

A Systematic Review of the Measurement of inpatient falls BMC Final

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Abstract

Background:

In-patient falls are a major cause of morbidity and mortality in the United Kingdom (UK) National Health Service (NHS). Although falls prevention guidelines exist, there is little evidence supporting the efficacy of interventions in hospital settings. Current national benchmarking based on occupied bed days (OBD) does not acknowledge varying ward layouts, differences in patient visibility, and staffing levels, which affect the ability to monitor at-risk patients. This systematic review seeks to evaluate the use and limitations of the measurement of accidental falls in hospital, when considered in the context of the setting in which it is reported.

Methods:

This review was conducted to PRISMA guidelines for systematic reviews. Interventional studies that used falls/1000 OBD as a metric were included. Thematic analysis within NVivo15® was utilised to analyse the results. The Systems Engineering Initiative for Patient Safety (SEIPS) model was used to interpret and present the results.

Results:

From 3,541 articles searching 9 databases, 103 studies from 18 countries were included. The study has four key findings. The definition of a fall varies between study sites and is not stated in 42 (50%) of the full text studies. There is a lack of consistency in how the measure is expressed, resulting in comparison between hospitals that is not equivalent. The type of fall or how it is classified may mean that not all falls are reported due to subjectivity at ward level. There are multiple different interpretations of what constitutes a fall. There are multiple contextual challenges that cause an unacceptable level of variability; such as ward design and patient visibility, that are not measured or accounted for within any of the studies. Number of staff available on each shift has also not been measured as a variable.

Conclusion:

The findings from this study emphasise the importance of understanding how hospital falls are shaped by interactions between technology, people, and the environment. This reinforces the need for a systems perspective and Human Factors methodologies to tackle this pervasive patient safety challenge.

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Background

Inpatient falls are a significant cause of morbidity and mortality, with approximately 250,000 occurring annually at a cost of £2.3 billion to the NHS_(1, 2). Although falls prevention guidelines exist, there is little

evidence supporting the efficacy of practical interventions in hospital settings particularly with patients who are cognitively impaired ^(3, 4).

Benchmarking performance using falls per 1,000 OBD⁽⁵⁾ does not acknowledge the context in which falls occur, varying ward layouts, differences in patient visibility, and staffing levels, which all affect the ability to monitor at-risk patients. The Royal College of Physicians ⁽⁶⁾ recognised these issues and now actively discourages benchmarking. However, the practice persists due to the lack of an alternative; with falls/1000 OBD used as a performance indicator in many hospitals in the UK and other countries.

Definition and Classification of falls

Multiple definitions of what constitutes a fall can lead to variance in reporting. The World Health Organization ⁽⁷⁾ defines an accidental fall as,

“an event which results in a person coming to rest inadvertently on the ground or floor or other lower level”.

Anticipated falls with assistance, when a patient is being mobilised as part of their recovery and are gently lowered to the floor, versus an unwitnessed fall where a patient is found unexpectedly on the floor are regarded very differently. Subjective reporting decisions at ward level result in local variation ⁽⁸⁾. Additionally, slight variations to the definition of a fall can lead to inaccurate reporting of fall incidence and significantly alter outcomes of research ⁽⁹⁾. Improvement is difficult if reporting is not standardised.

Reporting of falls

In the UK there is no obligation to report falls nationally, however most but not all secondary care foundation trusts (FT) report their falls to the National Audit of Inpatient Falls (NAIF) ⁽⁶⁾. There is however a requirement to report all falls resulting in a head injury or hip fracture and the reporting emphasis and actions now focus on post falls care ⁽¹⁰⁾. For all other falls that result in minor or no injury there is no requirement to distinguish between types of fall. Reporting variability is not limited to the UK ⁽¹¹⁻¹³⁾ and can be influenced by system-person interactions, including unwillingness to report due to financial implications for the hospital, administrative workload avoidance or blame culture - to name a few. Different staff may have different thresholds at which they report. These variances mean that the small number of studies undertaken to measure the efficacy of fall prevention measures lack generalisability and provide inconclusive results.

