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BMJ Open Quality Restraint reduction during psychiatric intensive care: a controlled bi-phasic time series evaluation of a culture change intervention

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ABSTRACT

Background Restrictive practices (ie, physical restraint, rapid tranquilisation and seclusion) are used to manage risk of harm to self and/or others during inpatient psychiatric admissions. Restrictive practices can be physically and psychologically hazardous for both patients and staff, but there have been few well-controlled evaluations of interventions to reduce restrictive practices.

Objective To conduct a controlled evaluation of the implementation of a culture change intervention on a psychiatric intensive care unit (PICU) compared with a control PICU on use of restraint.

Methods A new staff role was created on the intervention PICU (ie, the *reducing restrictive interventions advocate*; RRIA). The RRIA met with patients/carers and advised, trained, supervised and debriefed the multidisciplinary team concerning restraint. Mixed methods evaluated the effectiveness of the RRIA role. Restraint outcomes on the intervention and the control PICU were compared pre (19 months) and post intervention (19 months). Qualitative interviews were conducted with the RRIA, the PICU ward manager and the RRI organisational lead.

Results On the intervention PICU, there were significant reductions in the use of seclusion, full restraint and use of standing holds. Qualitatively, positive changes to the safety culture of the intervention PICU were reported, and these were consistently rated as important, impactful and unlikely without the RRIA role.

Conclusions PICU safety culture can improve when specific roles focused on changing ward practices around restraints are implemented. More controlled evaluations of reducing restraint interventions on PICUs are needed.

BACKGROUND

Psychiatric intensive care units (PICUs) are specialist 24-hour inpatient units for individuals experiencing a severe mental health crisis who are sectioned under the Mental Health Act and pose a risk to themselves or others and whose needs cannot be safely managed on an acute psychiatric ward.¹ National Association of PICUs² (NAPICUs) defined someone requiring PICU admission as having ‘significant risk of aggression, absconding with associated risk, suicide or vulnerability (eg, due to sexual disinhibition or over-activity)

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ That the use of restrictive practices on inpatient psychiatric wards (in the effort to manage risk to self and others) is, unfortunately, frequently, also physically and emotionally harmful to both patients and staff. Policy demands restraint reduction, but little is known about what works to reduce restrictive practices on wards, due to a lack of controlled evaluations.

WHAT THIS STUDY ADDS

⇒ This project evaluated the effectiveness of a ward culture change intervention to reduce restrictive practices on a psychiatric intensive care unit (PICU) and restraint outcomes were compared with a control PICU. The intervention was a member of the staff team who took responsibility for predicting and managing/supervising restraints. The study shows that across various restraint outcomes, there was a relative increase in patient safety on the intervention PICU compared with little change on the control PICU.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ The study challenges the belief that it is too difficult to conduct research on PICUs. Practice-wise, creating reducing restrictive practice ward champions is indicated, as this study shows that it is possible to increase patient safety when there is a culture leader for restraint reduction in the multidisciplinary team (MDT). Policy should emphasise the drive towards increased psychiatric inpatient safety in the context of well-trained, resourced and supported PICU MDTs, consistently delivering evidence-based restraint reduction interventions.

in the context of a serious mental disorder’. PICUs are therefore locked and secure wards with access to seclusion rooms and have low patient capacity, high staff to patient ratios and are staffed by a multidisciplinary team (MDT) using a biopsychosocial approach. Restrictive practice on such wards includes use of physical restraint, chemical restraint via rapid tranquilisation and the use of seclusion.

The patient experience of these practices is that they are frequently psychologically traumatic or retraumatising,³ and this negative experience also extends to staff.^{4,5} Both groups are also at risk of physical injury during physical restraints. The use of these restrictions can even breach an individual's human rights.⁶ The Mental Health Units (Use of Force) Act⁷ acknowledged these risks and so clinical guidelines published by NAPICU¹ Royal College of Psychiatrists,⁸ National Health Service (NHS) England⁹ and the Care Quality Commission (CQC)⁶ all acknowledge the need to create least restrictive practice ward cultures.

