & Brill, 2000; Donat, 2003; D'Orio et al., 2004; Espinosa et al., 2015; Fisher, 2003; Goetz & Taylor-Trujillo, 2012; Gulpers et al., 2013; Hellerstein et al., 2007; Khadivi et al., 2004; Madan et al., 2014; McCue et al., n.d.; Pérez-Revuelta et al., 2021; Taxis, 2002; Visalli & McNasser, 2000; Wale et al., 2011). We note that in some studies, the reported effect of the intervention on rates of restrictive practices was extremally large. Fisher, (2003) and Taxis, (2002), for example, reported a 94% and 67% reduction in the rate of seclusion and restraint, respectively and Gulpers et al. (2013) a 65% reduction in the use of mechanical restraint (belts).

Ashcraft & Anthony, (2008), in a quality improvement project, reported that they had been able to eliminate recorded seclusion and restraint within 10 months in one and 31 months in another crisis inpatient unit in the USA, seemingly without an increase in the use of medication (which was not objectively recorded) (Ashcraft & Anthony, 2008).

One author reported that whilst rates of restrictive practices declined, there was an increase in incidences of violence and aggression (Khadivi et al., 2004).

Trauer et al. (2010) did not report a reduction in the rates of restrictive practices following the implementation of a novel complex intervention.

Sensory modulation rooms

Seven studies reported evaluations of sensory modulation rooms where an outcome of the evaluation was a restrictive practice (Andersen et al., 2017; Cummings et al., 2010; Lloyd et al., 2014; Novak et al., 2012; Sivak, 2012; Smith & Jones, 2014; Yakov et al., 2018). Sensory rooms are spaces with a variety of items (such as weighted blankets), lighting and sounds that can help a person to relax and undertake self-soothing routines or activities – such as stroking their hair or tapping a foot – and have theoretical links to the trauma, sensory modulation, self-management, and recovery literature. Five studies reported a reduction in restrictive practices (Andersen et al., 2017; Cummings et al., 2010; Lloyd et al., 2014; Sivak, 2012; Yakov et al., 2018). For example, Yakov et al. (2018) implemented sensory reduction as part of a quality improvement project on a psychiatric intensive care ward in the USA. The authors reported a 72% reduction in rates of restraint over an 11-month evaluation period (Yakov et al., 2018). The authors of two studies (Novak et al., 2012; Smith & Jones, 2014) reported no changes in rates of seclusion following the implementation of a sensory room.

Ward structural design

We identified four studies where the authors examined if ward design was associated with restrictive practices (Eggert et al., 2014; Georgieva et al., 2010; Jenkins et al., 2015; Ulrich et al., 2018). Ten architectural elements were included in the model: single patient rooms with private bathrooms, communal area with moveable seating with ample space to regulate relationships, design for low social density, noise reducing design, environmental control in rooms, accessible garden, nature window view, nature art, daylight, communal spaces and bedrooms observable from a central area (Ulrich et al., 2018). The authors compared rates of restrictive practices in a new ward built with the listed design and compared with two comparator wards. The authors report that number of physical restraints were 50% lower in

the new compared to control wards (Ulrich et al., 2018). Eggert et al. (2014), Georgieva et al. (2010), and Jenkins et al. (2015) similarly reported that a purposefully designed psychiatric ward was associated with lower rates of seclusion.

Training

Clinician training was an important component of many studies where multi-component interventions were tested. We identified three studies where authors specifically tested a training intervention to reduce restrictive practices (Forster et al., 1999; Jonikas et al., 2004; Kontio et al., 2014). Jonikas et al. (2004) reported the evaluation of training staff members in crisis de-escalation and nonviolent intervention. Data on the number of restraints were extracted from 2000 through 2002, a year before and after the training package was introduced in all three psychiatric wards. A 48% reduction in rates of restraint three months after training and 98% at six months were reported (Jonikas et al., 2004). A cluster randomised controlled trial compared eLearning or training as usual in nurses working on 10 wards. Training comprised legal and ethical issues, behaviour-related factors, therapeutic relationships and self-awareness, teamwork and integrating knowledge with practice (Kontio et al., 2014). No differences in rates of restrictive practices (seclusion and mechanical restraint) were reported between the two groups. A quality improvement project described by Forster et al. (1999) examined the impact of mandatory staff training on the management of assaultive behaviours, plus weekly ward meetings of staff. The authors reported that the rate of restraint dropped by around 14% (Forster et al., 1999).

Six core strategies

There were two studies we included that evaluated a set of interventions described as the six core strategies (Maguire et al., 2012; Putkonen et al., 2013). The six core strategies are:

- Leadership towards organisational change
- Full inclusion of lived experience
- Using data to inform practice
- Workforce development
- Use of seclusion and restraint reduction tools
- Debriefing techniques

We note that some or all these strategies are included in other multi-component interventions we have included in this review.

A randomised controlled trial of the six core strategies is reported by Putkonen et al., (2013). Four long-term secure psychiatric wards for men were randomly allocated to experimental or control wards. In the experimental wards, staff, consumers, and psychiatrists received six months of training followed by six months of supervision in applying six core strategies. There was a 12% difference in the incident rate ratio, suggesting that the six core strategies led to a reduction in restrictive practices (seclusion, restraint, or room observation) (Putkonen et al., 2013).

Maguire et al. (2012) describe the implementation of the six core strategies in a forensic setting in Australia and suggest that there was a reduction in rates of seclusion, however, the manuscript is not a formal report of research findings.

Post restrictive practice review

We included a single case study involving three consumers and 12 members of the clinical team (Goulet et al., 2018). The authors examined the rates of seclusion and restraint in the six months before and after the implementation of the debriefing intervention.

Meta-analyses

Included studies were extremely heterogeneous in terms of methodology (for example, setting, design, duration of follow-up), intervention/exposure. We did not consider that it was plausible to undertake any meta-analyses.

Discussion

The aim of this review was to consider legislative and legal framework and other interventions to reduce restrictive practice in inpatient mental health settings. The review was conducted by a group of researchers that included those with lived experience. The review included XX studies that we grouped under the following themes for the purposes of narrative synthesis.

1. Legislative framework
2. Open door policy
3. Implementation of a policy or strategy

4. Behavioural methods
5. Nursing models
6. Multi-component interventions
7. Sensory modulation rooms
8. Ward structural design
9. Training
10. Six core strategies
11. Post restrictive practice review

Interventions generally seemed to be extremely effective at reducing rates of restrictive practices (especially seclusion and restraint). However, many of the studies are small and were not methodologically rigorous. Small studies may be more likely to produce false positive results or overestimate the magnitude of the association. Although many of these studies were experimental in design, authors generally did not comply with the requirements for Good Clinical Practice Guidelines for clinical trials (World Health Organization, 2005). Of particular concern was a failure to monitor for harms associated with the intervention. We identified important sources of bias across almost all the studies we included in the review. It was beyond the scope of this review to conduct a formal GRADE of the credibility of the evidence. However, we would advise that the overall credibility of the evidence base was low. We would recommend that in the absence of high-quality evidence we are cautious in making recommendation for practice. Despite this reservation, the aim of this review was to inform a legislative framework and provide advice on what approaches could be recommended.

The literature does not provide evidence that legislative reform contributes to reductions in seclusion and restraint. No studies were found that compared rates of seclusion and restraint with legislative provisions or legislative reforms, although Newton-Howes et al. (2020) noted that legislative differences were one factor that may have led to the wide variation in restraint use between jurisdictions in their studies. This is not to suggest that the literature provided evidence to the contrary, nor that the absence of evidence is indicative that legislation has not, or cannot, contribute to reductions in seclusion and restraint. In addition, it is widely recognised that increased regulation, oversight and advocacy all contribute to less restrictive practices and help prevent abuses of power (McSherry & Maker, 2020). The gap identified by

this literature review simply reflects a lack of studies that have attempted to link rates of seclusion and restraint directly with legislative reform. The literature detailed above does indicate that there are successful strategies for reducing seclusion and restraint, and it seems likely that these strategies could be supported by legislation. For example, de-escalation training was consistently identified in the literature as contributing to reductions in seclusion and restraint, and this training could be enforced through a statutory obligation for all clinicians. Similarly, legislation can require post-event debriefing, another established strategy for reducing seclusion and restraint. Legislative reform can support these evidence-based strategies to promote their uptake and implementation.

Comparison to similar systematic reviews

We identified two previous systematic reviews (Dahm et al., 2017; Lan et al., 2017) and one umbrella review (Barbui et al., 2021) that have examined interventions to reduce restrictive practices in mental health settings, coming to essentially similar conclusions both about the effectiveness of interventions and the quality of research. For example, Lan et al. (2017) reviewed trials testing educational interventions for clinicians in long-term care facilities (that included psychiatric inpatient wards). The review included 16 studies of which 10 were randomised controlled trials – involving 5,819 participants – that were included in a meta-analysis. The odds of physical restraint being applied were reduced by 50% in the education group compared to the comparator group (Lan et al., 2017). An umbrella review of randomised controlled trials (Barbui et al., 2021) included 23 primary studies involving 8,554 participants. Meta-analysis showed that educational interventions for clinicians were effective at reducing restraints, and as in our review, the authors highlighted risk of bias in included trials (Barbui et al., 2021).

Consideration for legislation

This review supports previous findings that regulating seclusion and restraint tends to involve a mix of legislation, policies, procedures and guidelines. Specific restrictions and prohibitions that are already commonly included in regulatory frameworks include:

- Ensuring medication is only used for certain purposes (not restraint)
- What devices can be used for mechanical restraint
- Limiting the use of physical holds

- Giving particular attention to additional regulation when it comes to vulnerable or marginalised groups such as children, the elderly or First Nations people

However, most seclusion and restraint regulation is based in policy or accreditation rather than legislation.

