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Original Research Article

Improving therapeutic engagement and observations on inpatient mental health wards in the English National Health Service: lessons from using quality improvement to scale up interventions

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Abstract

Background: Observations on mental health inpatient wards account for a large amount of staff time and cost to organisations. Ideally, observations should support meaningful engagement between staff and service users on wards, benefiting both the recovery of service users and the well-being of staff. However, observation practice is varied, and the therapeutic benefit it brings is questioned in some instances.

Methods: Over 18 months, 55 inpatient mental health wards across one English National Health Service (NHS) Foundation Trust employed Quality Improvement (QI) methodology to test interventions aimed at improving observation completion and therapeutic engagement. A standard framework for scaling up was used to sequence the work and support moving from testing a large number of interventions locally to scaling three across the organisation. The three interventions were a board relay, zonal observations, and the use of life skills recovery workers to lead activities. Measures used included general and intermittent observation completion, incidents of violence and agression (physical, verbal and racial), restrictive practice (prone restraint, restraint, seclusion, and rapid tranquillisation), and staff sickness.

Results: Sustained improvements were seen in all 10 measures used in this work, as evidenced by shifts in statistical process control charts. General observation completion increased by 1.2%, and intermittent observation completion rose by 1.9%. Incidents of physical violence were reduced by 23%, verbal aggression by 38% and racial aggression by 60. Restrictive practice use also reduced, with restraint reduced by 16%, prone restraint by 35%, seclusion by 38%, and rapid tranquillisation by 26%. Staff sickness also decreased by 16%.

Conclusion: Observation completion and therapeutic engagement have been shown to improve with zonal observations, a board relay, and life skills activities led by recovery workers. QI can be used to test and scale interventions rapidly across a system.

Keywords: quality improvement; delivery of healthcare; mental health; psychiatry; patient safety

Background

Observations are a core activity to help reduce the risk of harm to service users and staff on inpatient mental health wards. The National Institute for Clinical Excellence in the United Kingdom (UK) describes four levels of observation, including low-level or general observation (every 30 to 60 minutes), intermittent observation (every 15 to 30 minutes), continuous enhanced observation (one-to-one with a patient within eyesight or at arm's length), and multi-professional observation (two to one).

However, research has indicated that observations are often modified in practice, and staff suggest that they lack clinical utility [1]. Without meaningful interaction, observations risk becoming custodial surveillance, which conflicts with modern healthcare practices [2]. One study found that 84% of patients admitted to inpatient mental health wards are socially disengaged at any one time, which can impede recovery and increase aggression [3]. This can harm patients and reduce the therapeutic value of the environment by expanding the use of restrictive practices [4]. For staff, it leads to psychological distress, which can contribute to burnout and sickness [5].

Observation practices should facilitate therapeutic engagement with service users [6]. Although difficult to define, therapeutic engagement encompasses both verbal and non-verbal interactions aimed at enhancing mental health, and it significantly impacts nursing quality [7]. Despite this, few interventions demonstrate sustained improvements in making inpatient wards more therapeutic, with observation practice remaining varied [8].

This study describes the application of Quality Improvement (QI) methods to develop, test, and scale interventions aimed at improving observation completion and enhancing the therapeutic

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environment across 55 inpatient mental health wards within one English NHS provider organisation.

Methods

Study context

East London NHS Foundation Trust (ELFT) provides mental health, community, and primary care services covering a population of around 1.8 million people across East London and Bedfordshire in England. Across ELFT, there are 55 inpatient mental health wards offering services across several geographical locations. All inpatient wards from across the organisation were involved in the work, with their characteristics described below (Table 1).

Use of QI methodology

QI is a systematic method for solving complex problems through the structured testing of ideas designed by those closest to the issue and the use of data to understand their impact [9]. Each team used the Model for Improvement [10] to develop an aim, agree on a set of measures, create a driver diagram to visualise their change theory, and test change ideas using Plan-Do-Study-Act (PDSA) cycles. Teams also followed a standard sequence of improvement, which emphasises the identification of the problem, understanding the problem using QI tools, developing a precise aim and potential changes, testing ideas, and implementing successful ones into business as usual.