The changes to national audit programmes have resulted in less benchmarking between hospitals, with data held locally, allowing for further local discrepancies ⁽¹⁰⁾. This variation is evidence of suboptimal governance in this space, with opportunity for system improvements once the full extent of diversity in measurement is understood. This systematic review therefore seeks to evaluate the use of falls/1000

OBD as a measurement of accidental falls in hospital when considered in the context of the hospital setting.

Methods

Search strategy

This review was prospectively registered (PROSPERO CRD42024527948) and adhered to the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA)⁽¹⁴⁾. The search string (Appendix 1) comprised keywords and synonyms related to accidental fall prevention in hospitals. This was subsequently expanded to include studies counting percent of patients experiencing a fall or a simple count, as a rate of falls or an odds ratio or relative risk due to the small number of studies identified. The databases searched from inception were Medline, Embase, Web of science, Cinahl, APA Psych, AMED, Scopus, Cochrane and Epistemonikos. Proquest Dissertations and Theses was also searched for grey literature. Databases were last searched 3rd January 2026.

Study Selection and Eligibility Criteria

Population - Studies were eligible for inclusion if participants were aged 50 years and over in line with NICE guidance⁽⁴⁾ that advises all patients 65 years old and over and those over 50 years old with long term conditions should be considered at high risk of falls when in a hospital setting. This included mental health and rehabilitation, in any country published in any language as this is a worldwide problem⁽¹⁵⁾. Any study considering Emergency Departments, Children's wards, Critical Care or community residential setting or long-term care, were excluded as the environment is different to standard inpatient care.

Intervention - Any paper where the impact of an intervention, aimed at reducing accidental falls in hospital, was being measured to illustrate a change in the number of accidental falls experienced. The intervention itself was not limited to any specific type of intervention. Where technology was utilised, the term technology referred to any equipment used to prevent falls in hospital such as non-slip socks, bed rails, camera, infra-red and bed chair exit alarms.

Comparator – Studies with or without a comparator were included.

Outcomes - Any paper that measured and recorded the outcome as a change in the number of falls with any metric that could be converted to falls/1000 bed days.

Whilst occupancy calculation is explicit in the UK the method to calculate occupancy varies in other countries. The calculation of falls per 1000 OBD is designed to interpret the rate of falls experienced in one area as bed numbers or occupancy rates may vary. The Patient Safety Observatory⁽¹⁶⁾ stated "this

allows for comparisons between different units and between organisations” and at the time was recommended for benchmarking between hospitals.

The calculation is as follows:-

$X/Y = \text{Falls per 1000 occupied bed days}$

Where:

X = the total number of all patient falls reported in the hospital/unit in the most recent year for which data are available.

Y = the total number of OBD in the hospital/unit in the most recent year for which data are available, divided by 1,000 ⁽¹⁶⁾. An OBD is defined as a bed which is occupied at midnight on the day in question ⁽¹⁷⁾ and is reportable on a daily basis to NHS England (NHSE).

The Lead author independently screened title and abstracts for eligibility, then reviewed all full text studies. Review of the full text studies was then undertaken by 2 colleagues (AB, LE). The same standardised screening form was utilised by the lead author and piloted and approved by the two independent reviewers (Appendix 2).

Data Extraction

The lead author independently extracted data from all the included studies. To validate the content of the data extraction the two reviewers (AB, LE) independently extracted data from 24% of the included studies. All reviewers utilised the same data extraction form (Appendix 3) and any disparity was discussed with the lead author. The intention was to convert all quantifiable measures to the per 1000 OBD measure where possible (dependent on availability of data) so that data could be compared directly or where an alternative measure was used evidence was sought to illustrate why. There was, however, insufficient data available in the included studies that did not use OBD, to calculate falls per 1000 OBD and in those that did use falls per 1000 OBD the occupancy data was not available to validate the calculation. The heterogeneity and quality of data available was too limited to consider conversion to one metric and as such it was not possible to attempt a meta-analysis.

