Patient Safety Incident Reporting and Learning guidelines implemented by the health care professionals in specialized care units: A Scoping Review

Thusile Mabel Gqaleni, Sipho W. Mkhize, Geldine Chironda

Submitted to: Journal of Medical Internet Research
on: May 02, 2023

Table of Contents

Patient Safety Incident Reporting and Learning guidelines implemented by the health care professionals in specialized care units: A Scoping Review

Thusile Mabel Gqaleni[1] MSc; Sipho W. Mkhize[1] PhD; Geldine Chironda[1] PhD

[1]School of Nursing and Public Health University of KwaZulu-Natal KwaZulu-Natal Durban ZA

Corresponding Author:
Thusile Mabel Gqaleni MSc
School of Nursing and Public Health
University of KwaZulu-Natal
KwaZulu-Natal
5th Floor Desmond Clarence Building
Mazisi Kunene Road
Durban
ZA

Abstract

Background: Implementing PSIs reporting guidelines is critical in guiding clinical practice and improving clinical outcomes in specialized units. Limited research on evidence looks at the implemented PSIs reporting in specialized units at the global level.

Objective: This review aims to map the evidence of Patient Safety Incident Reporting and Learning guidelines implemented by healthcare professionals in specialized care units globally.

Methods: A scoping review methodology, according to Joanna Briggs Institute, was adopted. The eligibility criteria were guided by the Population (Healthcare professionals), Concept (Patient Safety Incident Reporting and Learning guidelines), and Context (Specialised units; Global). Articles written in English were searched from relevant databases and search engines. The report was per the Preferred Reporting Items for scoping reviews (PRISMA-ScR) checklist.

Results: The thirteen (13) selected articles were published from 2003 to 2020. Most articles are from Netherlands and Switzerland (n=3), followed by South Africa (n=2). The nature of implemented incident reporting guidelines was computer online based (n=9) and paper-based incident reporting (n=4). The reporting system was for all the healthcare professionals within the specialized units, focusing on patients, staff members, and families. The outcomes of implemented incident reporting guidelines were positive, as evidenced by improved reporting of incidents, including medication errors (n=7) and decreased rate of incidents and errors (3). Other studies showed no change (n=3) in implementing the incident reporting guidelines.

Conclusions: Discussion: The implementation of reporting of PSIs in specialized units started to be reported around 2002, however, the frequency of yearly publications remains very low. Although some specialized units are still using multifaceted paper reporting systems in reporting Patient Safety Incidents, the implementation of electronic and computer-based reporting systems is gaining momentum.

Conclusion: Implementing a simplified electronic-based reporting system effectively should extend into other units beyond critical care units. Clinical Trial: No

(JMIR Preprints 02/05/2023:48580)
DOI: https://doi.org/10.2196/preprints.48580

Preprint Settings

1) Would you like to publish your submitted manuscript as preprint?

✓ **Please make my preprint PDF available to anyone at any time (recommended).**
Please make my preprint PDF available only to logged-in users; I understand that my title and abstract will remain visible to all users.
Only make the preprint title and abstract visible.
No, I do not wish to publish my submitted manuscript as a preprint.

2) If accepted for publication in a JMIR journal, would you like the PDF to be visible to the public?

✓ **Yes, please make my accepted manuscript PDF available to anyone at any time (Recommended).**
Yes, but please make my accepted manuscript PDF available only to logged-in users; I understand that the title and abstract will remain v
Yes, but only make the title and abstract visible (see Important note, above). I understand that if I later pay to participate in <a href="http

Original Manuscript

Patient Safety Incident Reporting and Learning guidelines implemented by the health care professionals in specialized care units: A Scoping Review

Thusile Mabel Gqaleni, PhD[1]; Sipho Wellington Mkhize, PhD[1]; Geldine Chironda, PhD[1]

1. School of Nursing and Public Health, College of Health Sciences, University of KwaZulu-Natal, Durban, South Africa.

Corresponding Author:
Thusile Gqaleni
School of Nursing and Public Health
College of Health Sciences, University of KwaZulu-Natal
238 Mazisi Kunene Road
Umbilo
Durban, 4041
South Africa
Phone: 27 31 260 4000 ext 1559 Email: gqalenit@ukzn.ac.za

Abstract

Background: Implementing Patient Safety Incident Reporting and Learning (PSIRL) guidelines is critical in guiding clinical practice and improving clinical outcomes in specialized care units (SCUs). There is limited research on the evidence of the implemented PSIs Reporting and learning guidelines in SCUs at the global level.

Objective: This review aims to map the evidence of PSIRRL guidelines implemented by healthcare professionals in specialized care units globally.

Methods: A scoping review methodology, according to Joanna Briggs Institute, was adopted. The eligibility criteria were guided by the Population (Healthcare professionals), Concept (Patient Safety Incident Reporting and Learning guidelines), and Context (Specialized units; Global). Articles written in English were searched from relevant databases and search engines. The report was per the Preferred Reporting Items for scoping reviews (PRISMA-ScR) checklist.

Results: The thirteen (13) selected articles were published from 2003 to 2023. Most articles are from Netherlands and Switzerland (n=3), followed by South Africa (n=2). The nature of implemented patient safety incident reporting and learning guidelines was computer online based **(**n=11) and paper-based incident reporting (n=2). The reporting system was for all the healthcare professionals within the specialized units, focusing on patients, staff members, and families. The outcomes of

implemented incident reporting guidelines were positive, as evidenced by improved reporting of incidents, including medication errors (n=8) and decreased rate of incidents and errors (n=4). One study showed no change (n=1) in implementing the incident reporting guidelines.

