INTRODUCTION

Inpatient mental healthcare settings should offer safe environments for patients to heal and recover and for staff to provide high-quality treatment and care. However, aggressive patient behaviour, unengaged staff approaches, and the use of restrictive practices are frequently reported. The Safewards model includes ten interventions that aim to prevent conflict and containment. The model has shown promising results but at the same time often presents challenges to successful implementation strategies. The aim of this study was to review qualitative knowledge on staff experiences of barriers and enablers to the implementation of Safewards, from the perspective of implementation science and the i-PARIHS framework. A search of the Web of Science, ASSIA, Cochrane Library, SCOPUS, Medline, Embase, PsycINFO, and CINAHL databases resulted in 10 articles. A deductive framework analysis approach was used to identify barriers and enablers and the alignment to the i-PARIHS. Data most represented by the i-PARIHS were related to the following: local-level formal and informal leadership support, innovation degree of fit with existing practice and values, and recipients' values and beliefs. This indicates that if a ward or organization wants to implement Safewards and direct limited resources to only a few implementation determinants, these three may be worth considering. Data representing levels of external health system and organizational contexts were rare. In contrast, data relating to local (ward)-level contexts was highly represented which may reflect Safewards's focus on quality improvement strategies on a local rather than organizational level.

KEYWORDS
aggression, implementation, mental health nursing, prevention, Safewards

Abstract
Inpatient mental healthcare settings should offer safe environments for patients to heal and recover and for staff to provide high-quality treatment and care. However, aggressive patient behaviour, unengaged staff approaches, and the use of coercive measures are frequently reported, adding to a negative spiral of physical and psychological trauma and injury to both patients and staff (Weltens et al., 2021).

In 2014, the Safewards model was introduced to reduce conflict and containment in psychiatric inpatient settings. The model is based on more than 1000 research papers published from the 1960s onwards (Bowers, 2014). It consists of ten separate evidence-based interventions and focuses on developing a violence-preventive ward
culture that is co-created and sustained by both staff and patients (Table 1). The model has the characteristics of a complex intervention, in which the complexity resides in the parallel implementation of the ten interventions, the change in behaviours required by staff individually and as a group, the involvement of patient activity, the variability of outcomes, and the local tailoring of interventions (Craig et al., 2008). The complexity of Safewards makes it context-dependent, that is, what system it is used within, how it may perform differently depending on different implementation strategies, and how it may have different effects on different persons involved (Booth et al., 2016).

Previous literature reviews on Safewards have focused on examining the effectiveness of reducing conflict and containment (Finch et al., 2022; Mullen et al., 2022; Ward-Stockham et al., 2022), improving ward climate (Finch et al., 2022), nurses’ perspectives on adopting and implementing Safewards and consumers’ needs (Mullen et al., 2022), and the perceptions of staff and consumers (Ward-Stockham et al., 2022). The results showed that Safewards could provide evidence for reducing restrictive practices. However, the results varied between studies, from no or minor reductions to substantial reductions (Finch et al., 2022; Mullen et al., 2022; Ward-Stockham et al., 2022). Similarly, the perceptions of staff and patients were mainly positive (Ward-Stockham et al., 2022) but staff experiences showed variability in acceptance and engagement (Mullen et al., 2022) and the impact on ward climate presented inconsistent results (Finch et al., 2022).

In these studies, a variety of results have often been discussed in terms of challenges to implementation fidelity, and the different barriers and enablers identified in relation to implementation complexity. Reviews that examined qualitative data based on staff implementation experiences (Mullen et al., 2022; Ward-Stockham et al., 2022) used inductive-based methods for analysis, which was also the case in the included articles, with the exception of Fletcher et al. (2021), who mapped inductively derived data into a theoretical model. Consequently, in the results of the reviews and in all but one included article, many different inductively derived terms were used for the categories and sub-categories. Therefore, to develop a more comprehensive and structured understanding of the barriers and enablers to the implementation of Safewards, there is a need to lift current knowledge to a more theoretical level and find guidance from the perspective of implementation science.

There is general agreement that bridging the research–practice gap through the implementation of evidence is the key to improving patient outcomes (Nilsen & Birken, 2020). Many implementation theories, models, and frameworks can contribute to clinical research by providing clarity, structure, and terminology regarding complex implementation processes (Greenhalgh, 2020). There are three overarching aims of different theories, models, and frameworks: to describe the implementation process, to understand or explain what influences implementation outcomes, and to evaluate implementation (Nilsen & Birken, 2020). Using implementation science to understand the qualitative data collected from the clinical implementation processes of complex innovations, new insights can be drawn into areas of implementation that otherwise could remain unnoticed.

**Table 1** The 10 Safewards interventions (from Fletcher et al., 2019).

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear mutual expectations</td>
<td>Patients and staff work together to create mutually agreed aspirations that apply to both groups equally</td>
</tr>
<tr>
<td>Soft words</td>
<td>Staff take great care with their tone and use of collaborative language. Staff reduce the limits faced by patients, create flexible options, and use respect if limit setting is unavoidable</td>
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<tr>
<td>Talk down</td>
<td>De-escalation process focuses on clarifying issues and finding solutions together. Staff maintain self-control, respect, and empathy</td>
</tr>
<tr>
<td>Positive words</td>
<td>Staff say something positive in handover about each patient. Staff use psychological explanations to describe challenging actions</td>
</tr>
<tr>
<td>Bad news mitigation</td>
<td>Staff understand, proactively plan for, and mitigate the effects of bad news received by patients</td>
</tr>
<tr>
<td>Know each other</td>
<td>Patients and staff share some personal interests and ideas with each other, displayed in unit common areas</td>
</tr>
<tr>
<td>Mutual help meetings</td>
<td>Patients offer and receive mutual help and support through a daily, shared meeting</td>
</tr>
<tr>
<td>Calm down methods</td>
<td>Staff support patients to draw on their strengths and use/learn coping skills before the use of PRN medication or containment</td>
</tr>
<tr>
<td>Reassurance</td>
<td>Staff touch base with every patient after every conflict on the unit and debrief as required</td>
</tr>
<tr>
<td>Discharge messages</td>
<td>Before discharge, patients leave messages of hope for other patients on a display in the unit</td>
</tr>
</tbody>
</table>
One implementation framework is the i-PARIHS (integrated-Promoting Action on Research Implementation in Health Services) (Harvey & Kitson, 2016). It was initially developed inductively based on clinical quality improvement needs and has since been subjected to more deductive testing and refinements, as well as minor and major revisions. It is also well established with more than 1000 published article citations (Harvey & Kitson, 2020). It is classified as a determinant framework which means that the aim is to predict, understand, or explain implementation outcomes by specifying the constructs of determinants that act as barriers and facilitators and the relationship between them (Nilsen & Birken, 2020).