Based on our review of the literature, we offer some considerations for factors that could be relevant to developing a stricter legislative structure:

- Providing definitions of seclusion, mechanical and physical restraint, and chemical restraint (or rapid tranquillisation). This could also extend to 'emotional' or 'psychological' restraint (see discussion about these definitions in MSEI, 2014 pg. 31).
- Defining when seclusion and restraint are 'necessary and reasonable'.
- Defining what is meant by using seclusion and restraint as a last resort and endorsing the need to demonstrate prevention strategies and stepped approaches, including one-to-one nursing, supervision and observation.
- Regulating reporting requirements and transparency regarding rates of seclusion and restraint by every provider.
- Requiring a nominated carer, advocate or anyone named in an advanced statement to be notified if a person is subjected to seclusion or restraint.
- Requiring post-incident reviews that include, with the person's consent, a nominated carer and advocate and the authorised psychiatrist and nurse unit manager. A report from this review and agreed actions should be distributed to all parties.
- Requiring accredited micro and macro credentialling for anyone with powers to seclude or restrain.
- Legislate for density on wards to reduce overcrowding and require single rooms with access to private bathroom facilities.
- Requiring all compulsory patients to have access to outdoor spaces and external windows that enable natural light.
- Requiring all compulsory patients have access to therapeutic spaces such as a sensory modulation room. This room should be used in the place of a seclusion room wherever possible.

- Set limits regarding the number of seclusion rooms per ward or patient with a view to eliminating seclusion rooms.

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Table 1, Summary of the characteristics of the included studies

Variable	Number	Percentage
Country		
Australia	8	13
Canada	1	2
China	1	2
Denmark	1	2
Finland	3	5
Germany	1	2
Netherlands	5	8
New Zealand	1	2
Spain	1	2
Sweden	1	2
Switzerland	2	3
United Kingdom	3	5
United States	31	52
Unknown	1	2
Study design		
Experimental	37	62
Observational	23	38
Data collection method		
Routine hospital administrative data	40	67
Routine hospital administrative data and survey/interview	6	10
Survey	5	8
Survey and observation	2	3
Interview	1	2
Not reported	4	7
Type of restrictive practice		
Mechanical restraint	2	3
Mechanical restraint and manual restraint	1	2
Mechanical restraint and seclusion	2	3
Physical restraint	2	3
Physical restraint and mechanical	1	2
Physical restraint including use of belts	1	2
Restraint	4	7
Seclusion	16	27
Seclusion and restraint	31	52
Law		
Civil law	15	25
Common law	44	73

Variable	Number	Percentage
Civil and criminal law	1	2

Table 2, JBI Critical Appraisal Checklist for randomized Controlled trials

Study author	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6	Criteria 7	Criteria 8	Criteria 9	Criteria 10	Criteria 11	Criteria 12	Criteria 13
Putkonen et al. (2013)	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Unclear
Kontio et al. (2014)	Yes	No	Yes	Unclear	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

Table 3, JBI Critical Appraisal Checklist for quasi-experimental studies

Study author	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6	Criteria 7	Criteria 8	Criteria 9
Andersen et al. (2017)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	No
Beaglehole et al. (2017)	Yes	Unclear	Unclear	No	Unclear	Unclear	Unclear	Unclear	Unclear
Blair et al. (2016).	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Unclear
Borckardt et al. (2011)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Boumans et al. (2014).	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes
Ching et al. (2010).	Yes	Yes	Yes	No	Yes	Yes	Yes	Unclear	No
Cummings et al. (2010)	Yes	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	No
Currier & Farley-Toombs (2002)	Yes	Unclear	Unclear	No	Unclear	Unclear	Unclear	Unclear	Unclear
Dewey & Brill (2000).	Yes	Unclear	Unclear	No	Unclear	Unclear	Unclear	Unclear	Unclear
Donat (2002)	Yes	Unclear	Unclear	Unclear	Unclear	Unclear	Yes	Unclear	Unclear
D'Orio et al. (2004)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
Eggert et al. (2014).	Yes	Unclear	Unclear	No	Unclear	Unclear	Yes	Unclear	Unclear
E-Morris et al. (2010).	Yes	Unclear	Unclear	No	Unclear	Unclear	Unclear	No	Unclear
Fletcher et al. (2017)	Yes	Unclear	Unclear	No	Unclear	Yes	Yes	Yes	Yes
Forster et al. (1999)	Yes	Yes	Yes	No	Unclear	Yes	Yes	Yes	Unclear
Goulet et al. (2018)	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Unclear	Unclear	Unclear
Gulpers et al. (2013).	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No
Hellerstein et al. (2007)	Yes	Unclear	Unclear	No	Unclear	Unclear	Yes	Unclear	Unclear
Huckshorn, 2004	Yes	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear
Jenkins et al. (2015).	Yes	Yes	Yes	No	Yes	Unclear	Yes	Yes	Yes
Jonikas et al (2004)	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No
Khadivi et al. (2004)	Yes	Unclear	Unclear	No	Unclear	Unclear	Yes	Unclear	Unclear
Lloyd et al. (2014).	Yes	Unclear	Yes	No	Unclear	Unclear	Yes	Unclear	No
Madan et al. (2014).	Yes	Unclear	Unclear	No	Unclear	Unclear	Yes	Unclear	No
Maguire et al. (2012).	Yes	Unclear	Unclear	Yes	Unclear	Unclear	Yes	Unclear	Unclear
McCue et al. (2004)	Yes	Not applicable	Not applicable	No	Unclear	Unclear	Yes	Unclear	Unclear
Novak et al. (2012).	Yes	Yes	Yes	No	Yes	Yes	Yes	Unclear	Unclear
Pollard et al. (2007)	Yes	Unclear	Unclear	No	Unclear	Yes	Yes	Unclear	Yes
Schneeberger et al. (2017).	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sees (2009)	Yes	Unclear	Unclear	No	Unclear	Unclear	Yes	Unclear	Unclear
Shields (2022).	Yes	Unclear	Unclear	No	Unclear	Unclear	Yes	Unclear	Unclear
Smith et al. (2014).	Yes	Yes	Yes	No	Unclear	Unclear	Unclear	No	No
Sullivan et al. (2004)	Yes	Yes	Yes	No	Yes	Yes	Yes	Unclear	No
Taxis (2002)	Yes	Unclear	Unclear	No	Unclear	Unclear	Unclear	Unclear	Unclear
Trauer et al. (2010).	Yes	Yes	Yes	No	Yes	Yes	Yes	Unclear	No
Ulrich et al. (2018).	Yes	Yes	Unclear	Yes	Unclear	Unclear	Yes	Unclear	Yes
Yakov et al. (2018).	Yes	Unclear	Unclear	No	Unclear	Yes	Unclear	Unclear	No

Table 4, JBI critical appraisal checklist for cohort studies

Study author (Year	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6	Criteria 7	Criteria 8	Criteria 9	Criteria 10	Criteria 11
Ash et al. (2015).	Unclear	Unclear	Unclear	Unclear	No	Unclear	Unclear	Yes	Yes	Not applicable	Unclear
Goetz et al. (2012).	Not applicable	Not applicable	Yes	Unclear	No	Unclear	Unclear	Yes	Yes	Not applicable	Unclear
Fisher W. (2003)	Not applicable	Not applicable	Yes	No	No	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear
Hochstrasser et al. (2018)	Not applicable	Not applicable	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Not applicable	Yes
Jungfer et al. (2014)	Not applicable	Not applicable	Yes	Yes	Yes	Unclear	Unclear	Yes	Yes	Not applicable	Yes
Qurashi et al. (2010).	Not applicable	Not applicable	Yes	No	No	Unclear	Yes	Yes	Yes	Not applicable	Unclear

Table 5, JBI critical appraisal checklist for analytical cross-sectional studies

Study author (Year)	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6	Criteria 8	Criteria 9
An et al. (2016)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ashcraft & Anthony (2008)	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear
Donat (2003)	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Unclear	Yes
Espinosa et al. (2015).	Not Applicable	Yes	Yes	Unclear	No	No	Yes	Unclear
Georgieva et al. (2010).	Yes	Yes	Yes	Unclear	No	No	Unclear	Unclear
Keski-Valkama et al. (2007)	Yes	Yes	Unclear	Yes	No	No	Yes	No
Newton-Howes et al. (2020)	Yes	Yes	Yes	Unclear	Yes	No	Unclear	Unclear
Noorthoornet et al. (2015)	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes
Pérez-Revuelta et al. (2021)	Unclear	Yes	Yes	Unclear	Yes	Yes	Unclear	Yes
Sivak (2012).	Not Applicable	Yes	Yes	Unclear	No	No	Yes	Unclear
Visalli, & McNasser (2000).	Not Applicable	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear
Vruwink et al. (2012)	Not Applicable	No	Yes	Unclear	No	No	Unclear	Unclear
Wale et al. (2011)	Not Applicable	Unclear	Yes	Unclear	No	No	Unclear	Unclear
Wieman et al. (2014).	No	No	Yes	Unclear	No	No	Unclear	Unclear