Previous literature

Interventions to try to reduce restraint have therefore been implemented, but the evaluation of these has been limited. Behavioural support plans try to increase safety through formulating past and present factors contributing to patient risk and the creation of associated management plans including primary, secondary and tertiary interventions by the MDT.¹⁰ A model has been developed to conceptualise the initiation and maintenance of restrictive practice in inpatient settings¹¹ and staff training interventions have been implemented to increase patient safety.¹² A randomised control trial in dementia care found that the odds of restraint were lower in the intervention dwellings with an associated positive change to staff attitudes.¹³ Since staff attitudes are a major factor in any MDT culture around restrictive practices, the introduction of 'reducing restrictive practice champions' has been strongly advocated.¹⁴ This project therefore sought to conduct a controlled evaluation of whether patient safety increased due to the introduction of such a role.

METHOD

The cultural intervention: reducing restrictive interventions advocate

The reducing restrictive interventions advocate (RRIA) role (see online supplemental material for the job description) was based within a PICU. The role was developed because of patient and family feedback of their negative experiences of restrictive practices. The RRIA role was therefore intended to increase the patient safety culture on the intervention PICU. New patient and family psychoeducation was developed that was integrated into the admission process and delivered by the RRIA. Each admission was therefore 'co-produced' with individual patients in terms of how restraints could be effectively managed. On the occasions when restrictive practices were necessary, the RRIA took the lead, modelling the ability to assess the situation, implementing least-restrictive practice approaches and then leading on post-incident debriefs. The PICU also had a weekly reflective practice group led by a consultant clinical psychologist, during which the team would discuss creating and

maintaining effective teamwork and a positive ward culture. All staff receive 3 days of annual mandatory training on restraint reduction by the organisation-wide RRI team on how to manage restraint scenarios in a physically safe manner. The RRIA role was held by a female unqualified member of the MDT who spent 1 day per week with the RRI team delivering mandatory training. The RRIA therefore linked with the RRI team, bridging the gap between theory and practice. The RRIA had joint clinical supervision every 4–6 weeks from the PICU ward manager and the RRI team lead.

Psychiatric intensive care units

The intervention PICU was an adult, mixed-gender inpatient psychiatric ward with five beds, a seclusion room and an attached section 136 suite. It was staffed by an MDT of medics, qualified and unqualified nurses, an occupational therapist and a clinical psychologist. A comparison and matched mixed-gender six-bedded PICU was recruited within the same organisation but on a different site. The staff mix was the same on the control PICU.

Design

Quality improvement

This is a novel approach to using a time series methodology in two PICUs (ie, one intervention PICU and one control PICU) to evaluate the effectiveness of a restraint-reduction intervention. This met the criteria for being a quality improvement (QI) approach as it 'aims to improve patient safety, effectiveness and experience of care by: (a) using understanding of our complex healthcare environment and (b) applying a systematic approach'.¹⁵ Using a time-series approach enabled the observation of longitudinal changes to ward restrictive practice trends.¹⁶ The impact of the intervention was anticipated not to be immediate and therefore long time-series (ie, 19 months pre intervention and post intervention) were deemed necessary. Under the remit of a QI design, the initiative required both 'thinking' and 'doing' aspects. The thinking aspect contained two parts: (a) recognising that restraint was being frequently used and having the motivation to reduce this and (b) identifying appropriate outcome measures. The doing aspect consisted of implementing a 'plan-do-study-act' cycle, summarised as: (a) planning, the ward manager and RRI lead discussing the restraint vision for the PICU, (b) do, the recruitment and training of the RRIA (c) study, the design of the evaluation, registration and ethical approval and collection of the data and (d) act, the analysis of the data and feedback to the ward team and wider organisation. Outcomes on the intervention and control PICUs were evaluated using a biphasic time series design (ie, a 19-month preintervention baseline phase 'A' vs the 19-month postintervention phase 'B' on each PICU). Online supplemental table 1 defines the primary and secondary outcome variables. Seclusion, rapid tranquilisation and use of physical restraint were the primary outcome variables.

Context, measures and materials

The evaluation data was sourced from incident reporting forms (Incident reporting forms (IRF) documentation). Incident data are recorded on PICUs as routine practice and incidents are defined as ‘any event which has given rise to potential or actual harm or injury, to patient dissatisfaction or to damage/ loss of property’.¹⁷ NHS local policy is that all incidents are reported as soon as practicable and within at least 12-hours of the incident occurring.