The i-PARIHS framework uses context, innovation, and recipients as its primary constructs. Context refers to the micro-, meso-, and macro-levels that can impact implementation; innovation refers to the new knowledge that is introduced; and recipients refer to the individuals involved in the implementation (Harvey & Kitson, 2016). Each main construct has several characteristics that must be considered. In this study, these characteristics are referred to as subconstructs (Table 2). The underlying philosophy of i-PARIHS is that an implementation process within a healthcare system will not be neat and predictable, but rather complex, unpredictable, and challenging (Harvey & Kitson, 2020). According to this framework, implementation success means that goals are met, innovation is embedded in practice, and individuals and teams are motivated and take ownership of the innovation (Harvey & Kitson, 2016). This further states that implementation should be activated and facilitated through a continuous process of assessing and responding to the different characteristics of the innovation and recipients within a specific contextual setting (Harvey & Kitson, 2016).

The Safewards model has in several studies shown important and promising results in reducing restrictive practices and promoting a violence-preventive culture in psychiatric care. However, the implementation of Safewards by staff has often proven to be a challenge that requires changes in staff and organizational behaviours. Previous qualitative literature reviews of staff experiences in implementing the Safewards model have analysed data inductively, leading to knowledge about perceived barriers and enablers based on a variety of thematic terms.

**AIM**

This study aimed to systematically review and synthesize qualitative research on the experiences of staff regarding barriers and enablers to the implementation of Safewards from the theoretical perspective of i-PARIHS.

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>Overview of i-PARIHS main and subconstructs.</th>
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<tbody>
<tr>
<td><strong>Context</strong></td>
<td><strong>Innovation</strong></td>
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<tr>
<td>External health system level:</td>
<td>Underlying knowledge sources</td>
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<tr>
<td>Policy drivers and priorities</td>
<td>Clarity</td>
</tr>
<tr>
<td>Incentives and mandates</td>
<td>Degree of fit with existing practice and values</td>
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<td>Regulatory frameworks</td>
<td>Usability</td>
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<td>Environmental (in)stability</td>
<td>Relative advantage</td>
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<td>Inter-organizational networks and relationships</td>
<td>Trialability</td>
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<td>Organizational level:</td>
<td>Observable results</td>
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<td>Organizational priorities</td>
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<td>Senior leadership and management support</td>
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<td>Culture</td>
<td>Observable results</td>
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<td>Structure and systems</td>
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<td>History of innovation and change</td>
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<td>Absorptive capacity</td>
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<td>Learning networks</td>
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<td>Local level:</td>
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<td>Formal and informal leadership support</td>
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<tr>
<td>Culture</td>
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<td>Past experience of innovation and change</td>
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<td>Mechanisms for embedding change</td>
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<td>Evaluation and feedback processes</td>
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<td>Learning environment</td>
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</table>
Research questions

What implementation barriers and enablers are described, and how are they aligned with the i-PARIHS constructs?

Are there data that do not fit the i-PARIHS framework, and if so, what other themes do they represent?

METHODS

This systematic review was conducted in accordance with the PRISMA (the Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement (Page et al., 2021) and reported following the ENTREQ (Enhancing Transparency in Reporting the Synthesis of Qualitative Research) statement (Tong et al., 2012). The study was registered with PROSPERO (International Prospective Register of Systematic Reviews) on the 4th of September 2020 (reg no CRD42020202580).

Inclusion criteria

The literature search was pre-planned to seek all relevant available studies meeting the following inclusion criteria: original peer-reviewed studies including qualitative outcomes related to the experiences of staff in psychiatric and mental health settings regarding the implementation of the Safewards model, published between 2014 (when Safewards was first published) and 2022 in English.

Data sources and search strategy

The literature search was guided by an academic librarian and included the following electronic databases: Web of Science Core Collection, ASSIA, Cochrane Library, SCOPUS, Medline, Embase, PsycINFO, and CINAHL. These databases were chosen to cover a wide variety of possible publications. The search strategy was based on the term ‘Safewards’ in ‘All fields’ since this would narrow the search down to literature including the Safewards model. A first search was conducted on 9 June 2020 and a complementary search on 8 February 2022. A list of the full search strategy can be found in Appendix S1.

Study screening methods

The study screening followed three steps. First, Author UJ screened the titles and abstracts of articles found in the database searches to remove duplicates and articles not in English. Second, UJ screened the full texts to examine eligibility, and articles assessed as ineligible were discussed with Author AB to reach a consensus before removal. Finally, the full texts were examined in detail by AB and UJ to ensure that the articles met all inclusion criteria.

Quality assessment

The Critical Appraisal Skills Programme (CASP, 2018) was used to evaluate the quality of each article. CASP is a commonly used tool for quality assessment in qualitative synthesizes (Long et al., 2020). Author 1 and Author 2 independently assessed the studies. Any inconsistencies were discussed until a consensus was reached. Studies were considered to have minor, moderate, or substantial methodological limitations (Carstensen et al., 2017). None of the studies with methodological limitations were excluded as they contained relevant qualitative data.

Synthesis methodology

Framework synthesis was performed using the i-PARIHS. The i-PARIHS was chosen because it states several well-underpinned possible determinant factors that could, either as barriers or enablers, influence the implementation of complex interventions, such as the Safewards model. The framework synthesis method allows for the use of a deductive a priori theoretical model and complementary inductive thematic analyses (Brunton et al., 2020).