Conclusion: The implementation of reporting of PSIs in specialized units started to be reported around 2002, however, the frequency of yearly publications remains very low. Although some specialized units are still using multifaceted interventions and paper reporting systems in reporting Patient Safety Incidents, the implementation of electronic and computer-based reporting systems is gaining momentum. The effective implementation of an electronic-based reporting system should extend into other units beyond critical care units, as it increases the reporting of PSIs, reducing time to make an informed reporting of PSIs and immediate accessibility to information when needed for analysis. The evidence on the implementation of PSI reporting guidelines in SCUs comes from 5 different continents (Asia, Africa, Australia, Europe, and North America),however, the number identified for certain countries within each continent is very minimal.

Keywords:
Patient safety incidents; adverse events; harm; near misses; reporting guidelines; implementation guidelines; implementation practices; intervention strategies; critical care units; intensive care units

Background

Reducing the occurrence of Patient Safety Incidents (PSIs) in the healthcare system has become a global concern. According to the World Health Organisation (WHO) [1], the healthcare system

has still demonstrated unacceptably high rates of PSIs and preventable deaths [1]. Patient Safety remains crucial in the improvement of quality patient care and has been defined by WHO International Classification for Patient Safety (ICPS) as the reduction of the risk of unnecessary and avoidable harm associated with health care to an acceptable minimum [2, 3]. Specialized units (critical care and high care units) are no exception as critically ill patients tend to be more susceptible and exposed to a complex environment, therefore incurring high rates of preventable PSIs and death [4]. The SCU environment is different from the general wards as it is characterized by highly invasive and complicated procedures, that make the patients vulnerable and susceptible to PSIs, leading to prolonged length of stay in the hospital. Moreover, these critically ill patients have comorbidities that are life-threatening, leading to various complications that require immediate interventions. Near misses and PSIs require constant surveillance, to improve patient safety in acute and critical care units [5]. Near misses are incidents or situations that have the potential to cause harm but did not reach the patient due to timely intervention, whereas a PSI is harm caused by medical mismanagement, instead of the underlying disease [6]. PSIs contribute to the cost of care, adding to the burden of the patient and because of malpractice claims, causing mounting and spiraling costs to the healthcare system and for society at large [7].

Evidence revealed that in high-income countries, it was estimated that one in every 10 patients was harmed while receiving hospital care [8]. This harm might have further increased the length of hospitalization, and utilization of more healthcare resources, with cost implications. In low and middle-income countries (LMICs),134 million PSIs occurred in hospitals due to unsafe care, which resulted in 2.6 million deaths, each year (National Academies of Sciences and Medicine) [9]. A study done in the Eastern Mediterranean and Africa revealed that almost one-third of patients who suffered PSIs died and four out of five of those incidences were preventable [10]. In South Africa, a study conducted in KwaZulu-Natal revealed that PSIs were still high (47%), and were serious in nature, which might have suggested poor implementation of Patient Safety Incident Reporting and Learning (PSIRL) guidelines and a lack of improvement strategies [11, 12]. Therefore, mitigation of the occurrence of PSIs remains an important component in rendering quality patient care and improving clinical outcomes.

Implementation guidelines are critical in guiding the clinical practice and improvement of clinical outcomes. Rosa, Teixeira and Sjoding , affirmed that incorporating evidence into critical care practice is recognized as a crucial requirement for the optimal care of critically ill patients [13]. However, implementation of evidence-based practices is often insufficient, due to many barriers

resulting in frequently poor adherence to guideline recommendations in critical care settings [13,14,15]. In response to mitigate the occurrence of PSIs, a global effort was made by the WHO Members States to develop the implementation intervention strategies, relevant to their nations to create a safer environment in the healthcare system [10]. The World Alliance for Patient Safety first drafted the guidelines for adverse events report and learning system, which were updated and revised as WHO Guidelines for PSIRL Systems. In South Africa, it was recommendation by the NDoH, that every health establishment was expected to adhere to PSRIL system as stipulated in this Guideline [1]. A patient safety learning system (sometimes called a critical incident reporting system) refers to structured reporting, collation, and analysis of critical incidents [17]. Nevertheless, failure to reduce the PSIs occurrence might be related to the poor implementation of PSIRL guidelines which might have led to the negative clinical outcomes which made it difficult for the policy makers and healthcare professionals to handle PSIRL guidelines effectively. There is limited research on evidence that looks at the implementation of PSRL guidelines in specialized units at global level.

Aim and questions of the review

The aim of this review is to map the evidence of PSIRL guidelines implemented by health care professionals in specialized care units (SCUs), globally. The broad question of the review is: what evidence exist on the implementation of PSIRL guidelines by the healthcare professionals? What gaps in the implementation of PSIRL guidelines in SCUs?

Methodology

The Joanna Briggs Institute Scoping Review Methods (2020), scoping reviews as described in the 2020 JBI Manual for Evidence Synthesis [18] was used to map the available evidence on PSI Reporting and Learning guidelines implemented by healthcare professionals in SCUs. A scoping review protocol was developed and registered with the Open Science Framework (OSF) (https://osf.io/). The Preferred Reporting Items for Systematic Reviews (PRISMA) extended to scoping reviews (PRISMA-ScR): a checklist and explanation guided the reporting, to ensure the review conforms to the reporting standards of a scoping review [19].

Eligibility Criteria

The eligibility criteria were guided by the Population, Concept and Context (PCC) framework,

language, timeline and type of articles as illustrated in (Table 1).