Table 6, List of excluded studies

Study	Reason for exclusion
1. Ash, D., Metcalfe, P., & Burton, C. (2014). Poster #T11 Reduction in the use of seclusion with the introduction of recovery principles in an acute psychiatric unit. Schizophrenia Research, 153, S292–S293. https://doi.org/10.1016/S0920-9964(14)70828-X	Poster presentation
2. Bak, J. Zoffmann, V., Sestoft, D. M., Almvik, R., & Brandt-Christensen, M. (2014). Mechanical Restraint in Psychiatry: Preventive Factors in Theory and Practice. A Danish-	Wrong outcome
3. Barr, Wynaden, D., & Heslop, K. (2019). Promoting positive and safe care in forensic mental health inpatient settings: Evaluating critical factors that assist nurses to reduce the use of restrictive practices. International Journal of Mental Health Nursing, 28(4), 888–898. https://doi.org/10.1111/inm.12588	Wrong outcome
4. Beezhold, J., Williams, P., Taylor, J., Harris, A., & Kandasamy, S. (2010). A quasi-experimental controlled intervention to reduce violence on an acute psychiatric ward. European Psychiatry, 25, 873.	Poster presentation
5. Blair, M., & Fletcher Moulton-Adelman. (2015). The Engagement Model for Reducing Seclusion and Restraint: 13 Years Later. Journal of Psychosocial Nursing and Mental Health Services, 53(3), 39–45. https://doi.org/10.3928/02793695-20150211-01	Wrong outcome
6. Bowers, L., Van Der Merwe, M., Nijman, H., Hamilton, B., Noorthorn, E., Stewart, D., & Muir-Cochrane, E. (2010). The Practice of Seclusion and Time-out on English Acute Psychiatric Wards: The City-128 Study. Archives of Psychiatric Nursing, 24(4), 275–286. https://doi.org/10.1016/j.apnu.2009.09.003	Wrong outcome
7. Bowers. L., (2014). Safewards: a new model of conflict and containment on psychiatric wards. Journal of Psychiatric and Mental Health Nursing, 21(6), 499–508. https://doi.org/10.1111/jpm.12129	Wrong outcome
8. Cullen, Bowers, L., Khondoker, M., Pettit, S., Achilla, E., Koeser, L., Moylan, L., Baker, J., Quirk, A., Sethi, F., Stewart, D., McCrone, P., & Tulloch, A. D. (2018). Factors associated with use of psychiatric intensive care and seclusion in adult inpatient mental health services. Epidemiology and Psychiatric Sciences, 27(1), 51–61. https://doi.org/10.1017/S2045796016000731	Wrong outcome
9. Dresler, T., Rohe, T., Weber, M., Strittmatter, T., & Fallgatter, A. J. (2015). Effects of improved hospital architecture on coercive measures. World Psychiatry, 14(1), 105–106. https://doi.org/10.1002/wps.20201	Letter
10. Fletcher, J., Hamilton, B., Kinner, S. A., & Brophy, L. (2019). Safewards Impact in Inpatient Mental Health Units in Victoria, Australia: Staff Perspectives. Frontiers in Psychiatry, 10, 462–462. https://doi.org/10.3389/fpsyt.2019.00462	Wrong outcome
11. Gill, N.S., Parker, S., Amos, A., Lakeman, R., Emeleus, M., Brophy, L., & Kisely, S. (2021). Opening the doors: Critically examining the locked wards policy for public mental health inpatient units in Queensland Australia. Australian and New Zealand Journal of Psychiatry, 55(9), 844–848. https://doi.org/10.1177/00048674211025619	Wrong outcome
12. Hansen, Hazelton, M., Rosina, R., & Inder, K. J. (2021). Exploring the frequency, duration and experience of seclusion for women in a forensic mental health setting: a mixed-methods study protocol. BMJ Open, 11(6), e044261–e044261. https://doi.org/10.1136/bmjopen-2020-044261	Study protocol
13. Happell, & Koehn, S. (2011). Impacts of Seclusion and the Seclusion Room: Exploring the Perceptions of Mental Health Nurses in Australia. Archives of Psychiatric Nursing, 25(2), 109–119. https://doi.org/10.1016/j.apnu.2010.07.005	Wrong outcome
14. Happell, & Koehn, S. (2011). Seclusion as a necessary intervention: the relationship between burnout, job satisfaction and therapeutic optimism and justification for the use of seclusion. Journal of Advanced Nursing, 67(6), 1222–1231. https://doi.org/10.1111/j.1365-2648.2010.05570.x	Wrong outcome
15. Huizing, A. R., Hamers, J. P. H., Gulpers, M. J. M., & Berger, M. P. F. (2009). A Cluster-Randomized Trial of an Educational Intervention to Reduce the Use of Physical	Wrong population

Study		Reason for exclusion
	Restraints with Psychogeriatric Nursing Home Residents. Journal of the American Geriatrics Society (JAGS), 57(7), 1139–1148. https://doi.org/10.1111/j.1532-5415.2009.02309.x	
16.	Huizing, A. R., Hamers, J. P. H., Gulpers, M. J. M., & Berger, M. P. F. (2006). Short-term effects of an educational intervention on physical restraint use: a cluster randomized trial. BMC Geriatrics, 6(1), 17–17. https://doi.org/10.1186/1471-2318-6-17	Wrong population
17.	Koczy, P., Becker, C., Rapp, K., Klie, T., Beische, D., Büchele, G., Kleiner, A., Guerra, V., Rißmann, U., Kurrle, S., & Bredthauer, D. (2011). Effectiveness of a Multifactorial Intervention to Reduce Physical Restraints in Nursing Home Residents. Journal of the American Geriatrics Society (JAGS), 59(2), 333–339. https://doi.org/10.1111/j.1532- 5415.2010.03278.x	Wrong population
18.	Köpke, S., Mühlhauser, I., Gerlach, A., Haut, A., Haastert, B., Möhler, R., & Meyer, G. (2012). Effect of a Guideline-Based Multicomponent Intervention on Use of Physical Restraints in Nursing Homes: A Randomized Controlled Trial. JAMA : the Journal of the American Medical Association, 307(20), 2177–2184. https://doi.org/10.1001/jama.2012.4517	Wrong population
19.	Kuivalainen, S., Vehviläinen-Julkunen, K., Louheranta, O., Putkonen, A., Repo-Tiihonen, E., & Tiihonen, J. (2017). De-escalation techniques used, and reasons for seclusion and restraint, in a forensic psychiatric hospital. International Journal of Mental Health Nursing, 26(5), 513–524. https://doi.org/10.1111/inm.12389	Wrong outcome
20.	Lantta, T., Varpula, J., Cheung, T., Wong, W. K., Cheng, P. Y. I., Ng, T., Ng, C. F., Yam, C. P., Ip, G., Bressington, D., & Välimäki, M. (2020). Prevention and management of aggressive behaviour in patients at psychiatric hospitals: a document analysis of clinical practice guidelines in Hong Kong. International Journal of Mental Health Nursing, 29(6), 1079–1091. https://doi.org/10.1111/inm.12742	Document analysis
21.	LeBel. (2008). Regulatory Change: A Pathway to Eliminating Seclusion and Restraint or "Regulatory Scotoma"? Psychiatric Services (Washington, D.C.), 59(2), 194–196. https://doi.org/10.1176/ps.2008.59.2.194	Not a research study
22.	Mann-Poll, P., Smit, A., de Vries, W. J., Boumans, C. E., & Hutschemaekers, G. J. M. (2011). Factors Contributing to Mental Health Professionals' Decision to Use Seclusion. Psychiatric Services (Washington, D.C.), 62(5), 498–503. https://doi.org/10.1176/ps.62.5.pss6205_0498	Wrong outcome
23.	Muir-Cochrane, E. C., Baird, J., & McCann, T. V. (2015). Nurses' experiences of restraint and seclusion use in short-stay acute old age psychiatry inpatient units: a qualitative study. Journal of Psychiatric and Mental Health Nursing, 22(2), 109–115. https://doi.org/10.1111/jpm.12189	Wrong outcome
24.	Pellfolk, T. J. E., Gustafson, Y., Bucht, G., & Karlsson, S. (2010). Effects of a Restraint Minimization Program on Staff Knowledge, Attitudes, and Practice: A Cluster Randomized Trial. Journal of the American Geriatrics Society (JAGS), 58(1), 62–69. https://doi.org/10.1111/j.1532-5415.2009.02629.x	Wrong population
25.	Southard, K., Jarrell, A., Shattell, M. M., Mccoy, T. P., Bartlett, R., & Judge, C. A. (2012). Enclosed Versus Open Nursing Stations in Adult Acute Care Psychiatric Settings: Does the Design Affect the Therapeutic Milieu? Journal of Psychosocial Nursing and Mental Health Services, 50(5), 28–34. https://doi.org/10.3928/02793695-20120410-04	Wrong outcome
26.	Testad, I., Aasland, A. M., & Aarsland, D. (2005). The effect of staff training on the use of restraint in dementia: a single-blind randomised controlled trial. International Journal of Geriatric Psychiatry, 20(6), 587–590. https://doi.org/10.1002/gps.1329	Wrong population
27.	Testad, I., Mekki, T. E., Førland, O., Øye, C., Tveit, E. M., Jacobsen, F., & Kirkevold, Øyvind. (2016). Modeling and evaluating evidence-based continuing education program in nursing home dementia care (MEDCED)-training of care home staff to reduce use of restraint in care home residents with dementia. A cluster randomized controlled trial. International Journal of Geriatric Psychiatry, 31(1), 24–32. https://doi.org/10.1002/gps.4285	Wrong population

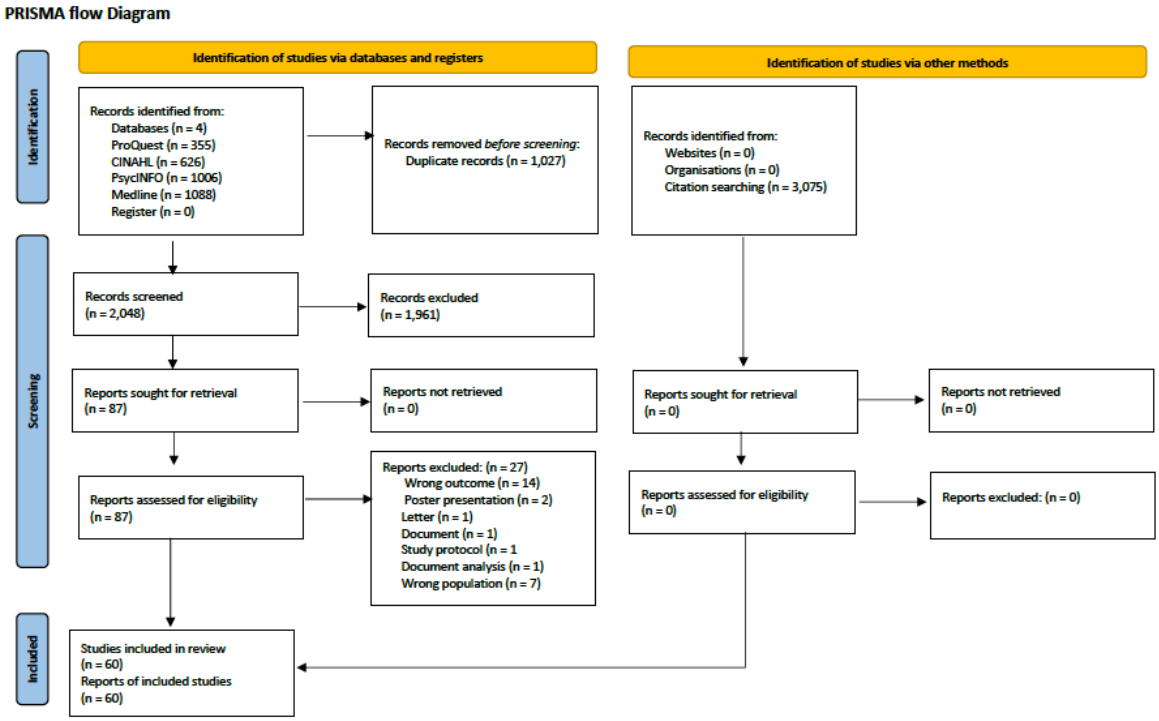

Figure 1, PRISMA flow diagram

Supplementary document 1, list of the included studies

1. An, F., Sha, S., Zhang, Q.-E., Ungvari, G. S., Ng, C. H., Chiu, H. F. ., Wu, P.-P., Jin, X., Zhou, J.-S., Tang, Y.-L., & Xiang, Y.-T. (2016). Physical restraint for psychiatric patients and its associations with clinical characteristics and the National Mental Health Law in China. Psychiatry Research, 241, 154–158. https://doi.org/10.1016/j.psychres.2016.04.101