Deductive framework synthesis involves five stages: familiarization with data, framework selection, indexing, charting, and mapping and interpretation (Brunton et al., 2020). It was set up to include the three i-PARIHS constructs, with their listed characteristics as subconstructs (Harvey & Kitson, 2016) (Table 2). Each article was first coded line by line independently into the i-PARIHS framework by Author 1 and Author 2 and then discussed together until a coding consensus was reached. The introduction of i-PARIHS (Harvey & Kitson, 2016), the i-PARIHS facilitation checklist (Harvey & Kitson, 2015), and a chapter on the i-PARIHS (Harvey & Kitson, 2020) in the Handbook on Implementation Science (Nilsen & Birken, 2020) were used as guidelines for the coding process. In this review, bits of coded data are referred to as ‘text units’, meaning citations, sentences, or paragraphs of the included articles (Kibiswa, 2019). All texts under both the headings ‘results’ and ‘discussion’ were extracted and coded since original data in terms of ideas or concepts can be found in both sections (Booth et al., 2016). Texts in visual displays of data, such as tables, were included in the coding process if they contained original qualitative data. Only qualitative results were coded for articles that used mixed methods.
All relevant data from the articles that did not fit into any of the i-PARIHS subconstructs were initially coded as ‘Other’. When all articles had been coded, a complementary thematic analysis of the ‘Other’ codes was performed by Author 1 and Author 2 together, following five phases: familiarizing with data, generating initial codes, searching for themes, reviewing themes, and defining and naming themes (Nowell et al., 2017). Phases were not followed as a linear process but involved steps going back and forth to ensure that themes were based on the data. Thus, a revised framework representing the final synthesis was developed based on what in the a priori i-PARIHS framework was confirmed by the study data and the new themes that emerged in the inductive analysis (Booth & Carroll, 2015; Brunton et al., 2020). QSR International’s NVivo Release 1.5.2 software was used to aid the coding and analysis.

Assessment of data alignment to the i-PARIHS

The alignment between the coded data and the revised framework has been quantitatively explored (Booth & Carroll, 2015; Brunton et al., 2020). This analysis used the NVivo data function of Organize/Coding/Codes. In this function, after the coding process was completed, each i-PARIHS subconstruct was presented with the number of files (articles) and references (text units) as a whole and as represented by each article, which was the result of the coding process.

RESULTS

Study selection results

The initial database search yielded 314 records. The screening process resulted in 10 articles and is displayed in the flow chart (Figure 1).

Study characteristics

The characteristics of included studies are presented in Table 3, and they cover country, year, participants, settings, qualitative data collection and analysis methods, and implementation strategy.

Quality assessment of studies

The CASP quality evaluation showed that seven studies had no or minor methodological limitations, whereas three studies had substantial methodological limitations (Table 4). These three studies contained rather rich qualitative data which led to the decision to include them; however, the authors were mindful of their limitations in the analyses (Booth et al., 2016).

Staff experiences of barriers and enablers to the implementation of Safewards and the alignment with the i-PARIHS

In total, 409 text units were extracted from the included articles. Of these, 376 were coded into the subconstructs of the i-PARIHS framework, while 33 text units did not match the characteristics of any of the subconstructs and were initially coded as ‘Other’. The thematic analysis of the 33 ‘Other’ text units resulted in two new themes: ‘Local environmental instability’ and ‘Adaptation of intervention to local context’. In the revised framework, representing the final synthesis, the two new themes were matched into two main i-PARIHS domains: context/local level and innovation. The revised framework and distribution of the text units extracted from each article are presented in Table 5 and Figure 2. Examples of full text unit codings into i-PARIHS can be found in Appendix S2. Below, the i-PARIHS subconstructs most frequently represented by text units are presented individually, and the less frequently represented subdomains are presented together.

Context: External health system level, organizational level, and local level

The i-PARIHS main construct ‘context’ includes external health system level, organizational level, and local level which cover 18 subconstructs. ‘context’ was unevenly represented by the text units extracted from the studies. Only 21 text units related to external health system level and organizational level, leaving five of their 12 subconstructs unrepresented. By contrast, local level was matched by 80 text units, covering all six subconstructs.

External health system level and organizational level

The external health system level refers to aspects of the wider societal health system that may affect implementation. This may relate to areas such as national priorities for action and improvement, political discussions and decisions, current laws, movements, and organizational networks in society. Only three studies referred to the external health system: two related to incentives and mandates (Fletcher et al., 2021; James et al., 2017) and one to policy drivers and priorities (Kipping et al., 2019). In one study, the implementation of Safewards was supported and enabled by a government sponsor which arranged and funded the training and purchase of equipment (Fletcher et al., 2021). In another study, upcoming inspections by the Care Quality Commission were described as important for the implementation of Safewards (James et al., 2017). Another relevant aspect was related to provincial legislation on workplace violence (Kipping et al., 2019).
The organizational level focuses on issues related to the larger local organization within, for example, a hospital, clinic, or trust. This level includes the alignment of innovation with organizational priorities, the support of key individuals, history of change, and organizational mechanisms to support and embed change in routine practice. This level was represented in seven studies. The most represented subconstructs, ‘Organizational priorities’ and ‘Structure and systems’, comprised text units from five and two studies, respectively. Maguire et al. (2018) reported an implementation enabler in terms of support from hospital executives to provide and enable staff training, and Kipping et al. (2019) described how Safewards aligned with the local organizational priorities of person-centred care. Several organizational barriers were described, including a lack of additional budget from the organization to engage and train staff (Higgins et al., 2018) and decisions regarding ward closures (James et al., 2017). Other challenges described were related to implementation strategies that were initiated only at the organizational level without the support of ward staff, implementation on wards struggling with structural instability, or those already engaged in other major initiatives (James et al., 2017).