Quality Assessment

Quality assessment was undertaken after data extraction to minimise the risk of bias in study selection. Risk of bias of the included studies was assessed using Downs and Black's ⁽¹⁸⁾ 27 item checklist for randomised and non-randomised studies, where all 27 items were considered. This tool has been used across systematic reviews including randomised and non-randomised studies ⁽¹⁹⁾. Studies were assessed independently for risk of bias by the lead author and one independent reviewer (AB) reviewed 6% to corroborate.

Data Analysis

Thematic analysis was undertaken in NVIVO 15® and structured using the SEIPS 2.0 model ⁽²⁰⁾.

Descriptive and analytical data were identified as pertinent to the review question posed, extracted and themed.

Data Synthesis

Studying phenomena like hospital falls requires a focus on how these events are shaped by various interacting elements rather than viewing them as isolated incidents. SEIPS 2.0 ⁽²⁰⁾ is a framework for understanding and improving complex healthcare systems by considering how work-system interactions influence patient outcomes. Fall prevention interventions are an example of this complex web of interactions. The context of each study was also examined in this systematic review, whereby themes were extracted and mapped to the five internal work-system components of the SEIPS model, organisation, internal/external environment, person, tasks, tools and technology ⁽²⁰⁾.

Results

The search strategy yielded 3541 non-duplicate studies, 2 additional articles were included after reference, websites and grey literature screening. Subsequently, 414 papers qualified for full text screening and 103^(21–103) met the inclusion criteria (Fig. 1). Nineteen were abstracts and did not include enough information to be fully analysed but were counted to represent the small number of studies that demonstrated the wide geographical relevance of fall prevention.

Study Characteristics

Of the 103 studies included 36 (35%) were undertaken in the US, 20 (19%) in Australia and 11 (11%) in the UK. The remaining studies were performed in Ireland and Canada (n = 5), Singapore (n = 4), Switzerland, Germany and Netherlands (n = 3), Korea, Italy and China (n = 2), Malaysia, Spain, Brazil, Iran, Japan, Norway and Thailand (n = 1).

Seventeen (17%) of the 103 included studies were randomised controlled trials. Forty-eight (47%) studies were quality initiatives or performance management interventions including all 19 abstracts ^(104–122).

The remaining studies were 15 (15%) time series analysis of pre and post-test design, six (6%) quasi experimental and four (5%) retrospective longitudinal studies. Also, a mixture of non-equivalent (n = 6) or case-controlled cohort studies (n = 4), retrospective document reviews (n = 2) and surveys (n = 1).

Quality Assessment

There were 9 studies that ranked as high quality, 51 as medium quality and 43 rated as poor quality which included 19 abstracts. No studies were excluded from the review based exclusively on their overall

score although the 19 abstracts were removed from the total count in the analysis. Publication bias was considered but most papers acknowledged failures to make a difference as well as reporting on improvements.

Limitations identified by authors included that blinding was not possible as the nursing team needed to be aware of the intervention in the RCTs.

Definition of a fall

Of the 84 full studies included, 42 (50%) included a definition of a fall and there were 21 different definitions (Table 1: Appendix 4). Fifteen (18%) of the organisations hosting the studies devised a local definition. The WHO definition was referenced in 9 studies, 2 had added 'with or without injury' and 1 had added some exclusions. Six used their national standards definition^(11,123,124). Two^(80,92) used the definition proposed by the Kellogg International Work Group⁽¹²⁵⁾ and 10 used definitions from published papers studying falls^(9,126–132). There were 6 different adverbs used within the different definitions.