Table 1: PCC, language and timeline to determine the eligibility

Variable	Inclusion Criteria	Exclusion criteria
Population	Heath care workers, Health Care Provider(s), Health care professionals, Health Personnel, Allied health care professionals, nurses, ICU nurses, intensive care nurses, critical care nurses, medical doctors	Healthcare professionals working in non-specialised units.
Concept	Implementation, Practices, Intervention strategies, Patient Safety Incident Reporting guidelines, Voluntary Patient Safety Event Reporting, Risk management, Reporting guidelines, Patient safety learning systems, Critical Incident reporting system, Adverse events; errors, critical incident, incident reports, Hospital risk reporting	Articles on implementation of patient safety reporting guidelines in medical, surgical, theatre and emergency departments were excluded.
Context	Specialized/Specialized care units, ICUs; critical care units; Coronary care unit/Renal units/Burns unit/High care units, Worldwide, Globally, African continent, European continent, Asian continent, American continent, Australasian continent, WHO regions, United Nations regions.	Studies written in non-English language and articles on implementation of PSIRL in medical, surgical, theatre and emergency departments were excluded.
Language	Article written in English language were published as from January, 2002	Articles written in non-English language
Timeline	From January 2002 to December 2023	December 2001 and backwards
Type of articles	Quantitative, Qualitative, Mixed methods, Review articles (systematic, meta-analysis, Integrative and scoping reviews), Reports, text and opinion papers, Grey literature sources (academic outputs in the form of theses and dissertations and ongoing research, Professional organisations such as WHO	Quantitative, Qualitative, Mixed methods, Review articles, Reports, text and opinion papers, Grey literature sources and professional organisations with no outcome of interest

Search terms

The following search terms and electronic databases were used to identify articles for the scoping review (Table 2).

Table 2: Search words

MeSh terms	Health care professional(s), health plan implementation, hospital risk reporting, globally
Search words	(Health care professionals) OR (Heath care workers or health

	Care Provider or health personnel) OR (Nurses or ICU nurses or intensive care nurses or critical care nurses) OR (medical doctors) AND Implementation or (practices or Intervention strategies) AND (Patient Safety Incident Reporting guidelines) OR (Voluntary Patient Safety Event Reporting or Risk management or Reporting guidelines or Patient safety learning systems or Critical Incident reporting system or Adverse events or errors or critical incident or incident reports or Hospital risk reporting) AND (Specialised/Specialized care units) OR (ICUs; critical care units or Coronary care unit or Renal units or Burns unit or High care units) AND (Worldwide) or (Globally) or (African continent or European continent or Asian continent or American continent or Australasian continent) OR (WHO regions) OR (United Nations regions)

Search strategy

This was secondary research where the authors were looking at electronic published health literature from different data bases on patient and safety incident reporting electronic systems within the specialised care units in a hospital setting. The researchers followed a three-step search strategy to find evidences related to implementation of PSIRL guidelines implemented by healthcare professionals in SCUs. The reviewers involved the research librarian in designing and refining the search. Firstly, two appropriate data bases namely MEDLINE (PubMed or Ovid) and CINAHL were searched. Thereafter, an analysis of the text words contained in the title and abstract of retrieved papers, and of the index terms used to describe the articles were followed. A second search was done using all identified keywords and index terms in all the remaining data bases namely PubMed, EBSCO Host, Web of Science, Scopus, African Journals online (AJOL) and Sabinet. A search for Grey literature was done to locate unpublished evidences, including academic outputs (theses and dissertations) and ongoing research. The authors search grey literature for completed unpublished academic outputs (theses and dissertations) for further evidence on Patient Safety Incident Reporting Guidelines Implemented by The Health Care Professionals in Specialized Care Units. This was done through searching the ProQuest Dissertation and Theses Global (PQDT), then search engines Google and Google Scholar. Professional organizations such as WHO were also searched. Lastly, the reference list of identified articles was searched for additional sources. A sample of a complete search strategy for at least one major data base is included an appendix to the protocol.

Source of evidence selection

The process of source selection was done in two stages. The first stage was based on title and abstract examination using the PCC inclusion criteria, thereafter, full-text examination followed as

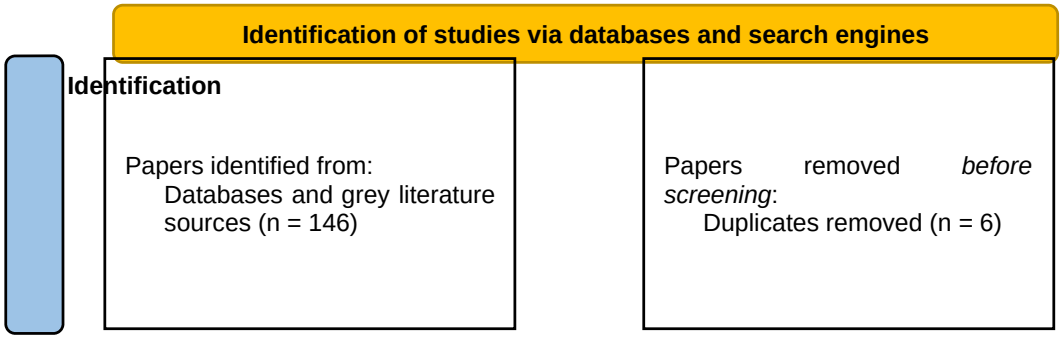
the second stage. All the stages of the review were done by two reviewers (TG & GC), independently and any disagreements solved by consensus. A flowchart of review process (from the PRISMA-ScR statement) detailing the flow from the search, through source selection, duplicates, full-text retrieval, and any additions from third search, data extraction and presentation of the evidence was availed. The Endnote and Ryann software were used for the management of the results of the search.

Data extraction process, presentation, and analysis

Data extraction and verification were done by two reviewers (TG & GC). A logical and descriptive summary of the results that aligns with the specific questions was presented in the form of charting table. The data included the following key information: authors, year of publication, country where the study was done, populations involved, study methods, guidelines or strategies implemented and outcomes. Analysis of evidence was done through frequency counts of concepts, population and context. A narrative summary was done to describe the existing evidence on the implementation of PSI Reporting and Learning guidelines by the healthcare professionals working in SCUs.