Qualitative interviews

To supplement the quantitative data, qualitative perspectives were sought of the changes to restraint practices on the PICU. Semistructured interviews were conducted with the RRIA, the ward manager on the intervention PICU and the RRI lead. These 30-minute interviews were conducted with the ‘change interview’, a semi structured interview which identifies changes created by an intervention.¹⁸ This approach takes a sceptical approach to evaluating change, does not assume that changes reported are the direct result of the intervention being evaluated and therefore considers the likelihood of the change occurring without the intervention or due to the influence of other factors. Each interviewee therefore identified changes to restraint practices on the PICU and then rated each change in terms of *expectation* (ie, 1: expected to 5: very surprised), *importance* (ie, 1: not at all to 5: very), *cultural impact* (0: did not impact on ward culture to 5: the culture was transformed) and *likelihood of change without the RRIA role* (1: change likely to 5: very unlikely). Interviewees also rated (0–100%) how effective the RRI role has been on changing the intervention PICU culture.

Analysis

Restraint outcomes were analysed using a combination of visual and statistical analyses. Visual analysis of the restraint outcome trends included phase changes in central tendency, level, trend, variability, latency and overall patterns.¹⁹ Effectiveness was assessed with non-overlap statistics, including the percentage of data points exceeding the median (PEM)²⁰; and non-overlap of all pairs (NAP)²¹. Non-overlap statistics assess the degree to which outcomes during an intervention phase overlap with the same outcomes in the baseline phase. For example, if seclusion was being regularly used during the baseline phase and irregularly used during the intervention phase, then there would be a high degree of non-overlap, and this would indicate an effective intervention. Where there is a large overlap, this shows an ineffective intervention. Effect-size descriptors for these non-overlap statistics are as follows: <50% ineffective intervention, 50–69% debatably effective intervention, 70–89% moderately effective intervention and >90% as indicative of a very effective intervention.²² Kendall’s Tau (τ) statistics was used to identify the presence of a within-phase linear trend and provide an effect-size estimate, while also adjusting for the baseline trend.²³ τU^{AvsB} assessed whether there was a statistically significant

reduction in restraint between the phases, while $\tau U^{(AvsB)-trend A}$ performed the same evaluation while adjusting for any significant trends in the baseline phases.²⁴ Non-overlap statistics were produced using *SingleCaseES* (V.0.7.2.9999²⁵). Tau was calculated using the Baseline Corrected Tau Web Calculator²⁶ and time series plots were developed using Microsoft Excel.

RESULTS

Descriptive analysis

Table 1 reports the total frequency, mean and SD for restraint outcomes in each phase on each PICU. On the intervention PICU, there was evidence of reductions to restraint and this was in comparison to restraint appearing to increase on the control PICU. Both PICUs increased their use of the safety pod.

Effectiveness analysis

Non-overlap outcomes are reported in table 2, illustrated in online supplemental file 9. Due to the stability of the intervention PICU baseline phase, Tau (t^{AvsB}) is reported, as there was no need for baseline adjustments. Results indicate little change in terms of use of restraint on the control PICU (ie, substantial overlap between the A and B phases). The RRIA role was debatably effective in reducing overall use of restraint on the intervention PICU (PEM=65%, NAP=56%), but this was in the context of an ineffective reduction in restraint on the control PICU (PEM=38%, NAP=36%). On the intervention PICU, the RRIA role was moderately effective in reducing the use of seclusion (PEM=85%, NAP=71%), increasing the use of safety pod (PEM=78%, NAP=74%) and very effective in reducing the use of standing holds (PEM=93%, NAP=80%).

Online supplemental files 2–6 contain time series plots of the total incidents, use of seclusion, full restraint, use of the safety pod and use of standing holds. The intervention PICU had a significant reduction in the use of seclusion (Tau -0.32 , $p=0.026$) in the context of a non-significant ($p=1.000$) increase on the control PICU. There was a significant reduction in full restraint on the intervention PICU (Tau= -0.297 , $p=0.047$) and by the mid-point of the intervention phase (ie, month 29 in the time series) use of full physical restraint had extinguished. There was also a significant reduction in use of standing holds on the intervention PICU (Tau= -0.474 , $p=0.001$).