2. Andersen, C., Kolmos, A., Andersen, K., Sippel, V., & Stenager, E. (2017). Applying sensory modulation to mental health inpatient care to reduce seclusion and restraint: a case control study. Nordic Journal of Psychiatry, 71(7), 525–528. https://doi.org/10.1080/08039488.2017.1346142

3. Ash, D. Suetani, S., Nair, J., & Halpin, M. (2015). Recovery-based services in a psychiatric intensive care unit – the consumer perspective. Australasian Psychiatry : Bulletin of the Royal Australian and New Zealand College of Psychiatrists, 23(5), 524–527. https://doi.org/10.1177/1039856215593397

4. Ashcraft, & Anthony, W. (2008). Eliminating seclusion and restraint in recovery-oriented crisis services. Psychiatric Services (Washington, D.C.), 59(10), 1198–1202. https://doi.org/10.1176/appi.ps.59.10.1198

5. Beaglehole, B., Beveridge, J., Campbell-Trotter, W., & Frampton, C. (2017). Unlocking an acute psychiatric ward: The impact on unauthorised absences, assaults and seclusions. BJPsych Bulletin, 41(2), 92–96. https://doi.org/10.1192/pb.bp.115.052944

6. Blair, E. W., Woolley, S., Szarek, B. L., Mucha, T. F., Dutka, O., Schwartz, H. I., Wisniowski, J., & Goethe, J. W. (2016). Reduction of Seclusion and Restraint in an Inpatient Psychiatric Setting: A Pilot Study. Psychiatric Quarterly, 88(1), 1–7. https://doi.org/10.1007/s11126-016-9428-0

7. Borckardt, J. J., Madan, A., Grubaugh, A. L., Danielson, C. K., Pelic, C. G., Hardesty, S. J., Hanson, R., Herbert, J., Cooney, H., Benson, A., & Frueh, B. C. (2011). Systematic Investigation of Initiatives to Reduce Seclusion and Restraint in a State Psychiatric Hospital. Psychiatric Services (Washington, D.C.), 62(5), 477–483. https://doi.org/10.1176/ps.62.5.pss6205_0477

8. Boumans, C. E., Egger, J. I. M., Souren, P. M., & Hutschemaekers, G. J. M. (2014). Reduction in the use of seclusion by the methodical work approach. International Journal of Mental Health Nursing, 23(2), 161–170. https://doi.org/10.1111/inm.12037

9. Champagne, T., & Stromberg, N. (2004). Sensory approaches in inpatient psychiatric settings: innovative alternatives to seclusion and restraint. Journal of Psychosocial Nursing and Mental Health Services, 42(9), 35–44.

10. Ching, H., Daffern, M., Martin, T., & Thomas, S. (2010). Reducing the use of seclusion in a forensic psychiatric hospital: assessing the impact on aggression, therapeutic climate and staff confidence. The Journal of Forensic Psychiatry & Psychology, 21(5), 737–760. https://doi.org/10.1080/14789941003681361

11. Cummings, K. S., Grandfield, S. A., & Coldwell, C. M. (2010). Caring with Comfort Rooms: Reducing Seclusion and Restraint Use in Psychiatric Facilities. Journal of Psychosocial Nursing and Mental Health Services, 48(6), 26–31. https://doi.org/10.3928/02793695-20100303-02

12. Currier, & Farley-Toombs, C. (2002). Datapoints: Use of Restraint Before and After Implementation of the New HCFA Rules. Psychiatric Services (Washington, D.C.), 53(2), 138–138. https://doi.org/10.1176/appi.ps.53.2.138

13. Dewey, & Brill, C. (2000). Decrease in restraint use: In a study of a geropsychiatric unit. Journal of Psychosocial Nursing and Mental Health Services, 38(10), 14–18. https://doi.org/10.3928/0279-3695-20001001-11

14. Donat. (2002). Employing behavioral methods to improve the context of care in a public psychiatric hospital: Reducing hospital reliance on seclusion/restraint and psychotropic PRN medication. Cognitive and Behavioral Practice, 9(1), 28–37. https://doi.org/10.1016/S1077-7229(02)80036-0

15. Donat. (2003). An Analysis of Successful Efforts to Reduce the Use of Seclusion and Restraint at a Public Psychiatric Hospital. Psychiatric Services (Washington, D.C.), 54(8), 1119–1123. https://doi.org/10.1176/appi.ps.54.8.1119

16. D'Orio, Purselle, D., Stevens, D., & Garlow, S. J. (2004). Reduction of Episodes of Seclusion and Restraint in a Psychiatric Emergency Service. Psychiatric Services (Washington, D.C.), 55(5), 581–583. https://doi.org/10.1176/appi.ps.55.5.581

17. Eggert, J. E., Kelly, S. P., Margiotta, D. T., Hegvik, D. K., Vaher, K. A., & Kaya, R. T. (2014). Person-Environment Interaction in a New Secure Forensic State Psychiatric Hospital. Behavioral Sciences & the Law, 32(4), 527–538. https://doi.org/10.1002/bsl.2127

18. E-Morris, M., Caldwell, B., Mencher, K. J., Grogan, K., Judge-Gorny, M., Patterson, Z., Christopher, T., Smith, R. C., & McQUAIDE, T. (2010). Nurse-Directed Care Model in a Psychiatric Hospital: A Model for Clinical Accountability. Clinical Nurse Specialist, 24(3), 154–160. https://doi.org/10.1097/NUR.0b013e3181d82b6c

19. Espinosa, L., Harris, B., Frank, J., Armstrong-Muth, J., Brous, E., Moran, J., & Giorgi-Cipriano, J. (2015). Milieu Improvement in Psychiatry Using Evidence-Based Practices: The Long and Winding Road of Culture Change. Archives of Psychiatric Nursing, 29(4), 202–207. https://doi.org/10.1016/j.apnu.2014.08.004

20. Fisher. (2003). Elements of successful restraint and seclusion reduction programs and their application in a large, urban, state psychiatric hospital. Journal of Psychiatric Practice, 9(1), 7–15. https://doi.org/10.1097/00131746-200301000-00003

21. Fletcher, J., Spittal, M., Brophy, L., Tibble, H., Kinner, S., Elsom, S., & Hamilton, B. (2017). Outcomes of the Victorian Safewards trial in 13 wards: Impact on seclusion rates and fidelity measurement. International Journal of Mental Health Nursing, 26(5), 461–471. https://doi.org/10.1111/inm.12380
22. Forster, Cavness, C., & Phelps, M. A. (1999). Staff training decreases use of seclusion and restraint in an acute psychiatric hospital. Archives of Psychiatric Nursing, 13(5), 269–271. https://doi.org/10.1016/S0883-9417(99)80037-5
23. Georgieva, I., de Haan, G., Smith, W., & Mulder, C. L. (2010). Successful reduction of seclusion in a newly developed psychiatric intensive care unit. Journal of Psychiatric Intensive Care, 6(1), 31–38. https://doi.org/10.1017/S1742646409990082
24. Goetz, S. B., & Taylor-Trujillo, A. (2012). A Change in Culture. Journal of the American Psychiatric Nurses Association, 18(2), 96–103. https://doi.org/10.1177/1078390312439469
25. Goulet, Larue, C., & Lemieux, Ashley, J. (2018). A pilot study of "post-seclusion and/or restraint review" intervention with patients and staff in a mental health setting. Perspectives in Psychiatric Care, 54(2), 212–220. https://doi.org/10.1111/ppc.12225
26. Gulpers, M. J. M., Bleijlevens, M. H. C., Ambergen, T., Capezuti, E., van Rossum, E., & Hamers, J. P. H. (2013). Reduction of Belt Restraint Use: Long-Term Effects of the EXBELT Intervention. Journal of the American Geriatrics Society (JAGS), 61(1), 107–112. https://doi.org/10.1111/jgs.12057
27. Hellerstein, Staub, A. B., & Lequesne, E. (2007). Decreasing the use of restraint and seclusion among psychiatric inpatients. Journal of Psychiatric Practice, 13(5), 308–317. https://doi.org/10.1097/01.pra.0000290669.10107.ba
28. Hochstrasser, L., Fröhlich, D., Schneeberger, A. ., Borgwardt, S., Lang, U. ., Stieglitz, R.-D., & Huber, C. (2018). Long-term reduction of seclusion and forced medication on a

hospital-wide level: Implementation of an open-door policy over 6 years. European Psychiatry, 48(1), 51–57. https://doi.org/10.1016/j.eurpsy.2017.09.008

29. Huckshorn. (2004). Reducing seclusion and restraint use in mental health settings: Core strategies for prevention. Journal of Psychosocial Nursing and Mental Health Services, 42(9), 22–33. https://doi.org/10.3928/02793695-20040901-05

30. Jenkins, O., Dye, S., & Foy, C. (2015). A study of agitation, conflict and containment in association with change in ward physical environment. Journal of Psychiatric Intensive Care, 11(1), 27–35. https://doi.org/10.1017/S1742646414000065