Results

The authors conducted secondary research where the electronic published health literature from different data bases on patient and safety incident reporting electronic systems within the SCUs were searched. According to Figure 1, a total of 146 articles were identified from the data bases and the search engine google scholar. Prior to selection process, 6 duplicates were removed to remain with 140 articles for abstract and title screening. After abstract and title screening, 96 articles were excluded based on the following reasons: wrong population (7); wrong concept (30), wrong context (59). This resulted in remaining with 44 articles for full text screening. Three full texts articles could not be retrieved hence excluded to remain with 41 full text articles for second level screening. Full text screening yielded in the exclusion of 28 articles based on the following reasons: Wrong population (n=2); Wrong concept (n=13); Wrong context (n=9); Unclear outcomes (n=4). As illustrated in Figure 1 below, 13 articles were found to be fitting the inclusion of this scoping review (19-31)



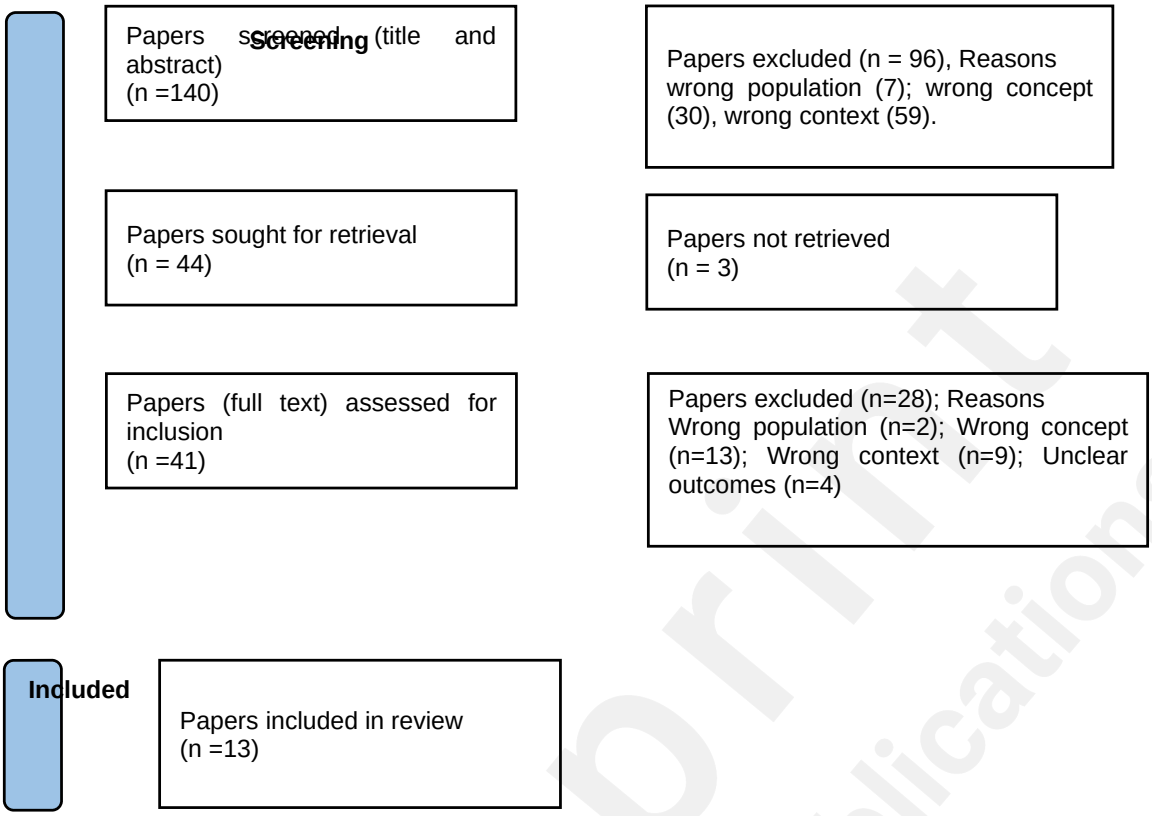


Fig 1: Implementation of PSI Reporting and Learning guidelines in specialized units' results presented in a PRISMA flow diagram

Publication trends, distribution, and characteristics

The articles utilized quantitative (n=11) and review (n=2) methodologies and one was not stated. The thirteen (13) selected articles (Table 3) were published in 2003 (n=1), 2007 (n=1), 2009 (n=1); 2010 (n=1); 2011 (n=1), 2012 (n=1), 2013 (n=1), 2014 (n=1), 2017 (n=2), 2018 (n=1), 2020 (n=1) and 2023 (n=1). The articles were identified from four different continents namely Asia (n=2), Africa (n=2), Australia (n=1), North America (n=1) and Europe (n=8). Most articles are coming from Netherlands and Switzerland (both with n=3), followed by South Africa (n=2). Others specific countries like Spain, Ireland, Jordan, Australia, North America, and Japan had only one article each.

Table 3: Author, year, country, Research design, Nature of PSI guidelines, Type of healthcare professional, Population recipient, The outcome of the implementation and Recommendations (n=13).