Qualitative outcomes

Table 3 reports the qualitative outcomes. All reported changes were positive. Change was expected due to the remit of the RRIA role, but change was also impactful and important and would have been unlikely without the intervention. A common change was in relational dynamics with patients (ie, increased interaction and dialogue). The mean effective rating was 80 (range 70–100).

**Table 1** Descriptives of restraint outcomes on the intervention versus control PICU

Outcome measure (frequency)	Baseline (phase A) (19 months)		Intervention (phase B) (19 months)	
	Total frequency	Mean (SD)	Total frequency	Mean (SD)
Total incidents				
Intervention PICU	114	6.00 (3.25)	111	5.55 (3.20)
Control PICU	166	8.74 (4.36)	250	12.5 (7.03)
Use of seclusion				
Intervention PICU	74	3.89 (2.47)	46	2.30 (1.56)
Control PICU	94	4.95 (2.25)	100	5.00 (3.43)
Use of full physical restraint				
Intervention PICU	30	1.58 (1.46)	15	0.75 (1.07)
Control PICU	34	1.79 (1.75)	47	2.35 (4.16)
Use of safety pod				
Intervention PICU	2	.11 (.32)	18	.90 (1.02)
Control PICU	1	.05 (.23)	11	.55 (.94)
Frequency of standing holds				
Intervention PICU	56	2.95 (2.04)	19	.95 (1.19)
Control PICU	41	2.16 (1.54)	45	2.25 (1.29)

PICU, psychiatric intensive care unit.

Table 2 Effectiveness of restraint reduction on the intervention versus control PICU

Outcome measure (frequency)	Baseline phase (A) versus intervention phase (B)					
	Baseline trend τ trend A	Tau	Direction of effect	PEM (%)	NAP (%)	Interpretation
Total incidents						
Intervention PICU	-0.199	-0.093	Decrease	65	56	Debatably effective
Control PICU	-0.226	0.211		38	36	Not effective
Use of seclusion						
Intervention PICU	-0.179	-0.316 *	Decrease	85	71	Moderately effective
Control PICU	-0.069	0.002		50	50	Debatably effective
Use of full physical restraint						
Intervention PICU	0.194	-0.297 *	Decrease	68	68	Debatably effective
Control PICU	-0.421 *	0.485 *		65	62	Debatably effective
Use of safety pod						
Intervention PICU	0.079	0.469	Increase	78	74	Moderately effective
Control PICU	-0.072	0.325		65	63	Debatably effective
Frequency of standing holds						
Intervention PICU	-0.314	-0.474	Decrease	93	80	Very - moderately effective
Control PICU	-0.027	0.100		40	44	Not effective

*If baseline trend is not significant, Tau between phase effect size is reported (t^{AvsB}).
 \dagger = Significant at $p \leq 0.05$
 \ddagger If baseline trend is significant, baseline corrected Tau-U between phase effect size is reported ($t^{AvsB - trendA}$).
 NAP, non-overlap of all pairs; PEM, points exceeding the median; PICU, psychiatric intensive care unit.

Table 3 Culture change interview results

	Change was:	Importance of this change to the ward:	Impact on the ward culture:	Likelihood of this change to ward culture without RRIA role:
	1 – Expected by me. 2 – Somewhat expected by me. 3 – Neither expected nor surprising. 4 – I was somewhat surprised. 5 – I was very surprised by.	1 – Not at all. 2 – Slightly. 3 – Moderately. 4 – Very. 5 – Extremely	1 – Did not impact 2 – Made a bit of an impact. 3 – Some change to ward culture 4 – A lot of change to ward culture. 5 – The culture was transformed.	1 – Likely 2 – Somewhat likely 3 – Neither 4 – Somewhat unlikely 5 – Very unlikely
Changes to PICU ward culture				
Changes 1–6 RRIA changes;				
7–12 PICU ward manager				
changes; 13–19 RRIA lead				
Increase in staff confidence	2	4	4	5
Development of a least restrictive mindset	1	4	5	5
Active leadership around restraint	1	5	5	5
Better documentation	5	4	4	5
Reduced retort to seclusion	4	5	4	5
More staff: patient interaction	2	5	4	5
Calmer ward environment	4	4	4	5
Change in staff attitudes	3	5	5	5
More equal and collaborative relationships	3	5	5	5
Reducing restraint via de-escalation	1	5	5	5
Increased staff confidence	5	5	5	5
Change in the patient experience of care	4	5	5	5
Clear theory–practice links	1	5	5	5
Increase in trust of patients	4	4	4	5
Increase in use of de-escalation techniques	2	4	4	5
Patient voice heard more often	5	5	4	5
Increased dialogue with patients	3	5	5	5
Better teamwork during restraint	5	5	3	5
Clearer leadership on restraint	3	5	4	5