31. Jonikas, Cook, J. A., Rosen, C., Laris, A., & Kim, J.-B. (2004). Brief Reports: A Program to Reduce Use of Physical Restraint in Psychiatric Inpatient Facilities. Psychiatric Services (Washington, D.C.), 55(7), 818–820. https://doi.org/10.1176/appi.ps.55.7.818

32. Jungfer, H., Schneeberger, A. R., Borgwardt, S., Walter, M., Vogel, M., Gairing, S. K., Lang, U. E., & Huber, C. G. (2014). Reduction of seclusion on a hospital-wide level: Successful implementation of a less restrictive policy. Journal of Psychiatric Research, 54, 94–99. https://doi.org/10.1016/j.jpsychires.2014.03.020

33. Keski-Valkama, A., Sailas, E., Eronen, M., Koivisto, A.-M., Lonnqvist, J., & Kaltiala-Heino, R. (2007). A 15-year national follow-up : Legislation is not enough to reduce the use of seclusion and restraint. Social Psychiatry and Psychiatric Epidemiology, 42(9), 747–752. https://doi.org/10.1007/s00127-007-0219-7

34. Khadivi, Patel, R. C., Atkinson, A. R., & Levine, J. M. (2004). Association Between Seclusion and Restraint and Patient-Related Violence. Psychiatric Services (Washington, D.C.), 55(11), 1311–1312. https://doi.org/10.1176/appi.ps.55.11.1311

35. Kontio, R., Pitkänen, A., Joffe, G., Katajisto, J., & Välimäki, M. (2014). eLearning course may shorten the duration of mechanical restraint among psychiatric inpatients: A cluster-randomized trial. Nordic Journal of Psychiatry, 68(7), 443–449. https://doi.org/10.3109/08039488.2013.855254

36. Lloyd, C., King, R., & Machingura, T. (2014). An investigation into the effectiveness of sensory modulation in reducing seclusion within an acute mental health unit. Advances in Mental Health, 12(2), 93–100. https://doi.org/10.1080/18374905.2014.11081887

37. Madan, A., Borckardt, J. J., Grubaugh, A. L., Danielson, C. K., McLeod-Bryant, S., Cooney, H., Herbert, J., Hardesty, S. J., & Frueh, B. C. (2014). Efforts to Reduce Seclusion and Restraint Use in a State Psychiatric Hospital: A Ten-Year Perspective. Psychiatric Services (Washington, D.C.), 65(10), 1273–1276. https://doi.org/10.1176/appi.ps.201300383

38. Maguire, T., Young, R., & Martin, T. (2012). Seclusion reduction in a forensic mental health setting. Journal of Psychiatric and Mental Health Nursing, 19(2), 97–106. https://doi.org/10.1111/j.1365-2850.2011.01753.x

39. McCue, R. E., Urcuyo, L., Lilu, Y., Tobias, T., & Chambers, M. J. (2004). Reducing restraint use in a public psychiatric inpatient service. The Journal of Behavioral Health Services & Research, 31(2), 217–224. https://doi.org/10.1007/BF02287384

40. Newton-Howes, G., Savage, M. K., Arnold, R., Hasegawa, T., Staggs, V., & Kisely, S. (2020). The use of mechanical restraint in Pacific Rim countries: an international epidemiological study. Epidemiology and Psychiatric Sciences, 29, e190–e190. https://doi.org/10.1017/S2045796020001031

41. Noorthoorn, E. O., Lepping, P., Janssen, W. ., Hoogendoorn, A. ., Nijman, H. L. ., Widdershoven, G. A. ., & Steinert, T. (2015). One-year incidence and prevalence of seclusion: Dutch findings in an international perspective. Social Psychiatry and Psychiatric Epidemiology, 50(12), 1857–1869. https://doi.org/10.1007/s00127-015-1094-2

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Supplementary document 2, data extraction table

Study author (Year)	Country where fieldwork was conducted	Common/civil law	Study aim	Study design	Number of participants	Methods of data collection	Type of restrictive practice	Intervention /exposure to reduce restraint and seclusion	Summary of results	Consumer and community involvement and engagement	Any reference to legislation or policy (yes/no)
Borckardt et al. (2011)	United States	Common law	To assess the effect of systematic implementation of behavioral interventions on the rate of seclusion and restraint in an inpatient mental health hospital.	Experimental design	446 patient and 340 staff	Review of hospital records	Seclusion and restraint	Training on trauma-informed care. 2. Reviewing and modifying unit rules and policies to be less restrictive to patients or eliminating unit rules that were too restrictive. 3. Physical changes, including repainting walls with warm colors, placement of decorative throw rugs and plants. 4. Training nurses on patient involvement in treatment planning.	The mean seclusion and restraint rate was reduced from .027 per patient day (baseline phase) to .005 per patient day (follow-up phase). The whole engagement model initiative was associated with an 82.3% decrease in use of seclusion and restraint.	No	No
E-Morris et al. (2010)	United States	Common law	To improve the quality of care	Quality improvement project	53 staff and 19 patients	Hospital records and survey	Seclusion and restraint	Implementation of the Nurse-Directed Care Model that combines components from primary nursing and team nursing models. It provides structure, accountability, coordination, and communication between the client, significant others, and paraprofessional and professional staff, ongoing clinical supervision by the unit advanced practice psychiatric nurses to	10% decrease in rates of seclusion and restraint in where the model was implemented and 69% increase in building where model was not introduced.	No	Yes, policy

								assist staff link the day-today interventions to the client's treatment plan goals.			
Goetz et al. (2012)	Mid-west USA	Common law	To evaluate the impact of a patient focused intervention model	Longitudinal study, retrospective analysis	n/a	The data on seclusion and restraint, Code Gray episode, and staff injuries are collected by the hospital as part of their routine monitoring of these indicators. The staff safety survey was developed by the hospital leadership. It is a biannual survey with 10 Likert-style questions focusing on staff's perceptions of the environment, their training, and patient aggression management.	restraint and seclusion	Intervention: Adolescent Unit - Trauma-informed care, Aggression management (Sorensen and Wilder Associates (SWA) aggression management program), Code event review, Leadership involvement. Intervention: Adult Units - Recovery orientation Wellness Recovery Action Plan (WRAP) approach; Collaboration- peer support program; Patient assessment; Staff education	During the first year of implementation of the PFI model, injuries were reduced by 48%, ; Seclusion and restraint rates were reduced by at least 50%, along with the number of aggressive-patient incidents.; the staff safety survey data improved in 5 out of 10 areas, including the staff's perceptions of the effectiveness of the patient aggression management program; There was a marked decrease in the gross number of patient events (Code Gray events); the number of seclusion and restraint hours decreased by 75% in the first 2 years of the implementation of the SWA program and trauma-informed care principles	Collaboration was a key component in the success of the PFI model. Collaboration with patients, staff, administrators, and external experts contributed to the process of developing this model. No consumer co-authors	No

Putkonen et al. (2013)	Finland	Civil law	To reduce seclusion and restraint	Randomized controlled trial	300 patients	Routinely recorded data on seclusions and restraint	Seclusion and restraint	Staff, patients, and doctors were provided with training for six months in using six core strategies to prevent seclusion-restraint; six months of supervised intervention. Strategies include de-escalation of tense situations, and coping with crises.	For intervention wards, the proportion of patient-days involving seclusion, restraint, or room observation reduced from 30% to 15%. In intervention wards, seclusion-restraint time decreased from 110 to 56 hours per 100 patient-days, but it rose from 133 to 150 hours in control wards. The difference between the groups was statistically significant.	Yes	No
Andersen et al. (2017)	Denmark	Civil law	To decrease use of restraint and seclusion in inpatient mental health wards.	Experimental design	Two psychiatric open units, each with 17 beds	Data were extracted from the electronic database of the Danish Department of Health	Seclusion and restraint	Use of sensory modulation (SM)	The use of belts restraints was reduced by 38% compared to the control group. The use of forced medication decreased by 46% compared to the control group. Altogether the use of physical restraint and forced medication were reduced significantly with 42% ($p < .05$).	No	No
Ash et al. (2015)	Australia	Common law	To determine the effects recovery-based practice on seclusion rates in a psychiatric intensive care unit.	Prospective study	725 admissions	Interview	Seclusion	Recovery-centered practices including collaborative care, safety care plans, a comfort room, and debriefing after coercive interventions. Introduction of seclusion/restraint committee.	Seclusion rates were significantly reduced from 28% to 15% post intervention.	Yes, attended interview	No
An et al. (2016)	China	Civil law	To examine the association between physical restraint and the implementation of the National Mental Health Law (NMHL) in China.	Cross-sectional study	1,364 patients	Medical records review and confirmed in a clinical interview.	Physically restraint (Mechanical restraint)	Implementation of the National Mental Health Law	The overall physically restraint rate was 27%, with 31% and 22% happening before and after the National Mental Health Law implementation, respectively. The prevalence of physically restraint seems to have decreased following the introduction of the NMHL.	No	No

Ashcraft & Anthony (2008)	United States	Common law	To reduce seclusion and restraint	Cross-sectional study	Not reported	Hospital records	Seclusion and restraint	Training on specific issues and crisis management, Policy and procedural change, Debriefing	In the larger crisis center there were zero seclusions in 10 months and zero restraint in 31 months. The smaller crisis centre accomplished the same objectives in two and 15 months, respectively.	No	Yes policy
Beaglehole et al. (2017)	Christchurch, New Zealand	Common law	To compare long-term adverse event data before and after ward configuration change	Pre post	Not reported	routinely recorded data on unauthorised absences, seclusions and violent incidents	Locked wards and seclusion	The service underwent major architectural change in 2013. The wards were reconfigured into 4 largely unlocked 16-bed wards (except overnight when the wards remain locked). included 'high care area' for up to 3 more unwell patients.Nursing staff numbers increased, from 27 nurses routinely rostered on the wards to 34 nurses.	1. a mean increase of 9.7 unauthorised absences per month and a percentage increase of 58% that was statistically significant (P = 0.005).2. a mean increase of 5.9 violent incidents/month, or an 8% increase in incidents, which was not statistically significant (P = 0.696), the mean difference of 2.8 assaults/month, from 11.5 (s.d. = 5.9) before to 14.3 (s.d. = 10.1) after, was also not statistically significant 3. The mean length of seclusion prior to the change was 391.5 (s.d. 203.0) compared with 185.2 (s.d. 135.6) following the change. This represented a mean drop of 206 hours/month or a percentage drop of 53% that was statistically significant (P = 0.001).	No	the reduction in seclusion occurred alongside national and local initiatives to minimise the use of seclusion
Blair et al. (2016)	United States	Common law	To reduce seclusion and restraint	Observational study	8,029 admissions	Brøset Violence Checklist,	Seclusion and restraint	1. Use of the Brøset Violence Checklist, 2. Compulsory staff education in crisis intervention and trauma informed care, 3. Increased frequency of psychiatrist reassessment of need for seclusion/restraint, 4. Formal administrative review of seclusion/restraint incidents and 5. Environmental enhancements such as comfort rooms to support sensory modulation.	52 % reduction in the rate of seclusion ($p < 0.001$). Rates of restraint incidents decreased by 6 % (p = 0.44). Duration of seclusions per admission during the study period decreased by 27 %, whilst duration of restraints per admission was increased by 52 %.	No	Yes, changes in seclusion/ restraint protocol