Multiple approaches to scaling interventions exist with no clear consensus over which is better [11]. This work used Barker et al.'s [12] framework for going to full scale to sequence the work, which offers a way of scaling interventions in four stages (Fig. 1): set up (understanding the aims and infrastructure required for the work), developing the scalable unit (identifying the scalable unit and developing and testing change ideas locally), tests for full scale (testing change ideas under different conditions to build degree of belief) and going to full scale (rapid deployment of interventions that work to full scale across a system). The consideration of context underpins this framework via adoption mechanisms and support systems.

Table 1. Characteristics of the 55 wards involved in the programme

Characteristic	Number of wards
Acute adult male	12
Acute adult female	10
Adult male psychiatric intensive care unit (PICU)	4
Adult female psychiatric intensive care unit	1
Child and adolescent acute	2
Child and adolescent psychiatric intensive care unit	2
Forensics	16
Mother and Baby unit	1
Older adult	6
Rehabilitation	1

Set up and develop a learning system

Each ward formed a multidisciplinary QI team that met weekly or fortnightly. The teams comprised nurses, medics, allied health professionals, and support staff. Each team has service users involved in the work to ensure change ideas were co-designed and developed together. At the unit level, the work was led by the most senior local nurse and a senior clinician from another discipline, often a medic. A programme-wide aim and driver diagram were developed, along with unit-level driver diagrams to reflect local theories of change.

In this work, the term 'learning system' is used to describe the adoption mechanisms and support structures required to enable interventions to scale up fully. At the trust level, unit leaders came together monthly to share learning in a space supported by the Chief Nurse, Chief Medical Officer, Chief

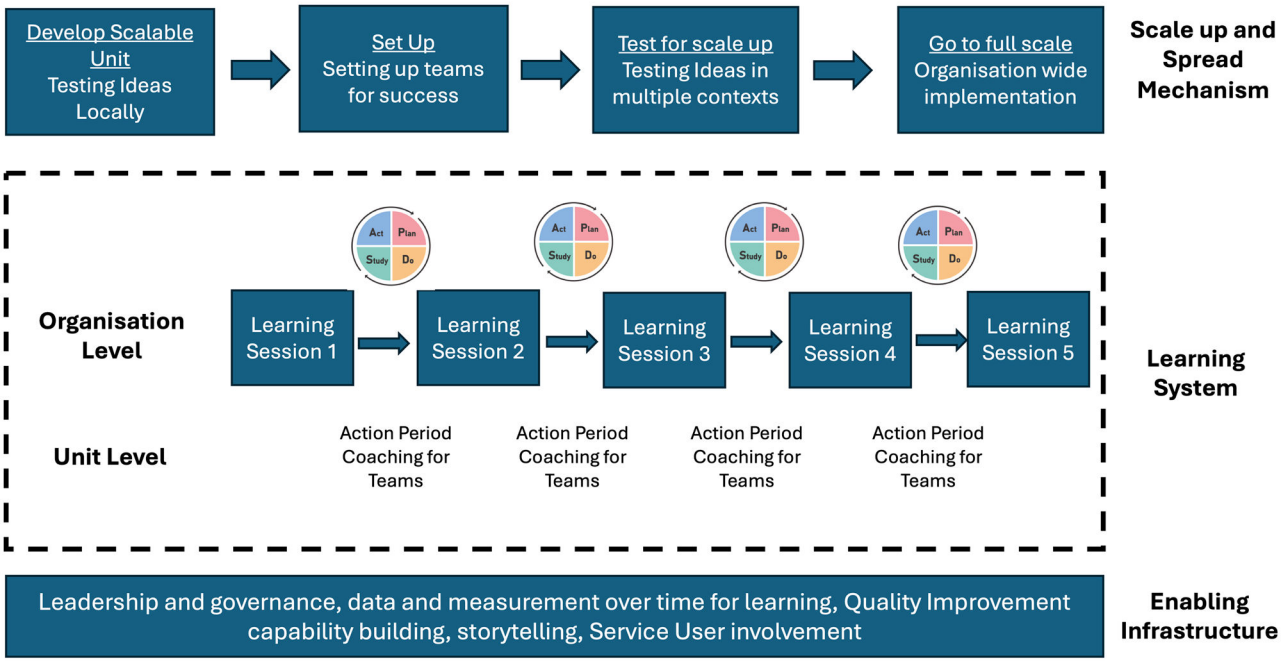

Figure 1. Design of the therapeutic engagement and observations QI Programme. Framework adapted from Barker et al. [12].
LS—Learning Session.
Arrows show the temporal progression of the programme.