PICU, psychiatric intensive care unit; RRIA, reducing restrictive interventions advocate.

DISCUSSION

This study conducted an innovative mixed methods and controlled evaluation of an organisational intervention to increase patient safety on a PICU. The positive impact of the RRIA role was indexed—(a) quantitatively, in terms of reductions to restraint compared with baseline (and in comparison to the control PICU) and (b)

qualitatively, through staff reporting key changes to the ward safety culture. The common theme across the interviews was a change led by the RRIA in patient:staff relational dynamics, in which the least restrictive ward culture meant that restraint was the last and not the first option. This involved more use of de-escalation skills, requiring staff to work more psychologically and less physically with

patients at risk of harming themselves or others. These findings would align with the CQC⁶ call for PICU care to be more person-centred and less control centred. Rather than an instantaneous change in outcomes, there was evidence of a slowly decreasing pattern of restraint on the intervention PICU, and this is consistent with the pace of culture change interventions. The RRIA had an active coaching role in the MDT and such roles need the close support and commitment of ward managers. This active behavioural coaching approach fits with the recent National Collaborating Centre for Mental Health⁸ call for QI coaches to reduce restrictive practices on wards. The application of full physical restraint is the most dangerous restrictive practice⁷ and this practice stopped on the intervention ward. Less physical restraint reduces risk of psychological and physical trauma for both patients and staff.

Outcome 1: total incidents

Restraint is still necessary on PICUs to manage acute and ongoing risks and so it was not anticipated that the RRIA role would completely prevent the occurrence of incidents. The RRIA role aimed to change how risk incidents were anticipated and responded to by the MDT, and this was evidenced in other outcomes and in the qualitative evidence.

Outcome 2: use of seclusion

The RRIA role was effective in reducing the use of seclusion; there was a statistically significant reduction in seclusion relative to an increase on the control PICU.

Outcome 3: use of full physical restraint

There was a reducing trend in the use of full restraint on the intervention PICU during the intervention phase and this appears to reflect the naturally slow shift to a least restrictive culture in the MDT and the increased adoption of de-escalation strategies.

Outcome 4: safety pod usage

This was introduced as a piece of safety apparatus across both PICUs at the start of the study and it was expected that both PICUs would increase usage over time, and this was borne out in the outcomes. However, greater usage was evident on the intervention ward.

Outcome 5: frequency of standing holds in interventions

The RRIA role saw a significant reduction in standing holds during restraint incidents. This is demonstrative of a culture shift towards a more 'hands-off' patient risk management approach. Taken alongside the findings of less implementation of full restraint (see the Outcome 3 section), this offers reciprocal support for the RRIA role effecting a positive safety cultural change in the MDT.

In terms of guidance around patient safety, the 'Safewards' model is the most commonly used.²⁷ However, a scoping review²⁸ found that while Safewards enabled positive patient safety ward cultures to emerge, the approach did not enable reductions to restrictive practice,²⁹ with no

significant change to the number of incidents reported.³⁰ Safewards therefore appears useful in terms of changing staff attitudes but appears less effective in changing staff behaviours. Both are required to increase patient safety. The current evaluation found significant reductions to the way incidents were responded to and managed on the intervention PICU, and this does index changes to staff behaviour. The RRIA role has three key components. First, it enables changes to staff behavioural responses to distressed patients through active coaching of less restrictive responding and the active leadership during restraints themselves when necessary. Second, it changes staff attitudes to restraint and the team dynamics around restraint.³¹ Third, by 'co-producing' with each patient on admission how restraints needed to be handled by the team, this created more patient-centred care. It is worth noting that the person in the RRIA role was already a member of the PICU and this likely mitigated resistance to change in the MDT. Close links with the RRI team were helpful and the RRIA role is non-specialist and low-cost. There needs to be an organisational commitment to reducing restraint.