The measure

Four studies described how they had calculated OBDs. Melin⁽⁶¹⁾ and Padula et al⁽⁷⁰⁾ stated the calculation and provided the data on patient falls and patient days that was calculated by the organisation. Mitchell and Jones⁽³⁵⁾ expressed the calculation citing the daily number of in-patients instead of occupancy and Morris⁽³⁶⁾ provided the calculation and the occupancy rates for the time period of the intervention. Seventy-nine (94%) of the studies did not provide enough data to fully understand how the outcome was measured.

In the 84 full studies there were 14 different ways of expressing the measure (33 used Falls/1000 patient days, 12 used Falls /1000 Occupied Bed Days, 11 used % of patients falling, 10 used a straightforward count, 9 used Falls/1000 Bed days, 3 used Falls/1000 Hospital Days, 2 used Falls /1000 Participant Days, 2 used Falls/1000 Patients per day, 1 used Falls/1000 Separations, 1 used Falls/1000 Days in hospital, 1 used falls /1000 in patient days, 1 used Falls/ patient falling, 1 used Falls/1000 median length of stay days and 1 used Falls/1000 admissions). Four studies used 2 different ways to express the measure in the same paper^(27,49,67,88).

Fifty (67%) studies stated that they had demonstrated an improvement in the rate of falls and this group used 8 different metrics. Twenty-one studies (25%) reported inconclusive results using 7 different metrics and 13 (15%) reported no difference with 9 different metrics.

Classification of falls

Forty-four (52%) studies reported different types of fall. Ten of the 44 reported a classification other than level of harm with five using location, three using study specific classification, one using national guidance and one using international classification of disease categories. Twenty-six of the studies who

did report different types of fall also reported a reduced level of harm and 21 of these also reported a reduction in falls overall.

SEIPS analysis

Organisation

The organisation element of the work-system (policies, scheduling and other facets of work) associated with falls ⁽²⁰⁾ has significant influence on the other elements of the work system ⁽⁴⁰⁾.

Seven studies reported on new clinical guidelines or policy implementation, to prevent falls by altering the way care was delivered ^(26,36,57,58,66,134,135). Twenty (24%) of the studies quantified the number of staff employed. Ten of these used national benchmarks, a different ward, different hospital or a different cohort of patients as a control and recorded the budgeted whole-time equivalents per patient day ⁽⁷⁰⁾ or stated that “adequate staffing was achieved” ⁽¹⁰²⁾. Without definition of parameters and measurement of any deviation from these, ‘adequate’ or a generalisation of staff available to respond to patient calls fails to recognise a limiting variable. Sixteen studies (19%) examined the number of staff available to deliver the care but did not record a shift-by-shift variance from safe staffing or note any correlation between staffing levels and number of falls occurring.

External Environment

The external environment relates to the societal, economic, regulatory and policy factors outside an organisation. Twenty-seven of the 29 (93%) studies authored in the US have been published since 2008 when national policy for reimbursement changed and represents 32% of the included studies.

Internal Environment

The internal environment component of SEIPS refers to the physical environment in which the teams studied were working. Design of the built environment including layout and space play a significant part in ward teams routine functioning, as visibility of patients to detect changes in symptoms or behaviour is vital to determine priorities of care.

Twenty (24%) of studies reported the location of the fall. Fifty-two (62%) used different cohorts on the same ward as a control to remove the environmental variable. Sixty-two (74%) of the studies did not consider the internal environment in which the study took place as a potential variable and did not report or record the location of the fall. Nineteen (31%) of these used a control group in a different hospital, different ward or national benchmarks. None of the studies reported on physical environmental conditions such as lighting, temperature and auditory stimuli.