Author, year, country	Research design	Patient Safety Incident Reporting guideline				Recommendation
		Nature of PSI guidelines/strategy	Type of healthcare professional	Population recipient	The outcome of the Implementation	
African continent						
Kabane et al., 2013; South Africa	Interventional study	Computerized incident reporting system; Hospital	Healthcare workers	Patients	Increased reporting of incidents is significantly higher in the intervention compared to the control sites. The findings reported for improving the safety culture were largely positive, but only in selected areas. The researcher and the management of the Free State Department of Health are convinced that this model has reduced patient safety risks at its hospitals indeed.	The utilization of the patient safety risk reduction model should serve as a fundamental framework for enhancing patient safety and improving healthcare quality. This model can be effectively utilized by any province or country that is delivering healthcare in a setting with limited resources, with some necessary modifications.
Truter et al., 2017; South Africa	Prospective, quantitative design with a descriptive approach.	Medication error checklist	Neonatal intensive care unit (NICU) staff	Paediatric patients and staff	Higher incidences of medication errors were reported.	It is recommended to implement a formal system for documenting these errors, in addition to regular talks among the interdisciplinary team about preventive measures.
Asian Continent						
Kanda, 2011; Japan	Not clearly stated; Hospital	An online report input system	All healthcare professionals	Patients	307 and 789 cases were reported within 24 h and 48 h, respectively, indicating that the first report was input mostly without delay by the operational guidelines. Cases that took more than two weeks to be reported would likely have gone unreported had there not been a first report to indicate and confirm that an incident had even occurred.	It is necessary to include specific information about occurrences in this system using unrestricted text, which provides details that cannot be obtained using multiple-choice options like in typical reporting systems.

Author, year, country	Research design	Patient Safety Incident Reporting guideline				Recommendation
Mohamed et al., 2017; Jordan	Health Services Executive (HSE) change module; Health Services Executive (HSE) change module	Electronic safety program; Intensive care unit	ICU nursing staff	Adult Patients and staff	Implementing an electronic safety program within Health Services Executive (HSE) change module would protect patient safety and help healthcare providers to be aware of patients' conditions and quality of care.	It is crucial to use electronic safety measures in healthcare centers and hospitals to enhance the quality of patient service.
Australia Continent						
Fraenkel et al., 2003; Australia	Longitudinal observational study; adult general intensive care unit	Clinical information system to replace paper-based charts of patient observations, clinical records, results reporting, and drug prescribing	Nursing staff	Patients	A significant reduction in the rates of medication, intravenous therapy, and ventilator incidents. There was a trend toward a reduction in pressure sores. A positive perception of the clinical information system by nursing staff, with less time spent on documentation and more time in patient care. Nursing staff recruitment and retention improved after the clinical information system implementation.	The introduction of a comprehensive clinical information system resulted in significant enhancements in important quality measures, favorable perceptions among nursing staff, and certain positive effects on resources.
European continent						
Garcia, et al., 2020; Spain	Retrospective descriptive analysis; Intensive care unit	Critical patient Transport protocol And its application Through checklists	ICU Doctors; nurses; hospital Managers; representatives From the Quality Unit	ICU patients	The rate of safety-related incidents was less. Over time adherence to protocol compliance increased.	Implementing a critical patient transport policy and utilizing checklists can effectively decrease the occurrence of adverse events and non-damaging mishaps in these patients.
Snijders, et al., 2009; Netherlands	Descriptive survey; NICUs and one pediatric surgical ICU.	a specialty-based, voluntary, the nonpunitive incident reporting system	All ICU personnel	Patients	The number of self-reported incidents increased after the intervention. It was positively associated with a non-punitive response to error and negatively associated with overall perceptions of safety and hospital management support for patient safety.	The absence of punishment for mistakes, the support from hospital management for patient safety, and the general sense of safety are factors that determine the likelihood of incident reporting in the NICU.

Author, year, country	Research design	Patient Safety Incident Reporting guideline				Recommendation
Reinders et al, 2016(27, 31); Netherlands	Systematic review; Adult intensive care	ICU incident reporting systems	All ICU healthcare professionals	ICU patients	All the IRSs still need to fulfill the WHO checklist criteria. This resulted in an administrative report system rather than the much-desired instrument for practice change. increase of quality as an IRS can only effectively contribute to improving patient safety and quality of care if more attention is given to analyzing incidents and feedback	Healthcare organizations should prioritize the recruitment of skilled professionals who can effectively provide feedback on information and improvement measures, as well as assist in implementing and monitoring the impact of these efforts.
Pagnamenta et al. 2012 Southern Switzerland	Before-and after-study design. Self-reporting questionnaire and Risk index scores	Multifaceted paper reporting strategy	Health caregivers	Adult ICU patients	mean risk-index score for medication errors improved, as well as communication. No change for the airway and indwelling lines related AEs	Effective implementation of any risk assessment system requires educational interventions, protocol execution, thorough training, and the use of relevant examples to ensure maximum consistency in scoring.
Frey and Schwappach,2010 Switzerland	Review; Paediatric and adult critical care	Risk scoring of critical incident reports and root cause analysis	Paediatric and adult critical care staff	Patients and their families	Hard outcome criteria have shown no improvement in critical incident monitoring, e.g., standardized mortality ratio.	Integrating system modifications based on event reports and incorporating the knowledge and insights of patients and their families, can enhance patient outcomes.
Van der Veer et al. 2007, Netherlands	Implementation design	ICU Incident registry added to the existing registry	Nurses and physicians	ICU patients	The number of reported events was more than doubled	Further refinement and modifications are necessary.
Muhammed, 2014 (Dissertation) Ireland	Survey on Patient safety culture	Handoff communication process	ICU nurses	ICU patients	The project evaluation results showed a decline in the percentages of handoff related incidents and improved the nurses' satisfaction.	Similar improvement projects are expected to be conducted.
North America Continent						
Griffeth,et al.,2023 USA	a multifaceted intervention developed using quality improvement methodology	Study intervention involved creation of patient safety peer-leadership role, feedback process, interactive dashboards for patient safety data,	ICU staff	Patients	This multifaceted quality improvement intervention increased patient safety incident reporting in the ICUs. Intensive care unit patient safety incident reporting increased by	Increase in ratings of learning culture and support for staff underline the importance of a well-functioning patient safety incident reporting

Author, year, country	Research design	Patient Safety Incident Reporting guideline				Recommendation
		and education resources accessible via quick response codes.			48% after intervention Near misses were the most common incident report	system