Study limitations

The PICUs were not randomly allocated to intervention or control ward. It is acknowledged that changes to restraint rates are proxy measures for changes to restraint culture and there were factors that could not be fully controlled for, including staff retention and change over time. While a direct effect between change to ward practice/culture and reduced restraint is evidenced here, this may indeed be bi-directional in that reduced use of restraint also changes the ward culture. In clinical practice on a PICU, this would be a virtuous circle. Use of seclusion on PICUs has been found to be significantly associated with any ongoing damage to the ward environment and patient violence; the measurement of these factors is important in future studies.³² Other unmeasured factors influencing use of restraint include the mental state of patients on admission and the PICU physical environments; these were not measured or compared in the current study. There is evidence that ward design features (eg, more total private space per patient) decrease the use of seclusion.³³ It is acknowledged that the intervention ward had more consistent staffing and the control PICU did use more temporary/agency staff. It is worth noting that the PICUs operated within the same organisation and so patients were, on occasion, transferred between the PICUs, but staff were not. The evaluation was reliant on the quality of information entered onto IRF documentation. Data were not collected in terms of patient diagnosis, symptom severity, symptom chronicity and current medication, and all these factors may have interacted with the restraint outcomes. This project followed on from previous work that had identified relevant predictive staff, patient and context factors for restraint being used³⁴ and wanted to shift to reducing restraint. There is a risk of measurement bias in an intervention study such

as this in terms of deciding and selecting how and what outcomes to evaluate, how to measure these outcomes, the overall design of the evaluation and the consequential prioritisation of particular outcomes. There is also the risk of the ‘mere measurement effect’³⁵ whereby simply measuring restraint causes changes to restraint practice. This may account for some of the changes on the control PICU. It is hoped these potential sources of bias were mitigated by the experimental design, use of precollected restraint outcomes and the data analysis being conducted independently from the clinical teams. Evaluation work is complex nevertheless and carries the risk of creating unintended positive and negative consequences³⁶ that then can be falsely attributed to the intervention. Further controlled restraint intervention evaluations on PICUs should integrate into their methods the assessment of potential unintended outcomes, try to avoid creating negative unintended outcomes and also be able to account for and explain positive and negative unintended outcomes when they occur.

Future research and practical recommendations

Regarding the sustainability of the intervention, the RRIA was formally established as part of the funding model for the PICU; the team recognised the importance of a collaborative relationship between the RRI team, ward manager and RRIA in facilitating and sustaining this (please refer to online supplemental material and figures 6, 7). It is acknowledged that the ‘intervention’ was the role of the RRIA and so this needs to be a team member with the relevant skills, experience and interpersonal characteristics (including assertiveness) to enable positive and consistent change to ward restraint culture. Given the core responsibility of the RRIA role, it is important to recognise that as the culture change began to occur on the intervention PICU, our data illustrated maintained change even during periods of RRIA annual leave and sickness leave. Therefore, despite the challenges and logistics of individual working patterns, the implementation of the RRIA role was still influencing restraint practices on the intervention PICU. The RRIA role was established as a pilot, with organisational commitment required to support the wider implementation of this across other mental health acute and PICU wards.