Boumans et al. (2014)	Netherlands	Civil law	To determine the impact of the methodical work approach on the use of seclusion.	Experimental design	678 patients	Routinely collected hospital data	Seclusion	Implementation of the methodical work approach, which has five phases: (i) translation of problems into goals; (ii) search for means to realize the goals; (iii) formulation of an individualized plan; (iv) implementation of the plan; and (v) evaluation and readjustment.	The number of seclusion episodes per 1000 patient days on the experimental ward reduced from 15 in the first quarter of the study period to three in the last quarter. The amount of hours that patients in the experimental ward spent in seclusion reduced from 934 hours/1000 patient days in 2008 to 62 hours/1000 patient days in 2010. The number of seclusion events per 1000 patient days on the control wards was 11 during the first quarter of the study and 12 during the last quarter. The initial assessment in 2008 revealed 398 hours spent in seclusion, while in 2010, 356 hours were spent in seclusion.	No	Yes, policy
Ching et al. (2010)	Australia	Common law	To assess the effect of a suite of interventions designed to reduce the use of seclusion in a forensic psychiatric hospital.	pre and post intervention	141 participants	Hospital seclusion records and incident reports	Seclusion and restraint	Review of existing seclusion practices, staff training in the management of aggression and implementation of evidence based alternatives, e.g., 1. Safety plans that were completed on admission, 2. Post Seclusion Debriefing (for patients who were secluded) and 3. Seclusion Reviews	Seclusion decreased from an average of 48 in phase 1 to 14 in phase 2. Restraint was reduced from a mean of 869 in phase 1 to 385 in phase 2.	Patients were included in debriefing process post seclusion	Yes, policy
Champagne & Stromberg (2004)	United States	Common law	To reduce reduce seclusion and restraint	cross sectional study	47 patients	Questionnaire	Seclusion and restraint	Sensory modulation	Seclusion and restraint was reduced by 54%	No	No
Cummings et al. (2010)	United States	Common law	To reduce the use of seclusion and restraint using comfort room.	Before and after study design	105 patients	Review of quality improvement data	Seclusion	Comfort room with comfortable furniture, soothing colors, soft lighting, quiet music, and other sensory aids to help reduce unsettled patients'	Comfort room significantly decreased seclusion and restraint	No	No

								level of stress.			
Currier & Farley-Toombs (2002)	United States	Common law	To reduce seclusion and restraint	Pre and post intervention	121 restraint episodes	Not reported	Seclusion and restraint	Rules require that a physician or a licensed independent practitioner make a face-to-face assessment of a patient within one hour of the initiation of restraint or seclusion	Restraint incidents were reduced by more than 50 percent after the new rules were introduced. The average duration of an episode dropped by 4i% percent overall and 72% on the general adult unit.	No	Yes, rules
Dewey, & Brill (2000)	United States	Common law	To reduce the usage of restraint in geropsychiatric unit	Observational study	Not reported	Chart reviw (hospital records)	Restraint	1. Educational programe on validation techniques, 2. environmental changes, e.g., bed alarms	Restraint use decreased from 21% to 6%.	No	No
Donat, D. C. (2003)	United States	Common law	To examine the effectiveness of interventions used to reduce seclusion and restraint in mental hospitals for adults.	Retrospective record review	252	Not reported	Seclusion and restraint	1. Changes in the criteria for administrative review of incidents of seclusion and restraint, 2. changes in the composition of the case review committee, 3. development of a behavioral consultation team, 4. enhancement of standards for behavioral assessments and plans, 5. improvements in the staff-patient ratio	Use of seclusion and restraint was reduced by 75 %. Changes in the process for identifying critical cases, initiating a clinical and administrative case review was significantly associated with reduction in the use of seclusion and restraint.	No	Yes, policy
Donat. (2002)	United States	Common law	To assess the impact of organisational change programme on reducing seclusion and	Cohort	Not reported	Hospital records	Seclusion and restraint	Organisational change	58% decrease in average monthly seclusion/restraint.	No	Yes policy

			restraint.								
D'Orio et al. (2004)	United States	Common law	To assess if early diagnosis and treatment of problematic behaviours reduces seclusion and restraint in a psychiatric emergency care unit.	Before and after method	Average 484 admissions per month	Reviewing hospital adminstrative data	Seclusion and restraint	Early identification and management of problematic behaviors	39% decrease in the number of episodes of seclusion and restraint (p<.001). 4% increase in compliance with hospital standards for seclusion and restraint (p<.001)	No	No
Eggert et al. (2014)	United States	Common law	To identify the impact of changes in the structural designs of the wards on patient outcomes.	Quasi-experimental	353 staff and 526 patients (n = 879) participants	Survey	Seclusion and restraint	Changes in structural designs of the wards	The number of incidents of seclusion and restraint did not decrease over time.	Yes	No
Espinosa et al. (2015)	United States	Common law	To enhance the milieu for mental inpatients using practises supported by evidence.	Quality improvement project	600 staff	Medical record review	Seclusion and restraint	1. Intensive multi-modal staff education based on the literature review and starting in orientation, 2. Introduction of comfort rooms, 3. Changes in debriefing practices, 4. Careful review of all seclusion and restraint episodes, 5. Introduction of integrative modalities, 5. Careful review of all 1:1 observation and review of unit structure.	Seclusion rates increased initially and then declined. Staff gradually began to lose their competencies in manual and mechanical restraint erode. If restraint was required, it seemed doubtful that personnel would recall how to do it appropriately.	No	No

Goulet et al. (2018)	Canada	Common law	To develop and assess a post-seclusion and/or restraint review strategy in an acute mental care unit.	Pre and post intervention	32	Interview and hospital records	Seclusion and restraint	Post-seclusion and/or restraint review	Six months after the intervention was put in place, both the incidence and duration of seclusion dropped significantly.	No	No
Fisher W. (2003)	Chicago	Common law	Restraint reduction program	Cohort	Not reported	Hospital records	Restraint	High level administrative endorsement, participation by recipients of mental health services, culture change, training	Reduced combined seclusion and restraint by 67% over two years	Yes	No
Fletcher et al. (2017)	Australia	Common law	To evaluate the effect of introducing Safewards on seclusion in inpatient mental health services.	Before-and-after design,	44 inpatient mental health wards	The state-wide mental health data from the Client Management Interface (CMI), and the Fidelity Checklist. The Fidelity Checklist is a brief, standardized audit tool used by the UK Safewards trial team.	Seclusion	Safewards	In Safewards trial wards, seclusion rates decreased by 36% by the 12-month follow-up period (incidence rate ratios (IRR) = 0.64), however in comparison wards, seclusion rates did not change from baseline to post-trial (IRR = 1.17) or to follow-up period (IRR = 1.35). The average seclusion rate for adult and adolescent wards that adopted Safewards trended down over 15 months, with substantial heterogeneity between individual wards. Following the trial period, the number of Safewards interventions implemented continued to increase.	No	No
Forster et al. (1999)	United States	Common law	To reduce seclusion and restraint	Pre and post intervention	Not reported	Routinely collected hospital data	Seclusion and restraint	Staff training session on the management of assaultive behavior and recording the progress of the effort	There was a 14% decrease in the incidents restraint. The mean duration of seclusion and restraint per admission dropped 55%.	No	Yes, policy
Georgieva et al. (2010)	Netherlands	Civil law	To reduce seclusion	Qualitiy improvement study	6 patients	Review of medical records	Seclusion	A newly developed Psychiatric intensive care unit	Prior to transfer to the PICU, 40% of admission days were spent in seclusion. During their stay in the PICU, that number fell to 0.1%.	No	No

Gulpers et al. (2013)	Netherl ands	Civil law	To assess the effects of the EXBELT intervent ion program on belt restraint use	Quasi-experi mental longitu dinal design.	914	Direct observa tion, survey	Physic al restrai nts includi ng use of belts	EXBELT comprised four components : a policy change, an educational program, consultation, and availability of alternative intervention s which were aimed at promoting safety mobility	In the panel group, 24 months after baseline, belt use had decreased by about 65% in the intervention group, whereas belt use among residents in the control group remained comparable to baseline. The proportion of residents in the survey group who used belts was 13% in the control group and 3% in the intervention group (P .0001).	No	Yes policy
Hellerst ein et al. (2007)	United States	Commo n law	To reduce restraint and seclusion in psychiatr ic inpatient wards.	Before-and-after design	3 inpatien t units totaling 58 beds.	Not reporte d for seclusio n and restrain t. Quesitio nnaire to assess patient prefere nces for managi ng with agitatio n.	Seclusi on and restrai nt	1. Reducing initial time in restraint or seclusion from 4 to 2 hours before a new order was required, 2. Training of staff regarding identificatio n of patients at risk of restraint or seclusion and early intervention s to avoid crises. 3. Use of a coping questionnair e to assess patient preferences for managing agitation.	Average number of restrained patients reduced from 0.35 0.6 to 0.32 0.5 per month. Mean number of hours of restraint declined from 1.7 5.2 to 1.0 2.4 per month. Average number of patients secluded reduced significantly from 3.1 1.4 to 1.0 1.1. Mean monthly hours of seclusion reduced significantly, from 41.6 52 to 2.7 4.5 hours.	No	No
Hochstr asser et al. (2018)	Switzer land	Civil law	To determin e whether the impleme ntation of an open-door policy is associate d with a long-term decrease in the frequenc y of seclusion and forced medicati on.	longitu dinal, observa tional study	17,359 patients	Electron ic Hospital records	Seclusi on	Open-door policy	During the observation period, the proportion of patients affected by at least one seclusion decreased from 8.2 to 3.5%. A reduction in frequency of seclusion from a mean of 5.1 to 2.9 seclusions per affected patient. The was a drop in the during of selusion from 27.1 to 18.2 hours. When an open-door policy was implemented, the number of people who were forced to take medicine went down from 2.4% to 1.2%.	No	Yes, policy
Hucksh orn (2004)	United States	Commo n law	To reduce seclusion and restraint	Cross-section al design	Not reported	Hospital records	Seclusi on and restrai nt	National Association of State Mental Health Program Directors seclusion/re straint reduction training curriculum	Seclusion/restraint hours were decreased by 79%, seclusion/restraint was decreased by 62%, and the number of seclusion/restraint episodes in a month was decreased by 68%.	No	No