Quality Officer, Directors of Nursing, and colleagues from the trust's QI team. Four in-person learning sessions were held throughout the programme every six months. These brought together representatives from each team, including service users, to share learning. Other support mechanisms included the allocation of improvement advisors to each unit to support the use of the QI method, data support from the trust's business intelligence team, and support from the People Participation team to co-produce work effectively.

Developing the scalable unit

Between August 2022 and September 2023, wards developed and tested ideas that they believed would make the biggest difference in improving therapeutic engagement and observations locally. Twenty-five change ideas were developed and tested in collaboration with service users, as outlined in Table 2.

Testing for full scale

From October 2023 to March 2024, a small number of ideas that had made a difference locally were incorporated into a change package and tested across the organisation. Each unit selected two ideas they perceived had made the biggest difference to observation practice and engagement, based on improvements seen in their data and feedback from staff and service users who were involved in the testing. These ideas were presented at a learning session with staff and service users voting on three to be scaled trust wide. Change ideas were shared and framed using Rogers' categories of successful innovations: observability, trialability, relative advantage, complexity, and compatibility [13].

The first idea was a board relay, where the sheet for observation recording was always kept in the hands of staff and handed over between them. Staff then give a verbal handover of how each service user presented in the previous hour and any critical information that will help the next staff member to conduct the observations safely and therapeutically. The theory behind the idea was threefold: the board would visibly signal that someone was undertaking observations, so they would be undisturbed; not putting the board down would help ensure observations were completed; and the verbal handover would ensure that any information was not missed.

The second idea was zonal observations, an alternative method of observation practice that involves designating the ward into different zones where allocated staff observe and engage with patients individually and as a group over a set period. The theory behind this was that zonal observations would increase the relational security in the ward.

The third change idea was the use of life skills recovery workers (LSRW) between 2 p.m. and 10 p.m. LSRW are members of staff employed on inpatient wards to provide coordinated activities. The theory behind this idea was that increasing the number of activities at a time of day when violence was higher would reduce incidents, and staff would carry out their observations more comprehensively.

Standard documentation was produced by the team that initially developed and tested each idea to share the details of the intervention, which is key in helping to test in different contexts [14]. Each unit decided locally on which wards to test each of these ideas, with teams designing a series of tests under different conditions. This resulted in each idea being tested in one or two wards within each unit.

Table 2. Summary of change ideas tested across the units involved in the programme to improve observation completion and therapeutic engagement

Unit	Change ideas tested
Bedford and Luton	Board Relay, LSRW on twilight shift, Revised observation templates, Infrared torches for night-time observations
Child and Adolescent Mental Health (Coborn and Evergreen)	Board Relay, high visibility jackets, Buddy system, using social stories to promote observations
City and Hackney Centre for Mental Health	Board relay, protected engagement time, using tablets to collect Friends and Family tests.
East Ham Care Centre	Activity boxes, Spot checks on 1-1, developing life stories for service users to share what mattered to them, loved ones attending meal times.
Forensics	Zonal Observations, revised observation template, infrared torches for night-time observations
Newham Centre for Mental Health	Alarm reminders for observations, protected engagement time, QR Codes to record observations, Zonal observations, Spot checks on observations
Tower Hamlets Centre for Mental Health	Leaflet explaining observations, go to person on admissions, Board relay, Asking family about triggers

Going to full scale

As part of the testing for scale-up, teams found it challenging to use the interventions as designed without tailoring them to the local context. To support this, work was undertaken with those using the interventions to distil the core concepts behind each change idea, thereby facilitating any necessary tailoring of ideas while retaining their key essence. A trust-wide observation and engagement oversight group was developed, and the organisation's policy on observations was revised to include the three change ideas as standard practice. Local teams were supported in embedding the changes into business as usual and transitioning to quality control through integrated oversight within existing local governance structures. Further to this, work has begun on an app to incorporate a tool for recording observation completion within the electronic patient record system RiO (The Access Loughborough, UK), replacing the Standard Observation Measurement (SOM) tool that was previously developed for this purpose.