Future research may seek to more directly measure the staff and patient experience through established measures, such as the Ward Atmosphere Scale³⁷ and more qualitative interviewing. Intervention evaluations should also collect contemporaneous information on patient diagnoses and medications and more information on staff demographics and staffing levels. Staff turnover and rates of staff physical and psychological trauma could be potential outcome measures in future research. Co-production with patients and carers of interventions to reduce restraint would be a valuable contribution to the methods of future studies. This raises the possibility of randomising patients to personalised versus generic restraint reduction interventions in future studies. More use of randomisation to

safety culture interventions would be useful generally. It is probable (on the basis of the current evidence) that the RRIA role is likely to be beneficial; a stepped-wedge RCT would also be a candidate future methodology. Due to the slow nature of organisational cultural change, extended follow-up periods are needed. Where evaluation focuses on single wards, then the A/B design used in the current study could be improved by the addition of a withdrawal and reintroduction phase to form an A/B/A/B design.¹⁶ This design could therefore also be used where real-world working practices have changed. There is an assumption that research on PICUs is particularly difficult to achieve due to the complexity of the patients,¹ but this project illustrates that it is possible. The development and testing of conceptual models of restraint that take account of context, patient and staff factors will be useful.¹¹

CONCLUSIONS

This project has been the first to evaluate the effectiveness of a safety culture change intervention on a PICU and was achieved through comparing restrictive practices over time against a control PICU and interviewing of key staff members. The project supports the effectiveness of having an RRIA in psychiatric inpatient ward settings that have a behavioural coaching and leadership brief. Qualitatively, there was a shift towards better teamwork around the consideration of whether restraint was needed, consistent application of de-escalation strategies and an increase in staff confidence. The RRIA role therefore emerges as a key cultural lever in the drive to reduce restrictive practices.