Local level

The local level refers to the characteristics of a particular ward trying to implement Safewards. It relates to the roles and support of local leaders and management, ward culture, staff involvement, history of change, and support mechanisms. Text units were identified in all studies. Most represented by text units were the subconstructs: ‘Formal and informal leadership support’ (30 text units), ‘Learning environment’ (21), and ‘Mechanisms
<table>
<thead>
<tr>
<th>Article (year/country)</th>
<th>Participants (N)</th>
<th>Settings (N)</th>
<th>Qualitative data collection/analysis</th>
<th>Implementation strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davies et al. (2020/UK)</td>
<td>Safewards leads (N=8)</td>
<td>Assessment and treatment unit/intellectual disability (N=1)</td>
<td>Written answers to questions/unclear analysis</td>
<td>Training for all staff before implementation Local champions Monthly Safewards meetings</td>
</tr>
<tr>
<td>Fletcher et al. (2019/Australia)</td>
<td>Staff members (N=39)</td>
<td>Inpatient psychiatric wards: adult, adolescent/youth, aged acute wards secure extended care units (N=14)</td>
<td>Free text comments in a survey/inductive thematic approach</td>
<td>Local champions and central champions (government funded a lead for each ward) 3-day train-the-trainer workshop Training packs for local training</td>
</tr>
<tr>
<td>Fletcher et al. (2021/Australia)</td>
<td>Safewards leads (N=7)</td>
<td>Inpatient psychiatric wards: adult, adolescent/youth, aged acute wards, secure extended care units (N=18)</td>
<td>Readiness checklist, fidelity checklist Training and implementation diary/inductively coded data mapped into theoretical model</td>
<td>Training for all staff before implementation Central champions and local champions</td>
</tr>
<tr>
<td>Higgins et al. (2018/Australia)</td>
<td>Staff nurses (N=15)</td>
<td>Acute mental health inpatient units (N=3)</td>
<td>Individual interviews/Open inductive content analysis</td>
<td>Training for all staff before implementation, support by nurse educators, implementation science informed guidance Central champions and local champions Safewards materials to staff (coffee cups, pens) Project team at each site</td>
</tr>
<tr>
<td>James et al. (2017/UK)</td>
<td>Research assistants/central champions (N=11)</td>
<td>Acute mental health inpatient units (N=16)</td>
<td>Two focus groups and written observational data/inductive thematic analysis</td>
<td>Two weeks of training for research assistants/central champions who trained all staff and 10 local champions before implementation Continuous implementation support from central champions Handbooks for staff, training presentation, and intervention materials Regular updates on progress from local champions to central champions</td>
</tr>
<tr>
<td>Kipping et al. (2019/Canada)</td>
<td>Staff members (N=108)</td>
<td>Forensic units (N=6)</td>
<td>Free-form answers from training evaluation form/summary of feedback</td>
<td>Training for all staff before implementation, complementary online training, Weekly community meetings with staff and patients, Safewards intranet website, hospital blog</td>
</tr>
<tr>
<td>Lee et al. (2021/Ireland)</td>
<td>Staff nurses and managers (N=21)</td>
<td>Acute mental health unit (N=1)</td>
<td>Four focus groups/Thematic analysis</td>
<td>Intervention training videos to all staff, staff resource folder, Local champions/co-champions Continuous support from champions to staff</td>
</tr>
<tr>
<td>Maguire et al. (2018/Australia)</td>
<td>Patients (N=14) and staff members (N=12)</td>
<td>Forensic unit (N=1)</td>
<td>Open-ended fidelity checklist questions/content analysis</td>
<td>Training for all staff before implementation, in-house training for patients Local champions Local steering committee, local working party including two paid positions for patients, newsletters, community meetings</td>
</tr>
<tr>
<td>Price et al. (2016/UK)</td>
<td>Unspecified number of staff</td>
<td>Forensic units (N=3)</td>
<td>Notes collected from staff meetings/unclear analysis</td>
<td>Training for all staff before implementation, complementary training videos Central champions and local champions Weekly support by senior clinical manager, staff folder, and follow-up visits by project team</td>
</tr>
<tr>
<td>Yates &amp; Lathlean (2022/UK)</td>
<td>Healthcare assistants (N=8) and nurses (N=2)</td>
<td>Acute adolescent unit (N=1)</td>
<td>Individual interviews/thematic analysis</td>
<td>Training for staff before implementation Emails with instructions to staff Central champions (principal investigator and healthcare assistant) and local champions Intervention meetings before implementing each intervention</td>
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### TABLE 4  CASP quality assessment of the included studies.

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</thead>
<tbody>
<tr>
<td>1. Was there a clear statement of the aims?</td>
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<td>2. Is a qualitative methodology appropriate?</td>
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<td>3. Was the research design appropriate to address the aims?</td>
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<td>4. Was the recruitment strategy appropriate to the aims?</td>
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<td>5. Was the data collected in a way that addressed the research issue?</td>
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<td>6. Has the relationship between researcher and participants been adequately considered?</td>
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<td>7. Have ethical issues been taken into consideration?</td>
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<td>8. Was the data analysis sufficiently rigorous?</td>
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<td>9. Is there a clear statement of findings?</td>
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<tr>
<td>Overall quality assessment</td>
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*No or minor methodological limitations.
Moderate methodological limitations.
Substantial methodological limitations.*
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<td><strong>Context</strong></td>
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\(^a\)New theme added to the revised framework.
for embedding change’ (17). ‘Environmental instability’, one of the two themes added to the revised framework, was the fourth most represented with 15 text units. The remaining three subconstructs were represented by 12 text units.

**Formal and informal leadership support**

In Safewards, ward managers and designated local champions are vital for implementation. The importance of local leadership support and commitment was evident from the data. If senior nurses on a shift were pro-Safewards, they became role models, and there was a high level of staff intervention engagement (Higgins et al., 2018). Ward managers who showed that they were engaged by taking responsibility for implementation and supported champions and patient involvement demonstrated the value of Safewards and served as enablers (Fletcher et al., 2021). However, leadership aspects were often described in terms of struggles. If there was no buy-in from senior managers, implementation was difficult (Higgins et al., 2018). Similarly, champions could feel unprepared, undersupported, and lacked time to support fellow nurses (Price et al., 2016).

**Learning environment**

The studies described a variety of Safewards education and training arrangements for staff members. Most studies reported that staff received an introduction and training in groups led by local Safewards champions. Several studies highlighted the importance of not rushing...
through staff training, and more extensive training was a recurring wish (Lee et al., 2021; Price et al., 2016). Another suggestion was to provide further in-depth training specifically to team leaders and managers (Price et al., 2016). One of the challenges described was the lack of a system to ensure that new staff and students were properly introduced to Safewards (Davies et al., 2020). In some cases, online self-education was provided to staff and students (Kipping et al., 2019; Lee et al., 2021). However, nurses expressed that they would prefer mandatory in-class training rather than a brief introduction of optional online training and that this would signal an organizational commitment and that the implementation of Safewards was considered important (Lee et al., 2021).

**Mechanisms for embedding change**

Mechanisms for embedding change refer to the processes that enable interventions to be adopted more easily by finding ways to overlap new and old practices. Different mechanisms were identified from the data. The most common mechanisms described were to ‘bridge’ Safewards interventions to already existing ward processes or habits at a local or organizational level, such as including ‘Positive words’ in the handover documentation (Davies et al., 2020) or the addition of a tick box for ‘Reassurance’ in incident forms (Price et al., 2016). Another mechanism was to ensure that an intervention was not reliant on the presence of an intervention lead (Davies et al., 2020). Without strong embedding mechanisms, staff could worry that Safewards would not survive beyond the introductory period and that patients may be unaware of Safewards despite booklets and leaflets (James et al., 2017; Lee et al., 2021). Similarly, it was apparent that the change process was often fragile, even though a particular intervention was generally supported (James et al., 2017).