One study highlighted the importance of being able to see the patient and the difficulties encountered with side rooms and unusual ward layout but this was not included as a metric and was specific to volunteer companions ⁽⁴⁴⁾. Other studies did mention visibility in the context of moving patients to observable beds but not the difficulty in providing observation or how the limitation in number of

observable beds was managed, particularly regarding patients in single rooms. No studies reported staffing at the time of a fall or reported any correlation between these. No studies reported any operational issues or issues for patients with cognitive impairment associated with these bed moves. No detail was provided of how the alternative bed space provided more visibility or how the internal environment supported or challenged this recommendation. 1 study did provide a 4 bed close observation area but did not explain what happened to patients who needed observation and were unable to access this facility ⁽⁸⁴⁾.

Person

Holden et al ⁽²⁰⁾ placed the person in the centre of the sociotechnical system reflecting and emphasising that design should support people ⁽¹³⁶⁾. The measure of falls needs to reflect both the capacity and capability of the staff and the dependency and acuity of the patients.

Thirty-seven (44%) of the included studies' interventions were based on education or re-education of the nurses and/or the provision of new risk assessment tools. Twenty-five (30%) of studies consulted with the ward teams before, during or after the study. Studies changing policy did not report any outcome from staff feedback or consultation and 2 (2%) reported patient or relatives opinion ^(37, 44). Sixteen (19%) studies considered the potential for under reporting, 7 (8%) measured reporting during the study. Kalafus et al ⁽⁵⁴⁾ did consider the importance of how staff interacted with the intervention.

Twelve (14%) of the studies excluded patients who were cognitively impaired and 8 (67%) of those reported an improvement in the number of falls. Thirty-two (38%) studies did not state whether patients who were cognitively impaired had been included or not. One study ⁽⁶⁷⁾ selectively included patients based on their level of cognitive impairment (MMSE > 23). Fifty-nine (70%) of the studies included patients with cognitive impairment although not all clearly stated that they had, it was inferred from their sampling strategy.

Tasks

Tasks are specific actions within larger work processes ⁽²⁰⁾. All eighty-four full paper studies included a nursing risk assessment to be completed on admission, 9 (11%) reported compliance from audit of all assessments completed during the study, 2 reported improvement in compliance during the study, 9 estimated compliance from sampling notes. Four mentioned the importance of compliance but did not report results. Thirty eight (45%) offered advice on what resource to use to help prevent falls but did not report compliance. Three (3%) studies assigned humans as companions to provide enhanced observation.

Reporting is a standardised task post fall; in more recent studies an electronic incident form is used. Of the 7 (8%) studies that measured fall reporting accuracy, 3 reported compliance figures, ranging between 43%-98% ^(69, 81, 92).

Tools and Technology

Design of technology and their integration into systems of work should be based on the needs of users⁽¹³³⁾. Thirty-five (34%) of the studies utilised fall prevention technology that could be deployed to alert the nurse if the patient was getting out of their bed or chair. Twenty four (69%) of these 35 were simple bed and chair pressure pads. Twelve (34%) of the 35 looked at the technology as a single intervention to study its efficacy. 1 study used the technology to provide insight into how many falls had been prevented.

Discussion

This systematic review seeks to evaluate the use of falls /1000 OBD as a measurement of accidental falls in hospital. Eighty-four full studies were included, published between January 1993 and January 2026 reporting on interventions to reduce accidental falls in hospitals. The study has four key findings:-

1. The definition of a fall varies between study sites and is not stated in 61 (73%) of the studies.
2. There is a lack of consistency in how the measure is expressed as the method of calculation and data used is not transparent or consistent, resulting in comparison between hospitals that is not equivalent.
3. The type of fall or how it is classified may mean that not all falls are reported due to subjectivity at ward level. There are multiple different interpretations of what constitutes a fall.
4. There are multiple contextual challenges that cause an unacceptable level of variability, such as ward design and patient visibility that are not measured or accounted for within any of the studies. Number of staff available on each shift has also not been measured as a variable.