Patient Safety Incident Reporting and Learning guidelines

The nature of implemented patient safety incident reporting and learning guidelines was computer online based (n=11) and paper-based incident reporting (n=2). The reporting system was for all the healthcare professionals within the SCUs with focus on patients, staff members and families. The outcomes of implemented incident reporting and learning guidelines were positive as evidenced by improved reporting of incidents including medication errors (n=9). The strategies implemented in these studies included electronic reporting, voluntary-nonpunitive reporting system, medication error checklist, ICU incident registry and a multifaceted intervention which involved creation of patient safety peer-leadership role, feedback process, interactive dashboards for patient safety data, and education resources accessible via quick response codes, improved the reporting of PSIs. Moreover, studies that revealed decreased rate of incidents and errors (n=2) executed various strategies, including clinical information system, Critical patient Transport protocol, Handoff communication process. Two studies did not show any change (n=2) in the implementation of the incidents reporting and learning guidelines (See Table 3).

Discussion

The review aimed at mapping the evidence of PSIRL guidelines implemented by healthcare professionals in SCUs, globally. The review was specifically focusing more on the SCUs, however, 4 articles, might be non-specialized ICUs , but they were standardized to be used across the hospital including the specialized units. The evidence on implementation of PSIRL guidelines in SCUs comes from 5 different continents (Asia, Africa, Australia, Europe, and North America), however, the number of identified countries within each continent is very minimal. Yet globally, there is higher percentage of PSIs in SCUs [12]. The implementation of reporting of PSIs in SCUs started to be reported around 2002, however the frequency of yearly publications remains very low. Whilst healthcare systems in developing and developed countries have implemented the patient safety reporting system, challenges still exist to reach full scale [33]. Incident reporting systems (IRS), as safety culture promoters serves as a starting point of the learning process to prevent the occurrence of the same incident in the future [34, 35]

Implementation of IRS for risk identification and organizational learning is one way of improving patient safety in healthcare including specialized settings [36]. The nature of implemented incident reporting guidelines identified in the review were computer based online reporting [20, 23, 24, 26, 27, 29, 31, 32], paper based incident reporting [21, 25, 28] and hand off communication [30].The use of electronic and computer-based reporting system is gaining momentum due to its effectiveness in increasing the reporting of PSIs events, reducing time to make an informed reporting of PSIs and immediate accessibility to information when needed for analysis [22, 29, 37]. Adopting the electronic safety program in specialised units like critical care units will enhance the quality of services that are provided for patients as indicated by Muhsein et al [23].

Paper based reporting system of PSIs has proved to be inefficient as fewer staff are willing to report the incidents [38]. However, some SCUs are still using multifaceted paper reporting system in reporting PSIs, errors related to medication and critical transportation of patients with positive results [21, 25, 28]. On the other hand, Fraenkel et al implemented a computerized clinical information system which replaced paper-based charts of patient observations, clinical records, results reporting, and drug prescribing which resulted in the reduction of the occurrence of PSIs, less documentation and more time spent on the patient [24]. According to Ramirez et al [39], the implementation of a hospital IRS including the systematization of the method and analysis of PSIs by workshop-trained result in reduction of the frequency of PSIs.

In some cases, reporting of PSIs and handling them at a unit level (SCUs) is not adequate in developing patient safety, hence the need to use multiple methods to strengthen the overall patient safety culture [31, 36]. Griffeth et al., involved creation of patient safety peer-leadership role, feedback process, interactive dashboards for patient safety data, and education resources accessible via quick response codes which resulted in patient safety incident reporting increased by 48% [31]. Van der Veer et al, utilized the concept of multiple methods where the ICU Incident registry was added into the existing registry, and this resulted in double the number of PSIs reported [29]. Additionally, Handoff communication process has proved to lower the numbers of the handoff related incidents and enhancing the satisfaction of nurses [30]. Whilst strong evidence of the current review has revealed the positive outcomes of implementing online or computer-based reporting system in SCUs such as critical care units, the systematic review done by Frey and Schwappach indicated no improvement in critical incident monitoring after the implementation [32]. Similarly,

use of the multifaceted paper reporting strategy highlighted no change for the PSIs related to airway and indwelling lines [28].

Strengths

Scoping reviews ensure high-quality articles are included for data extraction. Publications were emanating from different countries, worldwide, depicting comprehensive available information on the implementation of the reporting guidelines and strategies, which provided further recommendations. Evidence-based information from the results will be used by the policymakers to improve patient safety culture in SCUs.

Limitation

The review was limited to SCUs only, therefore, pertinent information from other units and other categories of healthcare professionals may have been disregarded. Also, only articles published in English were used, therefore excluding articles published in other languages, whose information may have had a valuable contribution. There is a paucity of literature on the implementation of PSI reporting and learning guidelines worldwide, therefore future research studies need to be conducted, especially in the African continent

Conclusion

The implementation of reporting of PSIs in specialized units started to be reported around 2002, however, the frequency of yearly publications remains very low. Although some specialized units are still using multifaceted interventions and paper reporting systems in reporting Patient Safety Incidents, the implementation of electronic and computer-based reporting systems is gaining momentum. The effective implementation of an electronic-based reporting system should extend into other units beyond critical care units, as it increases the reporting of PSIs, reducing time to make an informed reporting of PSIs and immediate accessibility to information when needed for analysis. The evidence on the implementation of PSI reporting guidelines in SCUs comes from 5 different continents (Asia, Africa, Australia, Europe, and North America),however, the number identified for certain countries within each continent is very minimal.

Acknowledgments

The authors would like to acknowledge the University of KwaZulu-Natal for supporting the publication of this paper.