**Environmental instability**

Local environmental instability was described as a challenge and barrier to implementation quality in most studies. Therefore, we added this theme to the i-PARIHS subconstructs. The environment was often described as busy or chaotic. Specifically, factors such as high local staff turnover and staff shortages, severely unwell patients, frequent ward incidents, changes to ward function, temporary staff, lack of or change of ward manager, and high patient turnover were exemplified (Fletcher et al., 2021; Higgins et al., 2018; Price et al., 2016; Yates & Lathlean, 2022). The unstable environment in the ward left staff unable to split time between ward responsibilities, maintaining Safewards, and find time for training staff (Fletcher et al., 2021; Yates & Lathlean, 2022). The business and acuteness of everyday clinical practice in acute wards were sometimes recognized as something that would be a challenge to any improvement effort, not just Safewards. Attempts to adjust the implementation process to environmental instability were described, for example, by implementing only a few interventions (Higgins et al., 2018).

**Other subconstructs**

**Culture:** The culture of a ward was in a few studies described as colliding with Safewards. Staff could be openly resistive depending on the way they interpreted the message of Safewards, and the importance of not underestimating the impact of the ward environment on implementation was highlighted (Higgins et al., 2018). Similarly, ward cultures and how staff identified themselves within the culture could influence staff responses to Safewards (James et al., 2017).

**Evaluation and feedback processes:** Good-quality evaluations were identified as important but could be a challenge especially regarding less visible interventions (Lee et al., 2021). One study also lifted the importance to continually review the mutual expectation intervention to make sure it met the needs of the service users (Davies et al., 2020).

**Past experiences of innovation and change:** Only one study described a staff member’s experience of previous ‘things’ on the ward that had not made any difference and that research would never change anything (James et al., 2017).

**Innovation**

The i-PARIHS main construct ‘innovation’, in this case, the Safewards model, includes seven subconstructs (Table 2). All the subconstructs were matched by text units. An eighth subconstruct ‘Adaptation of innovation to local context’ was added in the revised framework. The subconstructs ‘Degree of fit’ (30 text units), ‘Observable results’ (27), ‘Relative advantage’ (27), and ‘Adaptation of innovation to local context’ (18) were the most represented. The remaining subconstructs included 11 text units or fewer.

**Degree of fit**

A high degree of fit enables a smoother uptake of a new intervention. However, the experience of how well Safewards fitted into current practices in the wards varied. Some text units described an uncomplicated fit connected to an understanding of how the model could lead to better care and address important local issues with conflict and containment (Fletcher et al., 2019, 2021; Higgins et al., 2018; James et al., 2017; Yates & Lathlean, 2022). Another degree of fit was related to the experience of Safewards interventions, which were already business-as-usual. However, this experience could be either positive, as the staff felt validated in what they were already doing (Higgins et al., 2018; James et al., 2017;
Price et al., 2016), or negative, in the sense that they felt their competence was being questioned (Higgins et al., 2018; Lee et al., 2021). Several text units described situations in which interventions were at odds with current practice (Higgins et al., 2018; James et al., 2017), or the training was of a too basic level (Higgins et al., 2018; Lee et al., 2021), which challenged uptake and acceptance among staff. Therefore, Safewards were sometimes perceived as partly unsuitable for a particular type of ward or group of patients, such as patients resistant to engagement with nursing staff (Price et al., 2016) or forensic wards (Maguire et al., 2018; Price et al., 2016).

Observable results

If a new intervention leads to results that staff can observe, it is more likely to be adopted because it has proven its effectiveness and could be worth the effort. The text units indicated that the observable results were often related to a more positive ward culture. Safewards was observed to make the ward safer and staff more mindful and approachable to patients (Lee et al., 2021; Maguire et al., 2018). Similarly, less social distance and increased respectfulness and collaboration between staff and patients as well as among patients were observed (Fletcher et al., 2019; Maguire et al., 2018). Some text units described improved language and communication towards patients and staff (Davies et al., 2020; Maguire et al., 2018). At the same time, some text units stated that Safewards did not have an impact on nursing practice and that a lack of observable results was confirmed to be a barrier to implementation (James et al., 2017).

Relative advantage

To be adopted, an innovation needs to not only deliver observable results but also be experienced by staff as advantageous in comparison to current practice, as well as to other innovations or models being considered. Some text units described the advantage of Safewards' strong focus on the staff–patient relationship rather than on task-oriented nursing (Fletcher et al., 2019; Higgins et al., 2018). Other text units stated that Safewards interventions presented new patient advantages relative to previous practices, such as messages of hope from other patients (Fletcher et al., 2019) and more rapid and sensitive responses to patients' needs (Yates & Lathlean, 2022). Most of the text units, however, highlighted that unless staff felt that Safewards were something new and better than the current practice, this would be a barrier to implementation. If the staff felt that the interventions would not add anything useful relative to the current practice, there was no requirement for practice changes (James et al., 2017; Lee et al., 2021; Price et al., 2016). On the other hand, if staff believed that an intervention would lead to positive results or develop current practices, they could put extra effort into implementation (James et al., 2017).

Adaptation of innovation to local context

To enhance the degree of fit in the local context, the room for modification and adjustment of an innovation is considered to facilitate quality. The most common text units related to adapting Safewards interventions to the group of patients which the ward was serving, such as patients with intellectual disabilities or forensic units (Davies et al., 2020; James et al., 2017; Maguire et al., 2018) or to incorporating interventions into already established local events (Yates & Lathlean, 2022). Other text units described changes in the names of Safewards' role titles or interventions (Davies et al., 2020; James et al., 2017) and adjustments of training materials (Higgins et al., 2018). Text units from one study showed that modifications could be, to a higher or lesser degree, consistent with Safewards and could lead to either enhanced or diluted effectiveness (James et al., 2017). In another study, text units highlighted the importance of local context adaptation and involvement of both staff and patients in developing unit-specific strategies before implementation (Kipping et al., 2019).