Definitions

The differences between the 21 definitions centres around the adverbs: inadvertently, unintentionally, unexpectedly, suddenly or involuntarily, to describe a fall. Using adverbs defines how the fall happened and that shouldn't be decided until after investigation. This subjectivity can result in variability in local and national reporting. Whilst there are clear definitions published by National⁽⁴⁾ and International organisations^(15, 137) they do differ and this variance alone suggests that hospitals are not measuring the same thing.

Planned assessment of a person's ability to mobilise safely can involve the patient having to be lowered gently to a surface lower than their original position and constitutes a fall. This could be regarded as a planned lowering and therefore intentional, but Hardin et al⁽⁴⁹⁾ definition 'includes assisted falls'. The review provides evidence, therefore, that comparisons between hospitals are of little value as contradictory guidance suggests different data will be reported. A more specific definition targeting preventable falls may mean we produce data that can influence practice and empower teams in falls prevention.

Standardising what is reported may not be possible. Haines et al ⁽⁸⁾ gave prior falls definition training to 446 healthcare professionals, to standardise reporting but there was still significant variance in agreement between respondents when presented with fourteen different falls scenarios.

The Measure

An occupied bed day in the UK is defined as a bed which is occupied at midnight on the day in question ⁽¹⁷⁾. This part of the calculation is not replicated across different countries and is often replaced by the number of admissions, patient days or days in hospital ^(49, 75, 138) leading to multiple different metrics. Data that would allow retrospective calculations has not been collected. This renders a meta-analysis and the ability to impact national and international guidelines impossible. Current UK hospital occupancy rates are reported by organisations as circa 90% ⁽¹⁷⁾ but this does not reflect the clinical experience of overcrowding, extra beds on wards and corridors and long waits in the Emergency Department ⁽¹³⁹⁾. As such this may skew data on falls risk and incidence.

Classification of Falls

Detail of the type of fall was not recorded in the majority of the studies and level of harm was the most common classification used. The absence of 'type of fall' data raises the question of how to implement the findings. If we accept that some falls are unavoidable ^(140, 141) reducing level of harm is a useful aspiration but understanding impacts of interventions requires further contextual detail. It is not ethical to remove standard care therefore multiple specific measures may be the way forward. It is also possible that a fall occurring outside the remit of an intervention should not be included in the outcome measure, such as corridors where video observation is not deployed, but if the location of the fall is not reported this is difficult to assess. When a bedside alarm sounds and the nurse takes the patient to the toilet, the bedside alarm has prevented a fall. If the nurse then leaves the patient on the toilet, a fall under those circumstances is not a failure of the intervention but failed monitoring in the toilet. A recent Cochrane review ⁽⁶²⁾, however, excluded a paper ⁽⁷⁶⁾ for only measuring bedside falls rather than total.

Falls Work System

Funding of healthcare shapes how systems are designed. The proliferation of studies in the US after 2008 may suggest that the risk of funding being withheld motivated an increased emphasis on fall prevention. The subsequent reduction in reported falls may not be an indication that interventions worked, more that staff reported less for fear of being blamed for loss of income. One study ⁽⁸⁸⁾, resulted in the nursing team vocalising concerns that education provision suggested wrongdoing. This expressed feeling of negative repercussions may also result in underreporting of falls. There is an over reliance on humans to provide safety controls in the healthcare system ⁽¹⁴³⁾. Humans are fallible, and personal and team performances vary and are likely to deteriorate in high-pressure situations ⁽¹⁴³⁾. There will continue to be both local and national variation in reporting, impacting measurement, until there are reliable ways to report falls without negative implications and additional workload.

The built environment impacts staff job satisfaction, patients' satisfaction, patients' stress and fall reduction ⁽¹⁴⁴⁾. Visibility of patients and coworkers reduces cognitive load ⁽¹⁴⁵⁾ but screening of wards to provide increased privacy and dignity means visibility is compromised. Measurement of falls must include the specific challenge of multiple individual rooms, reduced visibility and subsequent impact on situation awareness for nursing teams. Studies using a different 'control' environment ^(36, 56) overlook the impact of the physical layout of a ward, the staffing variability, ward organisation, lighting, temperature and auditory factors, potentially contributing to the 34 (41%) results that failed to demonstrate significant change.