Measurement and data analysis

No validated measure of therapeutic engagement exists that covers all types of clinical settings in this work. Therefore, a standardised measurement plan was developed for all teams in this work based on their ease of collection and what had previously been used in similar work [15]. To understand the therapeutic nature of the environment, measures of violent incidents (physical, verbal, and racial) and restrictive practices (restraint, prone restraint, tranquilisation, and seclusion) were used. These were collected from incident data carried out as part of routine reporting. A standardised way of collecting observation completion via a Microsoft Excel tool was developed, known as the SOM tool, and adopted across all teams after a period of prototype testing.

Data were charted on Statistical Process Control (SPC) charts, either as run charts or control charts. SPC enables users to

identify patterns of variation in the data based on established analytical statistical theory [16]. All data relating to incidents of violence and the use of restrictive practices were charted as rates per 1000 occupied bed days (OBD) on U charts. U charts are used for count data where an unequal area of opportunity exists [16]. Observation completion was plotted on a P-Prime chart for classification data due to the size of each subgroup. Staff absences were plotted on a run chart because insufficient data were available for a control chart. Special causes were interpreted using standard rules for SPC, with improvements in the data identified by shifts of eight or more data points above or below the mean on a control chart and six or more on a run chart (16]. A detailed measurement plan is provided in Table 3.

Measures were charted monthly, except for observation completion, which was displayed weekly due to the frequency of data collection. The baseline for all measures of violence and restrictive practice spanned 18 months, from January 2021 to August 2022. Measures were provided at the individual ward level and then aggregated to the unit and trust levels. Charts were created using a Microsoft Excel plugin called QI Charts (Process Improvement Products, San Antonio, TX, USA).

Results

Improvements were observed in all 10 measures used in this work. The percentage completion of general observation across the trust increased from an average of 98.49% per week in the baseline to an average of 99.57% per week by the end of the testing period. General observation completion saw 3 increases: one in March 2023, one in August 2023 and a final one in December 2023. Intermittent Observation completion rose from 96.39% to 98.25%, with the shift occurring in September 2023. These shifts in the data do not readily coincide with the immediate testing of change ideas. Given that no data were collected before January 2023, sometime after initial testing began, there are challenges in understanding what contributed to the first shift in the data, which occurred in March 2023. One theory is that the increased focus on collecting and interpreting data that had not been done so before may have led more people to question completion rates and drive these up. The last shift occurred at the end of December 2023, which is two - three months after the three main change ideas were implemented at scale across the trust.

The rate of incidents of physical violence decreased from an average of 11.3 incidents per 1000 OBD per month during the baseline to an average of 8.7 per 1000 OBD per month (–23%) at the end of testing. An initial shift was observed in November 2022, two months after teams began testing local change ideas. A further shift was observed in December 2023, two months after the testing of the three change ideas trust wide.

Incidents of verbal aggression reduced from 1.3 per 1000 OBD per month during baseline to an average of 0.8 per 1000 OBD per month (–38%) at the end of testing. This shift occurred in September 2022, one month after teams began testing local change ideas. No further improvements were observed following the implementation of the three change ideas across the trust. Incidents of racial aggression reduced from an average of 0.5 per 1000 OBD to an average of 0.2 per 1000 OBD each month (–60%) at the end of testing. One shift was observed in September 2022, which is one month after teams tested change ideas locally. No further shifts in the data were observed.

Throughout the work, there were reductions seen across four measures related to restrictive practice. Incidents of prone restraint reduced from an average of 20 per 1000 OBD each month in the baseline to an average of 1.5 per 1000 OBD (–35%) by the end of testing. One shift was observed in September 2022, one month after teams began testing local change ideas. Seclusion use decreased from an average of 3.4 per 1000 OBD to 2.1 per 1000 OBD (–38%) each month. The first shift was in March 2023, which did not coincide with testing of ideas. A further shift was seen in December 2023, two months after testing of three ideas across the trust.