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REFERENCES

- Cullen AE, Bowers L, Khondoker M, *et al*. Factors associated with use of psychiatric intensive care and seclusion in adult inpatient mental health services. *Epidemiol Psychiatr Sci* 2018;27:51–61.
- National Association of Psychiatric Intensive Care Units (NAPICU). (2016) guidance for commissioners of psychiatric intensive care units (picu). 2016. Available: https://napicu.org.uk/wp-content/uploads/2016/04/Commissioning_Guidance_Apr16.pdf
- Hallett N, Dickinson R, Eneje E, *et al*. Adverse mental health inpatient experiences: qualitative systematic review of international literature and development of a conceptual framework. *Psychiatry and Clinical Psychology* 2023.
- Butterworth H, Wood L, Rowe S. Patients' and staff members' experiences of restrictive practices in acute mental health in-patient settings: systematic review and thematic synthesis. *BJPsych Open* 2022;8:e178.
- Oxford HI, Valley T. Reducing restrictive practice in mental health. 2019. Available: <https://www.healthinnovationoxford.org/our-work/community-involvement-and-workforce-innovation/workforce-innovation/identification-of-need/restrictive-practice/>
- Care Quality Commission. 2024. Available: <https://www.cqc.org.uk/publications/monitoring-mental-health-act/2022-2023/restrictive-practices>
- Department of Health and Social Care. Mental health units (use of force) act 2018: statutory guidance for nhs organisations in england, and police forces in england and wales. 2021. Available: <https://www.gov.uk/government/publications/mental-health-units-use-of-force-act-2018/mental-health-units-use-of-force-act-2018-statutory-guidance-for-nhs-organisations-in-england-and-police-forces-in-england-and-wales>
- Royal College of Psychiatrists. Reducing restrictive practice collaborative. n.d. Available: <https://www.rcpsych.ac.uk/improving-care/nccmh/quality-improvement-programmes/MHSIP-reducing-restrictive-practice/reducing-restrictive-practice>
- NHS England. Reducing restrictive practice through least coercive care. Available: <https://www.england.nhs.uk/mental-health/mental-health-learning-disability-and-autism-inpatient-quality-transformation-programme/reducing-restrictive-practice/> [Accessed 20 May 2025].
- Clark LL, Shurmer DL, Kowara D, *et al*. Reducing restrictive practice: Developing and implementing behavioural support plans. *British Journal of Mental Health Nursing* 2017;6:23–8.
- Lawrence D, Bagshaw R, Stubbings D, *et al*. The Maintenance Model of Restrictive Practices: A Trauma-Informed, Integrated Model to Explain Repeated Use of Restrictive Practices in Mental Health Care Settings. *Issues Ment Health Nurs* 2024;45:1006–21.
- Reeves J. Reducing the use of restrictive interventions by changing staff attitudes. *Nurs Manag (Harrow)* 2017;24:30–7.
- Pellfolk TJ-E, Gustafson Y, Bucht G, *et al*. Effects of a restraint minimization program on staff knowledge, attitudes, and practice: a cluster randomized trial. *J Am Geriatr Soc* 2010;58:62–9.
- Whyte A. Challenging behaviour: finding another way. *Nurs Stand* 2016;31:18–20.
- Jones B, Vaux E, Olsson-Brown A. How to get started in quality improvement. *BMJ* 2019;364:k5408.
- Smith JD. Single-case experimental designs: a systematic review of published research and current standards. *Psychol Methods* 2012;17:510:510–50.
- Rotherham Doncaster and South Humber NHS Foundation Trust. Incident management policy. 2024. Available: <https://www.rdash.nhs.uk/policies/incident-management-policy/> [Accessed Feb 2024].
- Rodgers B, Elliott R. *Qualitative methods in psychotherapy outcome research*. Vienna: Psychotherapy Research, 2015:559–78.
- Cohen LL, Feinstein A, Masuda A, *et al*. Single-case research design in pediatric psychology: considerations regarding data analysis. *J Pediatr Psychol* 2014;39:124–37.
- Ma HH. An alternative method for quantitative synthesis of single-subject researches: percentage of data points exceeding the median. *Behav Modif* 2006;30:598–617.
- Parker RI, Vannest K. An improved effect size for single-case research: nonoverlap of all pairs. *Behav Ther* 2009;40:357–67.
- Scruggs TE, Mastropieri MA. Summarizing single-subject research. Issues and applications. *Behav Modif* 1998;22:221–42.
- Brossart DF, Laird VC, Armstrong TW. Interpreting Kendall's Tau and Tau-*U* for single-case experimental designs. *Cogent Psychol* 2018;5:1518687.
- Tarlow KR. An Improved Rank Correlation Effect Size Statistic for Single-Case Designs: Baseline Corrected Tau. *Behav Modif* 2017;41:427–67.
- Pustejovsky JE, Chen M, Grekov P, *et al*. Single-case effect size calculator (Version 0.7.2.9999). 2023.
- Tarlow KR. Baseline corrected tau calculator. n.d. Available: <http://www.ktarlow.com/stats/tau>
- Bowers L. Safewards: a new model of conflict and containment on psychiatric wards. *J Psychiatr Ment Health Nurs* 2014;21:499–508.
- Lawrence D, Bagshaw R, Stubbings D, *et al*. Restrictive Practices in Adult Secure Mental Health Services: A Scoping Review. *Int J Forensic Ment Health* 2022;21:68–88.
- Maguire T, Ryan J, Fullam R, *et al*. Evaluating the Introduction of the Safewards Model to a Medium- to Long-Term Forensic Mental Health Ward. *J Forensic Nurs* 2018;14:214–22.
- Price O, Burbery P, Leonard SJ, *et al*. Evaluation of safewards in forensic mental health. *Mental Health Practice* 2016;19:14–21.
- Whitmore C. Evaluation of Safewards in forensic mental health: a response. *Mental Health Practice* 2017;20:26–9.
- Dye S, Brown S, Chhina N. Seclusion and restraint usage in seven English psychiatric intensive care units (PICUs). *J Psychiatr Intensive Care* 2009;5:69–79.
- van der Schaaf PS, Dusseldorp E, Keuning FM, *et al*. Impact of the physical environment of psychiatric wards on the use of seclusion. *Br J Psychiatry* 2013;202:142–9.
- Somerville E, Turner L, Cox F, *et al*. Predicting the use of restraint on adult inpatient psychiatric wards: a four-year incident report analysis. *J psych intensive care* 2025.
- Long PA, Huberts AS, di Torro AN, *et al*. The mere-measurement effect of patient-reported outcomes: a systematic review and meta-analysis. *Qual Life Res* 2025;34:1211–20.
- Oliver K, Lorenz T, Tinkler J. Evaluating unintended consequences: New insights into solving practical, ethical and political challenges of evaluation. *Evaluation (Lond)* 2020;26:61–75.
- Friis S. Measurements of the perceived ward milieu: a reevaluation of the Ward Atmosphere Scale. *Acta Psychiatr Scand* 1986;73:589–99.