Other subconstructs

Usability: The more useful an innovation is perceived as, the more likely it is to be adopted and implemented. In some text units, particular interventions were described as useful because they bridged theory and practical management of conflict (Higgins et al., 2018), supported patients in independent management, and helped staff identify patients in need of support (Yates & Lathlean, 2022). In contrast, other text units showed that interventions could be perceived of no use due to a lack of staff engagement or high levels of patient aggression (Higgins et al., 2018).

Underlying knowledge resources: To facilitate change, innovation should be perceived as credible in terms of underlying knowledge and evidence. Some text units describe how this was achieved through a renewed understanding of Safewards' explanatory model of the relationship between conflict and containment (Davies et al., 2020; Fletcher et al., 2019; Higgins et al., 2018; Price et al., 2016). It was also described that a poor understanding of underlying knowledge could be a reason for negative attitudes towards Safewards (Lee et al., 2021). Staff scepticism towards the underlying knowledge of Safewards was expressed based on the perception that the knowledge was not new (Higgins et al., 2018) or a critical approach to research (James et al., 2017).
Clarity: Innovation clarity will help staff see links to clinical practice and avoid confusion and misunderstanding in implementation. A few text units reflected that staff perceived clarity about Safewards (Fletcher et al., 2019, 2021) while others struggled to understand the underlying components which could lead to negative adaptation (James et al., 2017). Lack of clarity could lead to staff perceiving Safewards as an ‘academic exercise’ (Lee et al., 2021) or difficulties in implementing less visible interventions (Lee et al., 2021).

Trialability: Trialability refers to the potential to test an innovation on a small scale before full implementation, which is usually considered to facilitate quality. A few text units raised the issue of whether to implement all interventions simultaneously or in a staged process (Higgins et al., 2018; Maguire et al., 2018). Higgins et al. (2018) found that even implementing only three of the interventions each quarter to consider the high acuity of the wards was problematic because the staff turnover meant that there was continuously old staff leaving and new starting.

Recipients

‘Recipients’ is the third main construct of the i-PARIHS. It refers to persons who are affected by the implementation and influence it, both as individuals and in groups. The construct includes 10 subconstructs (Table 2). Similar to the main construct ‘innovation’, all subconstructs were matched by text units. Five of the 10 subconstructs were more frequently matched than the others: ‘Values and beliefs’ (35 text units), ‘Time, resources, and support’ (28), ‘Collaboration and teamwork’ (28), ‘Skills and knowledge’ (21), and ‘Power and authority’ (16). The remaining five subconstructs were matched by 12 text units or fewer.

Values and beliefs

The values and beliefs of the recipients are important to their willingness to adopt new practices. Perceiving the innovation as inconsistent with current values and beliefs can present a barrier to implementation. A positive alignment between Safewards and staff values and beliefs was described in some text units as centred around recovery principles, patient empowerment, positive staff–patient relationships, the impact of Safewards, and what could be considered the core of nursing (Fletcher et al., 2019; Higgins et al., 2018; James et al., 2017; Lee et al., 2021). Barriers to implementation related to discrepancies and incompatibilities between Safewards and staff values and beliefs were described in many text units from several perspectives. Some were related to non-specific negativity towards Safewards or that Safewards was perceived as false or forced (Davies et al., 2020; Higgins et al., 2018; James et al., 2017; Lee et al., 2021). Others reflected the belief that nurses’ professional power and responsibility compared to patients would make Safewards unsuitable (Fletcher et al., 2019; James et al., 2017). Another aspect related to staff beliefs was that patients’ mental illnesses or personalities cause violence and aggression; therefore, Safewards’ focus on developing staff behaviour was perceived as inappropriate (Higgins et al., 2018; Price et al., 2016). One intervention in particular, ‘Know each other’, which includes sharing personal information with patients, was described in many text units as colliding with the staff’s beliefs about what would be an appropriate and safe practice (Fletcher et al., 2021; Higgins et al., 2018; James et al., 2017; Price et al., 2016).

Time, resources, and support

Psychiatric wards are often busy; therefore, for developing new skills and maintain novel ways of working, the staff must have sufficient time and support. Several text units described the need for more time and resources to be allocated to education and training for regular and non-regular staff (Lee et al., 2021). Time for training was seen as important not only to introduce Safewards but also to engage and motivate staff, including agency staff (Price et al., 2016; Yates & Lathlean, 2022). Furthermore, many text units were related to the challenge of implementing Safewards in busy wards with staffing shortages, high-acuity patients, and overworked staff members. This could create a feeling of Safewards as an additional workload and as something that could not be prioritized (James et al., 2017; Lee et al., 2021; Price et al., 2016; Yates & Lathlean, 2022). Finding time to implement Safewards was often problematic and could lead to difficulties in maintaining already established interventions (Davies et al., 2020; Yates & Lathlean, 2022). The role of Safewards champions includes providing support to staff. Several text units, however, showed that since champions were often very busy staff members, as well as sometimes in a ward-managing role, a lack of allocated time to give such support was common (Lee et al., 2021). In one study, the positive effect of an external staff support resource disappeared when it was withdrawn from a unit (Higgins et al., 2018).

Collaboration and teamwork

Collaboration and teamwork created a sense of community and togetherness in the wards that facilitated the implementation of Safewards. However, many text units described the requirement of a ‘buy-in’ from staff along with strong leadership (James et al., 2017; Lee et al., 2021). Communication, conversations, and reminders about Safewards appeared to be important for maintaining collaboration and teamwork among the staff (Davies et al., 2020). Therefore, a lack of communication could
be perceived as a lack of positive support, which would hinder implementation (Higgins et al., 2018) and lead to different staff approaches that could confuse patients (Yates & Lathlean, 2022). In several studies, patient involvement was considered an important part of collaboration and teamwork in implementing Safewards. The active engagement of patients and seeing patients as part of the community would remind staff of the importance of implementing the interventions and help them maintain the interventions consistently (Maguire et al., 2018; Yates & Lathlean, 2022). Similarly, the failure to involve patients was identified as a barrier to implementation that could lead to a limited adoption of Safewards (Price et al., 2016).