Incidents of rapid tranquilisation reduced from 5.4 to an average of 4 per 1000 OBD (–26%) each month by the end of testing. Incidents of restraint reduced from an average of 11.2

Table 3. Measurement Plan that all teams on the programme used

Measure	Definition	Collection plan
Percentage of general observations completed	Denominator (Total number of expected general observation records that should have been completed)/Numerator (Total number of general observations completed)	Displayed weekly Collected manually via the Standard Observation Measurement tool
Rate of incidents of physical violence per 1000 occupied bed days	Count of the total number of incidents of physical violence divided by the number of occupied bed days. This is divided by 1000	Displayed monthly. Collected via Datix/Inphase
Rate of incidents of verbal aggression per 1000 occupied bed days	Count of the total number of incidents of verbal aggression divided by the number of occupied bed days. This is divided by 1000	
Rate of incidents of racial aggression per 1000 occupied bed days	Count of the total number of incidents of racial aggression divided by the number of occupied bed days. This is divided by 1000	
Rate of seclusion initiation per 1000 occupied bed days	Count of the total number of incidents of seclusion initiated divided by the number of occupied bed days. This is divided by 1000	
Rate of rapid tranquilisation use per 1000 occupied bed days	Count of the total number of incidents of rapid tranquilisation divided by the number of occupied bed days. This is divided by 1000	
Rate of restraint used per 1000 occupied bed days	Count of the total number of incidents of restrain divided by the number of occupied bed days. This is divided by 1000	
Rate of prone restraint used per 1000 occupied bed days	Count of the total number of incidents of prone restraint divided by the number of occupied bed days. This is divided by 1000	
Staff sickness	Count of the total number of staff sickness absence days	Displayed monthly Collected from human resources reporting systems

per 1000 OBD to 9.4 per 1000 OBD (–16%). For these two measures, the shifts in the data both occurred in July 2023, which did not coincide with any distinct phases of the work. Staff days of absence due to sickness across all inpatient units also decreased by 16% from 5481 to 4561 days each month. This shift occured in September 2023, which coincides with the testing of ideas for scale up. SPC charts for each measure are shown in Fig. 2 and annotated to indicate testing.