Jenkins et al. (2015)	United Kingdom	Common law	To determine the effect of a modified ward environment on the arousal and aggressiveness levels of patients in a psychiatric intensive care unit.	Quality improvement project	18 patients	Review of medical records	Seclusion	A new purpose-built psychiatric intensive care unit	Total length and number of seclusion incidents decreased significantly from the previous ward to the new ward for the time periods evaluated.	No	No
Jonikas et al (2004)	New York	Common law	Reduction of restraint	Before-and-after design,	1,602 patients were treated inthe general psychiatry unit and 308patients were treated in the clinicalresearch unit.	Quarterly restraint data from thehospital's quality improvement de-partment were examined for July2000 through December 2002—ap-proximately one year before and oneyear after the program was intro-duced	Restraint	Staff training in advance crisis management	99% reduction in restraints	No	No
Jungfer et al. (2014)	Switzerland	Civil law	To assess the hospital-wide impact of the move from closed to open wards on the incidence of seclusion and forced medication.	longitudinal, observational study	2838 inpatients	Electronic hospital records	Seclusion and forced medication	Open wards policy	The hospital-wide percentage of patients having at least one seclusion was significantly reduced. There were no significant changes to forced medication. On newly opened wards, the frequency of seclusions and forced medication decreased significantly. In permanently closed or open wards, there were no significant differences in seclusion, however the number of forced medications increased significantly on closed wards. Even after adjusting for diagnosis and severity of the disease, the drop in seclusions on newly opened wards was statistically significant.	No	No

Keski-Valkama et al. (2007)	Finland	Civil law	To examine the national trends in the use of seclusion and restraint in Finland during a 15-year period marked by legal reforms intended to clarify and limit the use of these measures.	Retrospective study	671 patients	Structured postal survey used to collect data after each seclusion and restraint incident.	Mechanical restraint and seclusion	Legal reforms intended to clarify and limit the use of seclusion and rstraint	During the study period, the duration of seclusion incidents increased. Throughout the 15-year study period, the length of restraint incidents did not change. In the study weeks, both the total number of secluded and restrained patients and the total number of inpatients decreased, but the risk of being secluded or restrained remained the same as compared to the first year of the study. The usage of coercive measures varied with region.	No	Yes, legislation
Khadivi et al. (2004)	United States	Common law	To examine the impact of an intervention designed to reduce the use of seclusion and restraint	Retrospective analysis	3 acute inpatient psychiatric units	Reviewing nursing log books of the department of psychiatry	Seclusion and restraint	1. Staff education, 2. Addition of the history of inpatient violence to admission forms, 3. Continuous nursing monitoring to minimize the duration of episodes of seclusion and restraint, 4. Post episode debriefing of the staff and the patient, and a review of each episode by the senior nurse and a physician.	52% reduction in the total number of episodes of seclusion and restraint from the 12 months before to the 12 months after the intervention, p<.001.	No	No
Kontio et al. (2014)	Finland	Civil law	To evaluated the effect of an eLearning course for staff on seclusion and mechanical restraint rates and duration among psychiatric inpatients.	Cluster-randomized intervention trial	1283 coercion incidents	Patient records	Seclusion and mechanical restraint	ELearning course for staff on seclusion and mechanical restraint	There were no statistically significant changes in the rates of seclusion and mechanical restraint on intervention wards. The median length of episodes involving mechanical restraints decreased from 36 to 4 hours on intervention wards. On the control wards, no statistically significant changes in seclusion and restraint rates were detected after the eLearning course. Within-group analysis revealed a statistically significant reduction in the length of restraint incidents on intervention wards. In either group of wards, no other differences in the length of seclusion or restraint episodes were observed.	No	No

Lloyd et al. (2014)	Australia	Common law	To reduce seclusion using sensory modulation (SM)	Naturalistic study	337 episodes of seclusion	Review of seclusion register and patient charts.	Seclusion	Use of sensory modulation (SM)	After SM was introduced, the rate of seclusion in experimental ward substantially decreased, whilst the rate of seclusion in control ward increased. In the second half of the year, the rate of seclusion in the control ward was much greater than in the experimental ward. The duration of seclusion episodes did not change.	No	No
Madan et al. (2014)	United States	Common law	To reduce seclusion and restraint over a 10 year period	Experimental design	3,040 seclusion and restraint incidents across 254,491 patient-days.	Reviewing hospital adminstrative data	Seclusion and restraint	1. Training related to trauma-informed care (for example, trauma's effects on patients' physiology and psychology), 2. Changes to rules and language (for example, making policies less restrictive), 3. Training related to patient involvement in treatment planning (for example, highlighting the clinical benefits of shared decision making), 4. Changes to the therapeutic environment (for example, repainting walls with warm colors, using decorative rugs and plants, and replacing and restructuring furniture in common areas), 5. Improving patient-staff communication.	The prolonged baseline phase (N=38 months) demonstrated a linear rising trend in the use of seclusion and restraint, whereas the formal intervention period and subsequent follow-up periods (N=82 months) demonstrated a stabilising effect (p.001).	Yes, policy change	No
Maguire et al. (2012)	Australia	Common law	To reduce secluson incidents in the forensic hospital	Qualitity improvement project	Not reported	Reviewing hospital adminstrative data	Seclusion	1. The Seclusion Policy and Procedure was rewritten to reflect changes to practice, 2. Staff training sessions, 3. Consumer	Patients' multiple seclusions and extended durations of seclusion incidents were reduced. There was less of a decrease in the number of patients secluded.	No	Yes, policy

								involvement .			
McCue et al. (2004)	United States	Common law	To reduce the usage of restraint in public inpatient psychiatric treatment.	Prospective study	10,753 patients	Hospital records	Physical amd mechanical restraint.	Better identification of restraint--prone patients, a stress/anger management group for patients, staff training on crisis intervention, development of a crisis response team, daily review of all restraints, and an incentive system for the staff.	The rate of restraint usage decreased significantly following the implementation of restraint reduction measures. After the restraint reduction initiatives were put in place, the number of patient-to-patient assaults did not change much. After the changes were made, there was a statistically significant rise in the number of assaults between patients and staff. But this difference can be explained by the fact that more things happened right after the measures were put in place. The number of suicide attempts and gestures did not change much after the restraints were reduced.	No	No
Newton-Howes et al. (2020)	Not reported	Both	To compare and contrast the reported rates of mechanical restraint in Australia, New Zealand, Japan and the United States.	Cross-sectional study	Not reported	Data extracted from the public domain.	Mechanical restraint	Policies to reduce use of mechanical restraint	In Australia, the usage of restraints decreased by about 40% annually between 2015/2016 and 2017/2018, before increasing marginally in 2018/2019. This is primarily attributable to a decline in the usage of restraints among the elderly. In New Zealand, the number of documented restraint incidents increased from 4 in 2008 to 52 in 2018, an almost 12-fold increase. From 2013 to 2018, the daily rate of restraints in the United States fluctuated between 0.38 and 0.72 per 1 million population. In 2013–2014, the rate of restraint among the elderly was greater than that of the group aged 18–64 years, although it decreased in 2018. In Japan, the rate of restraint increased by more than double between 2003 and 2016. Slight declines in restraint were seen in 2015, 2018, and 2019 across all age groups. The Japanese population is ageing, and the restraint rate for older people is higher than for younger people (5% of those 65 or	No	Yes, policy

									older in hospitals in 2017, decreasing to 4% in 2019). Despite the stated objective of reducing restraints, the only age group in all nations where restraints were lowered over time was the >65 year old group after 2016.		
Noorthoorn et al. (2015)	Netherlands	Civil law	To compare the incidence and duration of coercive measures in the Netherlands to global statistics.	Cross-sectional study	42.960 patients	Review of hospital records	Mechanical and manual restraint	Nationwide coercion reduction program	Twelve percent of hospitalised patients were subjected to coercive measures. The mostly used coercion was seclusion (11%) and, to a lesser degree, medicine (3%) and mechanical restraint (1%). The mean duration of seclusion was 192 hours and mechanical restraint was 332 hours. Comparing the 2011 Dutch figures relating the percentage of seclusions to those of other countries, the Netherlands rank tenth out of the 19 countries for which data is available. The Netherlands used less mechanical constraint than any other country, with the exception of England and Wales, where it does not exist.	No	No
Novak et al. (2012)	Australia	Common law	To assess the effect of a sensory room in reducing seclusion in an acute inpatient psychiatric unit.	Quality improvement project	75 patients	Review of hospital administratve data	Seclusion	Sensory room	Seclusion incidents was similar to before intervention, mean 17.2 preintervention and 18.2 post intervention.	No	No
Pérez-Revuelta et al. (2021)	Spain	Civil law	To assess the risk factors and the impact of specific strategies targeted to reduce the use of mechanical restraint in an acute mental health unit	Cross-sectional study	3,318 patients	Electronic Medical records	Mechanical restraint	1. Modified mechanical restraint protocol, 2. To allow family member to accompany patients during the admission process	Early-stage modifications successful in reduced the hours of mechanical restraint and mechanical restraint incidents per admission. The later-stage adjustments did not significantly lower the number of mechanical restraint episodes. Younger patients (M = 37 years) required mechanical restraints than older (M = 43 years). Patients with personality disorders were more likely to be restrained than others. People with longer admission period were had a higher risk of being mechanically restrained.	No	No