Skills and knowledge

The level of current skills and knowledge of all staff has an impact on their capability to implement innovations and understand the modifications needed in routine practice. This impact was acknowledged in several text units, showing that a lack of understanding of interventions could lead to a lack of or superficial implementation (Fletcher et al., 2019; James et al., 2017; Price et al., 2016). Difficulties or reluctance to implement Safewards were described in some text units as being related to staff feeling that their current nursing knowledge was being questioned (Lee et al., 2021). Therefore, it was important to help staff understand the differences between routine daily practice and structured interventions (Lee et al., 2021). Other described barriers were large numbers of temporary staff lacking Safewards skills and knowledge or inexperienced staff required to lead interventions without sufficient skills or support (James et al., 2017). Moreover, if there were staff working in wards with different levels of intervention skills and knowledge, the care provided would be inconsistent and confusing for patients (Yates & Lathlean, 2022). Several text units related to insufficient and inadequate Safewards training, especially among frontline staff, leading to a lack of confidence and understanding of the interventions (James et al., 2017). At the same time, staff could have been provided with adequate training but still lacked skills and knowledge due to their disinterest in the training (Lee et al., 2021). It was also indicated that champions who were expected to train staff could require more in-depth training, including pedagogical skills (Lee et al., 2021).

Power and authority

With a sense of power and authority in the implementation process, the staff can make decisions and take control of the new way of working in a way that enables progress. Some text units described that staff in challenging situations felt positively empowered by their renewed understanding of staff–patient interaction (Fletcher et al., 2019). Another enabling aspect for implementation was related to the active involvement of staff and in one case, patients and families, in a co-creation process that contributed to the acceptance of Safewards (Kipping et al., 2019; Lee et al., 2021). Barriers were related to passivity among staff due to experiencing a lack of ownership or seniority to implement the interventions, and that it was someone else who was accountable and owned the project (Fletcher et al., 2019; James et al., 2017). Sometimes, the champions were seen as accountable for implementation, leading to less engagement by other staff (Higgins et al., 2018).

Other subconstructs

**Local opinion leaders:** Of the local opinion leaders, senior nurses in senior positions seemed to be the most influential, both positively and negatively, towards Safewards (Higgins et al., 2018). At the same time, one study found that recently qualified nurses were generally more positive towards Safewards and that their enthusiasm could have a positive impact (Higgins et al., 2018). Moreover, in another study, a psychiatrist in the ward positively promoted implementation by adjusting her own routines according to Safewards (Fletcher et al., 2021). Negative senior nurses were described as sometimes holding back an entire ward from implementing Safewards (James et al., 2017). Similarly, strong opinions expressed by a negative group of staff about an intervention could change a previously positive staff member, and vice versa (Higgins et al., 2018; James et al., 2017).

**Motivation:** Some text units described that the level of motivation among staff was reflected by spontaneous ideas, creativity, and recommendations on how to proceed with the implementation of different interventions (Fletcher et al., 2021; Lee et al., 2021; Maguire et al., 2018). Similarly, discussions among staff about the need for change in practice revealed the underlying motivation. Another motivating and empowering factor for staff and reassuring for patients was positive feedback and encouragement from patients (Davies et al., 2020; James et al., 2017). Time was another issue that seemed to have either a negative or a positive impact on staff motivation. In some text units, it was described that the longer the implementation of Safewards, the less motivation and enthusiasm among the staff (James et al., 2017; Lee et al., 2021). Other text units indicated that the initially disengaged staff later became more engaged (Higgins et al., 2018).

**Presence of boundaries:** The presence of different types of implementation boundaries was described in a few text units. In one study, implementation difficulties with specific interventions were attributed to the severity of some patients’ mental health symptoms (Davies...
et al., 2020). Other boundaries related to an insufficient training model (Price et al., 2016) and the perceived feelings among nurses that the senior champion nurses designated to support the implementation were too busy to be interrupted (Lee et al., 2021).

Goals: Very few text units clearly describe goals for the implementation of Safewards. One text unit described the goal of achieving a positive change in the ward atmosphere (Maguire et al., 2018), and another text unit described that staff expected Safewards to only be something temporary (Lee et al., 2021).

Existing networks: Only one study included the use of existing networks. In this case, it was related to the benefits of collaboration between different wards to gain inspiration and ideas for the implementation of different interventions (Davies et al., 2020).

DISCUSSION

To the best of our knowledge, this is the first review to use an implementation science framework to analyse qualitative data from published Safewards studies. One of the main findings was the lack of data representing the first and second i-PARIHS constructs of context: External health system level (six text units, 1.5% of all text units) and organizational level (15 text units, 3.7%). This low representation is in stark contrast to the third construct of context: Local level (95 text units, 23%). Context has been identified as an important determinant for evidence-based practice (Nilsen & Bernhardsson, 2019). At the organizational level, (Cummings et al. 2007) found that hospital characteristics increased nurses' research utilization through factors such as staffing and support services, staff development, and opportunities for nurses to collaborate. Research on the implementation context has mainly focused on local and organizational levels, but rarely on external health system levels, a level described as under-researched and in need of further exploration (Harvey et al., 2019; Nilsen & Bernhardsson, 2019). In this review, the low representation of both organizational and external context data may indicate low staff awareness of the potential impact of both the organizational and external contexts or possibly low expectations among staff of implementation support outside the local-level context.

It is also possible that staff in wards are more used to local quality improvement projects based on the principles of improvement science and a bottom-up approach rather than an implementation science-based approach covering wider aspects of contextual factors than the local ward (Nilsen et al., 2022). In addition, suggestions for the implementation of Safewards described on the main international Safewards website (Safewards.net) are specifically directed at ward managers which further points to a quality improvement approach at the ward level. This is in contrast to another model often used to reduce the use of restrictive practices, the Six Core Strategies, which highlights the organizational level and calls its first strategy 'Leadership towards organizational change' mandatory and crucial to implementation success (Huckshorn, 2004). According to Nilsen et al. (2022), although implementation science and improvement science may have different starting points and academic perspectives, they have the same goal of improving healthcare service outcomes and can therefore benefit from each other's areas of knowledge.

Interestingly, the three subconstructs with the most coded text units represented all three main constructs: Formal and informal leadership support (Context), Degree of fit (innovation), and Values and beliefs (recipients). This suggests that if the local ward or organization wants to direct limited resources to only a few implementation determinants, these three may be a good start. This could include, for example, identifying senior nurses as role models and ensuring that managers are visibly engaged, identifying with staff what parts of Safewards feel familiar or strange, and whether they feel validated or questioned by Safewards interventions and the theoretical foundation.