Fifty-two (62%) of the studies in the review used a control cohort on the same ward to minimise internal environmental variables but did not measure them. Whilst this does utilise the same team and geographical environment the change in practice required to manage two different groups of patients is significant and disrupts the usual shift organisation. This can lead to a new system of work as nurses find workarounds ⁽¹⁴⁶⁾ and fails to capture changes in 'usual care', creating hidden unmeasured variables that impact on falls risk and prevention.

System design should be inductive, healthcare will be influenced by the organisational culture and by the skills and behaviours of individuals or teams ^(136, 147). Assigning staff to observe high risk patients, by moving a patient to a more observable bed with staff dedicated to the observation task, results in additional and modified workload. This system variance should be measured in future research to give insight to inconsistent results.

Tools like fall prevention alarms create and define patient safety opportunities that need to shape and be shaped by their interactions with people and practices. Measuring compliance should encompass both a) if equipment is used and b) how it is used. Without a measure of compliance within a system, it is difficult to understand how much it has or has not contributed to any outcomes. Where compliance was reported in the studies, it was determined by staff entries in notes or by manual sampling of bed-end notes. Neither of which confirm definitive action to protect patients, additionally their ability to be manipulated can introduce a lack of confidence in the results.

Limitations

It has not been possible to establish exactly how the calculations in all studies were made or whether the documented metric accurately reflects the outcomes. Where data was available and the calculation had been performed correctly the degree of variability in using admission data and calculating occupancy means that comparison of studies is ineffective. Whilst the RCTs are rated as high quality they fail to acknowledge variables in the workforce, patient, environment and organisation of care and the disruption caused by the research itself. Many of the studies are over 20 years old which presented difficulties in retrieving additional data that may have contributed to a better understanding.

Conclusion

This systematic review of studies using the measure, falls/1000 OBD, suggests limited relevant progress since Morse and Morse (148) highlighted the variability in measurement. It presents findings indicating that this measure of inpatient falls may only be appropriate for use where comparisons are drawn from the same individual ward or unit and where other variables are measured alongside it. Along with a specificity of how falls/1000 OBD is calculated there must also be a measure that includes some degree of confidence described in the reporting mechanism and compliance with the intervention. The lack of standardised reporting continues to hinder progress in understanding and preventing falls in hospitals. Additionally, diverse methods of measuring outcomes in inpatient care suggests that no single quantitative metric will adequately capture the complexity of fall prevention efforts.

Abbreviations

Abbreviation	Meaning
FT	Foundation Trusts
NAIF	National Audit for Inpatient Falls
NHS	National Health Service
NHSE	National Health Service England
Nvivo ¹⁵	Software program used to organize, analyse, and find insights into qualitative data.
OBD	Occupied Bed Days
PRISMA	Preferred Reporting Items for Systematic Review and Meta Analysis
RCT	Randomised Controlled Trial
SEIPS	System Engineering Initiative or Patient Safety
UK	United Kingdom

Declarations

Ethics approval and consent to participate

Not applicable

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all authors have approved the manuscript for submission

Competing interests:

None declared

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Author Contribution

Author JC developed the search strategy, conducted the search, screened all titles, abstracts and full text sources; piloted the data extraction form; performed the data extraction; analysis and write-up of the manuscript. Authors AL, MPC and KR reviewed the search strategy, analysis and critiqued the manuscript. Authors AB and LE screened a sample of the titles and abstracts, full text sources, independently quality assessed a sample of the included full text papers and piloted the data extraction form

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Data availability statement:

All data relevant to the study are included in the article or uploaded as online supplemental information (currently in Appendices).