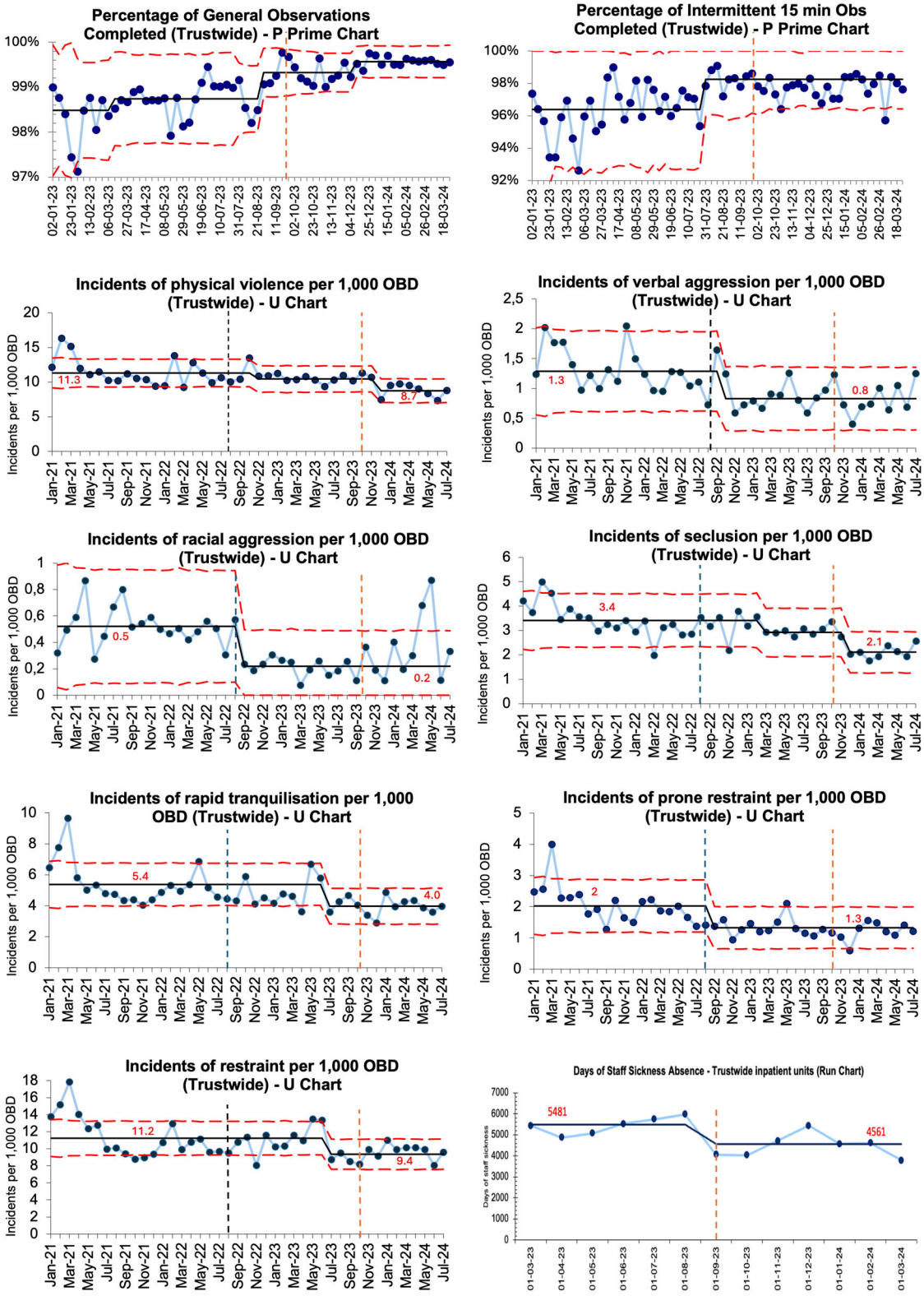

Figure 2. Summary of the SPC charts for all measures in the observation program.
First dotted line—When local testing of change ideas began.
Second dotted line—When the three main change ideas chosen were tested for scale-up across the trust.

Discussion

Statement of principal findings

Achieving therapeutic environments in inpatient mental health wards is a global problem, with few evidence-based change ideas that fit multiple contexts. Our findings suggest that the use of zonal observations, LSRW on twilight shifts, and a board relay could lead to reductions in the use of restrictive practices and the occurrence of violent incidents, as well as improve observation completion rates. Trust wide, there were improvements in all measures when comparing the baseline period and the end of the work.

For the measures of phsycial violence, verbal agression, racial agression and prone restraint, improvements were observed between one and three months after all teams initiated testing of local change ideas in August 2022. Furthermore, the measure of physcial violence, seclusion and staff sickenss saw improvements one to two months after testing the three change ideas across the organisation began in October 2023. Two of the measures (rapid tranquilisation and restraint) saw improvements in July 2023, but the shifts did not readily coincide with the introduction of the change ideas. We are unaware of any other significant organisational changes at this time, which could explain these observations.

In some cases, seasonality might be a confounding factor that influences changes. Work to understand seasonality concerning restrictive practice on inpatient psychiatric units suggests that these are often highest between July and December [17]. There appears to be no pattern of seasonality to violent incidents [18]. We do not observe these patterns in the data collected during this work, further supporting the utility of the ideas tested here.

Given the complexity of inpatient mental health settings and the fact that there is rarely a single explanation for violence, our theory is that one intervention alone is unlikely to have contributed to the observed improvements. Our findings also suggest that using a standardised, step-by-step approach to developing, testing, and scaling interventions can help an organisation achieve quick and sustainable improvements.

Strengths and limitations

This work had several limitations. First, the lack of a control group and the time series design before and after restrict the ability to attribute changes solely to the tested change ideas. In the future, we encourage others to use a control group to increase confidence that the observed changes are less likely to be influenced by other factors.

Secondly, we did not explore which, if any, combinations of the interventions worked together best. Consequently, it is difficult to say which of the change ideas contributed most to the improvements seen. Experimental approaches, such as planned experimentation in the form of factorial design [19], have been utilised in healthcare to identify the optimal combination of interventions that can amplify improvements in a system [18].