Pollard et al. (2007)	United States	Common law	To determine if the implementation ofthe Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) standards reduced seclusion or restraint	Quality improvement project	Not reported	Reviewing nursing reports extracted from hospital database	Seclusion and restraint	the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) standards for utilization of seclusion/restraint	Significant decrease in hours of restraint or seclusion in the months after the intervention implementation,($t(44) = 4.59$, $P < .001$). Significant decline in the hours of restraint or seclusion use per patient ($t(44) = 4.02$, $P < .001$). Reductions in seclusion and restraint remained statistically significant even after controlling for the confounders. Decrease in seclusion and restraint persisted over the year and a half after the intervention.	No	Yes, policy
Qurashi et al. (2010)	England and Wales	Common law	to report changes in patterns of seclusion use and adverse incidents over a five-year period following a number of measures being implemented as part of a multidisciplinary seclusion reduction programme	Longitudinal study, retrospective analysis	N/A	collected data on all episodes of seclusion and all assaults, recorded as adverse incidents, at Ashworth hospital over the period January 2002 to January 2007	seclusion	The measures introduced were improvements in organisational clinical governance frameworks already in place; Use of information and transparency; Effective use of audit and peer reviews; Positive risk management; Patient involvement and advanced directives; Education and training; Enhanced clinical leadership;	The number of seclusion episodes per month gradually fell from a high in January 2002 of 54 episodes per month to 18 episodes per month during January 2007 - a reduction of 67%. No increase in adverse incidents in conjunction with a reduction in seclusion episodes. Major incidents decreased by 63%, with moderate and minor incidents decreasing by 40%.	Yes - but only in context of the intervention - not the paper	Yes, Advanced directives
Schneeberger et al. (2017)	Germany	Civil law	Determine the impact of locked vs open door policy on seculsion and restraint	Quasi-experimental	The analysis included data from 1998 to 2012 and contained a total of n = 314,330 cases, either treated in one of 17 hospitals with (n = 68,135) or in one of 4 hospitals without an open door policy (n = 246,195).	Routinely collected hospital data	Restraint or seclusion	Open door/locked door	The effect of open vs. locked door policy was non-significant in all analyses of aggressive behavior during treatment. Restraint or seclusion during treatment was less likely in hospitals with an open door policy.	No	No

Sees (2009)	Minneapolis	Common law	To examine the impact of new Health Care Financing Administration on the use of restraint and seclusion.	Pre and post intervention	113 patients	Review of restraint and seclusion logs	restraint and/or seclusion episode	regulation/policy on restraint or seclusion regulation/policy on restraint or seclusion Health Care Financing Administration Regulations on Restraint and Seclusion Usage	Patients restrained or secluded were significantly reduced by 2% following the implementation of the new regulations. The average time spent in restraint or seclusion has reduced with the implementation of the new regulations. 82% of people who experienced restraint or seclusion were males, and 87 % were Caucasian.	No	Yes, regulation
Shields (2022)	United States	Common law	Whether nonprofits and for-profits responded differently to the program on targeted indicators	Pre and post intervention	The sample included for-profit and nonprofit psychiatric facilities in Massachusetts that participated in the IPFQR program (N = 50 unique facilities, 490 observations for 2008-2017). This sample includes all inpatient psychiatric facilities in Massachusetts that were eligible to participate in the IPFQR	Two types: Targeted Constructs of Restraint and Seclusion Use and Nontargeted Indicators of Quality	Seclusion and restraint	Inpatient Psychiatric Facility Quality Reporting Program	Using difference-in-differences estimators, we found no differential changes in R-S between for-profits and nonprofits. However, for-profits had larger increases in overall complaints, safety-related complaints, abuse-related complaints, and R-S-related complaints compared with nonprofits.	No	No
Sivak, K., (2012)	United States	Common law	To reduce seclusion using comfort rooms	Quality improvement project	Average 70 patients per month	Review of hospital administratve data	Seclusion and restraint	Comfort rooms	Since the introduction of the comfort rooms, there was no use of seclusion or restraint	No	Yes, policy
Smith et al. (2014)	United Kingdom	Common law	To determine the effect of a sensory room on seclusion rates	Pre and post intervention	10 staff members and 7 patients	Review of hospital administratve data interviews	Seclusion and restraint	Sensory room	Seclusion incidents increased post intervention, with 27 incidents of seclusion prior to the sensory room introduction and 37 incidents in post intervention. In post-intervention, multiple seclusions by few patients were	No	No

									responsible for the majority of incidents (67.5%) compared to 44.4% in pre-introduction.		
Sullivan et al. (2004)	Australia	Common law	To find out whether patient-centered care has an effect on the amount of time spent in seclusion and the frequency of seclusions	Quasi-experimental study	640 patients	Review of medical records	Seclusion	1. Patient-centred care, 2. Daily nursing brief mental state and risk assessment, 3. Nurses attended workshops verbal de-escalation.	The length of time for which patients were secluded was reduced. Number of patients secluded was reduced from 48 pre-intervention to 31 post-intervention.	No	No
Taxis (2002)	Texas	Common law	A 42-month project in which a comprehensive program revision was implemented in a psychiatric hospital that included numerous alternative strategies to the use of patient restraint and seclusion	Qualitity improvement project	Not reported	Not reported	Restraint and seclusion	development of an assault program, expanded use of individual treatment planning, implementation of mandatory staff education to focus on developing alternatives to restraint and seclusion, patient education to focus on empowering patients to make adaptive choices that enhance self-efficacy, environmental alterations, creation of a communication feedback loop to disseminate information and progress in reducing restraints and seclusions, and administrative and programmatic changes.	94% reduction in rates of seclusion and restraint.	No	No

Trauer et al. (2010)	Australia	Common law	To assess the efficacy of a programme designed to reduce acute arousal.	pre and post intervention	302 patients	Routinely collected hospital data	Seclusion	Implementation of Management of Acute Arousal Programme (MAAP), (in one ward for 6 months). The intervention comprised four elements: assessment, psychosocial interventions, pharmacological interventions, and debriefing	Both before and after adjusting for patient characteristics, seclusion rates were comparable between the two time periods, 64 seclusions in Time 1 and 67 in Time 2. In Time 1 the average duration of seclusions was 299 minutes (median: 230), while in Time 2 it was 312 minutes (median: 235). These differences are not statistically significant.	No	No
Ulrich et al. (2018)	Sweden	Civil law	To reduce restraint by redesigning the ward.	Old/New hospital comparison research design	960 patients	Reviewing hospital adminstrative data	Physical restraints	New hospital with stress reducing features, e.g., 1. Single bedrooms, Private bathrooms, 2. Communal areas with movable seating and ample space to regulate relationships, 3. Low social density (fewer patients than rooms at 100% occupancy), 4. Noise reducing design, 5. Garden accessible to patients, 6. Observation from central area to bedroom doors and communal areas	The proportion of patients restrained did not change. Use of restraints was significantly lower in the Old hospital (11.4%) in 2005 than in the new hospital in 2005 (20.3%) ($p < 0.001$). The average incidents of physical restraints for patients who were restrained for at least once decreased by 50% following the move from Old to New hospital.	No	No
Visalli, & McNasser, G. (2000)	New York	Common law	Reduce seclusion and restraint	Quality improvement project	Not reported	Not reported	Restraint and seclusion	Complex intervention involving staff education and supervision	Minimal seclusion and restraint	No	No
Vruwink et al. (2012)	Netherlands	Civil law	To reduce the incidence of seclusions	Quality improvement project	Not reported	Routinely collected hospital data (the Dutch Health Care Inspectorate)	Seclusion	Hospital to a specific target for reducing seclusion, developing psychiatric intensive care, gathering reliable data on coercive measures,	Although the number of seclusions decreased dramatically after the commencement of the national programme, the decline was small and did not reach the target of a 10 percent yearly decrease.	No	A nationwide program to reduce seclusion by 10% per year

								and enhancing expertise of staff, closing seclusion rooms, aggression de-escalation training, crisis plans or aggression-risk assessment			
Wale et al. (2011)	United states	Common law	To reduce seclusion and restraints	Quality improvement project	Not reported	Routinely collected hospital data	Seclusion and restraint	1. Creating Violence Free and Coercion Free Mental Health Treatment Environments for the Reduction of Seclusion and Restraint, 2. Crisis de-escalation training, 3. Sensory modulation tools and approaches, 4. Data transparency, 5. Corporate guidelines for developing facility-specific restraint and seclusion policies and procedures	During the project, the frequency of seclusion and restraint usage per 1000 patients decreased significantly. The rate of total length of restraint and seclusion incidents per 1000 patient hours fell by 28 percent and 27 percent, respectively.	No	Corporate guidelines for developing facility-specific restraint and seclusion policies and procedures
Wieman et al. (2014)	United States	Common law	examined implementation and outcomes of the Six Core Strategies for Reduction of Seclusion and Restraint (6CS) in 43 inpatient psychiatric facilities.	Cohort study	43 inpatient psychiatric facilities	Routinely collected hospital data	Seclusion and Restraint	Six Core Strategies for Reduction of Seclusion and Restraint (6CS)	Overall, the stabilized group reduced the percentage secluded by 17% (p=.002), seclusion hours by 19% (p=.001), and proportion restrained by 30% (p=.03). The reduction in restraint hours was 55% but nonsignificant (p=.08).	No	No
Yakov et al. (2018)	United States	Common law	To reduce restraint rates in a high-acuity inpatient milieu using sensory reduction interventions.	Experimental design	Not reported	Reviewing hospital adminstrative data	Restraint	Using sensory reduction/integration improvements over a 5-month	Restraint rates decreased by 72% at 11 months postimplementation.	No	No