Authors' Contributions

TMHG and GC contributed to the conceptualization of the scoping review, data extraction, analysis of results, drafting, editing of the manuscript and approved the final version. SWM contributed to the conceptualization, and editing of the manuscript and approved the final version of this results paper.

Funding. The study was funded by the University Capacity Development Programme and National Research Foundation Thuthuka funding.

Conflicts of Interests:

None

Abbreviations

PSIs: Patient Safety Incidents
SCUs: Specialised care units
WHO: World Health Organisation
MeSH: Medical Subject Headings
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

References

1. World Health Organization. National Guideline for Patient Safety Incident Reporting and Learning in the Public Health Sector of South Africa. World Health Organization. https://test.idealhealthfacility.org.za/App/Document/Download/53

2. Group WAFPSD, Sherman H, Castro G, Fletcher M, Hatlie M, Hibbert P, et al. Towards an International Classification for Patient Safety: the conceptual framework International journal for quality In health care. 2009;21(1):2-8. https://apps.who.int/iris/bitstream/handle/10665/70882/WHO_IER_PSP_2010.2_eng.

3. Runciman W, Hibbert P, Thomson R, Van Der Schaaf T, Sherman H, Lewalle P. Towards an International Classification for Patient Safety: key concepts and terms. International journal for quality in health care. 2009;21(1):18-26. PMID: 19147597

4. Ahmed AH, Thongprayoon C, Schenck LA, Malinchoc M, Konvalinová A, Keegan MT, et al., editors. Adverse in-hospital events are associated with increased in-hospital mortality and length of stay in patients with or at risk of acute respiratory distress syndrome. Mayo Clinic Proceedings; 2015; Elsevier, 321. https://doi.org 10.1016/j.mayocp.2014.12.015

5. Henneman EA, Gawlinski A, Giuliano KK. Surveillance: a strategy for improving patient safety in acute and critical care units. Critical Care Nurse. 2012;32(2):e9-e18. https://doi.org 10.4037/ccn2012166

6. Ochôa da Silva MV, Aquino Caregnato RC. Intensive care unit: safety and monitoring of adverse events. Journal of Nursing UFPE/Revista de Enfermagem UFPE. 2019;13. https://doi.org/10.5205/1981-8963.2019.239368

7. Oyebode F. Clinical errors and medical negligence. Medical Principles and Practice. 2013;22(4):323-33. PMID: 23343656

8. Slawomirski L, Auraaen A, Klazinga NS. The economics of patient safety: strengthening a value-based approach to reducing patient harm at national level. 2017. http://www.oecd.org/employment/

9. https://books.google.com/books?hl=en&lr=&id=bqjxUq0jAikC&oi=fnd&pg=PA108&dq=importance+of+Computer+based+online+reporting+systems+for+PSIs&ots=njl_A-ZSz1&sig=of9lVbih32SRgsFZ3RcajlzdklQ

10. World Health Organisation (WHO). Patient safety tool kit: World Health Organization. Regional Office for the Eastern Mediterranean; 2015. https://www.who.int/publications-detail-redirect/9789290220589

11. Gqaleni T, Mkhize S. Healthcare professionals' perception of knowledge and implementation of Patient Safety Incident Reporting and Learning guidelines in specialised care units, KwaZulu-Natal. Southern African Journal of Critical Care. 2023;39(1):25-9. https://doi.org/10.7196/SAJCC.2023.v39i1.559

12. Gqaleni TM, Bhengu BR. Analysis of Patient Safety Incident reporting system as an indicator of quality nursing in critical care units in KwaZulu-Natal, South Africa. Health SA Gesondheid. 2020;25(1):1-8. https://doi.org/10.4102/hsag.v25i0.1263

13. Rosa RG, Teixeira C, Sjoding M. Novel approaches to facilitate the implementation of guidelines in the ICU. Journal of Critical Care. 2020;60:1-5. https://doi.org/10.1016/j.jcrc.2020.07.014

14. Costa DK, White MR, Ginier E, Manojlovich M, Govindan S, Iwashyna TJ, Sales AE. Identifying barriers to delivering the awakening and breathing coordination, delirium, and early exercise/mobility bundle to minimize adverse outcomes for mechanically ventilated patients: a systematic review. Chest. 2017;152(2):304-11. https//doi.org 10.1016/j.chest.2017.03.054

15. Jeffs L, Hayes C, Smith O, Mamdani M, Nisenbaum R, Bell CM, et al. The effect of an organizational network for patient safety on safety event reporting. Evaluation & the Health Professions. 2014;37(3):366-78. https://doi.org 10.1177/0163278713491267

16. Weiss CH. Why do we fail to deliver evidence-based practice in critical care medicine? Current opinion in critical care. 2017;23(5):400-5. PMID: 28858917

17. Ontario HQ. Patient safety learning systems: a systematic review and qualitative synthesis. Ontario health technology assessment series. 2017;17(3):1. PMID: 28326148

18. Peters MD, Marnie C, Tricco AC, Pollock D, Munn Z, Alexander L, et al. Updated methodological guidance for the conduct of scoping reviews. JBI evidence synthesis. 2020;18(10):2119-26. https://doi.org 10.11124/JBIES-20-00167

19. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Annals of internal medicine. 2018;169(7):467-73. https://doi.org/10.7326/M18-0850

20. Kabane S. An evaluation of the effectiveness of a hospital clinical adverse event prevention programme: University of Pretoria; 2013. http://hdl.handle.net/2263/43364

21. Truter A, Schellack N, Meyer JC. Identifying medication errors in the neonatal intensive care unit and paediatric wards using a medication error checklist at a tertiary academic hospital in Gauteng, South Africa. South African Journal of Child Health. 2017;11(1):5-10. https://hdl.handle.net/10520/EJC-657567bbe