Measures of incidents and restrictive practices were used as proxies for therapeutic engagement, as reductions in these indicators have been associated with an improved therapeutic environment. Some efforts have been made to define measures of therapeutic engagement in the literature; however, only one validated tool exists, the Therapeutic Engagement Questionnaire [20]. This tool has only been tested in adult inpatient mental health settings and would have excluded many wards in this study [21].

Interpretation within the wider literature

The use of zonal observation was initially tested in two wards independently: a male Psychiatric Intensive Care Unit (PICU) and a male forensic ward for service users with learning disabilities. In both cases, there were sustained reductions in ward violence. The results are supported by Carr [22], who describes similar improvements in other settings. During this work, we found that the ability to use zonal observations depended on the physical layout and the type of service users on the wards. The physical design is a key factor in enabling observation completion [23], and wards with multiple zones and corridors found that their layout hindered effective implementation. The risk of service user falls prevented the use of zonal observations on older adult wards, as staff needed to move with patients.

Communication issues between staff conducting observations and other members of the care team have been identified as failure points in observation practice [24]. The board relay focused on physically handing over an observation sheet at the end of the staff member's assigned time. A verbal handover accompanied this to help staff share any key issues noted in the previous hour. In some locations, significant adjustments to the intervention were necessary to make it effective. In one Child and Adolescent Mental Health PICU, staff reported that holding the board posed a risk if a staff member needed to intervene in an incident. This was replaced with a paper copy of the form and a coloured bib to indicate that the person was conducting observations. Staff handed over the bib to the next person during the verbal handover.

Boredom is a significant concern in inpatient mental health wards and has been linked to hindered recovery, decreased satisfaction, and increased violence and aggression [25]. The use of LSRW to run activities during times of the day when incidents are typically higher may help reduce violence and restrictive practices. This approach allowed nursing staff to focus on observations of service users instead of assigning this duty to unqualified staff members. Using unqualified staff for observations has been identified as a risk factor for incomplete observations [26].

In the initial test ward, LSRWs worked from 2:00 p.m. to 10:00 p.m. Other wards adjusted this schedule to mornings, shortened shifts, or implemented it on weekends based on local needs. Some wards encountered challenges in staffing shifts during the testing of this intervention. Wards operating this from 2:00 p.m. to 10:00 p.m. found that some staff felt unsafe travelling home, and in certain areas, transportation options were limited. One older adult ward adapted the idea by recruiting several volunteers to run activities for service users from 8 a.m. to 8 p.m., as they observed that service users tended to sleep outside those hours.

Instead of focusing on detailed procedural descriptions, we found that explaining key components of the interventions helped share learning across different sites [27]. A structured testing approach using PDSA was then used to test these findings locally and determine what worked. This is especially important in situations where interventions may not be as simple as they initially appear [28]. A summary of the change ideas, including their main concepts and local adjustments, is provided in Table 4.

Implications for policy, practice, and research

The approach used in this study can be applied by other healthcare organisations aiming to improve observation completion

Table 4. Mapping of three main change ideas tested as part of the programme to the relevant theory and concept, with examples of how the idea was tailored in different locations

Change idea	Theory	Concept	Examples of local tailoring
Board relay	Having a physical board that is handed over will remind staff to complete observations. Handing over this board with a verbal handover will ensure that any issues are passed on. This will improve observation completion	*There is a visible way of indicating someone is undertaking observations with a physical reminder that is verbally handed over between staff* • Verbal Handover between staff of observations • Physical Reminder to complete observations • Visible way of indicating someone is undertaking observations	Using coloured bibs to signify the individual taking observations with the board and handing over both between staff. Swapping the use of a board for a notebook to take observations
Life skills recovery workers	Use ward resources to provide activities at times of the day when there are usually higher incidents. This will reduce issues. This will, in turn, free up staff to complete more observations.	*Regular, intentional therapeutic contact between staff and service users through the provision of activities at times of the day when there are likely to be higher incidents.* • Activities available for service users at times of the day when there are higher levels of incidents • Regular, intentional therapeutic contact between staff and service users in a structured way	Some wards have been using LSRW in the mornings to run activities as this is a period they identified higher than usual incidents.
Zonal observations	Zonal Observations and engagement will allow for care to be delivered in a less restrictive environment by reducing observations where possible.	*Staff visible on the ward floor are able to provide regular interactions and intervention with service users in a less restrictive environment.* Visibility of staff on the ward floor • Regular interaction between staff and service users in a less restrictive environment • Providing structured and ad hoc interventions	Using zonal observations at specific points where incidents are higher Use of zonal observations all the time