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Figures

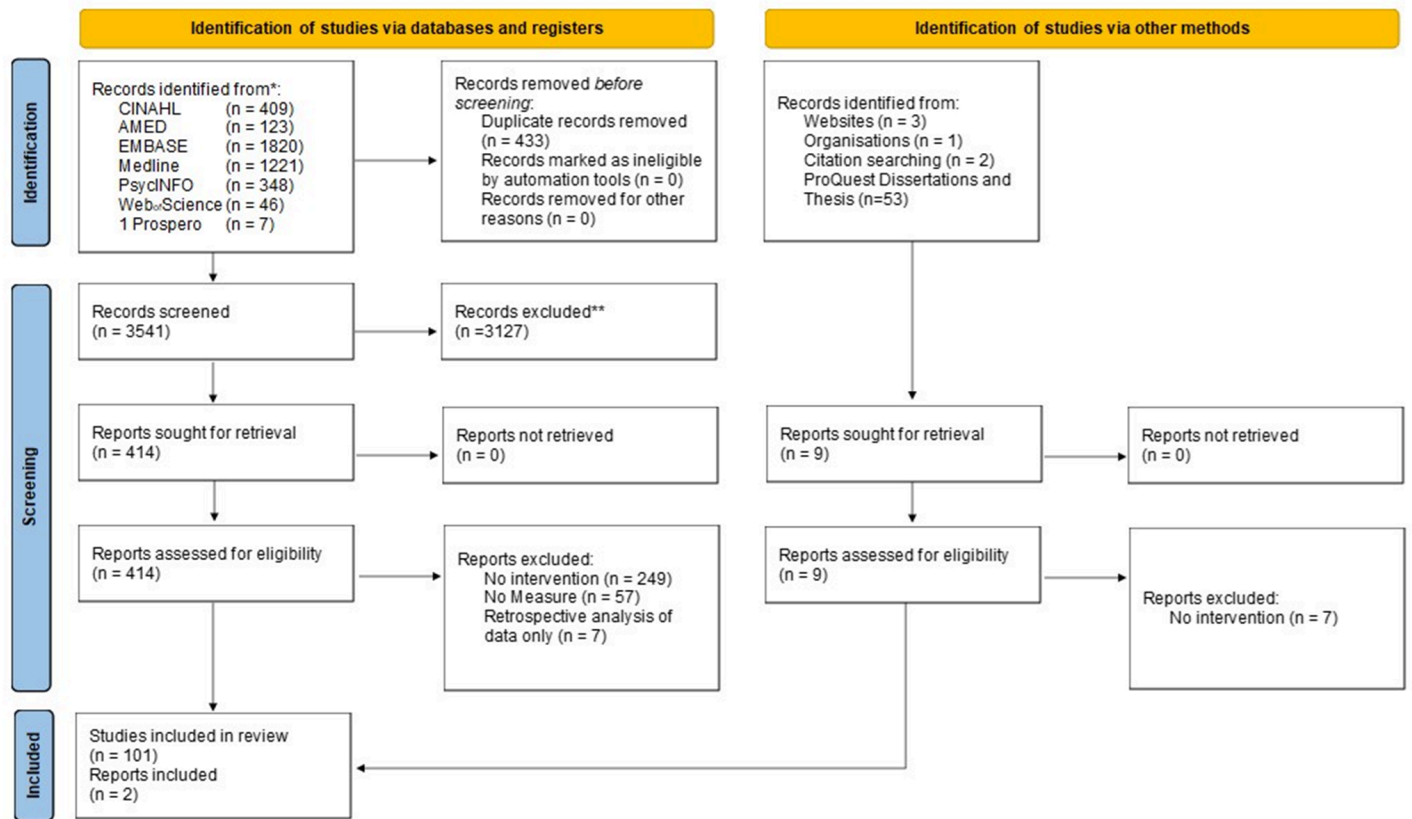


Figure 1

Prisma Flow Diagram

Supplementary Files

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