In general, the text units did not turn out evenly among the i-PARIHS subconstructs, with some clearly being more represented than others. Most text units in the 'innovation' construct were coded as Degree of fit, Observable results, and Relative advantage, with more than 25 text units. Among the 'recipients,' the subconstructs with more than 25 text units were Values and beliefs, Collaboration and teamwork, and Time, resources, and support. At the local Context level, only Formal and informal leadership support comprised more than 25 text units. This finding indicates that these implementation determinants, perceived as barriers or enablers, are the most relevant and important to the staff in implementing Safewards. As many studies have described the challenges in the implementation process, it is possible that by further strengthening and addressing these determinants, staff will feel more supported. As could be expected, the most represented subconstructs in this review were also identified to a high degree in the Safewards reviews by Mullen et al. (2022) and Ward-Stockham et al. (2022). A contribution of this review is the provision of a highly structured analysis of specific barriers and enablers and the introduction of i-PARIHS terminology that may facilitate further discussions on the implementation of Safewards.

Several subconstructs were matched by fewer than five text units, such as Past experience of innovation and change (context/local level), Trialability (innovation), and Goals and Existing networks (Recipients). Similar to the more highly represented subconstructs, it may be important to further highlight these determinants in the implementation process and explore whether they have...
previously undetected potential to contribute to implement-
mentation. At the same time, in the classic theory of dif-
fusion of innovation, which is one of the major theories
that underpins the i-PARIHS, it says that of all different
identified determinants, it should not be readily assumed
that all have to be prominent parts of the implementation
process. Rather, in reality, a few determinants acting as
strong enablers may compensate for other determinants
perceived as barriers or insignificant (Rogers, 2003).

In a systematic review of the use of implementation
theories, models, or frameworks in studies on the re-
duction of restrictive practices in psychiatric care, only
0.2% of the 5295 identified studies used any named the-
ory, model, or framework (Lantta et al., 2023). Two of
the 10 studies included in our review used theoretically
based implementation frameworks in their design. Higgins et al. (2018) used Michie's integrative frame-
work of behavioural change to help identify target
areas to enhance implementation. Fletcher et al. (2021)
used CFIR (Consolidated Framework for Implemen-
tation Research) to inform more effective implementa-
tion and identify CFIR constructs that distinguish
wards with different levels of implementation success.
They found that on high-implementing wards, defined
by implementing 8–10 interventions, Safewards was
compatible with current values and workflows, was
positively valued, had strong leadership support, com-
mitted champions, and more engaged consumers.
Interestingly, our findings of the most represented text
units matched into the i-PARIHS subconstructs, Formal and informal leadership support, Degree of fit, and
Values and beliefs reflect to a high degree the findings
of Fletcher et al. (2021) which further strengthens the
importance of these subconstructs. It is encouraging
to the development of successful implementation of
complex innovations in psychiatric care that the inclu-
sion of implementation frameworks may become more
common.

Strengths and limitations

A strength of this review is that the qualitative data
included in the analysis came from a variety of data
collection methods in the original studies, such as in-
dividual and focus group interviews, written diaries,
and surveys. Likewise, the data came from different
types of settings and groups of participants. The re-
results of this review indicate that, despite this variety,
the most and least noted implementation determinants
are similar.

The use of framework synthesis enabled a deductive
approach based on i-PARIHS which offered a highly
structured analysis appropriate for presenting the results
in a table and figure to identify and explore data pat-
tterns (Booth et al., 2016), as well as running texts to
describe barriers and enablers to increase the transparency
of the analysis. One benefit of this deductive approach,
compared with previously used inductive methods, is the
identification of what is not in the data.

This review has some limitations that should be con-
sidered. One limitation of the coding process was that
our unit of quantitative analysis, the text unit, was
weakly defined and could not be considered exact. This
led to repeated discussions between the coding authors
regarding what constituted the beginning and end of
each text unit. Similarly, text units were not always eas-
ily categorized into i-PARIHS subconstructs because,
although consulting guiding references, we found a lack
of concept clarity and difficulties in differentiating be-
tween subconstructs, especially within the same main
construct (Stetler et al., 2011). Therefore, it is possible
that another review team would define text units differ-
ently and code them in other i-PARIHS subconstructs.
However, we believe that this would not make enough
difference to change the most explicit findings of this
review.

Similarly, it is important to address the presence of
researcher effects (Booth et al., 2016). All authors of
this review are aware of several challenges in the imple-
mentation of Safewards in psychiatric and mental health
settings through their professional roles in psychiatric
services. This may have affected how the text units were
coded and interpreted. Similarly, in most of the included
studies, the authors were themselves involved in the
implementation of Safewards which could have biased their
choice of quotes and interpretations, which in turn was
used in this review.

Through a literature search, we identified 10 stud-
ies that met the inclusion criteria. Even though three of
these were assessed according to the CASP as having
more than no or minor methodological limitations, all 10
were included in the review. We found it inappropriate
to exclude three methodologically weaker studies because
they still presented substantial qualitative data relevant
to this review (Pawson, 2006).

CONCLUSION

These findings could contribute to new implementa-
tion science-based suggestions on possible Safewards
implementation determinants, whether perceived as
barriers or enablers, to pay closer attention to when
planning the implementation process or facing its chal-
enges. The three subconstructs of the i-PARIHS that
were most frequently referred to were Formal and infor-
mal leadership support (context), Degree of fit (innova-
tion), and Values and beliefs (recipients). The external
health system level and organizational level of the
main construct of Context were in this review hardly
represented at all which calls for further investigation
of an area that might be underrecognized in the imple-
mentation support.
RELEVANCE FOR CLINICAL PRACTICE

There is a need to minimize the use of restrictive practices in mental healthcare. Safewards is a model that has shown the potential to achieve this, but at the same time has often been found to present implementation challenges in clinical practice. The findings of this review could be used to further understand aspects of barriers and enablers to implementation and inspire implementers, whether at the organizational or floor level, to address determinants that may previously have been unrecognized.

AUTHOR CONTRIBUTIONS

All listed authors meet authorship criteria according to the guidelines of the International Committee of Medical Journal Editors. All authors are in agreement with the manuscript.

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All authors contributed to the article. AB, UJ, LK, and VP: conceptualization, design, methodology, and conduct of the study. AB and UJ: analysis and interpretation. AB: writing – original draft preparation. AB, UJ, LK, and VP: review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors have no interest to disclose in relation to this manuscript.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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