and enhance the therapeutic environment in inpatient mental health wards. QI was chosen to address this issue and facilitated a transformation that involved continuous learning and improvement while adapting to local circumstances. The challenge of scaling interventions is well-documented [29], and the approach presented here could be valuable in helping to rapidly scale localised interventions.

This work was initially designed to help teams test various interventions locally and scale those that prove effective. However, insights from testing for scale-up revealed challenges in replicating ideas exactly as designed. This prompts a discussion about the balance between fidelity and adaptability of an intervention to better fit local contexts [30]. While we have attempted to identify the core components of the interventions that facilitate practical scale-up, future qualitative research could be valuable in understanding what Denis [31] refers to as the soft and hard core of the interventions described here.

Given that context is considered key for the success of sustainable QI [32], it is essential to consider the broader organisation in which this work took place. The ability of an organisation to successfully test, scale, and implement QI work into practice may depend on several contextual factors. These could include organisational leadership, QI support and capacity, and the team undertaking the work [33].

Staff and service users involved in the work had several opportunities to engage in improvement capability building through a variety of regular training programmes offered at differing depths of detail [34]. Many of the staff involved in the work described had already received QI training or accessed it during the programme. Teams were also supported by improvement advisors, who are individuals with expertise in applying QI methods and supporting behaviour change.

Leadership is essential to allow QI to flourish [35]. The work was sponsored by three members of the executive board, providing challenge, support and legitimising permission to test ideas. Locally, the work was governed through local quality structures and overseen by QI sponsors, who are senior local leaders responsible for QI. In the case of this programme, this was often the most senior local nurse and the local senior medical director.

To support the existing organisational structures, a temporary secondary operating structure, a learning system, was created to improve problem-solving by promoting shared learning and mobilising organisational resources. A key element was the use of regular monthly sessions for leaders that helped individuals share their knowledge about what was working. It also enabled people to organise visits to different parts of the organisation to observe how various change ideas are being used in practice, aiding in testing for scale-up. The larger 6-monthly learning sessions for all staff provided an opportunity to maintain momentum. After completing the work, the existing operational and governance structures enabled the transition to quality control. These structures remove some of the constraints necessary for learning found in typical organisational hierarchies but maintain the leadership and organisational structures needed to sustain improvements [36].

Conclusion

This study describes a large-scale QI programme designed to enhance therapeutic engagement and observation completion across 55 inpatient mental health wards. A standardised approach was used to develop, test, and scale interventions across the system. Teams consisting of staff and service users used QI methods to design and test over 25 different change ideas locally. From these, they chose three to test across the trust in various conditions, including a board relay, LSRW, and zonal observations. Teams received support as part of a learning system to collaborate and share insights. Throughout the work, improvements were seen in observation completion, various measures of violent incidents, restrictive practices, and staff sickness.

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Author contributions

Conceptualization: L.S., D.B., C.M., S.S., A.S. Data curation: M.A., A.C., S.S. Funding Acquisition: M.A. Formal analysis: M.A., S.S., A.C., A.S. Investigation: M.A., A.S., A.C., C.M., E.M., S.S. Methodology: M.A., S.S., A.C., A.S., L.S., D.B., C.M., E.M. Project administration: M.A. Resources: L.S., A.S., D.B., C.M. Supervision: D.B., C.M., L.S., A.S,. E.M., S.S. Visualization: M.A. Writing—original draft: M.A., S.S., A.C., A.S., L.S., D.B., C.M., E.M. Writing—review & editing: M.A., S.S., A.C., A.S., L.S., D.B., C.M., E.M.

Conflict of interest

No known conflict of interest.

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Data availability

The data underlying this article will be shared on reasonable request to the corresponding author.

Ethics approval

Ethical approval was not required for this work as it was carried out as part of routine QI work.

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