22. Kanda H. Development of an online incident-reporting system for management of medical risks at hospital. Yakugaku Zasshi. 2011;131(9):1353-9. https://doi.org/10.1248/yakushi.131.1353

23. Muhsein AS, Al-Slehat MA, Ghurra MFB, Al-Shnaaq AaA, Salman ZS, Saleh AM. The

Impact of Implementing Electronic Safety Program on Patient Safety in Intensive Care Unit, Istishari Hospital. The Journal of Middle East and North Africa Sciences. 2017;10(4077):1-6. DOI:10.12816/0034678

24. Fraenkel DJ, Cowie M, Daley P. Quality benefits of an intensive care clinical information system. Critical Care Medicine. 2003;31(1):120-5. DOI: 10.1097/01.CCM.0000045565.11622.C4

25. García PN, Avión RC, Ruiloba ML, Pérez JR, Dobarro AB, García AR. Retrospective study of security in the transfer of critical patients after application of methodology for risk management. Revista Española de Anestesiología y Reanimación (English Edition). 2020;67(3):119-29. https://doi.org/10.1016/j.redare.2019.10.006

26. Snijders C, Kollen BJ, van Lingen RA, Fetter WP, Molendijk H, Group NS. Which aspects of safety culture predict incident reporting behavior in neonatal intensive care units? A multilevel analysis. Critical care medicine. 2009;37(1):61-7. DOI: 10.1097/CCM.0b013e31819300e4

27. Brunsveld-Reinders AH, Arbous MS, De Vos R, De Jonge E. Incident and error reporting systems in intensive care: a systematic review of the literature. International Journal for Quality in Health Care. 2016;28(1):2-13. https://doi.org/10.1093/intqhc/mzv100

28. Pagnamenta A, Rabito G, Arosio A, Perren A, Malacrida R, Barazzoni F, Domenighetti G. Adverse event reporting in adult intensive care units and the impact of a multifaceted intervention on drug-related adverse events. Annals of intensive Care. 2012;2:1-10. DOI:10.1186/2110-5820-2-47

29. van der Veer S, Cornet R, de Jonge E. Design and implementation of an ICU incident registry. International journal of medical informatics. 2007;76(2-3):103-8. https://doi.org/10.1016/j.ijmedinf.2006.08.003

30. Ibrahim MA. Improving Nursing Handoff process in the Cardiovascular Intensive Care unit: Royal College of Surgeons in Ireland; 2014. https://dx.doi.org/10.25419/rcsi.10811981.v1

31. Griffeth EM, Gajic O, Schueler N, Todd A, Ramar K. Multifaceted Intervention to Improve Patient Safety Incident Reporting in Intensive Care Units. Journal of patient safety. 2023;19(7):422-8. https://doi.org/10.1097/pts.0000000000001151

32. Frey B, Schwappach D. Critical incident monitoring in paediatric and adult critical care: from reporting to improved patient outcomes? Current opinion in critical care. 2010;16(6):649-53. *DOI:* 10.1097/MCC.0b013e32834044d8

33. Koike D, Ito M, Horiguchi A, Yatsuya H, Ota A. Implementation strategies for the patient safety reporting system using Consolidated Framework for Implementation Research: a retrospective mixed-method analysis. BMC health services research. 2022;22(1):409. https://doi.org/10.1186/s12913-022-07822-9

34. de la Torre-Pérez L, Granés L, Marín AP, Bertran M. A hospital incident reporting system (2016–2019): Learning from notifier's perception on incidents' risk, severity and frequency of adverse events. Journal of Healthcare Quality Research. 2023;38(2):93-104. https://doi.org/10.1016/j.jhqr.2022.08.004

35. Harsul W, Irwan AM, Sjattar EL. The relationship between nurse self-efficacy and the culture of patient safety incident reporting in a district general hospital, Indonesia. Clinical Epidemiology and Global Health. 2020;8(2):477-81. https://doi.org/10.1016/j.cegh.2019.10.013

36. Sahlström M, Partanen P, Turunen H. Patient-reported experiences of patient safety incidents need to be utilized more systematically in promoting safe care. International Journal for Quality in Health Care. 2018;30(10):778-85. https://doi.org/10.1093/intqhc/mzy074

37. Giles S, Fletcher M, Baker M, Thomson R. Incident reporting and analysis. Patient safety: research into practice OUP. 2005:108-7. https://books.google.com/books?hl=en&lr=&id=bqjxUq0jAikC&oi=fnd&pg=PP1&dq=Patient+safety:+research+into+practice&ots=njl1A0TMGX&sig=zMA1U2O8TsDI1DbRAwYOkwqEsic

38. Gao X, Yan S, Wu W, Zhang R, Lu Y, Xiao S. Implications from China patient safety incidents reporting system. Therapeutics and clinical risk management. 2019:259-67. https://www.tandfonline.com/doi/abs/10.2147/TCRM.S190117

39. Ramírez E, Martín A, Villán Y, Lorente M, Ojeda J, Moro M, et al. Effectiveness and limitations of an incident-reporting system analyzed by local clinical safety leaders in a tertiary hospital: Prospective evaluation through real-time observations of patient safety incidents. Medicine. 2018;97(38):e12509.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6160204

Supplementary Files

Untitled.
URL: http://asset.jmir.pub/assets/32214195e26ea4a57a8930e2ee0ab024.docx

Untitled.
URL: http://asset.jmir.pub/assets/ff3e7d9f5aa22f6a366d9a1603f97c21.docx

Untitled.
URL: http://asset.jmir.pub/assets/badf9bccd96c09e6993e6ba8f25b245c.docx

Untitled.
URL: http://asset.jmir.pub/assets/bfa0d39b522ff950eb887f508f5e9ceb.docx

Untitled.
URL: http://asset.jmir.pub/assets/d67cbf0479834e0b765c7057c6c0c8c9.docx